DELHI PSYCHIATRY JOURNAL

(Official Publication of Delhi Psychiatric Society)

Vol. 26 No. 1 April, 2023

Delhi Psychiatry Journal is Published by **Dr. M.S. Bhatia** on behalf of **Delhi Psychiatric Society (Regd.),** University College of Medical Sciences & G.T.B. Hospital, Dilshad Garden, Delhi-110095 (India). **Layout Designing and Printing** by Rajan Nair, 5-C, Pocket B-7, Mayur Vihar Phase-III, Delhi-110096. **Correspondence to:** D-1, Naraina Vihar, New Delhi-110028 (India).

Delhi Psychiatric Society

www.delhipsychiatricsociety.com

Executive Council (2022-2023)

Office Bearers

President	:	Vishal Chhabra
Vice President	:	Pankaj Kumar
General Secretary	:	Manusree Gupta
Patron	:	Neena Bohra
Joint Secretary	:	Ashwani Kumar
Treasurer	:	Shruti Srivastava
Hon. Editor	:	M.S. Bhatia
Immediate Past President	:	Deepak Raheja

Executive Council Members

Nimesh Desai

Sandeep Vohra

Pankaj Verma

Paramjeet Singh

Anuneet Sabharwal

Editorial Office :
Department of Psychiatry,
University College of Medical Sciences
and Guru Teg Bahadur Hospital,
Dilshad Garden, Delhi-110095
Tel.: 22586262 Extn. 2127 Fax : 0091-11-22590495
E-mail : manbhatia1@rediffmail.com
: dps_journal@yahoo.co.in

Nervisoft®
Methylcobalamin 1500mcg,
Alpha Lipoic Acid 100mg,
Folic Acid 1.5mg, Pyridoxine
3mg & Thiamin 10mg Tablets

Qucirol-CM®
Calcium Citrate Malate 500mg,
Calcitriol 0.25mcg, Zinc 7.5mg,
& Magnesium 50mg Softgel Capsules

Depseal™-20/30
Duloxetine 20/30mg. Tablets

Qucirol-5G®
Omega-3+ Ginseng+Ginkgo Biloba+Antioxi+Vit-C
+Zinc+FA+LAB+B12+D3+Biotin+VIT.k+Mins. Softgel Cap

Lozicalm™-1/2
Lorazepam 1/2mg Tablets

Trinidyl-2™
THP 2mg Tablets

Mazita™-15/30
Mirtazepine 15/30mg Tablets

Aripset™-5/10/20
Aripiprazole 5/10/15/20mg Tablets

Clonatop™-0.25/0.5/1/2MD
Clonazepam 0.25/0.5/1/2mg Tablets

Migrapose™-5/10
Flunarizine 5/10mg Tablets

Estapose™-5/10/20
Escitalopram 5/10/20mg Tablets

Trizonia™-5/10/Plus
Trifluoperazine-5/10mg (5+THP-2mg) Tablets

Seizorest™-5/10/20
Clobazam 5/10/20mg Tablets

Respain SP™
Aceclofenac-100mg+Paracetamol-
325mg+Serratiopeptidase-15mg Tablets

Puretam™-400/800/1200
Piracetam 400/800/1200mg Tablets

Triptomite™-10/25
Amitriptyline-10/25mg Tablets

Gerdofix™-40/DSR
Pantoprazole-40/40mg+Domperidone-30mg

Thiafort™-100
Thiamine 100mg Tablets

Qucirol®-XT
Ferrous Ascorbate+FA+Zinc Sulphate Tablets

Zeenite™-5/10
Zolpidem 5/10 mg Tablets

Prelodrin™-5
Procyclidine 5mg Tablets

Cycozyme™-Syp.
Cyproheptadine + Tricholine + Sorbitol (Sugar Free)

Olantic™-5/10 MD
Olanzapine 5/10mg Tablets

Malopride™-50/100/200
Amisulpride 50/100/200 Mg Tablets

Ringtovit™-Syp
Protein + Antioxidants + Multi-Vit & Minerals

xetdep™CR-12.5/25
Paroxetine 12.5/25mg Tablets

Etizite™-0.25/0.5
Etizolam 0.25/0.5 mg Tablets

Enadol™-5/10
Haloperidol 5/10mg Tablets

Estapose Plus™
Escitalopram-10mg+Clonazepam-0.5mg Tablets

Xingcold™-DP
Paracetamol-325mg+Phenylephrine HCL-5mg
+Caffeine-30mg+Diphenhydramine HCL-25mg
Tablets

Faitheal Biotech®
(Div. of Ivy Healthcare)
B-21, Som Datt Chambers-II, 9 Bhikaji Cama Place,
New Delhi-110066 Customer Care No. +91 9650156887
Email: faithealbiotech@yahoo.com
"A WHO-GMP Certified Company"

Contents

Editorial

- Pica: Nosologically difficult entity 5
  Aparna Goyal, M.S. Bhatia

Review Articles

- Anorexia Nervosa: Revisited 8
  Jagawat Tushar, Priyanka Bharadwaj, Ritu Meena, Pankaj Tandon, Savita Jagawat
- Opioid Substitution Therapy (OST) in India: Benefits and Controversies 13
  Geeteshwar Dewan, Ajeet Sidana

Original Articles

- *Dr. Saadgi Jagawat Award Paper* 20
  Cognitive Impairment in Individuals with Alcohol use Disorder
  Sanjana Mathur, Mina Chandra Anushrut Misra
- Relationship of rumination, mindfulness and emotion regulation in depression 27
  Aarzoo Gupta
- Demographic variables and Psychiatric Comorbidity of People with Intellectual Disability 35
  Rachna Kapoor, Mir Shahid Ali
- Gender, Institutionalization and Mental Health: an original study from Kashmir valley 50
  Sanna Khalid, Mahmood S. Khan
- Efficacy of cognitive training for children diagnosed with ADHD using Captain's Log 60
  Deepak Gupta, Nabanita Sengupta, Eti Goel
- A cross-sectional study to assess levels of anxiety, depression, insomnia, and stress in front-line health care workers rendering duties at a level-3 COVID-19 Care Centre 67
  Arnav, Tarun Yadav, Seema Singh, Akul Gupta
- Association of Socio-Demographic Variables with Stress and Marital Life in Spouses of Patients with Schizophrenia 75
  Akul Gupta, Prerana Gupta, Tarun Yadav, Prashant Singh, Abhilakshya Jyoti
- Psychiatric Morbidities in HIV Positive Patients on Anti-Retroviral Therapy 81
  Anuj Mittal, Prema Sharma, Varun Kalakoti
- Social Skills and Self Esteem in Adults with Psychogenic Non-Epileptic Seizures 90
  Garima, Vibha Sharma, Aldrin Anthony
- A study of Socio-demographic and Clinical Profile in Female patients with Dissociative (Conversion) Disorder 94
  Neelu Yadav, Bajrang Lal, Tushar Jagawat, Vikas Gaur, Pankaj Tandon, Ritu Meena, Savita Jagawat, Hemant Chhabra

Psychomicrobiology

Mucormycosis: The Psychological impacts 101
N Ilanchezhiyan, Shalini Malhotra, Nirmaljit Kaur, MS Bhatia, S Patil, P Kumar, A Malhotra

Psychophysiotherapy

Posttraumatic Stress Disorder (PTSD): A Psychophysiotherapeutic Approach 114
Jaswinder Kaur, Megha Masaun, Mansi Gupta, M.S. Bhatia

Drug Review

Minocycline in the Treatment of Major Depressive Disorder: A Review 119
Ayush Goel, Rachna Gupta, M.S. Bhatia

Forensic Psychatry

The Protection of Children from Sexual Offences Act, 2012 (POCSO) 124

Case Reports

- The dynamics between corticosteroids and antipsychotics in a patient with mesangioproliferative glomerulonephritis – A case report 138
  Gauri Gupta, Poonam Bharti, Sana Bano Usmani

- An unusual presentation: Paranoid Schizophrenia with Anorexic Symptoms in a female patient 140
  Tushar Jagawat, Priyanka Bhardwaj, Ritu Meena, Pankaj Tandon, Savita Jagawat, Yashika Gupta

Book Review 142

Forthcoming Events 143

Interesting Articles 144

Delhi Psychiatric Society Annual Awards 146
Rules & Regulations

Instructions to Authors 148

Editorial

Pica: Nosologically difficult entity!

Aparna Goyal[1], M.S. Bhatia[2]
Department of Psychiatry, [1]IHBAS and [2]UCMS & GTB Hospital, Dilshad Garden, Delhi-110095

Term "Pica" is derived from Latin for a bird Eurasian magpie identified for its intelligence and unconventional appetite. Pica is otherwise diagnosed as an eating disorder characterized by persistent ingestion of non-nutritive non-edible substances which do not amount to food over a period of one month not in keeping with sociocultural and development background. It is also sometimes referred as persistent, compulsive urge or craving to eat substances that are normally considered inedible. As per International Classification of Diseases version 10, Pica disorder was categorized for children and adults separately; however in the 11th version of the International Classification of Diseases (ICD-11), pica is left with only one code for the disorder and no longer distinguishes between pica in adults and children, although the diagnostic criteria remain the same in any age group.[1] Geophagia ("consumption of earth/ dirt/ soil"), amylophagia ("consumption of raw starches"), and pagophagia ("consumption of large quantities of ice") are the most common types of pica observed. Other includes hair, laundry detergents and paper, rock, chalk, grass, cigarette butts, dirt, pencil lead, ash etc. The prevalence of pica is not clear and varies from 10% to as high as fifty percent depending upon the age, social cultural factors and medical condition like pregnancy. It is identified more as a behavior than as a disease or disorder and is usually under reported and ignored until specifically pursued.

Studies have reported that pica is commonly seen in children with autism, mental retardation, pregnant women and those with mental health disorders like schizophrenia, obsessive-compulsive disorder, depression though that is not a rule and can occur in other population too. It has been postulated that pica occurs due to deficiency of iron, trace element deficiency like zinc etc and nutrients (niacin, thiamine, vit B & C) as supplement of these nutrients reduces the intake. Organic, psychodynamic, socioeconomic, developmental and cultural factors play a role in etiology of Pica. Decreased dopamine levels, psychodynamic states, iron deficiency and their interconnections are associated with pica. Other theories like nutritional theory where appetite-regulating brain enzymes can trigger specific cravings and physiological theory where pica relieve nausea, control diarrhea, increase salivation, remove toxins and alter odor or taste perception during pregnancy.[2] Pica can have life threatening complications and once suspected it is important to remove ingested substances quickly in order to avoid serious life-threatening complications. Clay and soil consumption can cause massive hepatosplenomegaly, poor wound-healing and a bleeding diathesis. Other complications of pica are malnutrition, intestinal obstruction, intestinal infections or parasites from soil, anemia, mercury poisoning, liver and kidney damage, constipation and abdominal problems, metabolic alkalosis.

Dilemmas in nosology

Due to multiple unclear possible causes in etiological basis it is more difficult to categorize it. It has been documented in ICD and DSM but reports of possibility of its origins in culture cannot be ignored also. It has also been described as impulse, an uncontrollable urge or craving making one wonder if consideration into impulse control or addiction should be even considered. Choudhary and Basu had put forward a notion of possibility of impulsive pica, a variant mimicking impulse control disorders.[3] Similarly, Rose et al suggested similarities in Pica with obsessive-compulsive disorder.[4] This was even

strengthened by positing that treatment of these disorders that is SSRIs[5] and habit reversal have been found useful in reversing pica. Even craving for inedible substance as seen in pica can have phenomenological overlap with those with addiction and there are case reports where pica has been found to co-occur in those with substance addiction like volatile solvents.[6]

Culturally bound or not

Pica is recognized as culturally not-sanctioned however, literature has reported its presence in many cultures making one wonder about its entity as culture bound syndrome. One of very common examples have been found in Indian sub-population. India is a country of wide diversity and multicultural, it has been observed that it is believed in North India that cravings for ash and dust by a pregnant woman predicts the sex of the child as girl and boy respectively. Non food substances have been considered to have spiritual health as it's a common belief that our souls are linked to earth.[7] In a study in rural south India, although pica is culturally taboo to some degree, it is not viewed as a disorder or illness. Also that different items are linked to different individual and acceptability towards the non-food substance. For example, raw rice was most commonly associated with mothers, mothers-in-law, and sisters, chalk with babies but no one else. Grandmothers were only associated with ash consumption, and children were associated with mud consumption. Pregnant women's sons were more likely to consume mud, unripe tamarind (pooli), and unripe mango (manga).[8]

Geophagy in pregnancy is a universal dynamic habit, the highest prevalence has been reported in African countries such as Kenya, Ghana, Rwanda, Nigeria, Tanzania, and South Africa.[9] Geophagy i.e. consumption of soil during pregnancy has been considered very sacred among the Chagga population of Tanzania. Geophagy was more of a women secret and considered as strong relations to fertility and reproduction. Infact, they even have it from specific places with preference to dry or wet soil and special preparation. Such cultural practices if not followed are seen in negative regard.[10] Among the Luo in Kenya, women and children are expected to consume soil as part of ascribed gender norms. For pregnant women, red soil "adds to the blood" and therefore ensures a healthy pregnancy outcome; however, it is shameful for men to engage in earth consumption and if married Luo men are caught eating earth they are described as soft and lose authority over their children by others. Even in Kenya around the coast and island communities of Lake Victoria it is concluded that the practice of geophagy was strongly connected to fertility, healthy blood during reproduction.[11] Most of the areas like The Black Christ Cult in Esquipulas, Guatemala, Haiti and The Igbo women of West Africa, geophagy and pica were considered beneficial during pregnancy and is considered normal.

In a study by Grigsby et al, it was reported that kaolin or white clay reported is a relatively common type of pica found in central Georgia Piedmont area. It was also concluded by the authors that this is more in the lines of culture bound syndrome rather than contributed by any other psychopathology.[12] Simpson reported ingestion of magnesium carbonate during pregnancy in certain regions of United States and Mexico helped in probably acting as an antacid and there was belief that chalk is healthy for the unborn baby.[13] The perceived benefits of pica were also physiological, including satisfying the cravings of the baby, thereby preventing birthmarks or fetal loss, as well as providing micronutrients in which the mother might be deficient. The risks associated with pica were also health related: they could damage the health of the consumer, e.g. through helminthic infections or toxic pesticides. In short, participants thought that not fulfilling a pica craving was harmful, but that if consumed, the pica substances themselves could be detrimental to health.[14] One study in Iran found that women's strong cravings for soil needed to be alleviated in order to reduce the likelihood that the infant would be born with green eyes indicating the inborn cultural beliefs in any region contributing to pica. Studies have reported that at times despite a long period of residence in France, geophagy was still a current practice among 10.9% of Sub-Saharan, South American and Caribbean travellers, who are poorly informed of its harmful effects.[15]

Conclusion

Pica is consumption of non-nutritive non-edible food items which can have harmful consequences ranging from malnutrition to intestinal obstruction

and heavy metal poisoning. It is also difficult to categorize pica into a particular nosology be it impulse control or eating disorder or culture bound syndrome. Studies have reflected individually over these but none in composite and it is needed to look for a comprehensive approach encompassing all these parameters based on evidence.

References

1. Lesinskienë S, Stonkutë G, Đambaras R. Pica in childhood: Prevalence and developmental comorbidity. Front Child Adoles Psychiatr 2023; 2 : 1099527.
2. Advani S, Kochhar G, Chachra S, Dhawan P. Eating everything except food (PICA): A rare case report and review. J Int Soc Prev Community Dent 2014; 4(1) : 1–4. doi: 10.4103/2231-0762.127851. PMID: 24818086; PMCID: PMC4015153.
3. Chowdhury AN, Basu S. 'Impulsive pica': a new diagnostic category? Indian J Psychiatry 2002; 44(4) : 372-4. PMID: 21206603; PMCID: PMC2955310.
4. Rose EA, Porcerelli JH, Neale AV. Pica: common but commonly missed. J Am Board Fam Pract 2000; 13(5) : 353-8.
5. Bhatia MS, Gupta R. Pica responding to SSRI: An OCD spectrum disorder. World J Biol Psychiatry 2009; 10 : 936-8.
6. Stein DJ, Bouwer C, Van Heerden B. Pica and the obsessive-compulsive spectrum disorders. S Afr Med J 1996; 86 (12 Suppl); 1586–88;1591–2.
7. Bhatia MS, Kaur J. Pica as a culture bound syndrome. Delhi Psychiatry Journal 2014; 17(1) : 144–7.
8. Placek CD. Ethnomedical and sociocultural factors of pica substances in rural South India. Ecol Food Nutr 2017; 56(3) : 238-55.
9. Kambunga SN, Candeias C, Hasheela I, Mouri H. Review of the nature of some geophagic materials and their potential health effects on pregnant women: some examples from Africa. Environ Geochem Health 2019; 41(6) : 2949–2975. doi: 10.1007/s10653-019-00288-5. Epub 2019 Apr 11. PMID: 30977022.
10. Knudsen JW. Kula Udongo (earth eating habits): A social and cultural practice among Chagga Women on the slopes of Mount Kilimanjaro. Indilinga: Afr J Indigenous Knowledge Syst (IAJIKS) 2002; 1(1) : 19–25.
11. Chung EO, Mattah B, Hickey MD, et al. Characteristics of Pica Behavior among Mothers around Lake Victoria, Kenya: A Cross-Sectional Study. Int J Environ Res Public Health 2019; 16(14) : 2510. doi: 10.3390/ijerph16142510. PMID: 31337101; PMCID: PMC6679355.
12. Warner-Robins G, Johnston GA, Macon G. Chalk Eating in Middle Georgia: A Culture-Bound syndrome of Pica. South Med J 1999; 92(2) : 190-192.
13. Simpson E, Mull JD, Longley E, East J. Pica during pregnancy in low-income women born in Mexico. West J Med 2000; 173(1) : 20.
14. Lin JW, Temple L, Trujillo C, et al. Pica during pregnancy among Mexican-born women: a formative study. Matern Child Nutr 2015; 11(4) : 550-8. doi: 10.1111/mcn.12120. Epub 2014 May 1. PMID: 24784797; PMCID: PMC 4216644.
15. Decaudin P, Kanagaratnam L, Kmiec I, et al. Prevalence of geophagy and knowledge about its health effects among native Sub-Saharan Africa, Caribbean and South America healthy adults living in France. Eat Weight Disord 2020; 25(2) : 465–469. doi: 10.1007/s40519-018-0624-9. Epub 2018 Dec 13. PMID: 30547293.

Review Article

Anorexia Nervosa: Revisited

Tushar Jagawat, Priyanka Bharadwaj, Ritu Meena, Pankaj Tandon, Savita Jagawat, Alankrita
Departments of Psychiatry and Clinical Psychology, National Institute of Medical Science and Research, Jaipur, Rajasthan
Contact: Alankrita, E-mail: alankritasingh21@gmail.com

Introduction

Anorexia nervosa is an eating disorder defined by ICD10/11 and DSM5, recognized as one of the most serious chronic mental illnesses with severe physical and psychological consequences[1].It disrupts both cognitive and emotional functions.[2]

It is a disorder with high rate of mortality and relatively low rate of remission.[3] It has highest mortality among all the mental disorder.[2] It was termed as Le Anorexia Hysterique by Dr. Charles Laseque. It was characterized and coined by Sir William Gull in 19th century but it was reported in India only in late 20th century and still has impacted the economy with loss of more than $15 billion in 2012, only.[4] It was thought of as an illness of Western countries but as multiple case reports and studies showing increase in prevalence in India over past years. The oldest mention is of holy men in 4th century practicing intense fasting. Similarly in 14th and 15th century holy anorexia is mentioned for women doing prolong and severe fasting and were later termed as catholic saints.

Uniquely, it has a particular risk at adolescent girls and young adult women with peak age of onset between 13 to 18 years.[2,5] It's more in women than in men and has occurrence 10 times more.

Lifetime prevalence of anorexia nervosa has increased by 0.1% to 0.3% in men.[6] Over all lifetime prevalence being 0.5% to 2%.[5]

The disorder causes serious affect in multiple systems of body. Affecting gastrointestinal system, cardiovascular system and endocrine system most specifically. Menstrual abnormalities being most common in females and was a diagnostic feature in ICD 10 but has been removed from ICD 11 as multiple cases of anorexia nervosa were seen in females with menstruation being intact.

Anorexia nervosa patients seen to have psychiatric co-morbidities of OCD, OCPD and anxiety disorder. They show personality traits of perfectionism, rigidity, higher impulse control and emotional restraint.[1] Recovery of patient depends on treatment taken, duration of illness, body weight during discharge from IPD treatment etc. Cognitive behavioural therapy plays important role in treatment with a newer E-CBT specifically interpersonal therapy.[7]

Adolescents, who are suffering from anorexia nervosa, have a higher rate of full recovery in comparison with adult, with mean mortality 2% versus 5% in adults.[2]

Diagnostic Criteria

ICD 10: F50.0[8]

Body weight maintained at least 15% below expected or quetelet's BMI < 17.5 with failure to gain weight in prepubertal patients.

Self-induced weight vomiting, purging, excessive exercise, use of appetite suppressants and diuretics.

Body image distortions with fatness as intrusive and overvalued ideas.

HPG axis dysregulation

Prepubertal onset has arrest or delay. Late menarche on recovery.

ICD 11: 6B80[9]

LBW for height, age, developmental stage or weight history. BMI <18.5 kg per meter square in adults and BMI for age <5th percentile in children and adolescents. Rapid wight loss >20% of total body weight in 6 months and failure to growth according to individual's developmental trajectory.

LBW not due to any medical condition or unavailability of food.

Persistent pattern of restrictive eating or other behaviour aimed at establishing or maintaining abnormal LBW associated with extreme fear of weight gain. Increasing energy expenditure by motor hyperactivity, deliberate exposure to cod and use of medication that would increase energy expenditure.

Excessive preoccupation with body weight and shape. LBW is overvalued and central to person's self-evaluation and same is inaccurately perceived as normal or excessive.

DSM – 5[10]

It doesn't have any specification for weight loss or BMI. But it does emphasis on the intense fear present for weight gain.

Epidemiology

Women have higher risk especially in age group 15 to 19 year with lifetime prevalence of 2% to 4%. Much more in western countries than in non-western countries initially but since 20th century it has increased much more in non-western countries, one of which being India.

Lifetime prevalence of men has increased from 0.1% to 0.3[6]. Mortality risk is 6 times more than from general population with 1 in 5 from suicide.

Genetic Factors

Anorexia nervosa is familial with hereditability estimate ranging from 0.41 to 0.74. 13 , it reflects a predisposition genetically.

According to a genetic study chromosome 1 has been identified on loci rs10747478 with the nearest coding gene being PTBP2, polypyrimidine tract binding protein. It is associated with both anorexia nervosa and body weight. It has larger effect on body weight regulation in males than in females.[11]

Biological Factors

The increased chances of a person having anorexia nervosa increases 11 times more with having 1st degree relatives diagnosed with it. It's seen in siblings, especially in twins of monozygotic than in dizygotic. The medical causes predisposing are HPA dysfunction, obstetric complications, premature birth and feeding complication.[12]

Developmental Factors

During the course of growing, especially in pre-adolescents and adolescents, the change in body shape and weight becomes a major stressor in some children earlier puberty than peers also make children more predisposed.

Multiple factors trigger anorexia nervosa in this age group such as body dissatisfaction specifically in children with increased body weight. Bullying or teasing related to weight causes low self-esteem which are both a triggering factor too.

Psychological Factors

In people with anorexia nervosa, some common personality traits observed are high level of perfectionism, self-discipline, harm avoidance, neuroticism, negative affectivity, reward dependence and self-criticism.[3]Obessionality being a premorbid personality trait which predisposes OCPD to eating disorder more towards anorexia nervosa[11].A significant coping style known as rumination has been observed in these patients.[13] It is a type of avoidant coping strategy.

Sociocultural Factors

How a person perceives their body weight and shape depends heavily on the sociocultural background one comes from. Peer influence and body image also has a significant association. Parental approval of body image also affects as significantl.[14]

Patients in occupation with emphasis on weight such as ballet, gymnastics, wrestling, light weight rowing etc have shown to have a predisposition towards anorexia nervosa.

Assessment

There has been no specific scale effective for anorexia nervosa. The most recent one used for diagnosing eating disorder consisting of anorexia nervosa with binge eating and bulimia nervosa is EDDS (Eating Disorder Diagnostic Scale, Stice et al).[15] It's a self-report consisting of 22 item questionnaires with 1st 4 questions about assessing attitudinal symptoms in past 3 months. Next 4 focus on the number of days per week over past 6 months and number of times per week over the last 3 months and the next 4 being about frequency of compensatory behaviour. The cut off score of 16.5 accurately distinguishing clinical patients from healthy controls.[16]

There have been many other sales used such as

Eating Disorder Examination (EDE), Yale-Brown-Cornell Eating Disorder Scale (YBC-EDS), Diagnostic Survey for Eating Disorder (DSED), Eating Attitude Test (EAT), Eating Disorder Examination Questionnaire (EDE-Q), Eating Disorder Inventory-2 (EDI-2) etc.[17]

Clinical Features

Physical Changes

The general appearance of a person changes due the weight loss is the first and most apparent. Low weight, loss of body fat and muscular atrophy seen in moderate to severe stages. Patient suffers from hypothermia due to excessive loss in body fat and muscular atrophy and shows peripheral oedema. There occurs growth of fine hair on body called lanugo but loss of hair from head. The skin also shows carotenemia; orangish discoloration. The gastrointestinal system shows delayed gastric emptying and latter process to constipation. Endocrinal changes in females seen are amenorrhea and loss of libido in males.

Investigational Changes

Patient shows hypotension and bradycardia and upon ECG it shows prolonged QTc. Deranged electrolyte balance with hypokalaemia, hyponatremia, hypochloraemia, hypoglycaemia and hypercholesterolemia. There is also elevated liver enzyme. There is also decreased bone marrow density further resulting in osteogenesis. In females there is low LH, FSH and estrogen and low testosterone in males. There have also been dysfunctional thyroid levels of low TSH, T4 and T3 with elevated reversible T3(rT3). The free T3 and T4 levels are in normal range.

The MRI brain shows changes in total brain volume with increase in ventricular size.

Differential Diagnosis

The most confused with disorder is bulimia nervosa as the subtype of anorexia nervosa has binge eating pattern. It's differentiated by the body weight, which is severely low in anorexia and not so in bulimia. After recovery in anorexia nervosa, a lot of patients still have binging and purging pattern intact and is diagnosed as bulimia if this pattern is intact with normal body weight for 1 year.

The diagnostic requirement that distinguishes from avoidant-restrictive food intake disorder is the lack of excessive preoccupation with body weight and shape that is overvalued and central to person's self-evaluation.

The intensity of preoccupation with food, weight or shape is nearly of delusional level but is distinguished from schizophrenia or other primary psychotic disorder by being specific to these 3 aspects and associated with purging and low body weight too.On the same criteria that obsession is specific to food, calorie, shape and weight then it's not diagnosed as OCD.

Body dysmorphic disorder is also common differentiating diagnosis. Mainly differentiated as having normal body part, weight or appearance but thinking that it's normal in body dysmorphic disorder whereas in anorexia nervosa it's the abnormal weight and changes shape being perceived as normal or excessive.

Treatment

Psychotherapy

Cognitive behavioural therapy is widely accepted for eating disorder specifically in bulimia nervosa and binge eating and had little evidence towards anorexia nervosa. Recent papers on an Enhanced-cognitive behavioural therapy (E-CBT) have shed light on its impact on these patients. As it aims specifically towards psychological and behavioural aspects underlying eating disorders. The intense desire of being thin and unacceptance of body shape being a cognitive dysfunction is aimed in these sessions.[18]

Interpersonal psychotherapy has also shown to help. It works on 4 problem areas in patients, being: grief, role transition, interpersonal role dispute and interpersonal deficit.[19]

A family-based therapy intervention is mostly needed in families with dysfunctional structure. It's observed that motivation and acceptance of body weight and shape by family members helps the person in further accepting on by self.[18]

Refeeding Programme

The primary concern in a patient of AN is to bring back to normal BMI values. There should be transient increase in weight as sudden increase would lead to refeeding syndrome, which occur due to a pre-existing electrolyte dysfunction. A new rapid

refeeding has been shown to benefit patient with a shorter stay in hospital by 21 days and the electrolyte imbalance was easily manageable by ORS supplements. The patient gain 0.21 kg/week compared to the old referring protocol. Resulting in lesser economical burden and exposure to hospital acquired infections.[20]

The weight gain is different on OPD and IPD basis, 2-3lb/week and 0.5-1lb/week respectively.

The calorie count is maintained 30-40kcal/kg i.e., 1000-1600 kcal/day and can be increased unto 70-100 kcal/kg. After adequate weight is achieved, maintaining it also a goal in AN patient as they tend to go back the eating pattern. 200-400 more calories than required for age, sex, weight and height.[21,22]

Psychopharmacology

No specific drug has role in the prognosis of AN. It's only useful for behavioural changes presents with it. SSRI - Citalopram 20mg/kg has shown to have modest effect on impulsivity, anger and OC symptoms in long term.

Low dose antipsychotics have also shown similar effect, low dose second generation e.g., olanzapine 5mg/day and quetiapine in 100-400mg/day. Antiepileptics are also used to treat mood changes and seizures. They also help in gaining weight similar to olanzapine e.g., carbamazepine and sodium valproate. Small change is also seen with supplemental addition of 14mg/day of zinc, it helps in increase in BMI than placebo.[22,17]

References

1. Young S, Rhodes P, Touyz S, Hay P. The relationship between obsessive-compulsive personality disorder traits, obsessive-compulsive disorder and excessive exercise in patients with anorexia nervosa: a systematic review. J Eating Disord 2013; 1(1) : 1-3.
2. Alwithy AK. Review article on Anorexia Nervosa. Int J Sci Engineer Res 2017; 8(1) : 749-755.
3. Puckett L, Grayeb D, Khatri V, Cass K, Mehler P. A comprehensive review of complications and new findings associated with anorexia nervosa. J Clin Med 2021; 10(12) : 2555.
4. Vaidyanathan S, Kuppili PP, Menon V. Eating disorders: An overview of Indian research. Indian J Psychol Med 2019; 41(4) : 311-7.
5. Sravanti L, Velusamy AJ, Karki U, Kommu JV, Girimaji SC. Clinical profile of children and adolescents diagnosed with anorexia nervosa in Indian context. Asian J Psychiatr 2022; 71 : 103077.
6. van Eeden AE, van Hoeken D, Hoek HW. Incidence, prevalence and mortality of anorexia nervosa and bulimia nervosa. Curr Opin Psychiatry 2021; 34(6) : 515–524.
7. Karam AM, Fitzsimmons-Craft EE, Tanofsky-Kraff M, Wilfley DE. Interpersonal psychotherapy and the treatment of eating disorders. Psychiatr Clin 2019; 42(2) : 205-18.
8. World Health Organization. ICD-10 : International Classification of Diseases and related Health Problems : Tenth revision, 2nd ed. Geneva: World Health Organization 2004.
9. World Health Organization. International Classification of Diseases, Eleventh Revision (ICD-11). Geneva: WHO, 2019/2021.
10. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders: DSM-5. 5th ed. Washington DC: American Psychiatric Association, 2013. DSM-V, doi-org.db29.linccweb.org/10.1176/ appi.
11. Zheng Y, Rajcsanyi LS, Herpertz-Dahlmann B, Seitz J, de Zwaan M, Herzog W, Ehrlich S, Zipfel S, Giel K, Egberts K, Burghardt R. PTBP2–a gene with relevance for both Anorexia nervosa and body weight regulation. Transl Psychiatry 2022; 12(1) : 241.
12. Woerwag-Mehta S, Treasure J. Causes of anorexia nervosa. Psychiatry 2008; 7(4) : 147-51.
13. Hernando A, Pallás R, Cebolla A, García-Campayo J, Hoogendoorn CJ, Roy JF. Mindfulness, rumination, and coping skills in young women with Eating Disorders: A comparative study with healthy controls. PLoS One 2019; 14(3) : e0213985.
14. Datta N, Foukal M, Erwin S, Hopkins H, Tchanturia K, Zucker N. A mixed-methods approach to conceptualizing friendships in anorexia nervosa. Plos one 2021; 16(9) : e0254110.
15. Stice E, Telch CF, Rizvi SL. Eating disorder diagnostic scale. Psychol Assess 2000.
16. Krabbenborg MAM, Danner UN, Larsen JK, Veer N, Elburg AA, Ridder DTD, Engels RC.

ME. The Eating Disorder Diagnostic Scale: Psychometric Features Within a Clinical Population and a Cut-off Point to Differentiate Clinical Patients from Healthy Controls. Eur Eating Disord Rev 2011; 20(4) : 315–320.
17. Court A, Mulder C, Kerr M, Yuen HP, Boasman M, Goldstone S, Fleming J, Weigall S, Derham H, Huang C, McGorry P. Investigating the effectiveness, safety and tolerability of quetiapine in the treatment of anorexia nervosa in young people: a pilot study. J Psychiatr Res 2010; 44(15) : 1027-34.
18. Baile JI, Rabito-Alcón MF. Cognitive Behavioural Therapy for an Adolescent with Anorexia Nervosa. Children 2022; 9(1) : 92.
19. Karam AM, Fitzsimmons-Craft EE, Tanofsky-Kraff M, Wilfley DE. Interpersonal psychotherapy and the treatment of eating disorders. Psychiatr Clin 2019; 42(2) : 205-18.
20. Staab R, Campagna J, Ma J, Sengar A. Rapid refeeding in anorexia nervosa: A dialectic balance. Int J Eat Disord 2022; 55(5) : 653-63.
21. Chakraborty K, Basu D. Management of anorexia and bulimia nervosa: An evidence-based review. Indian J Psychiatry 2010; 52(2) : 174.
22. Pruccoli J, Pugliano R, Pranzetti B, Parmeggiani A. Premenarchal anorexia nervosa: clinical features, psychopharmacological interventions, and rehospitalization analysis in a 1-year follow-up, controlled study. Eur J Pediatrics 2023; 13 : 1-0.

Review Article

Opioid Substitution Therapy (OST) in India: Benefits and Controversies

Geeteshwar Dewan, Ajeet Sidana
Department of Psychiatry, Government Medical College & Hospital (GMCH), Sector-32, Chandigarh (UT)-160030
Contact: Ajeet Sidana, E-mail: ajeetsidana@hotmail.com

Magnitude of harmful use of opioids

In the year 2017, the Global Burden of Diseases (GBD), Injuries, and Risk Factors Study estimated that about 40.5 million individuals globally were using opioids in a dependent pattern. Opioid use disorders were responsible for more than 1% of the age-standardized Years Lived with Disability (YLDs) in 135 countries.[1] Among all the illegally consumed substances across the world, opioid dependence has stood out to be the highest contributor to the number of Disability Adjusted Life Years (DALYs) lost (about 9.2 million people) and to the number of drug related mortalities across the world (43.5 deaths per million people between 15-64 years).[2,3]

In India, it has been reported that about 2.1% of population uses opioids, which is available in multiple forms. Opium (available as husk of poppy also known as bhukki or doda), heroin – pure or impure (in the form of smack or brown sugar) and pharmaceutical preparations of opioids are some of the forms available. Heroin (1.14%) is the most used opioid nationally closely followed by pharmaceutical opioids (0.96%) and opium (0.52%). The states with highest prevalence of opioid use (defined as more than 10% of the general population) are predominantly the north-eastern states of Mizoram, Nagaland, Sikkim, Arunachal Pradesh, and Manipur. A total of 13 states are attributed to having more than one percent of the population having opioid use disorders (which is indicative of a major public health concern). In terms of raw numbers, India has about 77 lakh problem users and 28 lakh dependent users of opioid. As compared to the global figures, prevalence of opioid use in a country like India is almost 3 times. Furthermore, across the country there are about 8.5 lakh People Who Inject Drugs (PWID). Amongst the PWID population, opioids are the predominant drug being injected with 46% injecting heroin and a similar number injecting pharmaceutical opioids. A major chunk of these PWID have reported risky injecting practices. States like Delhi, Maharashtra, Nagaland, Punjab, Karnataka, Uttar Pradesh, Andhra Pradesh, and Manipur have the highest number of PWID across the country.[4]

As per the Punjab Opioid Dependence Survey (PODS) held in 2015, 76% of the individuals who were opioid dependent fall between the age of 18 to 35 years. About 99% were males and about 54% were married. Data suggests that about 4 in 100 men belonging to Punjab are opioid dependent which shows how opioid dependence is present disproportionately among male youth in Punjab. Most of the opioid dependent individuals belonging to Punjab resided in rural areas (56%). Amongst the various professions, opioid use was particularly high amongst unskilled workers (27%). Following the global trend, heroin was the most common opioid drug being used, as it was the primary opioid for 53% of the population. 1/3rd of the opioid dependent population used the drug via the injecting route. Opioid use was also associated with considerably high financial burden. Speaking in numbers, heroin dependent individuals were spending about INR 1400 (USD 170.20) per day on drugs while opium users were spending INR340 (USD-4.13)/day and pharmaceutical opioid users spent about INR 265 (USD-3.22)/day. More than 4/5th of the opioid dependent population admitted to have tried to give up the drug in the past. However, only 35% of them have ever received treatment or help.[5]

It is estimated that among Injecting Drug Users

(IDUs), rates of HIV infection and Hepatitis C virus infection are significantly high as compared to other population, being 5% and 31.8% respectively. Hepatitis B Virus infection rates were also significantly higher (3.5%) amongst injecting drug users as compared to other population.[6]

Opioid Substitution Therapy in India

In opioid substitution therapy, an opioid dependent individual is provided a long acting opioid agonist medication over a long period of time which is under strict medical supervision. The pharmacological intervention is supported by other psychosocial interventions. If acute withdrawals are targeted alone, a short-term treatment is followed which lasts only for a few weeks, known as "detoxification." Detoxification, however, is associated with high relapse rates.

In India, only two opioid agonists have been approved for opioid substitution therapy by the Drug Controller General of India (DCGI). Buprenorphine via the sublingual route, either alone as Buprenorphine or in combination with naloxone as a fixed dose combination.

The other drug which has been approved by DCGI for OST is Methadone.

As per the Narcotic Drugs and Psychotropic Substances (NDPS) Act, buprenorphine and methadone have been classified as a psychotropic and narcotic, respectively. After an amendment in 2014 known as the NDPS (Third Amendment) Rules, 2015, methadone was designated as an Essential Narcotic Drug. Prior to this notification, requirements for licensing and licensing authorities for narcotics differed from state to state as the state governments held the power to formulate laws. However, power to regulate essential narcotic drugs lies with the Central Government. This ensures that regulations which are uniform in nature are applicable for methadone, across the country. "Recognized medical institutions" (RMIs) can now stock and dispense opioids for medicinal use. Furthermore, such RMIs can now be authorized by the state government itself – either by the State Drug Controller or the Food and Drug Administration.[7]

Buprenorphine was first used for treatment for opioid dependence in India by then Deaddiction Center, All India Institute of Medical Sciences, New Delhi in the year 1989.[8]

Initially, 0.2mg tablet was used for deaddiction treatment until DCGI approved higher strengths of 0.4mg and 2mg in the year 2000.[9] By the year 2006, buprenorphine and naloxone combination was approved for deaddiction treatment in India. The aim of the launching this combination was to prevent diversion of buprenorphine to an injectable form. At the same time, this combination provided a take-home option to patients seeking OST.[10]

Finally, in 2010, methadone was granted license for sale in domestic markets by DCGI. The project of Methadone Maintenance Treatment (MMT) was launched in India in 2012 under the aegis of the National Drug Dependence Treatment Center (NDDTC), All India Institute of Medical Sciences (AIIMS), New Delhi being piloted at a total of five locations. It was launched in collaboration with United Nations Office on Drug and Crime (UNODC).[11]

The National AIDS Control Organization is responsible for more than 280 targeted intervention (TI) centers running across the country which are working exclusively for injecting drug users (IDUs), out of which 150 centers offer opioid substitution therapy. Non-governmental organizations (NGOs) are majorly responsible for handling these TIs. A collaborative model was also launched to provide OST intervention which was jointly led between government hospital and nearby injecting drug user (IDU) targeted intervention (TI) center.[12] Infact, two-thirds of the OST centers across the country are located in government hospitals.[13] Studies conducted in India have shown favorable results in proving effectiveness of community based treatment of heroin dependence through OST in patients having opioid addiction. In a study conducted in urban slum area of Delhi on 108 patients of heroin dependence receiving sublingual buprenorphine treatment for a duration of six to eleven months, 70% of the participants had very little to no use of heroin at follow up.[14] Similarly, in an another small study carried out in Nagaland, 54 male opiate-dependent participants received buprenorphine and follow ups were conducted till six months from onset of pharmacotherapy. Retention rate which was observed was about 81.5% at 24 weeks. On the Addiction Severity Index (ASI), improved scores on various parameters were reported.[15] In 2015,

Bandawar et al reported that buprenorphine maintenance was about 4.5 times more effective than maintenance therapy with naltrexone and about 7 times more effective than psychosocial interventions.[16]

Access to OST amongst opioid dependent population In India, has scaled up in the last 10 years, however, the actual impact is limited. Only 5% of PWID in India with opioid dependence are currently receiving opioid substitution therapy. OST in India is delivered as a part of community based service.[17] In fact, a major chunk (26%) of treatment seekers at deaddiction centers in India have reported that their primary drug of abuse was opium.[18]

NACO Clinical Practice Guidelines (CPG) for Treatment with Buprenorphine

To address the issue of standardization of clinical protocols for OST centers, clinical practice guidelines for buprenorphine-based OST were formulated.[16] Under these guidelines, OST was strictly reserved for opioid injecting drug users. Department of AIDS Control (DAC) defines IDU as a person who has used any psychoactive substance through injecting route for non-medical purpose at least once in last three months. Prior to initiation of treatment, proper assessment and diagnosis is made considering details of psychoactive substance use and its complications, injecting or other high-risk behaviors, past attempts to abstain from drug use, evidence of current opioid withdrawals or intoxication and history of medical illnesses, to name a few. Assessment is required to be carried out by both the doctor as well as the counsellor present in the OST center. The benefit of such two-pronged strategy is to explore the psychosocial aspects via the counsellor's interview and ascertain the clinical aspects through the doctor's clinical interview.

Client suitability for OST is determined by necessary fulfillment of the essential criteria while the desirable criteria, while not being necessary, increases the clinician's confidence while prescribing the treatment. The essential criteria includes the following: diagnosis of opioid dependence syndrome, current injecting drug user, absence of any medical contraindications, informed consent as well as client's willingness to receive treatment on a daily basis. Desirable criteria includes age to be preferably more than 18 years, past failed attempts of abstinence, long duration of opioid use and certain motivation to give up drug use. There only absolute contraindication is known hypersensitivity to buprenorphine. Care should be taken in patients with hepatic impairment, severe respiratory problems and in clients with sever dependence on alcohol or benzodiazepines prior to initiation of buprenorphine-based OST. As per the NACO CPG, any laboratory test is not an essential criteria before initiating OST for the client.

Psychoeducation and preparation of the client and is equally important before initiation of OST. Important issues to be covered are – nature of the illness, nature of the treatment and active involvement of the client in the treatment process. The procedure is carried out by the counsellor or the doctor. During this step, all common myths and misconceptions associated with OST should ideally be addressed. Overall, it helps to improve the motivation levels of the client seeking OST to ensure continuation and treatment retention.

Induction phase of the treatment lasts from the initial dose till the stabilization dose is achieved. The last dose of opioid prior to first dose of buprenorphine-based OST should be at least 6-8 hours before. The initial dose ranges from 2-4mg. Client is required to be observed after a gap of about 2 hours. If the client continues to complain of withdrawal symptoms or craving of opioids, decision can be taken to administer an additional dose of 2-4mg of buprenorphine. Total dose must not exceed 8 mg on the first day of initiating buprenorphine-based OST. When the patient returns on the second day, point should be made to enquire about withdrawal symptoms and craving, which if present should necessitate an increase in dose by 2mg. Maximum dose on day 2 should not exceed 12mg. In no withdrawal symptoms or craving is present after 24 hours, stabilization dose is achieved. Commonly stabilization dose is achieved in 3-4 days, however it should be achieved by a maximum of 7 days.

During the maintenance phase, stabilization dose is continued till the time a decision is reached to stop the OST. It has been noted that many clients stop OST after 2-3 months of initiation, on noticing improvement. Hence, clients should be motivated and encouraged to continue OST and any temptation to reduce dose of buprenorphine needs to be avoided.

Decision to taper the dose and stop buprenorphine is taken in the termination phase. Buprenorphine is tapered over a duration of 2-3 months. Every 4 days to one week, 2mg is tapered till a dose of 2-4mg is reached. Tapering, further, is done in doses of 0.4-0.8mg of buprenorphine every 4 days to one week. Sleep disturbances and constipation are common side-effects associated with buprenorphine-based OST.

Special care should be taken in patients with co-morbid HIV/AIDS and tuberculosis. In patients of HIV on Non-nucleoside reverse transcriptase inhibitors, it has been noted that plasma concentration of buprenorphine is decreased and with protease inhibitors, there is a significant increase in buprenorphine concentration in plasma when the drugs are co-administered. Similarly in patients with tuberculosis, rifampicin decreased plasma concentration of buprenorphine whereas it is increased by isoniazid.

For adolescents, as per the NACO CPG, OST is not ideally recommended if age is less than 18 years. However, if duration of opioid use (IDU) is more than 2 years and simultaneous presence of high-risk behavior is observed, OST must be considered as an option.[19]

OST in Special Populations

OST in pregnancy carries a lower risk than continuing the illicit opioid use. OST can be prescribed any time during pregnancy, with both methadone and buprenorphine considered to be safe in pregnancy. Methadone has been associated with superior treatment retention amongst pregnant population. Buprenorphine and naloxone combination is usually avoided. Substitution therapy maybe initiated any time, however, detoxification carries risk of abortion, preterm delivery, fetal distress and stillbirth and therefore it is contraindicated in 1st and 3rd trimester. Further, neonatal abstinence syndrome (NAS) occurs due to withdrawal of opioids in neonates consequent upon intra-uterine opioid exposure. High pitched cry, ineffective feeding, hypertonicity and seizures in infants are common manifestations of NAS. Breastfeeding is not contraindicated in women who have been prescribed OST. Breastfeeding is said to reduce the severity in infants suffering from NAS, rather abrupt cessation can cause a delayed NAS.

In adolescent age group, usual age of OST initiation is beyond 18 years. However, if there is history of more than 2 years of intra-venous drug use and associated high risk behavior – OST must be considered. It can be used for both antagonist therapy and detoxification.

In patients suffering with chronic debilitating diseases like HIV AIDS and tuberculosis, certain drug interactions have been noted between drugs administered for the illness and OST agents which are known to alter the plasma concentration of the OST agents. Hence, correct choice of drugs and adequate dose titration is required in such a case.[19]

Indian Psychiatric Society Guidelines on OST

The Addictive Disorder Specialty Section of the Indian Psychiatric Society (IPS) has formulated guidelines titled as "Treatment of Opioid Dependence using Opioid Agonists (Buprenorphine)" to focus on the operational procedures of Opioid Substitution Therapy. The focus of IPS guidelines is mainly on buprenorphine. Relative safety of buprenorphine and decreased risk of diversion with the buprenorphine-naloxone combination is a major reason for buprenorphine being the drug being in focus by the IPS. It has been recommended that plain buprenorphine is advised to be administered as a directly observed treatment (DOT).

As per the IPS, patient must fulfil pre-requisite before initiation of OST. The first pre-requisite is "establishing opioid dependence." The second is "establishing the need of OST." This essentially means that prior to initiation of opioid substitution therapy, it is to be ascertained that indeed OST is the best treatment option for the patient in question. "Considering cautions and contraindications for opioid agonists for treatment of opioid dependence (OATOD)" is the third pre-requisite which includes exploring the concomitant use of other illicit substances and medical conditions which require caution. Willingness and consent of the patient of the patient is also required along with.

Setting up an "operational set up" to provide OST is the fourth pre-requisite as advised in the IPS guidelines. Psychosocial management is an important pillar of treatment which is to be provided in such set-ups. It may be provided by the treating psychiatrist or a counsellor or by a multi-disciplinary team consisting of a psychiatric social worker, nurse trained in psychiatric nursing, clinical psychologist,

and a vocational instructor. Even though a psychiatrist should ideally lead the process of providing OST, as per the IPS, other non-psychiatrists who have been capacitated in this process can also be allowed to provide treatment. Infrastructural requirements in addition to a well-documented dispensing system and supply chain management are necessary for an accountable and valid set-up for provision of OST.

Clinical and operational considerations to dispense buprenorphine-naloxone combination, especially for "take-home" doses have been provided by the IPS. It is recommended that prior registration of the patient with a clinical facility is of utmost importance. Furthermore, IPS advices to have a unique "identification number" for each patient which can be further linked to a computerized database. Establishing dose to be taken per day for a given patient forms the next step to the process. An optimum dose is one in which there are no side-effects, withdrawal symptoms or craving. Strict compliance is necessary for proper treatment. Documentation forms an important part of the dispensing process. Buprenorphine-naloxone tablets are to be dispensed only via authorized personnel with the exact number of tablets documented properly. As per the IPS guidelines, 7 days – 14 days is the ideal duration for take-home doses. In the initial duration of treatment, 7-10 days of home doses are advisable to be dispensed till stabilization. The upper limit of the total number of tablets should not exceed 100 tablets. However, if a patient asks for a take-home dose which is longer than a duration of 2 weeks or exceeds 100 tablets, care should be taken about the unavoidability of the situation and the genuineness before considering the same. The reasons of doing the same, are needed to be documented in the case file of the patient. Maximum dispensing period should never extent beyond 30 days, except very exceptional cases. There is no fixed duration for provision of OST. However, with buprenorphine the entire process of tapering down the medication and its final discontinuation is a slow process and requires close monitoring. At most, patients take 1-2 years of treatment to stabilize but certain patients can achieve stability more rapidly.

One important aspect of treatment with OST is the psychosocial management afforded by the set-ups providing such treatment. Improving the coping skills of the patient along with building motivation, in addition to relapse prevention counselling are important tenets of treatment to be provided to every patient. Furthermore, assertiveness training, vocational guidance and facilitation of alternate hobbies is equally important.[20]

OST in Punjab

The Punjab Government issued Standard Operating Procedures (SOP) on usage of Opioid Agonists for Treatment of Opioid Dependence. The hallmark of this SOP was inclusion of non-injecting drug users (IDUs) in the target group, in addition to IDUs, of those receiving OST which was unlike the NACO-CPG, where only IDUs were being provided OST. Non-injecting opioid use includes predominant opioid being relatively pure white heroin ("Chita") and other varieties of heroin, including street-variety brownish heroin, known as "Smack", considered to be the impure form of heroin. The drug combination used is sublingual buprenorphine-naloxone combination. No other preparation (plain buprenorphine, buprenorphine transdermal patch, injectable buprenorphine) is used for the same purpose. Initially, patient is provided take home doses for 3-5 days. After he or she has completed three such visits consecutively, doses maybe provided for 7 days in one visit. Only after due consideration of the unavoidability of the situation, maximum duration for which take-home doses can be provided is 2 weeks or a maximum of 100 tablets, whichever is less. As per the NDPS Act recommendation, opioid substitution therapy should be terminated within 1 year, but in no case later than 2 years. However, the duration and criteria for duration of treatment still remains very unclear.[21]

Controversies associated with OST

In India, OST is only available for injecting drug users (IDUs) under NACO-CPG. Non-IDU are excluded which means that a substantial proportion of opioid dependent users are not covered.[12] Evidence suggests that if OST is discontinued, it increases potential for relapse. However, life-long, and time-unlimited OST would impose a huge burden on the already meagre health-care resources, in a country like India. It is also important to scale-up the existing OST programme in India, considering only 5% of people with opioid dependence receive OST.[22]

Multiple legal challenges are also associated with OST in India, which makes it difficult to deal with various legislations. Methadone is classified as an essential narcotic drug which makes it easier to procure and use it in treatment. However, buprenorphine is not an essential drug and hence, certain restrictions have been imposed by the DCGI on its use.[23] The existing models of OST used in the Western world, especially the high-income countries – exclusive clinics, office-based OST prescriptions and licensed pharmacies - cannot be directly applied in South-Asian countries. Infrastructure, availability of health-care professionals and regulatory mechanisms seldom allow expansion of OST programme.[24]

The risk of diversion and abuse associated with OST also seems to be a major challenge, especially in India. Diversion of any medication is defined as the intentional transfer of any controlled drug from a legally recognized and legitimate distribution system into illegal channels. Diversion can be prevented through either usage of misuse deterrent formulations, strict dose supervision and psychoeducation of the treating physicians and patients.[25]

Conclusion

OST is an evidence based effective medical intervention to reduce the illicit opioid use. Although methadone has more retention rates but buprenorphine is also effective when used in adequate doses. There are multiple challenges associated with OST in India, from infrastructure to arduous legal difficulties, however, no evidence which prevents use of this intervention exists in literature available. Careful extension and expansion of OST centres is imperative in order to meet the growing demand of this service in India. In addition, most of the OST centres operate under NACO and only cater to opioid dependence in IDUs, which causes a stark discrimination in seeking treatment towards the non IDUs who have opioid dependence. In addition, it is important to address the impaired socio-occupational functioning and improve the quality of life via the OST centres in order to provide holistic treatment.

References

1. Institute for Health Metrics and Evaluation (IHME). Findings from the Global Burden of Disease Study 2017. Seattle, WA: IHME, 2018.
2. UNODC. World Drug Report 2016. Vienna: United Nations Pubns Publisher 2016.
3. Degenhardt L, Whiteford HA, Ferrari AJ, Baxter AJ, Charlson FJ, Hall WD, et al. Global burden of disease attributable to illicit drug use and dependence: Findings from the Global Burden of Disease Study 2010.
4. Ambekar A, Agrawal A, Rao R, Mishra AK, Khandelwal SK, Chadda RK. Magnitude of substance use in India. New Delhi: Ministry of Social Justice and Empowerment, Government of India 2019.
5. Ministry of Social Justice and Empowerment (India), National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, New Delhi (AIIMS), Society for the Promotion of Youth and Masses (India). India - Punjab Opioid Dependence Survey 2015.
6. Basu D, Sharma AK, Gupta S, Nebhinani N, Kumar V. Hepatitis C virus (HCV) infection and risk factors for HCV positivity in injecting and non-injecting drug users attending a de-addiction centre in northern India. Indian J Med Res 2015; 142(3) : 311-6.
7. Notified Essential Narcotic Drugs. 2015. [Last accessed on 2023 April 22]. Available from:https://www.dor.gov.in/sites/default/files/Essential%20Narcotic%20Drug%20Notification %20dated%2005%2005%202015_0.pdf
8. Kumar MS, Agrawal A. Scale-up of opioid substitution therapy in India: opportunities and challenges. Int J Drug Policy 2012; 23 : 169–70.
9. Ray R, Pal H, Kumar R, Maulick P, Mangla R. Post-marketing surveillance of buprenorphine. Pharmacoepidemiol Drug Saf 2004; 13 : 615–9.
10. Ray R, Vaswani M, Deb KS, Sethi H, Chopra A, Kishore N, et al. Post marketing surveillance of sublingual buprenorphine naloxone combination tablets. Indian J Physiol Pharmacol 2012; 56 : 359–66.
11. Dhawan A, Rao R, Ambekar A, Chopra A, Jain R, Yadav D, et al. Methadone Maintenance Treatment in India: A Feasibility and Effectiveness Report. UNODC, Regional Office for South Asia and NDDTC, AIIMS. 2014. [Last accessed on 2023 April 22].Available from: https://www.unodc.org/documents/southasia/publications/researchstudies/MMT_

REPORT_final.
12. Rao R. The journey of opioid substitution therapy in India: Achievements and challenges. Indian J Psychiatry 2017; 59(1) : 39-45.
13. Annual Report NACO 2015-2016 English. National AIDS Control Organisation, Ministry of Health and Family Welfare, Govt. of India. 2016. [Last accessed on 2023 April 15]. Available from: http://www.naco.gov.in/sites/default/files/Annual%20Report%202015-16_NACO.pdf
14. Mohan D, Ray R. Community based treatment for heroin dependence in an urban slum of Delhi (India)–Report submitted to WHO. New Delhi: SEARO 1997.
15. Mohan D, Dhawan A, Chopra A, Sethi H. A 24 week outcome following buprenorphine maintenance among opiate users in India. J Subst Use 2006; 11(6) : 409-15.
16. Bandawar M, Kandasamy A, Chand P, Murthy P, Benegal V. Adherence to buprenorphine maintenance treatment in opioid dependence syndrome: A case control study. Indian J Psychol Med 2015; 37(3) : 330-2.
17. Sharma M, Oppenheimer E, Saidel T, Loo V, Garg R. A situation update on HIV epidemics among people who inject drugs and national responses in South-East Asia Region. AIDS. 2009; 23 : 1405–13.
18. UNODC. South Asia Regional Profile. 2005. [Last accessed on 2023 April 20]. Available from: http://www.unodc.org/pdf/india/publications/south_Asia_Regional _Profile_Sept_2005/10_india.pdf)
19. Rao R. Substitution Therapy with Buprenorphine for Opioid Injecting Drug Users. National AIDS Control Organisation, Ministry of Health and Family Welfare, Govt. of India. 2008. [Last accessed on 2023 April 20]. Available from: http://www.naco.gov.in/sites/default/files/Bupenorphine_%20Practice_Guidelines.pdf
20. Indian Psychiatric Society, Addictive Disorder Specialty Section. Guidelines: Treatment of Opioid Dependence using Opioid Agonists (Buprenorphine). Gurugram Indian Psychiatric Society 2019.
21. Department of Health and Family Welfare, Government of Punjab. Standard Operating Procedure for Private Centers 2018. [Last accessed on 2023 May 12] Available from: https://www.pddrc.in/SOPPrivateCentres.pdf.
22. Ghosh A, Basu D, Avasthi A. Buprenorphine-based opioid substitution therapy in India: A few observations, thoughts, and opinions. Indian J Psychiatry 2018; 60(3) : 361-366.
23. Math SB, Mohan A, Kumar NC. Opioid substitution therapy: Legal challenges. Indian J Psychiatry 2018; 60(3) : 271-277.
24. Rao R, Agrawal A, Kishore K, Ambekar A. Delivery models of opioid agonist maintenance treatment in South Asia: a good beginning. Bull World Health Organ 2013; 91(2) : 150-3.
25. Adler JA, Mallick-Searle T. An overview of abuse-deterrent opioids and recommendations for practical patient care. J Multidiscip Healthc. 2018; 11 : 323-332.

Original Article

Dr. Saadgi Jagawat Award Paper

Cognitive Impairment in Individuals with Alcohol use Disorder

Sanjana Mathur, Mina Chandra, Anushrut Misra
Department of Psychiatry, Centre of Excellence in Mental Health, ABVIMS and Dr. RML Hospital, New Delhi
Contact: Mina Chandra, Email: doctorminachandra@gmail.com

ABSTRACT

***Background**: Alcohol Use Disorders (AUDs) are common globally including in India. The prevalence of AUDs is 5.2% globally and 4.6% in India. AUDs can cause Cognitive impairment (CI) which can have deleterious effect on treatment outcomes of these patients. **Methods**: 100 out patients and inpatients with AUDs of Department of Psychiatry of a tertiary care institute in New Delhi meeting the inclusion and exclusion criteria for the study were recruited and assessed using Alcohol Use disorder Identification Test (AUDIT), Severity of Alcohol Dependence Questionnaire (SADQ), Montreal Cognitive Assessment (MoCA) and Community Screening Instrument for Dementia (CSI-D) using an android app named DeSTAC. **Results**: On MoCA screening 64% of the participants had mild CI, 16% had moderate CI and 1% had severe CI. MoCA domains of attention, delayed recall and abstraction were found to be significantly more affected in patients with severe alcohol dependence. On detailed evaluation on CSI D using DeSTAC app 28% had mild CI, 12% had moderate and 4% had severe CI. Severity of Alcohol Dependence was directly proportional to the severity of CI. **Conclusion**: AUDs are associated with significant CI which remains underreported and undetected. Since CI can result in treatment non adherence and drop outs resulting in relapse, it is important to routinely screen for CI for improving therapeutic outcomes.*

***Key Words**: Alcohol Dependence, Cognitive impairment, Dementia, Executive functioning*

Introduction

Alcohol Use Disorders (AUDs) are common globally including in India. It has been estimated globally that around 5.2% of alcohol consuming population in the age group of 10–75 years meets the criteria of harmful use or dependence.[1]

National Mental Health Survey, conducted by NIMHANS, reported the prevalence of AUDs in India to be 4.6% with higher rates in urban areas, among working males in the age group of 40–49 years.[2]

Alcohol use and cognition have a bidirectional relationship. Individuals with impaired cognition are more likely to start alcohol use and have Alcohol use disorders (AUDs). Furthermore, AUDs can lead to cognitive impairment and dementia. AUDs are associated with impairment in complex attention, executive function, learning, memory, social cognition, language, motor ability.[3] The adverse cognitive impact of AUDs is through two pathophysiological mechanisms: direct and indirect.[4]

The adverse impact of AUDs include Gastro intestinal symptoms, cardiac symptoms,[5] hypertension, neurological symptoms, anxiety, depression,[6] head trauma, sleep disturbances[7] and cancers.[8] All these chronic disorders can have a deleterious impact on the cognition of persons with AUDs.

Furthermore, alcohol may have direct neurotoxic effects which may result in frank dementia,

termed as Alcohol related Dementia[9] or Substance Induced Major Neurocognitive Disorders.[10]

A systematic scoping review of published research evidence till 2018 reported that heavy alcohol use was associated not just with cognitive impairment but also changes in brain structure and an increased risk of all types of dementia including Wernicke – Korsakoff syndrome.[11,12]

CI in AUDs can interfere with the motivation to abandon maladaptive drinking behavior in favor of a healthier lifestyle (such as abstinence or controlled alcohol consumption). They can also limit the patient's capacity to fully benefit from pharmacological and non-pharmacological interventions. Understanding and implementing complex pharmacological prescriptions with multiple medications with different dosing can be difficult for persons with CI. Similarly participating in therapies like Motivation Enhancement Therapy, Cognitive Behavior Therapy for addiction and Relapse Prevention is challenging for persons with CI. Thus CI can contribute to poor treatment adherence and drop outs.

Majority of the available literature has focused on Alcohol Related Dementia and not on subtle cognitive deficits which remain under reported and under investigated. Furthermore, few studies are available on Asian population especially in Indian population. Since the sociodemographic profile, age of onset, pattern and duration of use, and genetic factors are different between Caucasian and Asian population, it was essential that original research should be conducted to determine the range of cognitive deficits in Indian patients with Alcohol Dependence.

This study aimed at finding out the relationship between AUDs and cognitive impairment in Indian population. Early identification and management of CI in AUDs can improve outcomes by improving treatment adherence.

Methods

Study design and Patient recruitment:

The study was a cross sectional study conducted in the Department of Psychiatry, Centre of Excellence In Mental Health (CEIMH) at ABVIMS and Dr. RML Hospital, New Delhi with data collection done between 1st January 2021 and 31st May 2022. The inclusion criteria of the study were persons aged 18 years and above, who met the ICD 10 diagnostic criteria of alcohol dependence admitted/attending OPD in the Department of Psychiatry, CEIMH, ABVIMS and Dr. RMLH. The exclusion criteria were persons in active withdrawal state, other substance dependence except nicotine, psychiatric illness or serious medical or neurological illness. The eligible patients were explained the purpose of the study orally and provided bilingual (English/Hindi) Participant Information Sheet and written informed consent taken for recruitment into the study. The data on socio-demographic profile and AUD profile was collected and transcribed on google forms (Google Inc., USA) to facilitate data entry in real time.

Sample Size Calculation:

Prevalence of cognitive impairment in Alcohol dependent individuals has been reported to be 42% in a study done in India.[13] Using the formula:

$\mathbf{n = Z\alpha^2\ p\ q\ /\ L^2}$,

Where, n = sample size

$Z\alpha = 1.96$ value of the standard normal variate corresponding to level of significance alpha 5% Alcohol Use Disorder

p = prevalence of cognitive impairment in Alcohol Use Disorder

q = 1 – p

L = relative error.

$$n = \frac{(1.96)^2*0.42*0.58}{(0.1)^2} = 93$$

We commit to recruit 100 cases for comprehensive assessment of the range and severity of cognitive impairment in alcohol dependence.

Assessment tools

I. *Mini International Neuropsychiatric Intervention (MINI) Screen*[14] was used to rule out any other psychiatric illness. It has high sensitivity (0.61-1.00) and specificity (0.81-1.00).[15]

II. Alcohol Dependence and its severity was assessed with the help of:

   a) *Alcohol Use disorder Identification Test (AUDIT)*[16] is a 10 item questionnaire approved by WHO to screen patients for hazardous and harmful use of alcohol with score ranging from 0 to 40. It has high sensitivity and speci-

ficity: 98% and 94% respectively.[17]

b) Severity of Alcohol Dependence Questionnaire (SADQ)[18] consists of 20 items with a total score of 60. It has high reliability for severity and clinical aspects of AUDs.[19]

III. *Withdrawal was assessed with the help of Clinical Institute Withdrawal Assessment Scale* – Alcohol - Revised (CIWA – Ar)[20] which consists of 10 items and a total score ranging from 0 to 67 with high sensitivity (99%) and specificity (98%).[20] Persons with score of less than 8 with stable vitals were included in the study.

The robust assessment using appropriate tools helped to fulfil the inclusion criteria efficiently and reduced the probability of illness related confoun-ders.

IV. Cognition of the patients was assessed using:

a) *Montreal Cognitive Assessment scale (MoCA)* assesses 8 domains of cognition with the help of thirteen tasks which are visuo-spatial, naming, immediate recall, attention, language, abstraction, delayed recall and orientation. This scale has a maximum score of 30 and individuals scoring 26 and above are considered to have normal cognitive functioning. The sensitivity of MoCA for detecting mild CI is 90% and specificity is 87%.[21] MoCA was chosen as it has been proven to be superior to MMSE for detecting mild cognitive deficits with a better validity and reliability.[22]

b) *Department of Science and Technology App for Cognition (DeSTAC)* is an android application developed by the second author using Community Screening Instrument for Dementia (CSI-D) which assesses memory, abstract thinking, judgment, other disturbances of higher cortical function (aphasia, apraxia, agnosia, constructional difficulty), personality changes and functioning at work and in social relationships.[23] CSI-D has high sensitivity (92%) and specificity (95.1%) in determining CI.[24] Our study is the first to compare DeSTAC assessment with MoCA screening **instrument for assessment of cognitive functioning.**

Statistical Analysis

The data was analyzed with the help of Software Package for Social Sciences (SPSS) version 22. Inferential analysis for categorical data was done using Chi square test and ANOVA was used for continuous data.

Results

The results of 100 participants with AUDs recruited in our study are given in tabular format below:

The socio-demographic profile of the participants is given in Table 1. All participants were men, most of whom were less than 40 years of age, having school level education, married and gainfully employed in urban settings.

Table 1 shows the socio-demographic profile of the participants.

The illness profile of the study participants is given in Table 2. Most participants started alcohol use in late adolescence, had become alcohol dependent by their late 20s but had received their first consultation for AUDs in early 30s only. Most participants consumed both Country Made Liquor and Indian Made Foreign Liquor, were either in Contemplation or Preparation Stage of Motivation at the time of assessment and had Moderate Alcohol Dependence as per SADQ scores. 27 participants had previous hospitalization and 13 had history of complicated withdrawal. Less than 10 participants had comorbid Nicotine Dependence and Non-Communicable Diseases (NCDs) like Hypertension, Diabetes Mellitus, Dyslipidemia and Liver cirrhosis.

The association between severity of alcohol dependence and cognitive impairment was investigated using ANOVA and is given in Table 3.

Both total MoCA and total DeSTAC scores were lower in patients with severe alcohol dependence as compared to patients with mild or moderate dependence ($p=0.01$ and 0.001 respectively). MoCA domains of attention, delayed recall and abstraction were found to be significantly more affected in patients with severe alcohol dependence ($p=0.01$, 0.01, 0.001 respectively).

Table 1: Sociodemographic profile of study participants with AUDs (N=100)

Sociodemographic Profile		N.
Age group		
(Mean Age = 36.51 ± 8.72 years)	21-30	25
	31-40	49
	41-50	17
	51-60	9
Gender	Male: Female	100:1
Educational status	Upto 5th standard	18
	5th to 10th standard	41
	10th/12th standardto Diploma	31
	Graduate and above	10
Domicile	Urban: Rural	100:1
Religion	Hindu	88
	Muslim	10
	Sikh	2
	Christian	0
Marital status	Married	73
	Divorced/ Separated	10
	Never married	17
Occupation	Govt. job	13
	Private job	59
	Business	3
	Farmer	2
	Laborer	12
	Unemployed	10
Monthly income	Below 50,000/month	42
	>50,000/month	58

Discussion

AUDs are associated with significant CI as per available data from developed countries. However, not much studies are available in Indian context, even though CI can have deleterious impact on treatment outcomes in patients with AUDs.

In this study 100 alcohol dependent patients were evaluated. The mean age in our study was 36.51 ± 8.72 years which was younger than a similar study conducted by Alarcon et al[25] in France (2015) (49.6 ± 8.8 years) indicating later age of medical consultation in European countries as alcohol is a socially acceptable drink in their culture.

Our study could enroll only male patients unlike studies in Western settings like the study conducted by Alarcon et al[25] which had males and females in the ratio of 1.6:1. Indicating broader acceptance of alcohol use by women in these societies as compared to South Asian cultural context.

Majority of the study participants were educated till class 10th, married and gainfully employed in urban settings, reflecting the catchment area of the institute.

While the mean age of onset of alcohol use was 19.40 ± 3.60, the mean age of alcohol dependence was 27.23 ± 5.93 years. The mean usual dose of alcohol consumed was 513.89 ± 225.40 ml and majority of the patients were consuming both Indian made foreign liquor (IMFL) and country made liquor (CML). These findings were consistent with other similar Indian studies by Nair et al[26] and Ramanan et al[27] thus indicating the general trend in India.

Even though none of the participants had reported cognitive deficits, high rates of CI found on screening with MoCA. 64% of the subjects were found to have mild CI, whereas 16% showed moderate CI and severe CI was found in 1% of the subjects similar to available literature on CI in Alcohol Use Disorders (AUDs) (range from 30-80%).[28]

On detailed cognitive assessment using CSI-D based DeSTAC app, 28% subjects had mild cognitive impairment,12% had moderate and 4% had severe cognitive impairment.

Significant negative association was seen between MoCA scores and severity of alcohol

Table 2: Illness profile of study subjects with alcohol dependence (N=100)

Illness Profile		Mean ± SD/ N.
Age of onset of Alcohol Use (in years)		19.40±3.60
Age of daily use (in years)		27.29±5.93
Age of dependence (in years)		27.23±5.93
Age of first consultation (in years)		33.88±7.26
Duration of alcohol use (in ml)		17.43±9.06
Usual daily dose of alcohol (in ml)		513.89±225.40
Past h/o complicated withdrawal		13
Alcohol preparation	Country Made Liquor	11
	Both Country Made Liquor and Indian Made Foreign Liquor	52
	Indian Made Foreign Liquor	37
Motivation stage	Pre contemplation	2
	Contemplation	46
	Preparation	43
	Action	9
Severity of alcohol dependence (SADQ scores)	Mild (< 16)	15
	Moderate (16 – 30)	67
	Severe (≥ 31)	18
Stated Reasons for quitting	Family reasons	45
	Health reasons	37
	Financial reasons	11
	Family and financial reasons	3
	Health and family reasons	1
	Health and financial reasons	1
	Family and occupation reasons	2
Reasons for previous relapse	Peer pressure	14
	Cravings	9
	Others	4
Participants with previous hospitalization (n)		27
Participants with comorbid nicotine use (n)		8
Participants with other comorbidities	Diabetes (n)	5
	Hypertension (n)	4
	Dyslipidemia (n)	1
	Liver cirrhosis (n)	1

Table 3: Association of Severity of alcohol dependence with cognitive impairment in study participants (N=100)

	Mild Dependence (SADQ <16) (mean ± sd)	Moderate Dependence (SADQ 16 - 30) (mean ± sd)	Severe Dependence (SADQ ≥31) (mean ± sd)	p value
MoCA total score	23.60 ± 3.35	22.49 ± 3.50	18.50 ± 6.01	**0.01***
MoCA Visuo-spatial	3.13 ± 0.99	2.90 ± 1.04	2.50 ± 1.68	0.54
MoCA Naming	2.73 ± 0.45	2.85 ± 0.39	2.67 ± 0.48	0.13
MoCA Attention	5.20 ± 1.01	4.70 ± 1.19	3.78 ± 1.59	**0.01***
MoCA Language	1.67 ± 0.62	1.45 ± 0.68	1.39 ± 0.85	0.44
MoCA Abstract learning	1.60 ± 0.63	1.40 ± 0.65	0.61 ± 0.85	**0.001***
MoCA Delayed Recall	2.80 ± 1.26	2.70 ± 1.10	1.83 ± 1.24	**0.01***
MoCA orientation	5.93 ± 0.25	5.72 ± 0.86	6.0 ± 0.0	0.26
CSI D using DeSTAC mobile app total score	65.0 ± 5.73	62.64 ± 6.61	54.39 ± 10.85	**0.001***

dependence (SADQ and AUDIT scores) with respective p values as 0.01, 0.001. Furthermore, CSI D Total score as assessed on DeSTAC android app was also associated with SADQ scores (p=0.001).

Heffernan et al (2002, UK)[29] also showed severe CI in chronic heavy alcohol users ($p < 0.05$), consistent with the findings in our study.

Our findings demonstrate that AUD and its severity is associated with early onset CI even though three quarters of the participants were aged less than 40 years, none of who had reported subjective cognitive deficits. This is a very significant finding.

Mild CI may not hamper the socio-occupational functioning and impaired socio-occupational functioning in moderate to severe alcohol dependence may be attributed to the alcohol use rather than CI. Hence CI in AUDs may stay undetected despite psychiatric consultation wherein the focus is on management of withdrawal, detoxification, craving and relapse prevention. Hence routine screening should be promoted for early identification of CI in AUDs so as to improve therapeutic outcomes.

The study has several strengths as it used standardized scales for assessment of alcohol dependence and CI. Further, the robust exclusion criteria ruled out transient cognitive impairment in intoxication or withdrawal phases resulting in identification of AUD related stable cognitive deficits.

The major limitation of the study is the cross-sectional study design which proves only association and not causality. However, the lower age and low rates of NCDs, indicate that alcohol dependence itself was the primary contributor to CI in persons with AUDs in this study. The study could not also provide any gender based difference in CI in AUDs as no female participant could be recruited in the study.

Conclusion

To conclude AUDs are associated with CI, even in younger age group with the severity of AUD being a significant predictor of CI. Hence, screening for cognitive impairment should be considered for early identification and improvement of therapeutic outcomes in AUDs.

References

1. International Classification of Diseases (ICD) [Internet]. [cited 2022 May 10]; Available from: https://www.who.int/standards/classifications/classification-of-diseases.
2. National Mental Health Survey of India 2015–2016 [Internet]. [cited 2021 Aug 15];Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5419008/
3. Castellanos-Ryan N, Conrod P. Chapter 7 - Cognitive risk factors for alcohol and substance addictions [Internet]. In: Verdejo-Garcia A, editor. Cognition and Addiction. Academic Press; 2020 [cited 2022 Aug 5]. page 91–102.Available from: https://www.sciencedirect.com/science/article/pii/B9780128152980000071
4. Kyriacou A, Smith-Spark JH, Senar J, Moss AC, Dyer KR. The Effects of Alcohol Use on Prospective Memory: A Systematic Literature Review. Subst Use Misuse 2021;56(3):359–69.
5. Stampfer MJ, Colditz GA, Willett WC, Speizer FE, Hennekens CH. A prospective study of moderate alcohol consumption and the risk of coronary disease and stroke in women. N Engl J Med 1988; 319(5) : 267–73.
6. Agabio R, Trogu E, Pani PP. Antidepressants for the treatment of people with co-occurring depression and alcohol dependence. Cochrane Database Syst Rev 2018; 4 : CD008581.
7. Panin F, Peana AT. Sleep and the Pharmacotherapy of Alcohol Use Disorder: Unfortunate Bedfellows. A Systematic Review With Meta-Analysis. Front Pharmacol 2019; 10 : 1164.
8. Cao Y, Willett WC, Rimm EB, Stampfer MJ, Giovannucci EL. Light to moderate intake of alcohol, drinking patterns, and risk of cancer: results from two prospective US cohort studies. BMJ 2015; 351 : h4238.
9. Oslin D, Atkinson RM, Smith DM, Hendrie H. Alcohol related dementia: proposed clinical criteria. Int J Geriatr Psychiatry 1998; 13(4) : 203–12.
10. Psychiatry.org - DSM [Internet]. [cited 2022 May 12]; Available from: https://psychiatry.org:443/psychiatrists/practice/dsm
11. Rehm J, Hasan OSM, Black SE, Shield KD, Schwarzinger M. Alcohol use and dementia: a systematic scoping review. Alzheimers Res Ther 2019; 11(1) : 1.
12. Westermeyer JJ, Soukup B, Mayer J, Lee K. Identifying, Assessing, and Treating Korsakoff Syndrome Patients: Updated Perspectives. J Nerv Ment Dis 2021; 209(8) : 592–9.
13. To Study the Prevalence of Cognitive

Impairment in Alcohol Dependence | IMSEAR [Internet]. [cited 2022 May 21]; Available from: https://pesquisa.bvsalud.org/portal/resource/pt/sea-187377
14. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry 1998; 59 Suppl 20 : 22-33; quiz 34-57.
15. Lecrubier Y, Sheehan D, Weiller E, Amorim P, Bonora I, Harnett Sheehan K, et al. The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI. Eur Psychiatry 1997; 12(5) : 224–31.
16. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption—II. Addict Abingdon Engl 1993; 88(6) : 791–804.
17. Moussas G, Dadouti G, Douzenis A, Poulis E, Tzelembis A, Bratis D, et al. The Alcohol Use Disorders Identification Test (AUDIT): reliability and validity of the Greek version. Ann Gen Psychiatry 2009; 8 : 11.
18. Stockwell T, Murphy D, Hodgson R. The severity of alcohol dependence questionnaire: its use, reliability and validity. Br J Addict 1983; 78(2) : 145–55.
19. Akyel B, Aldemir E, Altýntoprak AE. [Severity of Alcohol Dependence Questionnaire: Validity and Reliability of the Turkish Version]. Turk Psikiyatri Derg Turk J Psychiatry 2018; 29(3) : 202–8.
20. Sullivan JT, Sykora K, Schneiderman J, Naranjo CA, Sellers EM. Assessment of alcohol withdrawal: the revised clinical institute withdrawal assessment for alcohol scale (CIWA-Ar). Br J Addict 1989; 84(11) : 1353–7.
21. Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc 2005; 53(4) : 695–9.
22. Oudman E, Postma A, Van der Stigchel S, Appelhof B, Wijnia JW, Nijboer TCW. The Montreal Cognitive Assessment (MoCA) is Superior to the Mini Mental State Examination (MMSE) in Detection of Korsakoff's Syndrome. Clin Neuropsychol 2014; 28(7) : 1123–32.
23. Hall KS, Gao S, Emsley CL, Ogunniyi AO, Morgan O, Hendrie HC. Community screening interview for dementia (CSI 'D'); performance in five disparate study sites. Int J Geriatr Psychiatry 2000; 15(6) : 521–31.
24. Phung KTT, Chaaya M, Waldemar G, Atweh S, Asmar K, Ghusn H, et al. Validation of the 10/66 Dementia Research Group diagnostic assessment for dementia in Arabic: a study in Lebanon. J Geriatr Psychiatry Neurol 2014; 27(4) : 282–90.
25. Alarcon R, Nalpas B, Pelletier S, Perney P. MoCA as a Screening Tool of Neuropsychological Deficits in Alcohol-Dependent Patients. Alcohol Clin Exp Res 2015; 39(6) : 1042–8.
26. Nair UR, Vidhukumar K, Prabhakaran A. Age at Onset of Alcohol Use and Alcohol Use Disorder: Time-trend Study in Patients Seeking De-addiction Services in Kerala. Indian J Psychol Med 2016; 38(4) : 315–9.
27. Ramanan VV, Singh SK. A study on alcohol use and its related health and social problems in rural Puducherry, India. J Fam Med Prim Care 2016; 5(4) : 804–8.
28. Copersino ML, Fals-Stewart W, Fitzmaurice G, Schretlen DJ, Sokoloff J, Weiss RD. Rapid cognitive screening of patients with substance use disorders. Exp Clin Psychopharmacol 2009; 17(5) : 337–44.
29. Heffernan TM. Subjective Ratings of Prospective Memory Deficits in Chronic Heavy Alcohol Users. Alcohol Alcohol 2002; 37(3) : 269–71.

Original Article

Relationship of rumination, mindfulness and emotion regulation in depression

Aarzoo Gupta
Department of Psychiatry, Government Medical College & Hospital, Chandigarh 160031
Contact: Aarzoo, E-mail: aarzoo_gupta9@yahoo.com

ABSTRACT

***Background**: Depression is characterized by low mood associated with emotional, cognitive, somatic, and behavioral symptoms leading to disability and dysfunction. Behavioral accommodation and cognitive control are elementary to purposeful behaviors but are impaired in depression. The depressed individual tends to ruminate and this difficulty in disengagement from the negative information tends to impair the ability of a depressed person to flexibly reappraise or reinterpret the life event hence, turning to maladaptive emotion regulation strategies. **Methods**: The study aimed to probe rumination, emotion regulation, and mindfulness in depression using a cross-sectional single-sample design and purposive sampling. The sample size constituted 40 participants with the diagnosis of unipolar depression including both major depressive disorder (MDD) and recurrent depressive disorder (RDD) assessed on the Beck Depression Inventory (BDI), Ruminative Response Scale (RRS), Mindful Attention Awareness Scale (MAAS), Emotion Regulation Questionnaire (ERQ). **Results**: Depression intensified the ruminations. In addition, as the ruminations increased the mindfulness decreased. **Conclusion**: Rumination swayed the course as well as the treatment outcome. Interventions targeting mindfulness, and emotion regulation might play a significant role in the management of rumination in depressive disorders.*

Keywords:

Introduction

Depression is characterized by low mood associated with emotional, cognitive, somatic, and behavioural symptoms.[1] It has become a significant global health issue that is affecting the quality of life, mortality, and morbidity.[2] The prevalence of depression is 9% and of a major depressive episode is 36% in India.[3] Depression is also associated with disability and dysfunction in a socio-occupational and personal domain or even suicide. Although rumination is a transdiagnostic cognitive symptom and it puts an individual at-risk to develop depression, individuals suffering from depression tend to ruminate about the experiences from the past in an uncontrollable manner. The depressed indivi-dual's rumination interferes with cognitive control causing attentional difficulties. Cognitive control reasons the ability to attend to stimuli and flexibly choose an appropriate response using effective problem-solving and decision-making; it also involves impulse control and goal-directed behaviour by regulating distraction as well as the intrusion of competing stimuli.[4,5] Behavioural accommodation and cognitive control are elementary to purposeful behaviours but are impaired in depression[6] The difficulties in cognitive control arise from the reduced cognitive capacity (allocation hypothesis) and pre-occupation with emotional material (affective inter-ference hypothesis).[7] This intrudes the engagement in effortful cognitive tasks that require an individual to ignore the emotional information. The cognitive

biases affect the processing of information with extra focus on mood-congruent content during perception, appraisal, and memory retrieval. This suppressed inhibition of negative irrelevant information interferes with one's ability to respond adaptively as one is unable to discard the irrelevant material from working memory.[4,6] This difficulty in disengagement from the negative information tends to impair the ability of a depressed person to flexibly reappraise or reinterpret the life event hence, turning to maladaptive emotion regulation strategies. Rumination is also perceived as a maladaptive cognitive emotional strategy that tends to maintain depressogenic cognition thru sustained focus on negative emotions.[8] Rumination is a form of preservative cognition that focuses on the negative content reinforcing the attentional bias leading to worsening of the treatment outcome.[8,9] The maladaptive emotion regulation strategies further increase worthlessness, helplessness, hopelessness and; intense negative emotional state, and irritability in behaviour resulting in impaired functioning as well as interpersonal conflicts.[10] Rumination consumes mental energy reducing the mindfulness or awareness of present experiences increasing the risk for future relapses. Mindfulness practice is known to decrease rumination and facilitate adaptive emotion regulation strategies resulting in better functional outcomes. Rumination and emotional reactivity are well recognized in the management of depression still there are not many Indian studies delving into these. Mindfulness-based intervention accelerates cognitive flexibility and emotional regulation, thereupon, compressing depressive symptomatology.[10-12] Hence, this study attempted to probe rumination, emotion regulation, and mindfulness in depression. This can enhance the implication of techniques to remediate mindfulness and emotion regulation in the alleviation of symptoms and boost treatment outcomes.

Materials and Methods

Study design and setting

The study deployed was cross-sectional one sample design using purposive sampling. The data were collected from the outpatient department (OPD) of Psychiatry of a tertiary care teaching Hospital in North India through a face-to-face interview. The total sample size constituted 40 participants with the diagnosis of unipolar depression including both major depressive disorder (MDD) and recurrent depressive disorder (RDD).

Participants

Males and females between 18-60 years of age with a minimum of 10 years of formal education having mild or moderate depression on Beck's Depression Inventory (BDI) were included. Whereas those having severe depression, active suicidality, a severe depressive episode with psychotic symptoms, any psychiatric comorbidity, or comorbid unstable medical or neurological condition were excluded. Also, those seeking any form of evidence-based psychotherapy or practicing yoga/meditation currently or in the last 6 months, etc. were excluded.

Assessment Measures

Beck Depression Inventory (BDI)

The scale was developed by Beck in 1961 to assess the presence and intensity of mood symptoms.[13] It has 21 items; each item is responded to on a 0-4 scale. The scores range from 0-63, a score of up to 10 is considered absent or minimal depression, 11-18 indicates mild to moderate depression, 19-29 indicates moderate depression and 30-63 indicates severe depression. The questionnaire takes approximately 10 minutes to complete and has a Cronbach Alpha of .81 - .86.[14]

Ruminative Response Scale (RRS)

The Rumination Response scale was developed by Hoeksema and Morrow in 1991 to assess rumination in the individual, and the current version was developed in 2003.[15] It has 22 items, and the items are rated on a 4-point scale. It measures three factors; depression, brooding, and reflection. Higher scores indicate higher degrees of ruminative symptoms. The questionnaire takes approximately 5 minutes to complete and has a Cronbach's Alpha of .74 - .83.[16]

Mindful Attention Awareness Scale (MAAS)

The scale was developed by Brown and Ryan in 2003.[17] It assesses trait mindfulness. The scale has 15 items, and items are rated using a 6-point scale. The score ranges from 15 to 90, higher score indicates higher mindfulness. The questionnaire takes approximately 8 minutes to complete and has

a Cronbach's Alpha of .89 - .93.[18]

Emotion Regulation Questionnaire (ERQ)

The questionnaire was developed by Gross and John in 2003.[19] It measures individuals' tendency to regulate their emotions. It has 10 items scale, items are rated using a 7-point scale. It has two sub-scales; cognitive reappraisal and expressive suppression. The questionnaire takes approximately 5 minutes to complete and has a Cronbach's Alpha of .73-.82.[20]

Procedure

The research was carried out as part of the MPhil Clinical Psychology dissertation. The proposal was presented to Departmental Research Committee in the second year of the course and further approval was received from Institution Ethics Committee (IEC/673R/2021/428). The study period was from December 2021 until April 2022 and individual consent was sought from the participant as per the Declaration of Helsinki.[21] The co-author (Psychiatry Consultant) referred the patients having a diagnosis of MDD and RDD to the researcher, researcher (first author) verified the diagnosis as per ICD10 criteria along with the co-author (Clinical Psychology Consultant). The researcher explained the purpose of the study and then filled in the sociodemographic details of the participant. Further, a clinical profile sheet was used to screen for comorbid conditions (both psychiatric as well as medical or neurological). The participants who were included were taken back to the Psychiatry Consultant for confirmation of assessment and to look into the file record. Once morbidity and comorbidity were confirmed, the researcher then administered BDI through face-to-face clinical interviews along with the 2nd author. Those having mild to moderate levels of depression severity (BDI score of 11-29) were included and those excluded continued to seek treatment as usual with a note put in the File. Once recruited in the study each participant was assessed on Rumination Response Scale Short Form, Mindfulness Attention Awareness Scale, and Emotion Regulation Questionnaire. Once the assessment was completed, the researcher thanked the participant and informed him about the incentive of three follow-up consultations in the OPD to be facilitated by the researcher without waiting in the queue. The participants were taken back to the co-author (Psychiatry Consultant) for final disposal and those referred for psychotherapy were guided to the concerned Clinical Psychologist. Figure 1 showed the recruitment of a sample of 40 out of a total of 62 participants as per the inclusion/exclusion criteria.

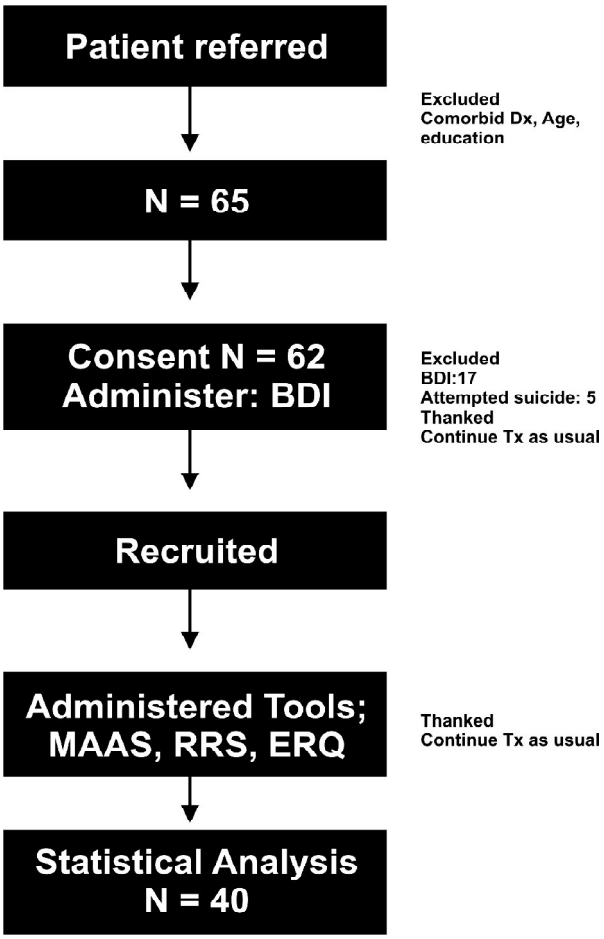


Fig. 1: Recruitment of participants and procedure

Statistical Analysis

Data was coded and appropriate statistical analysis was carried out using Statistical Package for Social Sciences (SPSS). Descriptive statistics were used for participant variables, clinical variables, and study measures. Correlation analysis was computed for measures of symptom severity, rumination, mindfulness, and emotion regulation.[22] Further, linear regression was computed to describe and predict the effect of these variables.[23]

Results

Table 1 depicts the participant characteristics. The sample had an equal number of participants with

a diagnosis of MDD and RDD and a higher proportion of married females. Table 2 showed the descriptive analysis of the scores on the assessment measures.

increased rumination also increased or vice-versa. Further, rumination had a significantly low negative correlation with mind-fulness (MAAS; r = -.32 significant at p < .05), implying as rumination

Table-1: Participant characteristics (N=40)

Variable		Mean (SD) / *f* (%)
Age		36.40 (8.89)
Sex	Male	16 (40)
	Female	24 (60)
Education (years)		13.43 (2.60)
Occupation	Student	5 (12.5)
	Job	14 (35)
	Business	5 (12.5)
	Housewife	16 (40)
Marital status	Married	33 (82.5)
	Unmarried	7(17.5)
Diagnosis	MDD	20 (50)
	RDD	20 (50)
DOI		52.05 (52.27)
Depression level	Mild to mod	18 (45)
	Mod	22 (55)

SD - Standard deviation; *f* - Frequency; % - Percentage; MDD - Major depressive disorder; RDD - Recurrent depressive disorder; DOI - Duration of illness; Mod - Moderate

Table-2: Descriptive statistics of scores on assessment measures (BDI, RRS, MAAS, ERQ) of the sample (N=40)

Measures		Mean (SD)
BDI		22.83 (4.39)
RRS	RRS	52.62 (10.26)
	RR-DEP	29.80 (5.62)
	RR-REF	10.95 (2.92)
	RR-BRO	12.03 (3.36)
MAAS		47.03 (10.18)
ERQ	ERQ	42.90 (10.53)
	ER-COG	25.80 (7.66)
	ER-EM	17.30 (5.38)

SD - Standard deviation; BDI - Beck Depression Inventory; RRS - Ruminative Response Scale; RR-DEP - Depression domain of Ruminative Response Scale; RR-REF - Reflection domain of Ruminative Response Scale; RR-BRO - Brooding domain of Ruminative Response Scale; MAAS - Mindful Attention Awareness Scale; ERQ - Emotion Regulation Questionnaire; ER-COG - Cognitive domain of Emotion Regulation Questionnaire; ER-EM - Emotional domain of Emotion Regulation Questionnaire

The correlation analysis showed that depression (BDI) had a significant moderate positive correlation with rumination (RRS; r = .58 significant at p <.01) and brooding (RR-BRO; r = .52 significant at p < .01). Whereas it (BDI) had a significant low positive correlation with domains of depression (RR-DEP; r = .47 significant at p < .01) and reflection (RR-REF; r = .47 significant at p < .01). This implied as depression severity increased, mindfulness decreased. It was observed that depression had no significant correlation with mindfulness (MAAS) and emotion regulation (ERQ).

The regression analysis determined the adjusted coefficient of determination (adjusted R2), predicting the amount of change in the dependent variable (DV) contributed to (IV). Depression accounted for 32% of the variation in rumination, 20% of the variation

in depression (RR-DEP), 20% variation in reflection (RR-REF), and 25% variation in brooding (RR-BRO). Rumination accounted for an 8% variation in mindfulness.

adolescents and adults.[24] Rumination was also seen as a risk factor in healthy, non-depressed individuals for the future onset of major depressive disorder and acted as a mediator between depression and

Table-3: Correlation analysis of the scores on the assessment measure (BDI, RRS, MAAS, ERQ) of the sample (N=40)

	BDI	RRS	RR-DEP	RR-REF	RR-BRO	MAAS	ERQ	ER-COG	ER-EM
BDI	1	.58**	.47**	.47**	.52**	– .10	– .01	– .04	.04
RRS	–	1	.89**	.75**	.84**	– .32*	– .13	– .13	– .11
RR-DEP	–	–	1	.49**	.61**	– .26	– .18	– .15	– .19
RR-REF	–	–	–	1	.53**	– .18	.01	– .01	.02
RR-BRO	–	–	–	–	1	– .26	– .09	– .08	– .09
MAAS	–	–	–	–	–	1	– .02	.12	– .17
ERQ	–	–	–	–	–	–	1	.88**	.73**
ER-COG	–	–	–	–	–	–	–	1	.32*
ER-EM	–	–	–	–	–	–	–	–	1

*** – $p < .001$; ** – $p < .01$; * – $p < .05$BDI - Beck Depression Inventory; RRS - Ruminative Response Scale; RR-DEP - Depression domain of Ruminative Response Scale; RR-REF - Reflection domain of Ruminative Response Scale; RR-BRO - Brooding domain of Ruminative Response Scale; MAAS - Mindful Attention Awareness Scale; ERQ - Emotion Regulation Questionnaire; ER-COG - Cognitive domain of Emotion Regulation Questionnaire; ER-EM - Emotional domain of Emotion Regulation Questionnaire

Table 4: Regression analysis of the scores on the assessment measure (BDI, RRS, MAAS, ERQ) of the sample (N=40)

IV	DV	r	Regression						
			Std Error	F	Adjusted R^2	B	t	p	Beta
BDI	RRS	0.58	0.31	19.49	0.32	1.37	4.41	0.00***	0.58
	RR-DEP	0.47	0.18	10.87	0.20	0.60	3.30	0.002**	0.47
	RR-REF	0.47	0.95	10.53	0.20	0.31	3.24	0.002**	0.47
	RR-BRO	0.52	0.11	14.44	0.25	0.40	3.80	0.001**	0.52
RRS	MAAS	0.32	0.15	4.34	0.08	-0.32	-2.08	0.044*	-0.32

*** – $p < .001$; ** – $p < .01$; * – $p < .05$IV - Independent variable; DV - Dependent variable; r - Correlation; BDI - Beck Depression Inventory; RRS - Ruminative Response Scale; RR-DEP - Depression domain of Ruminative Response Scale; RR-REF - Reflection domain of Ruminative Response Scale; RR-BRO - Brooding domain of Ruminative Response Scale; MAAS - Mindful Attention Awareness Scale; ERQ - Emotion Regulation Questionnaire; ER-COG - Cognitive domain of Emotion Regulation Questionnaire; ER-EM - Emotional domain of Emotion Regulation Questionnaire

Discussion

The study aimed to assess the relationship between rumination, emotion regulation, and mindfulness with depression. The findings of the present study revealed that depression intensified ruminations. In addition, as the ruminations increased the mindfulness decreased. The positive correlation between depression and rumination was identified by the studies considering rumination as a trans-diagnostic factor responsible for the co-occurrence of symptoms of depression and anxiety in both

suicide.[25,26] Rumination is common to all individuals but it's the uncontrollability of rumination that makes it clinically significant. It's the brooding that moderated the relationship between stress and depression.[27] Similarly, brooding and not reflecting mediated the relationship between negative cognitive styles and depression that contributed to the negative outcomes.[28] Contradictory to this, both levels of brooding and reflective rumination were related to elevated depressive symptom levels across the follow-up.[29] Reflection in rumination when compared with self-

reflection that created insight was found to be distinct and contributed to a reduction in well-being.[30] This could be because even purposeful rumination appeared to exacerbate the emotional reactivity while being mindful of one's goals was beneficial in healthy as well as clinical samples.[31] Although the current study did not find any significant relationship between rumination and emotion regulation, the studies have shown that emotion regulation is affected by mood or depressive state, and depressed individuals show a more dysfunctional use of emotion regulation strategies.[32] Additionally, emotion regulation is more selective and effective with age, neurocognition, adaptive functioning, personality structure, and social cognition.[33-37] The study sample had a larger number of employees and married individuals where possibly the environmental factors could have modulated the emotion regulation. The adults in their midlife reported significantly greater use of optimism as a mood-regulation strategy than was reported by the young adults.[38] Rumination mediates cognitive processes and depressive psychopathology through bottom-up processing although cognitive control is a top-down process but control operations can be triggered by contextual cues bottom-up, indicating an automatic aspect of cognitive control.[4,39,40] Automatic control is thought to be achieved by simply forming "context-control" associations where the context acts as a cue that triggers the retrieval of the associated control state. Thus, it can be ascertained that rumination and emotional regulation influence bottom-up processing which in turn affects top-down processing. Both bottom-up and top-down processes impinge the cognitive control incumbent for reappraisal.

The current study sample had a larger female representation which is in sync with data highlighting point prevalence of unipolar depressive episodes to be higher in women than men.[3] Also, women tend to have a more ruminative response style than men which increased their likelihood of developing and lengthening depressive episodes.[41] The study sample had more married participants, previous studies supported that the quality of marital relationships was associated with psychopathology and well-being.[42] It was found that married working women experienced a higher level of anxiety or depression and a lower quality of life in comparison to unmarried working women.[43]

Conclusion

The study implied that rumination swayed the course as well as the outcome of depressive disorder and hence requires the attention of mental health professionals in terms of both assessment as well as intervention. The study will be beneficial to highlight the role of interventions targeting mindfulness and rumination in the management of depressive disorders. Future studies can have a comparative group(s) and larger sample size to explore the interplay of rumination and emotion regulation; and the outcome of mindfulness-based interventions on these.

References

1. National Collaborating Centre for Mental Health. Common mental health disorders: identification and pathways to care. Leicester UK: British Psychological Society 2011.
2. Kessler RC, Bromet EJ. The epidemiology of depression across cultures. Annu Rev of Public Health 2013; 34 : 119-138.
3. Bohra N, Srivastava S, Bhatia MS. Depression in women in Indian context. Indian J Psychiatry 2015; 57 : 239-245.
4. Kang MS, Yu-Chin C. Well under control: control demand changes are sufficient for metacontrol. Front Psychol 2022; 13 : 1032304. doi: 10.3389/fpsyg.2022.1032304
5. Alderman BL, Olson RL, Bates ME, Selby EA, Buckman JF, Brush CJ, Panza EA, Kranzler A, Eddie D, Shors TJ. Rumination in major depressive disorder is associated with impaired neural activation during conflict monitoring. Front Hum Neurosci 2015; 9 : 269. doi: 10.3389/fnhum.2015.00269.
6. Hoffmann S, Beste C. A perspective on neural and cognitive mechanisms of error commission. Front Behav Neurosci 2019; 9 : 50. doi:10.3389/fnbeh.2015.00050.
7. Kircanski K, Joormann J, Gotlib IH. Cognitive aspects of depression. Wiley Interdiscip Rev Cogn Sci 2012; 3 : 301-313.
8. Joormann J, Gotlib IH. Emotion regulation in depression: relation to cognitive inhibition. Cogn Emot 2010; 24 : 281-298.
9. Roelofs J, Huibers M, Peeters F, Arntz A, Van Os J. Positive and negative beliefs about depressive rumination: a psychometric evaluation of

two self-report scales and a test of a clinical metacognitive model of rumination and depression. Cognit Ther Res 2009; 34 : 196-205.
10. Desrosiers A, Vine V, Klemanski DH, Nolen-Hoeksema S. Mindfulness and emotion regulation in depression and anxiety: common and distinct mechanisms of action. Depress Anxiety 2013; 30 : 654-661.
11. Shapero BG, Greenberg J, Mischoulon D, Pedrelli P, Meade K, Lazar SW. Mindfulness-based cognitive therapy improves cognitive functioning and flexibility among individuals with elevated depressive symptoms. Mindfulness 2018; 9 : 1-13.
12. McCarney RW, Schulz J, Grey AR. Effectiveness of mindfulness-based therapies in reducing symptoms of depression: a meta-analysis. Eur J Psychother Couns 2012; 14 : 279-299.
13. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961; 4 : 561-571.
14. Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck depression inventory: twenty-five years of evaluation. Clin Psychol Rev 1988; 8 : 77-100.
15. Treynor W, Gonzalez R, Nolen-Hoeksema S. Rumination reconsidered: a psychometric analysis. Cognit Ther Res 2003; 27 : 247-259.
16. Parola N, Zendjidjian XY, Alessandrini M, Baumstarck K, Loundou A, Fond G, Berna F, Lançon C, Auquier P, Boyer L. Psychometric properties of the ruminative response scale-short form in a clinical sample of patients with major depressive disorder. Patient Prefer Adher 2017; 11 : 929-937.
17. Brown KW, Ryan RM. The benefits of being present: mindfulness and its role in psychological well-being. J Pers Soc Psychol 2003; 84 : 822-848.
18. Black DS, Sussman S, Johnson CA, Milam J. Psychometric assessment of the mindful attention awareness scale (MAAS) among Chinese adolescents. Assessment 2012; 19 : 42-52.
19. Gross JJ, John OP. Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. J Pers Soc Psychol 2003; 85 : 348-362.
20. Wang D, Yuan B, Han H, Wang C. Validity and reliability of emotion regulation questionnaire (ERQ) in Chinese rural-to-urban migrant adolescents and young adults. Curr Psychol 2022; 41 : 2346-2353.
21. Williams JR. The Declaration of Helsinki and public Health. Bull World Health Organ 2008; 86 : 650-652.
22. Mukaka MM. A guide to appropriate use of correlation coefficient in medical research. Malawi Med J 2012; 24 : 69-71.
23. Ali P, Younas A. Understanding and interpreting regression analysis. Evid Based Nurs 2021; 24 : 116-118.
24. McLaughlin KA, Nolen-Hoeksema S. Rumination as a transdiagnostic factor in depression and anxiety. Behav Res Ther 2011; 49 : 186-193.
25. Deyo M, Wilson KA, Ong J, Koopman C. Mindfulness and rumination: does mindfulness training lead to reductions in the ruminative thinking associated with depression? Explore (NY) 2009; 5 : 265-271.
26. Liu D, Liu S, Deng H, Qiu L, Xia B, Liu W, Zhang D, Huang D, Guo H, Zhang X. Depression and suicide attempts in Chinese adolescents with mood disorders: the mediating role of rumination. Eur Arch Psychiatry Clin Neurosci 2022; PMID: 35763221.
27. Cox S, Funasaki K, Smith L, Mezulis AH. A prospective study of brooding and reflection as moderators of the relationship between stress and depressive symptoms in adolescence. Cogn Ther Res 2011; 36 : 290-299.
28. Lo CS, Ho SM, Hollon SD. The effects of rumination and negative cognitive styles on depression: a mediation analysis. Behav Res Ther 2008; 46 : 487-495.
29. Grassia M, Gibb BE. Rumination and prospective changes in depressive symptoms. J Soc Clin Psychol 2008; 27 : 931–948.
30. Harrington R, Loffredo DA. Insight, rumination, and self-reflection as predictors of well-being. J Psychol 2010; 145 : 39-57.
31. Gilbert K, Gruber J. Emotion regulation of goals in bipolar disorder and major depression: a comparison of rumination and mindfulness. Cogn Ther Res 2014; 38 : 375-388.
32. Ehring T, Fischer S, Schnülle J, Bösterling A,

Tuschen-Caffier B. Characteristics of emotion regulation in recovered depressed versus never depressed individuals. Pers Individ Differ 2008; 44 : 1574-1584.
33. Carstensen LL, Fung HH, Charles ST. Socio-emotional selectivity theory and the regulation of emotion in the second half of life. Motiv Emot 2003; 27 : 103-123.
34. Lewis MD, Granic I, Lamm C. Behavioral differences in aggressive children linked with neural mechanisms of emotion regulation. Ann NY Acad Sci 2006; 1094 : 164-177.
35. Hou J, Song B, Chen ACN, Sun C, Zhou J, Zhu H, Beauchaine TP. Review on neural correlates of emotion regulation and music: Implications for emotion dysregulation. Front Psychol 2017; 8 : 501.
36. Matsumoto D, Yoo SH, Nakagawa S. Culture, emotion regulation, and adjustment. J Pers Soc Psycho 2008; 94 : 925-937.
37. Liliana B, Nicoleta TM. Personality, family correlates and emotion regulation as wellbeing predictors. Procedia Soc 2014; 159 : 142-146.
38. Chapman BP, Hayslip Jr B. Emotional intelligence in young and middle adulthood: cross-sectional analysis of latent structure and means. Psychol Aging 2006; 21 : 411-418.
39. Roiser JP, Sahakian BJ. Hot and cold cognition in depression. CNS Spectr 2013; 18 : 139-149.
40. Ahern E, Bockting CL, Semkovska M. A hot-cold cognitive model of depression: integrating the neuropsychological approach into the cognitive theory framework. Clin Psychol 2019; 1 : e34396.
41. Nolen-Hoeksema S, Hilt LM. Gender differences in depression. In: Gotlib IH, Hammen CL, editors. Handbook of Depression, 2nd edition. Guilford Press 2009; 386-404.
42. Jaiswal P, Jilani AQ, Dalal PK. Marital quality and its relation with depression: a case-control study. Int J Adv Med 2016; 3 : 591-595.
43. Akhouri D, Madiha M, Ansari M. H. Anxiety and depression quality of life among working married and unmarried women: a comparative study. Indian J Psychiatr Soc Work 2019; 10 : 13-21.

Original Article

Demographic variables and Psychiatric Comorbidity of People with Intellectual Disability

Rachna Kapoor,[1] Mir Shahid Ali[2]
[1]*Indira Gandhi National Open University (IGNOU)*
[2]*Department of Social Welfare, Govt. of NCT Delhi*
Contact: Rachna, E-mail: rachnakapoork21@gmail.com

ABSTRACT

***Background**: Intellectual disability affects an individual's everyday life functioning. People with intellectual disability have a relatively high likelihood for developing psychiatric comorbidity than in general population. These people due to various problems like communication and cognitive deficits have difficulty in identification of psychiatric comorbidity.[1] According to DSM-5, Intellectual disability has an impact on three broad domains in a person's life: conceptual (e.g. language and money), social (e.g. empathy and social judgement), and practical (e.g. personal care and money management). **Aim**: The aim is to study demographic variables and psychiatric comorbidity of people with Intellectual disability. **Material & Methods**: 300 people (150 female, 150 male) diagnosed with intellectual disability were taken for the study sample. The age range was equal to 12 years old and above. Vineland Social Maturity Scale and Reiss Screen for Maladaptive Behaviour were used to screen them. **Statistical Analysis**: The statistical analysis was done by using the Statistical Package for Social Sciences (SPSS). Frequency, percentage, mean, standard deviation, t-test and ANOVA were used to analyze the data. **Results**: The significant psychiatric comorbidity was found in people with intellectual disability and gender difference was also observed. **Conclusion**: The results of this study clearly highlight the need to address the psychiatric comorbidity of people with intellectual disability and need for mental health services to have the capacity to identify and support people with intellectual disability.*

***Key words**: Intellectual disability, Demographic variables, Psychiatric comorbidity.*

Introduction

Intellectual disability is a term used when there are limits to a person's ability to learn at an expected level and function in daily life. Intellectual Disability is defined as significantly sub-average general intelligence, with onset during early developmental period, and concurrent deficits in adaptive functioning.

General intellectual functioning is assessed using standardized intelligence test with significantly sub-average intelligence as two standard deviations below the mean (usually an IQ of below 70), and adaptive behaviour is the person's ability to meet responsibilities of social, personal, occupational and interpersonal areas of life, appropriate to age, socio-cultural and educational background. A classification of intellectual disability on basis of IQ (Intelligence Quotient, is equal to mental age, i.e. M.A. divided by chronological age i.e. C.A. multiplied by 100 i.e. IQ=MA/CA*100).

Intellectual disability is defined in the 'International Classification of Diseases, 10th edition' (ICD-10) (World Health Organization) (WHO), 1992) as a condition with delayed or disturbed development of intellectual and adaptive ability and functioning, with onset before age 18. Signs of psychiatric comorbidity in people with intellectual

disability have been regarded as problem behaviour or as artifects of the developmental or social delay inherent in intellectual disability.[2]

Comorbidity is defined as the presence of at least two diseases or disorders in an individual. It is estimated that people who are elderly patients with intellectual disability have on average 2.5 times more chronic diseases in general population. Comorbidity is the co-occurrence of more than one disorder in the same individual. There are problems which have been identified causing problems in diagnosing in the intellectual disabled, like poor verbal skills, multiple handicaps and poor performance, on various psychological tests.[3] The rates of psychiatric comorbidity of intellectual disabled has varied from 31% to 100% across various studies.[4] One of the main reasons held responsible for this is the way, this is diagnosed in the intellectual disabled.[5] Commonly patients are described as having a 'behavioural problem' rather than a any specific disorder in many studies.[6] Most workers adopt two extreme approaches while dealing with comorbidity.

Psychiatric comorbidity is particularly frequent in patients with intellectual disability mental disorders are present in up to 40% of the population.[7] Challenging behaviours were the most frequent psychiatric comorbidity, they were present in almost 10% of the group, including verbally aggressive behaviour (7.5%), physically aggressive behaviour (6.3%) and destructive behaviour (3.0%). The most frequent psychiatric comorbidities were: challenging behaviours (32.4%), depression (15.2%) and anxiety (13.6%). The prevalence of behavioral problems range between 10% and 55%.[8,9] It is estimated that dangerous, self-injurious actions occur at a rate of 4-5% in children.[10] Additionally, the severity of intellectual disability plays a significant role in the behavioral disruption.[11]

Prevalence rates for types of behaviour problems like aggressive behaviour ranged from 6.49% to 32%, Self-injurious behaviour ranged from 4.4% to 21% and destructive behaviour ranged from 2.3% to 19%.[12]

The prevalence rates of mental illnesses of any type based on clinical diagnosis were 29.2% foe men and 27.3% for women, summed up that men were more likely to show aggression than females. Literature review summarised that boys and male adolescents were more likely to show distruptive, antisocial problem.[13]

The possibility that psychiatric comorbidity could affect intellectually disabled individuals was not considered till late 19th century. It has been documented that the intellectually disabled are at a greater risk of developing psychiatric comorbidity.[14]

Cognitive functioning as a potential risk factor of psychopathology is highly associated with language development, communication, coping strategies with stress, and other adaptive behaviour skills and other critical developmental variables. Although some have deemphasized the importance of intellectual disability levels of dimension of classification, it is one of the most robust predictors of developmental outcome in population with intellectual disability. There is strong correlation with prevalence of challenging behaviours in general.[15]

There are evidences that psychiatric comorbidity occur with high frequency with mental retarded people than in general population.[16,17] It is difficult to identify and diagnose them as traditional methods rely on evaluation of psychological process, which usually done through direct communication with the patient. The prevalence of intellectual disability in the general population is 1–3%.[18] Children and adolescents with intellectual disability are a high-risk group for mental health problems and previous studies have shown the diagnostic overshadowing of comorbid psychiatric diagnoses when an individual is diagnosed with an intellectual disability.[2,19]

Over the past few decades increased attention has been paid to identifying and responding to the mental health needs of children and adolescents with intellectual disability. The few prevalence studies which have been undertaken have suggested that people with intellectual disability are at significantly increased risk of psychiatric comorbidity when compared with their non-intellectual disabled peers.[20]

Demographic variables like age, sex, religion, education, income, job qualification may predict psychiatric comorbidity of people with intellectual disability. Some relevant demographic variables need to be understood before studying comorbidities. In addition, factors associated with intellectual disability may also be associated with comorbidity with intellectual disability regarding age, studies have been found age to be unrelated to total prevalence of psychiatric comorbidity,[13] although some have

found higher.[21] The prevalence of behavioural problems is higher than male than in female even in the absence of intellectual disability,[22] it could be that more male with intellectual disability are identified.

People with intellectual disability are at the higher risk of psychiatric comorbidity. The most common psychiatric comorbidity is problem behaviour (18.7%), affective disorder (5.7%), autism spectrum disorder (4.4%), psychotic disorder (3.8%) and anxiety disorder (3.27%).[15] Although much research has already been conducted in this area, further research is required to increase our understanding regarding the level of intellectual disability and different demographical variables of people with intellectual disability. So, this study will help to study the prevalence of psychiatric comorbidity of people with intellectual disability.

Aim

The aim of present research was to study demographic variables and psychiatric comorbidity of people with intellectual disability.

Objectives

1. To study prevalence of psychiatric comorbidity of people with intellectual disability.
2. To study gender difference in psychiatric comorbidity of people with intellectual disability.
3. To study difference in psychiatric comorbidity of people with intellectual disability on levels of intellectual disability.

Hypothesis

1. There would be significant prevalence of psychiatric comorbidity of people with intellectual disability.
2. There would be significant gender difference in psychiatric comorbidity of people with intellectual disability.
3. There would be significant difference in psychiatric comorbidity of people with intellectual disability on levels of intellectual disability.

Materials and Methods

Sample: A sample of 300 people (150 female, 150 male) with intellectual disability was selected through purposive sampling from Asha Kiran Home for Mentally Challenged and Asha Jyoti Home for Mentally Challenged for Adult Female of Delhi for the present study and informed consent was obtained from the concerned.

Inclusion criteria:

- People who are already diagnosed with intellectual disability.
- The age range above 12 years old were included in the study.

Exclusion criteria:

- People with chronic physical comorbidity.
- Profound intellectually disable individuals were excluded.

Tools used

Socio-Demographic Performa

Socio-demographics include age, gender, martial status, parental support, living and level of intellectual disability. This performa was semi structured form to get essential background information for screening.

Vineland Social Maturity Scale[23]

Vineland Social Maturity Scale (VSMS) is widely used psychometric assessment instrument. It is mainly designed to assess social and adaptive functions. VSMS was developed by American psychologist Edgar Arnold Doll and published in 1940. He published manual for it in 1953.[24] It is widely preferred test to assess intelligence whenever standard intelligence tests cannot be used due to various reasons for example when child speech is not clear or inadequate, when person is not cooperative etc. This test is less time consuming and is a brief test adopted by A.J. Malin (1965) and later further modification done by Dr. Bharat Raj (1992) Indian Adaption had only 89 items, except few are almost the exact match with original version. It takes 20–30 minutes to administer and evaluate the social age, social quotient and adaptive functioning ranging from 0–15 years. At the end of assessment full and half credits are counted. The procedure for obtaining the Social Age from the raw is as follows. S.Q = (Social Age / Actual Age) x 100. Research studies,[25] have shown a consistent and high correlation between VSMS Social Age (S.A.) and the Stanford Binet M.A Doll reported a correlation of + = 0.85 and

Patterson (1943) reporting a correlation of + = 0.96 with the Binet scale on a sample of normal children. The individuals were divided into 4 groups on the level of retardation, as per ICD-10, which were as follows:

(a) Mild mental retardation (IQ range 50 to 69)
(b) Moderate mental retardation (IQ range 35 to 49)
(c) Severe mental retardation (IQ range 20 to 34)
(d) Profound mental retardation (IQ range less than 20)

Reiss Screen for Maladaptive Behaviour

Reiss Screen for Maladaptive Behaviour (RSMB) was designed to meet the need for a standardized screening instrument for mental health disorders in persons with mental retardation.[26] This instrument is widely used both in clinical practice and in research. The Reiss Screen include 38 item statements, it takes about 20 minutes. Each item is scored on 3 categories: (0) no problem, (1) a problem and (2) a major problem, rating instrument designed for used in screening large populations in order to identify those persons who need further evaluation as to presence of psychiatric or behavioural disorder.

The scoring system of the Reiss Screen consists of: (1) seven scale scores, (2) six special maladaptive behaviour item scores, and (3) the 26 item total score. The seven scale scores are based on the results of a factor analysis of a national sample of 305 people. Each scale has five items, with some items counting on more than one scale. The seven scales are: aggressive disorder, psychosis, depression (behavioural signs), depression (physical signs), avoidant disorder, dependent personality disorder and paranoia. The six maladaptive behaviour items are drug abuse, overactivity, self-injury, sexual behaviour, suicidal tendencies and stealing. A person rated by the carer as suicidal should be referred for psychiatric or psychological evaluation, including total score and diagnostic status.[27] A 26 item total score is computed to identify whether a person has tested positive or negative for mental health disorder using the cut-off score. Reiss recommends this as people with severe disorders show symptoms characteristic of a variety of disorders. For example, people with severe psychosis tend to show some symptoms of anxiety disorder, and people with severe panic attacks tend to show some symptoms of psychosis. Reiss suggests that the 26 item total score may be viewed as a measure of the severity of the psychopathology. The total score is the sum of the scores for the 26 items used in calculating the seven scale scores. Each of the scoring criteria (seven scale scores, six special items and the total score) has a cut-off point. According to the Reiss Screen Manual, a person with learning disability is said to test 'positive' for dual diagnosis if any of the three categories (seven scale scores, six special maladaptive item score and the 26 item total score) is at or above the cut-off points. Interpretation of test results: A positive test result means that the subject is likely to require a mental health service and should be referred to mental health professionals in order to determine the validity of test results and for further investigation of his or her mental state.

Procedure

The research data was collected through a proper procedure followed prior to the commencement of data collection activity. It included a letter of consent form, project brief, questionnaires. The target population aged above 12 years old from Home for Mentally Challenged from Delhi. The tools VSMS and RSMB were used for data collection and socio-demographic sheet was also used for additional information. The inclusion criteria and exclusion criteria was specified. After developing a good rapport, assurance of confidentiality of information was maintained before collecting socio-demographic information followed by administration of VSMS for assessing level of intellectual disability and RSMB was administered to assess psychiatric comorbidity.

Data thus obtained was analysed using SPSS. t-test and ANOVA analysis along with other descriptive statistics.

Results

The demographic data of average age of the participants (N = 300) was 26.87 years old. The total sample of 300 people (150 male, 150 female), out of which only 1.3% were married and remaining 98.7% were unmarried. 2.7% had parental support i.e., living in an institute with family support and 97.3% had no parental support. The total sample included 19.2% mild, 50% moderate and 30.7%

severe level of intellectually disabled people.

Demographic data of participants as shown in Table 1.

Table-1: Demographic data of participants (N=300)

Variables	Frequency	Percentage
Gender		
Male	150	50
Female	150	50
Marital status		
Married	4	1.3
Unmarried	296	98.7
Parental support		
Yes	8	2.7
No	292	97.3
Living Institutional care	292	97.3
Institutional care with family support	8	2.7
Intellectual disability		
Mild	58	19.3
Moderate	150	50.0
Severe	92	30.7

The mean and standard deviation of demographic data of participants as shown in Table 2.

Table-2: Mean and SD demographic data of participants N=300

Variable	Mean	SD
Age	26.87	11.411

The gender differences were observed with the help of t-test. Mean, standard deviation and t-value of psychiatric comorbidity as shown in Table 3.

The mean value of females on aggressive domain was found to be 1.17 with .86 standard deviations whereas the mean value of males was found to be 1.04 with .86 standard deviations. No significant difference was observed between male and females on aggressive domain ($t = 1.34$, $p > .05$). The mean value of females on anxious domain was found to be 1.08 with .88 standard deviations whereas the mean value of males was found to be 1.49 with .76 standard deviations. A significant

Table-3: Mean, standard deviation and t-value of psychiatric comorbidity

Behaviours	Gender	N	Mean	Std. Deviation	t	Significance
Aggressive	Female	150	1.1733	.85724	1.34	.18
	Male	150	1.0400	.86606		
Anxious	Female	150	1.0800	.87868	4.36	.001
	Male	150	1.4933	.75748		
Attention-seeking	Female	150	.6133	.84175	1.15	.25
	Male	150	.7267	.86619		
Body stress	Female	150	.3067	.62333	.27	.79
	Male	150	.2867	.64856		
Complaining	Female	150	.8200	.88287	1.98	.05
	Male	150	.6200	.86444		
Confused Thinking	Female	150	.7200	.88325	4.57	.001
	Male	150	1.1867	.88528		
Crying Spells	Female	150	.4333	.71809	.08	.93
	Male	150	.4267	.72673		
Delusions	Female	150	.2133	.52567	2.08	.04
	Male	150	.3467	.57913		
Dependent	Female	150	.3800	.72046	2.09	.04
	Male	150	.5667	.82264		
Destructive	Female	150	.5333	.76559	1.67	.09
	Male	150	.6867	.82035		
Drugs/Alcohol abuse	Female	150	.0000	.00000	3.48	.001
	Male	150	.1400	.49195		
Eating Problem	Female	150	.3733	.73773	1.65	.10
	Male	150	.2467	.57855		
Echolalia	Female	150	.0467	.26764	1.75	.08
	Male	150	.0067	.08165		
Euphoria	Female	150	.3667	.68949	1.83	.07
	Male	150	.5200	.75725		

Contd....

Table-3: Mean, standard deviation and t-value of psychiatric comorbidity (Contd....)

Behaviours	Gender	N	Mean	Std. Deviation	t	Significance
Fearful	Female	150	.1133	.37607	2.27	.02
	Male	150	.2467	.61236		
Hallucinations	Female	150	.4133	.77880	1.04	.30
	Male	150	.3267	.66045		
Hostile	Female	150	.9400	.84528	.75	.46
	Male	150	1.0133	.85127		
Impulsive	Female	150	1.0400	.85042	1.70	.09
	Male	150	1.2067	.84581		
Inattentive	Female	150	.6600	.84210	2.20	.03
	Male	150	.8800	.88931		
Low energy	Female	150	.6067	.84263	1.47	.14
	Male	150	.7533	.88186		
Non-assertive	Female	150	.6400	.89952	1.50	.13
	Male	150	.8000	.94833		
Object attachment	Female	150	.3133	.63602	1.95	.05
	Male	150	.1867	.48309		
Overactive	Female	150	.3867	.71218	2.35	.02
	Male	150	.6000	.85137		
Overly Sensitive	Female	150	.3267	.62923	.54	.59
	Male	150	.3667	.64938		
Paranoia	Female	150	.1267	.40627	.29	.77
	Male	150	.1133	.37607		
Regressive Behaviour	Female	150	.0400	.22821	.26	.79
	Male	150	.0333	.21415		
Sadness	Female	150	.3800	.69195	4.02	.001
	Male	150	.7467	.87613		
Self-injury	Female	150	.2800	.62520	2.21	.03
	Male	150	.4467	.68087		
Self-stimulatory behaviour	Female	150	.5800	.79655	4.08	.001
	Male	150	.9600	.81825		
Sexual Problem	Female	150	.4200	.77952	3.02	.01
	Male	150	.7000	.82535		
Sleep problem	Female	150	.5333	.79145	1.07	.28
	Male	150	.4400	.71869		
Social Inadequacies	Female	150	.8067	.91002	2.42	.02
	Male	150	1.0667	.95304		
Stealing	Female	150	.2667	.59828	.50	.61
	Male	150	.2333	.54854		
Suicidal Tendencies	Female	150	.1133	.37607	1.42	.16
	Male	150	.0600	.26496		
Temper Tantrums	Female	150	.8333	.78933	.60	.55
	Male	150	.8867	.75562		
Tiredness	Female	150	.4733	.72996	2.55	.01
	Male	150	.7000	.80893		
Unusual Motor Movements	Female	150	.2400	.56378	3.20	.01
	Male	150	.4733	.69221		
Withdrawn	Female	150	.7733	.92066	2.30	.01
	Male	150	1.0933	.92936		

difference was observed between male and females on anxious domain ($t = 4.36$, $p < .01$). On attention seeking domain, the mean value of females was found to be .61 with .84 standard deviations whereas the mean value of males was found to be .73 with .87 standard deviations. No significant difference was observed between male and females on attention seeking domain ($t = 1.15$, $p > .05$).

The mean value of females on body stress domain was found to be .31 with .62 standard deviations whereas the mean value of males was found to be .29 with .64 standard deviations. No

significant difference was observed between male and females on body stress domain (t = .27, p > .05). The mean value of females on complaining domain was found to be .82 with .88 standard deviations whereas the mean value of males was found to be .62 with .86 standard deviations. No significant difference was observed between male and females on complaining domain (t = 1.98, p < .05). On confused thinking domain, the mean value of females was found to be .72 with .88 standard deviations whereas the mean value of males was found to be 1.19 with .88 standard deviations. A significant difference was observed between male and females on confused thinking domain (t = 4.57, p < .01).

The mean value of females on crying spells domain was found to be .43 with .71 standard deviations whereas the mean value of males was found to be .43 with .72 standard deviations. No significant difference was observed between male and females on crying spells domain (t = .08, It goes through series of steps (p > .05). The mean value of females on delusions domain was found to be .21 with .52 standard deviations whereas the mean value of males was found to be .35 with .57 standard deviations. A significant difference was observed between male and females on delusions domain (t = 2.08, p < .05). On dependent domain, the mean value of females was found to be .38 with .72 standard deviations whereas the mean value of males was found to be .57 with .82 standard deviations. A significant difference was observed between male and females on confused thinking domain (t = 2.09, p <.01).

The mean value of females on destructive domain was found to be .53 with .76 standard deviations whereas the mean value of males was found to be .69 with .82 standard deviations. No significant difference was observed between male and females on destructive domain (t = 1.67, p >.05). The mean value of females on drugs/alcohol abuse domain was found to be 0.00 with 0.00 standard deviations whereas the mean value of males was found to be .14 with .49 standard deviations. A significant difference was observed between male and females on drugs and alcohol abuse domain (t = 3.48, p < .01). On eating problem, the mean value of females was found to be .37 with .74 standard deviations whereas the mean value of males was found to be .24 with .58 standard deviations. No significant difference was observed between male and females on eating problem domain (t = 1.65, p > .01).

The mean value of females on echolalia domain was found to be .05 with .27 standard deviations whereas the mean value of males was found to be .01 with .08 standard deviations. No significant difference was observed between male and females on echolalia domain (t = 1.75, p > .05). The mean value of females on euphoria domain was found to be .37 with .69 standard deviations whereas the mean value of males was found to be .52 with .76 standard deviations. No significant difference was observed between male and females on euphoria domain (t = 1.83, p > .05). On fearful domain, the mean value of females was found to be .11 with .38 standard deviations whereas the mean value of males was found to be .25 with .61 standard deviations. A significant difference was observed between male and females on fearful domain (t = 2.27, p <.05).

The mean value of females on hallucinations domain was found to be .41 with .78 standard deviations whereas the mean value of males was found to be .25 with .61 standard deviations. No significant difference was observed between male and females on hallucinations domain (t = 1.04, p > .05). The mean value of females on hostile domain was found to be .94 with .84 standard deviations whereas the mean value of males was found to be 1.01 with .85 standard deviations. No significant difference was observed between male and females on hostile domain (t = .75, p > .05). On impulsive domain, the mean value of females was found to be 1.04 with .85 standard deviations whereas the mean value of males was found to be 1.2 with .84 standard deviations. No significant difference was observed between male and females on impulsive domain (t = 1.70, p > .05).

The mean value of females on inattentive domain was found to be .66 with .84 standard deviations whereas the mean value of males was found to be .88 with .89 standard deviations. A significant difference was observed between male and females on inattentive domain (t = 2.20, p < .05). The mean value of females on low energy domain was found to be .61 with .84 standard deviations whereas the mean value of males was found to be .75 with .88 standard deviations. No significant difference was

observed between male and females on low energy domain (t = 1.47, p > .05). On non-assertive domain, the mean value of females was found to be .64 with .90 standard deviations whereas the mean value of males was found to be .80 with .95 standard deviations. No significant difference was observed between male and females on non-assertive domain (t = 1.50, p > .05).

The mean value of females on object attachment domain was found to be .31 with .64 standard deviations whereas the mean value of males was found to be .19 with .48 standard deviations. A significant difference was observed between male and females on object attachment domain (t = 1.9, p = .05). The mean value of females on overactive domain was found to be .39 with .71 standard deviations whereas the mean value of males was found to be .60 with .85 standard deviations. A significant difference was observed between male and females on overactive domain (t = 2.35, p < .05). On overly sensitive domain, the mean value of females was found to be .33 with .63 standard deviations whereas the mean value of males was found to be .37 with .65 standard deviations. No significant difference was observed between male and females on overly sensitive domain (.54, p > .05).

The mean value of females on paranoia domain was found to be .13 with .41 standard deviations whereas the mean value of males was found to be .11 with .38 standard deviations. No significant difference was observed between male and females on paranoia domain (t = .29, p > .05). The mean value of females on regressive behaviour domain was found to be .04 with .23 standard deviations whereas the mean value of males was found to be .03 with .21 standard deviations. No significant difference was observed between male and females on regressive behaviour domain (t = 26, p > .05). On sadness domain, the mean value of females was found to be .38 with .69 standard deviations whereas the mean value of males was found to be .75 with .88 standard deviations. A significant difference was observed between male and females on sadness domain (t = 4.02, p < .05).

The mean value of females on self-injury domain was found to be .28 with .63 standard deviations whereas the mean value of males was found to be .45 with .68 standard deviations. A significant difference was observed between male and females on self-injury domain (t = 2.21, p < .05). The mean value of females on self-stimulatory behaviour domain was found to be .58 with .80 standard deviations whereas the mean value of males was found to be .96 with .82 standard deviations. A significant difference was observed between male and females on self-stimulatory behaviour domain (t = 4.08, p < .05). On sexual problem domain, the mean value of females was found to be .42 with .78 standard deviations whereas the mean value of males was found to be .70 with .83 standard deviations. A significant difference was observed between male and females on sexual problem domain (t = 3.02, p < .01).

The mean value of females on sleep problem domain was found to be .53 with .79 standard deviations whereas the mean value of males was found to be .44 with .72 standard deviations. No significant difference was observed between male and females on sleep problem domain (t = 1.07, p > .05). The mean value of females on social inadequacies domain was found to be .81 with .91 standard deviations whereas the mean value of males was found to be 1.07 with .95 standard deviations. A significant difference was observed between male and females on social inadequacies domain (t = 2.42, p < .05). On stealing domain, the mean value of females was found to be .27 with .60 standard deviations whereas the mean value of males was found to be .23 with .55 standard deviations. No significant difference was observed between male and females on stealing domain (t = .50, p > .05).

The mean value of females on suicidal tendencies domain was found to be .11 with .38 standard deviations whereas the mean value of males was found to be .06 with .26 standard deviations. No significant difference was observed between male and females on suicidal tendencies domain (t = 1.42, p > .05). The mean value of females on temper tantrums behaviour domain was found to be .83 with .79 standard deviations whereas the mean value of males was found to be .89 with .76 standard deviations. No significant difference was observed between male and females on temper tantrums behaviour domain (t = .60, p > .05). On tiredness domain, the mean value of females was found to be .47 with .73 standard deviations whereas the mean value of males was found to be .70 with .81 standard

deviations. A significant difference was observed between male and females on tiredness domain (t = 2.55, p < .01). The mean value of females on unusual motor movements domain was found to be .24 with .56 standard deviations whereas the mean value of males was found to be .47 with .69 standard deviations. A significant difference was observed between male and females on self-injury domain (t = 3.20, p < .05). The mean value of females on withdrawn behaviour domain was found to be .77 with .92 standard deviations whereas the mean value of males was found to be 1.09 with .93 standard deviations. A significant difference was observed between male and females on withdrawn behaviour domain (t = 2.30, p < .01).

The differences between intellectual disability were observed. Mean, standard deviation and f-value of psychiatric comorbidity as shown in Table 4.

Table-4: Mean, standard deviation and f-value of psychiatric comorbidity

Behaviours		N	Mean	Std. Deviation	F	Significance
Aggressive	Mild	58	1.1207	.79643		
	Moderate	150	1.1533	.88033	.67	.51
	Severe	92	1.0217	.87679		
	Total	300	1.1067	.86281		
Anxious	Mild	58	1.1724	.84059		
	Moderate	150	1.2400	.87990	2.19	.11
	Severe	92	1.4348	.77466		
	Total	300	1.2867	.84471		
Attention-seeking	Mild	58	.7241	.87445		
	Moderate	150	.6400	.83770	.221	.80
	Severe	92	.6848	.87617		
	Total	300	.6700	.85452		
Body stress	Mild	58	.3103	.62708		
	Moderate	150	.3467	.66541	1.41	.24
	Severe	92	.2065	.58438		
	Total	300	.2967	.63509		
Complaining	Mild	58	.6897	.82093		
	Moderate	150	.8467	.90292	3.76	.03
	Severe	92	.5326	.84452		
	Total	300	.7200	.87797		
Confused Thinking	Mild	58	.5862	.81724		
	Moderate	150	.7800	.89645	25.58	.001
	Severe	92	1.4674	.77674		
	Total	300	.9533	.91320		
Crying Spells	Mild	58	.2931	.56222		
	Moderate	150	.4067	.70565	2.52	.08
	Severe	92	.5543	.81691		
	Total	300	.4300	.72123		
Delusions	Mild	58	.2759	.58619		
	Moderate	150	.2200	.51644	2.40	.09
	Severe	92	.3804	.59007		
	Total	300	.2800	.55615		
Dependent	Mild	58	.3103	.68073		
	Moderate	150	.3533	.69646	10.46	.001
	Severe	92	.7717	.87835		
	Total	300	.4733	.77758		
Destructive	Mild	58	.5517	.72963		
	Moderate	150	.6667	.82468	.76	.47
	Severe	92	.5543	.78955		
	Total	300	.6100	.79583		

Contd....

Table-4: Mean, standard deviation and f-value of psychiatric comorbidity

Behaviours		N	Mean	Std. Deviation	F	Significance
Drugs/Alcohol abuse	Mild	58	.0517	.29154		
	Moderate	150	.0733	.36814	.10	.91
	Severe	92	.0761	.37014		
	Total	300	.0700	.35429		
Eating Problem	Mild	58	.2414	.53999		
	Moderate	150	.3333	.71105	.40	.67
	Severe	92	.3152	.66182		
	Total	300	.3100	.66486		
Echolalia	Mild	58	.0345	.18406		
	Moderate	150	.0267	.19888	.07	.93
	Severe	92	.0217	.20851		
	Total	300	.0267	.19855		
Euphoria	Mild	58	.2586	.57918		
	Moderate	150	.3467	.66541	10.34	.001
	Severe	92	.7174	.82975		
	Total	300	.4433	.72701		
Fearful	Mild	58	.1379	.43723		
	Moderate	150	.1667	.46942	.66	.52
	Severe	92	.2283	.61310		
	Total	300	.1800	.51167		
Hallucinations	Mild	58	.2241	.56330		
	Moderate	150	.3400	.70311	3.10	.05
	Severe	92	.5109	.81866		
	Total	300	.3700	.72215		
Hostile	Mild	58	.9655	.79396		
	Moderate	150	.9933	.83944	.06	.94
	Severe	92	.9565	.90071		
	Total	300	.9767	.84765		
Impulsive	Mild	58	1.0345	.87791		
	Moderate	150	1.1067	.82857	.78	.46
	Severe	92	1.2065	.87125		
	Total	300	1.1233	.85080		
Inattentive	Mild	58	.5690	.79719		
	Moderate	150	.7133	.86960	4.89	.008
	Severe	92	.9891	.88323		
	Total	300	.7700	.87157		
Low energy	Mild	58	.6897	.82093		
	Moderate	150	.6467	.85245	.26	.77
	Severe	92	.7283	.91511		
	Total	300	.6800	.86415		
Non-assertive	Mild	58	.5172	.80003		
	Moderate	150	.6067	.88913	8.12	.001
	Severe	92	1.0326	.98841		
	Total	300	.7200	.92617		
Object attachment	Mild	58	.1897	.47598		
	Moderate	150	.3000	.63192	1.18	.31
	Severe	92	.2065	.50357		
	Total	300	.2500	.56737		
Overactive	Mild	58	.2241	.53124		
	Moderate	150	.4933	.79213	5.65	.004
	Severe	92	.6630	.88052		
	Total	300	.4933	.79081		
Overly Sensitive	Mild	58	.2759	.52292		
	Moderate	150	.3267	.60752	1.10	.33
	Severe	92	.4239	.74471		
	Total	300	.3467	.63863		

Contd....

Table-4: Mean, standard deviation and f-value of psychiatric comorbidity

Behaviours		N	Mean	Std. Deviation	F	Significance
Paranoia	Mild	58	.1897	.51151		
	Moderate	150	.1067	.36905	1.16	.31
	Severe	92	.0978	.33347		
	Total	300	.1200	.39087		
Regressive Behaviour	Mild	58	.0172	.13131		
	Moderate	150	.0400	.22821	.28	.75
	Severe	92	.0435	.25303		
	Total	300	.0367	.22095		
Sadness	Mild	58	.7069	.81668		
	Moderate	150	.4933	.79213	1.52	.22
	Severe	92	.5870	.82744		
	Total	300	.5633	.80922		
Self-injury	Mild	58	.2759	.52292		
	Moderate	150	.3267	.67054	2.16	.12
	Severe	92	.4783	.70287		
	Total	300	.3633	.65785		
Self-stimulatory behaviour		Mild	58	.4310	.65191	
	Moderate	150	.7200	.82021	11.76	.001
	Severe	92	1.0652	.84910		
	Total	300	.7700	.82828		
Sexual Problem	Mild	58	.4310	.72818		
	Moderate	150	.4800	.76606	4.68	.01
	Severe	92	.7717	.90303		
	Total	300	.5600	.81360		
Sleep problem	Mild	58	.2586	.57918		
	Moderate	150	.5200	.80034	3.48	.03
	Severe	92	.5761	.75932		
	Total	300	.4867	.75613		
Social Inadequacies	Mild	58	.5862	.85910		
	Moderate	150	.9133	.93361	7.93	.001
	Severe	92	1.1957	.92865		
	Total	300	.9367	.93929		
Stealing	Mild	58	.1897	.51151		
	Moderate	150	.3200	.64838	2.27	.10
	Severe	92	.1739	.45954		
	Total	300	.2500	.57323		
Suicidal Tendencies	Mild	58	.1379	.34784		
	Moderate	150	.0533	.25348	1.72	.18
	Severe	92	.1087	.40482		
	Total	300	.0867	.32585		
Temper Tantrums	Mild	58	.8448	.72067		
	Moderate	150	.8867	.77318	.19	.83
	Severe	92	.8261	.80668		
	Total	300	.8600	.77183		
Tiredness	Mild	58	.4828	.68162		
	Moderate	150	.5267	.76585	3.03	.05
	Severe	92	.7500	.83370		
	Total	300	.5867	.77750		
Unusual Motor Movements		Mild	58	.1552	.41047	
	Moderate	150	.3067	.62333	8.61	.001
	Severe	92	.5652	.73086		
	Total	300	.3567	.64096		
Withdrawn	Mild	58	.6552	.86960		
	Moderate	150	.8533	.92240	8.39	.001
	Severe	92	1.2391	.93020		
	Total	300	.9333	.93727		

A significant difference between three levels of intellectual disability was observed on complaining, confused thinking, dependent, euphoria, hallucinations, inattentive, non-assertive, overactive, self-stimulatory behaviour. Sexual problem, sleep problem, social inadequacies, tiredness, unusual motor movements and withdrawn domain. On other domains, no significant difference was observed.

On complaining domain, the mean scores of mild, moderate, and severe were found to be .69, .85, and .92 respectively. A significant difference was observed among the intellectual level on complaining ($F= 3.76$, $p <.05$).

On confused thinking, the mean scores of mild, moderate, and severe were found to be .59, .78, and 1.47 respectively. A significant difference was observed among the intellectual level on confused thinking ($F= 25.58$, $p <.01$).

On dependent, the mean scores of mild, moderate, and severe were found to be .31, .35, and .77 respectively. A significant difference was observed among the intellectual level on Dependent ($F= 10.46$, $p <.01$).

On euphoria, the mean scores of mild, moderate, and severe were found to be .26, .35, and .72 respectively. A significant difference was observed among the intellectual level on euphoria ($F= 10.34$, $p <.01$).

On hallucinations, the mean scores of mild, moderate, and severe were found to be .22, .34, and .51 respectively. A significant difference was observed among the intellectual level on hallucinations ($F= 3.10$, $p = .05$).

On inattentive, the mean scores of mild, moderate, and severe were found to be .57, .71, and .99 respectively. A significant difference was observed among the intellectual level on inattentive ($F= 4.89$, $p <.01$).

On non-assertive, the mean scores of mild, moderate, and severe were found to be .52, .61, and 1.03 respectively. A significant difference was observed among the intellectual level on non-assertive ($F= 812$, $p <.01$).

On over-active, the mean scores of mild, moderate, and severe were found to be .22, .49, and .66 respectively. A significant difference was observed among the intellectual level on over-active ($F= 5.65$, $p <.01$).

On self-stimulatory behaviour, the mean scores of mild, moderate, and severe were found to be .43, .72, and 1.06 respectively. A significant difference was observed among the intellectual level on self-stimulatory behaviour ($F = 11.76$, $p <.01$).

On sexual problems, the mean scores of mild, moderate, and severe were found to be .43, .48, and .77 respectively. A significant difference was observed among the intellectual level on sexual problem ($F = 4.68$, $p <.01$).

On sleep problem, the mean scores of mild, moderate, and severe were found to be .26, .52, and .58 respectively. A significant difference was observed among the intellectual level on sleep problem ($F = 3.48$, $p <.05$).

On social inadequacies, the mean scores of mild, moderate, and severe were found to be .59, .91, and 1.19 respectively. A significant difference was observed among the intellectual level on social inadequacies ($F = 7.93$, $p <.01$).

On tiredness, the mean scores of mild, moderate, and severe were found to be .48, .53, and .75 respectively. A significant difference was observed among the intellectual level on tiredness ($F = 3.03$, $p = .05$).

On unusual motor movements, the mean scores of mild, moderate, and severe were found to be .16, .31, and .57 respectively. A significant difference was observed among the intellectual level on unusual motor movements ($F = 8.61$, $p <.01$).

On withdrawn domain, the mean scores of mild, moderate, and severe were found to be .65, .85, and 1.23 respectively. A significant difference was observed among the intellectual level on withdrawn ($F = 8.39$, $p <.01$).

Discussion

In the present study the most prevalent psychiatric comorbidity found was aggression, avoidant disorder and autism among males. 83 being the cut-off point for aggressive, 73 for avoidant disorder and for autism it was 48. The remaining findings of comorbidities included on basis of cut-off i.e., psychosis cut-off was 35, 18 for paranoia, 38 for depression (behavioural signs), 20 for depression (physical signs), 31 for dependent personality disorder among male. The prevalent psychiatric comorbidities among female were aggressive (76 cut-off) and avoidant disorder (50 cut-off). Similarly, the remaining findings of comorbidities among female included on basis of cut-off i.e., autism was

found to be 30 cut-off, 26 for psychosis, 17 for paranoia, 16 for depression (behavioural signs), 22 for depression (physical signs), and 23 in dependent personality disorder.

The most common finding in this study was aggression followed by avoidant disorder and autism among both males and females. However, this finding is not surprising because other researchers have also reported aggressive and autistic behaviour to be more prominent in persons with intellectual disability.[28] In this study, it was also observed that psychiatric comorbidity was more prevalent in moderate to severe levels of retardation.

Aggression was more associated with moderate level of intellectual disability. Autism, psychosis, depression (behavioural signs), depression (physical signs) were consistently found in severe level of intellectual disability. Paranoia and dependent personality disorders were found in both moderate and severe intellectually disabled. There were significant gender differences on anxious, complaining, confused thinking, delusions, dependent, drug/alcohol abuse, fearful, inattentive, object attachment, overactive, sadness, self-injury, self-stimulatory, sexual problem, social inadequacies, tiredness, withdrawn and unusual motor movements. The sample of this study did not have a family history, indicating a lack of genetic loading for a psychiatric illness and all our samples were taken from the institute. Though the significant difference between three levels of intellectual disabilities was observed on complaining, confused thinking, dependent, euphoria, hallucinations, inattentive, non-assertive, overactive, self-stimulatory behaviour.

In the previous studies, depressive mood, aggression, disruptive behaviours, socially inappropriate behaviours, self-injury, resistive behaviours, temper tantrums and wandering were reported to be important predictors of psychiatric comorbidity in persons with intellectual disability.[14] The present study indicated that aggression, complaining, confused thinking, dependent, euphoria, hallucination, non-assertive, overactive, self-stimulatory behaviour, sexual problem, sleep problem, social inadequacies, tiredness, withdrawn and unusual motor movement were found to be associated with psychiatric comorbidity. Therefore, presence of these behaviours should be taken as a comprehensive evaluation to facilitate appropriate psychiatric interventions. As it has been successfully established in the recent past that people with intellectual disability suffer psychiatric disorders, which significantly differs from normal people. People with intellectual disability do experience the full spectrum of psychiatric comorbidities has been reported.[29] In general, the prevalence of psychopathology in people with intellectual disability varies from 10% to 80%. A wide range of psychiatric comorbidity is associated with intellectual disability.[14,17] Drew and Bregman, et al. reported that people with intellectual disability with psychiatric comorbid may appear to have multiple causes including biological vulnerability, brain abnormalities, traumatic or stressful life experiences, maladaptive thoughts and behavioural problems.[35]

In conclusion, we found the significant gender differences and psychiatric comorbidity of people with intellectual disability on levels of intellectual disability. The results can be used for literature review, helps policy makers to enrich policies keeping the comorbidity in view. There is a clear need for mental health services to have the capacity to identify and support people with intellectual disability. The results of this study clearly highlight the need to address the psychiatric comorbidity of people with intellectual disability.

Limitations

- The sample was only collected from Delhi.
- The sample was collected from institute-setup.
- Profound intellectually disabled individuals were not included in the study.
- The age range below 12 years old were not included in the study.

References

1. Sturmey P, Reed J, Corbett J. Psychometric assessment of psychiatric disorders in persons with learning difficulties (mental handicap): A review of measures. Psychol Med 1991; 21 : 143-50.
2. Reiss S, Levitan GW, Szyszko J. Emotional disturbance and mental retardation: diagnostic overshadowing. Am J Ment Defic 1982; 86(6) : 567-74.
3. Padd W, Eyman RK. Mental Retardation and

Aggression: Epidemiologic Concerns, and Implications for Deinstitutionalization. In: The education and training of the mentally retarded. Routledg 2018; 145-168.
4. Jacobson JW. Problem behavior and psychiatric impairment within a developmentally disabled population II: behavior severity. Appl Res Ment Retard 1982; 3(4) : 369-381.
5. Russell AT. The association between mental retardation and psychiatric disorder: Epidemiological issues. In Mental Retardation and Mental Health. Springer, New York, NY 1988; 41-49.
6. Szymanski LS. Mental retardation and mental health: concepts, aetiology and incidence. Mental health in mental retardation: Recent advances and practices 1994; 19-33.
7. Costello H, Bouras N. Assessment of mental health problems in people with intellectual disabilities. Isr J Psychiatry Relat Sci 2006; 43(4) : 241-51.
8. Lowe K, Allen D, Jones E, Brophy S, Moore K, James W. Challenging behaviours: prevalence and topographies. J Intellect Disabil Res 2007; 51 : 625-36.
9. Cooper SA, Smiley E, Morrison J, Williamson A, Allan L: Mental ill-health in adults with intellectual disabilities: prevalence and associated factors. Br J Psychiatry 2007; 190 : 27-35.
10. Ruddick L, Davies L, Bacarese-Hamilton M, Oliver C. Self-injurious, aggressive and destructive behavior in children with severe intellectual disability: prevalence, service need and service receipt in the UK. Res Dev Disabil 2015; 45-46 : 307-15.
11. Lakhan R, Kishore MT: Behaviour problems in children with intellectual disabilities in a resourse-poor setting in India-Part 1 : Association with age, sex, severity of intellectual disabilities and IQ. J Appl Res Intellect Disabil 2018; 31 : 43-50.
12. Lowe K, Allen D, Jones E, Brophy S, Moore K, James W. Challenging behaviors: Prevalence and tropographies. JIntellect Disabil Res 2007; 51 : 625-636.
13. Witwer AN, Lecavalier L. Psychopathology in children with intellectual disability: Risk markers and correlates. J Ment Health Res Intellect Disabil 2008; 1(2) : 75-96.
14. Borthwick-Duffy SA, Eyman RK. Who are the dually diagnosed? Am J Ment Retard 1990; 94 : 586-595.
15. Cooper SA, Smiley E, Jackson A, et al. Adults with intellectual disabilities: prevalence, incidence and remission of aggressive behaviour and related factors. J intellect Disabil Res 2009; 53(3) : 217-232.
16. Cervantes PE, Matson JL. Comorbid Symptomology in Adults with Autism Spectrum Disorder and Intellectual Disability.J Autism Dev Disord 2015; 45(12) : 3961-70. doi: 10.1007/s10803-015-2553-z.PMID: 26254894
17. Szymanski LS, Wilska M. Mental retardation. In: Tasman A, Kay J, Liberman JA, editors. Psychiatry. Philadelphia: W.B. Saunders Co.; 1997; 624-5.
18. Strømme P, Diseth TH. Prevalence of psychiatric diagnoses in children with mental retardation: data from a population based study. Dev Med Child Neurol 2000; 42(4) : 266-270.
19. Manohar H, Subramanian K, Kandasamy P, Penchilaiya V, Arun A. Diagnostic masking and overshadowing in intellectual disability—how structured evaluation helps. Journal of Child and Adolescent Psychiatric Nursing 2016; 29(4) : 171-176.
20. Dykens EM. Psychopathology in children with intellectual disability. J Child Psychol Psychiatry 2000; 41 : 407-17.
21. Cooper SA. Epidemiology of psychiatric disorders in elderly compared with younger adults with learning disabilities. The Br J Psychiatry 170 : 375.
22. Keiley MK, Bates JE, Dodge KA, Pettit GS. A cross-domain growth analysis: Externalizing and internalizing behaviors during 8 years of childhood. J Abnorm Child Psychol 2000; 28(2) : 161-179.
23. Desai AS, Kothare SV. Neuropsychological and Behavioural Evaluations, J Indian Acad Appl Psychol 2009; 35 : 163-172.
24. Doll EA. The measurement of social competence: A manual for the Vineland Social Maturity Scale 1953.
25. Kumar D. Social Maturity of Senior Secondary

School Students in Relation to their Personality, Asian J Multi Dimensional Res 2013; 2; issue 8, ISSN 2278-4853.
26. Reiss S. The Reiss Screen for Maladaptive Behaviour. Ohio: IDS Publishing Corporation, 1988.
27. Reiss, S. Comments on the Reiss Screen for Maladaptive Behaviour and its factor structure. J Intellect Disabil Res 1997; 41 : 346–354.
28. Hardan A, Sahl R. Psychopathology in children and adolescents with developmental disorders. Res Dev Disabil 1997; 18(5) : 369-382.
29. Menolascino FJ. Emotional disturbance and mental retardation. Am J Ment Defic 1965; 70(2) : 248-56.
30. Bregman JD. Current developments in the understanding of mental retardation Part II: Psychopathology. J Am Acad Child Adolesce Psychiatry 1991; 30(6) : 861-872.

Original Article

Gender, Institutionalization and Mental Health: an original study from Kashmir valley

Sanna Khalid, Mahmood S. Khan
Govt. Degree College Shopian, Kashmir-192303
Contact: Mahmood S. Khan, E-mail: profmahmoodkhan@yahoo.com

ABSTRACT

Introduction: *Life inside an institution can in no way be considered equivalent or even nearer to the life within the family. The role of parents is irreplaceable for each age group particularly for children and adolescents. Be it the safety and security of adolescents, financial responsibility or emotional/social support both parents plays a giant role in nourishing and enhancing the personality of their children. The loss of either of them or both comes as a hard blow in the life of a growing adolescent who has innumerable aspirations and dreams from this world. Parental loss shatters the high ambitions and goals of children/adolescents which makes them hopeless and pessimistic towards this world of opportunities. However, on gender basis, girls are more vulnerable when it comes to orphan hood as their safety and security is now at greater risk than before and financial needs remaining unfulfilled and they get abused on different fronts. The vulnerability to physical, sexual abuse and mental harassment is bound to happen once they start living in the institutions, particularly for girls. This study aimed to assess the mental health of both boy and girl orphans living in the different institutions in Kashmir valley.* ***Objectives:*** *The main aims of thisstudy were: (1) To assess and compare the mental health of boys and girls who lost their parents in a conflict situation (2) To assess and compare the mental health of orphans living in the institutions with those living with other family members.* ***Method****: The sample comprised of 400 orphans out of which 200 were those living in the institutions (boys: 100, girls: 100) and 200 living with other family members (boys: 100, girls: 100) from the most conflict prone areas of Kashmir valley i. e; Shopian, Pulwama, Anantnag and Srinagar. Mental Health Inventory (MHI-38) by Veit and Ware was used in this regard.* ***Results****:The findings of this study showed that orphan hood affects the different aspects of mental health of both genders but girls are more drastically affected than boys living in the institutions.* ***Conclusion****: This study enhances the overview of the readers about the orphan hood scenario in Kashmir valley and the pressing need for psychologists to intervene in this regard in enhancing the mental health condition of orphans living in the institutions.*

Key words*: Gender, Orphans, Institutionalization, Mental Health*

Introduction

The state of Jammu and Kashmir, once upon a time, had the picture of "heaven on earth in the minds" of the people of this country and abroad. But vis-a-vis, it turned into a state of disturbance and conflict in a spell of just three decades. The eruption of political turmoil led to violent confrontation ultimately ending up with destruction and increased killings. In its setback, people of almost all age-groups were severely affected due to an increase in the day to day atrocities and killings which resulted into a bumper crop of orphans in the valley. In fact, children were worst affected since many of them lost one or both the parents in this ongoing conflict situation in Kashmir valley. A child under 18 years of age whose mother, father or both parents have died of any cause is considered to be an orphan (UNICEF, 2006). An NGO namely Save

the Child (2014) estimated 2, 15,000 natural and conflict-afflicted orphans in Kashmir out of which 15% lived in orphanages. The sample in this study comprised of 37% conflict-afflicted orphans, 55% natural orphans and the remaining 8% due to other reasons.[1]

The parental support plays a vital role in the overall growth and development of children. Parent fostering enhances the communication skills and coping abilities among children. Different research findings consider lack of parental support responsible for the stunted growth and development of children.[2] However, orphans who lose their parents in an insurgency or conflict situation seem to undergo a very pathetic state in their lives.[3] They suffer from various types of scarcities and hardships which might not be suitable for a child. As a result of this, their emotional and psychological needs aren't fulfilled reasonably.[4] The life of an orphan confined in the four walls of an orphanage can in no way be labelled as a happy life given the issues they face therein.[5] They experience problems like; Major Depressive Disorder, Post Traumatic Stress Disorder, Depression, Separation Anxiety Disorder, Attention Deficit Hyperactivity Disorder, Conversion Disorder and such other types of disorders.[6,7]

Though quite a good number of orphans (boys & girls) are usually taken care by their relatives, yet thousands wander in the valley of loneliness at the mercy of private and government orphanages.

In this regard, a study was propounded in order to assess the mental health condition of orphan boys and girls (Institutionalized and Non-Institutionalized) living in the different orphanages of Kashmir valley.

Mental Health

Mental Health is an important dimension of health. Mental Health is a broad concept encompassing both social and emotional well-being of an individual and his entire community. It affects an individual's way of thinking, feeling and behaving. W.H.O. (2004) defines Mental Health as: "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully and is able to make contribution to his or her community". An individual is considered mentally healthy when he is able to attain a degree of maturity at the mental and emotional level which is in accordance with his chronological age and is associated with his emotional and social background.[8]

Definitions of Mental Health

According to Menninger, "Mental health is the adjustment of human beings to the world and to each other with maximum effectiveness and happiness.... it is the ability to maintain an even temper, an alert intelligence, socially considerate behaviour and a happy disposition".[9]

Schneider defined Mental Health as "a psychic condition which is characterized by mental peace, harmony and content. It is identified by the absence of disability and debilitating symptoms, both mental and somatic in the person".[10]

In Encyclopedia of Britanica, The term "Mental health" represents a variety of human aspirations; rehabilitation of the mentally disturbed, prevention of mental disorder, reduction of tension in conflict and attainment of a state of well-being in which the individual functions at a level consistent with his mental and physical ties.[11]

Bhat, Rahman, and Bhat[4] underwent a study to ascertain the mental health problems among orphans residing in the orphanages of Kupwara district in Kashmir valley. On assessing the mental health problems according to DSM IV criteria, it was found out that a higher percentage of orphans suffered from Agoraphobia (20%) followed by Social Phobia (16.25%), Specific Phobia (15%), Major Depressive disorder (13.75%), Dysthymia (11.25%), Panic Disorder (10%), Generalized Anxiety Disorder (8.75%), Separation Anxiety Disorder (7.5%), Post Traumatic Stress Disorder (6.25%), Suicidality (6.25%), Attention Deficit Hyperactivity Disorder (3.75%), Oppositional Defiant Disorder (3.75%), Substance Dependence (non-alcoholic) (1.25%), Conduct Disorder (1.25%) and co-morbid psychological illnesses (23.75%).

Naqashbandi, Sehgal, and Hassan[12] examined a sample comprising of 60% male and 40% female orphans living in five different orphanages of Srinagar district of Kashmir valley. A higher percentage of female orphans reported increased difficulty in adjusting with life outside the institutions (52.5%) than male orphans (21.3%) though both genders reported difficulty in adjusting outside the four walls of the institution. Margoob, Rather, Khan, et al[6]

found out in their study that out of the total sample of 40 orphans, 32 met the DSM IV-TR diagnosis of psychiatric disorders. On analyzing the data, it was found out that 40.62% of the female orphans suffered Post Traumatic Stress Disorder (40.62%), Major Depressive Disorder (25%), Conversion Disorder (12.5%), Panic Disorder (9.38%), Attention Deficit Hyperactivity Disorder (6.25%) and Seizure Disorder (2.5%). However, since the sample was limited to a single female orphanage, this study was found less generalizable.

Research Objectives

Below mentioned are the main objectives which encouraged the researcher to conduct this study:

1. To assess and compare the Mental Health condition among Institutionalized and Non-Institutionalized Orphans in Kashmir valley.
2. To analyze the differences, if any, in the Mental Health condition of orphans, on Gender basis.

Method

Research Design

Between group research design was used in this research.

Participants

This study comprised of 400 orphans living in Kashmir valley selected through purposive sampling technique. The sample comprised of 200 orphans living in the institutions (boys and girls) and 200 orphans living with their other family members (boys and girls). These orphans were selected from the most conflict prone districts of Kashmir i.e. Shopian, Pulwama, Anantnag and Srinagar.

Inclusion Criteria

- Orphans in the age-range of 11-17 years
- Orphans whose either of the parents (mostly fathers) died in some conflict situation
- Orphans living in privately managed orphanages and within families

Exclusion Criteria

- Orphans below or beyond this age-range (11-17 years)
- Orphans whose parents died a natural cause or were either missing
- Destitutes and Natural orphans living in Govt. orphanages

Measures

1. **Mental Health Inventory MHI-38 (Veit & Ware, 1983)**[13]
   This scale comprises of 38 items rated on a 6-point Likert scale with the exception of two items i.e. 9 and 28 rated on a 5-point Likert scale. This Inventory comprises of six sub-scales i.e. Anxiety, Depression, Loss of Behavioural/Emotional Control, General Positive Affect, Emotional Ties and Life satisfaction, two Global Scales i.e. Psychological Distress and Psychological Well-being and a Global Mental Health Index. The reliability coefficient through Crobach's alpha coefficient was found .91 which is considered excellent.[14]

Procedure

The present research was difficult in terms of the availability and access of sample (conflict-afflicted orphans of Kashmir valley) for the purpose of data collection. The process began with filing an R.T.I. in the Social Welfare Departments of Anantnag, Pulwama, Shopian and Srinagar districts in order to determine the number of registered orphanages. However, it was found out that only two Bal Ashrams existed in each of these districts which comprised of children who are destitute (poor) not orphans. Thus, privately recognized orphanages were approached for the selection of one group of orphans (Institutionalized Orphans). Purposive Random Sampling technique was used in selecting a sample size of 235 orphans among whom only 200 orphans (male-100, female-100) were retained from the respective districts. The rest 35 subjects were dropped owing to their faking response style and unwillingness to answer the questions. On the other hand, the addresses of orphans living with their relatives or the child-headed families were confirmed through the information provided by the Social Welfare Departments of the respective districts. Thus, a purposive random sample of 224 Non-Institutionalized Orphans (male-100, females-100) was selected among whom 200 were retained dropping those whose parents died a natural death. The sample comprised of orphans in the age-range

of 11-17 years which was the age-range available in different orphanages of Kashmir valley. The biggest challenge of this research was the rapport building with the orphans living in orphanages, since they were either reluctant or shy in cooperating or being part of the research. Furthermore, owing to the frequent shut-downs in the valley, the investigator had to collect the data at five different occasions when situation was relatively normal.

Statistical Techniques

The software through which the analysis was done was: IBM Statistical Package for the Social Sciences (**SPSS-20**). The statistical techniques utilized during the research process were;

- Normality Checks
- Descriptive Statistics
- One-way ANOVA followed by Post-Hoc Analysis

Ethical Considerations

- The participants of the study gave their informed consent only after debriefing about the purpose of the study and the possible benefits in their favour.
- It was ensured that each participant willingly becomes a part of the present research. No forced will or unwillingness was entertained in this regard.
- The participants were fortified that their responses and personal details will be kept confidential.

Results and Discussion

Table 1.1: The first step was to check the normality of the data which is an important assumption of most of the parametric tests in statistics. The Skewness and Kurtosis scores of the overall Mental Health score and its dimensions were found within the normal range as suggested by statisticians (Kline, 1998, pp.230-298). Hence, the data was found valid for further statistical analysis.

Table 1.1. Normality Test findings (Skewness & Kurtosis)

Variables	Skewness	Kurtosis
Mental Health	-.12	-1.59
Anxiety	.01	-1.23
Depression	-.03	-1.13
Loss of Behavioural/ Emotional Control	-.04	-1.33
General Positive Affect	-.00	-1.33
Emotional Ties	.31	-1.15
Life satisfaction	.01	-1.34
Psychological Distress	.00	-1.88
Psychological Well-being	-.23	-1.26

Table 1.2. Mean and Standard Deviation on the Mental Health scale and its Dimensions among Institutionalized (n_1= 200) and Non-Institutionalized Orphans (n_2= 200)

	Institutionalized Orphans (n_1= 200)	Non-Institutionalized Orphans(n_2= 200)
Variables	Mean/SD	Mean/SD
Mental Health	81.7 (12.01)	141.40 (8.07)
Anxiety	44.78 (3.91)	31.11 (3.79)
Depression	18.66 (2.31)	10.75 (2.37)
Loss of Behavioural/Emotional Control	40.43 (4.00)	24.90 (4.35)
General Positive Affect	15.65 (3.83)	30.54 (3.82)
Emotional Ties	2.46 (.49)	4.88 (.82)
Life Satisfaction	1.47 (.50)	3.45 (.49)
Psychological Distress	118.34 (5.59)	57.51 (5.58)
Psychological Well-being	27.81 (6.77)	48.49 (4.53)

Table 1.3. Mean and SD on the Mental Health Scale and its Dimensions among Boy & Girl Orphans both Institutionalized and Non-Institutionalized

	Boys Inst. (n=100)	Girls Inst. (n=100)	Boys Non Inst. (n=100)	Girls Non Inst. (n=100)
Variables	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Self-esteem	11.51 (2.64)	8.22 (2.12)	18.47 (2.11)	16.78 (1.36)
Mental Health	91.15 (7.22)	72.25 (7.59)	148.07 (3.69)	134.73 (5.23)
Anxiety	41.26 (1.78)	48.31 (1.58)	27.67 (1.67)	34.55 (1.51)
Depression	16.61 (1.08)	20.71 (1.05)	8.65 (1.35)	12.86 (.77)
LOB	36.74 (1.66)	44.13 (1.36)	20.98 (1.38)	28.83 (2.26)
Gen. Positive Affect	19.20 (1.44)	12.11 (1.46)	34.03 (1.41)	27.05 (1.65)
Emotional Ties	2.78 (.41)	2.14 (.34)	5.55 (.53)	4.21 (.40)
Life Satisfaction	1.80 (.40)	1.14 (.34)	3.79 (.40)	3.12 (.32)
Psycho Distress	113.35 (2.14)	123.34 (2.81)	52.43 (2.37)	62.60 (2.21)
Psycho Well-being	34.33 (1.89)	21.29 (1.65)	52.66 (1.85)	44.32 (1.68)

LOB- Loss of Behavioural/Emotional Control, Psycho- Psychological

Table 1.2 and Table 1.3: From Table 1.2, it can be observed that orphans living with other family members scored higher on Mental health scale and its positive dimensions (General Positive Affect, Emotional Ties, Life Satisfaction, and Psychological Well-being) than Orphans living in the institutions. However, on the negative dimensions of Mental Health scale (Anxiety, Depression, Loss of Behavioural/ Emotional Control, & Psychological Distress) orphans living in the institutions scored higher than Orphans living with other family members. Moreover, on gender basis, Orphan Boys living in the institutions scored higher on overall Mental Health and its positive dimensions (General Positive Affect, Emotional Ties, Life Satisfaction, and Psychological Well-being) as compared to the other three categories of orphans. On the other hand, on the negative dimensions of Mental Health scale (Anxiety, Depression, Loss of Behavioural/ Emotional Control, Psychological Distress) Girl Orphans living in the institutions reported higher scores than the other groups of orphans. On the whole, all the four groups of orphans reported poor mental health.

Effect size

Eta Squared (n^2) is one of the suitable measures of effect size in case of one-way ANOVA method. The Table below shows descriptors for magnitude of n^2 as suggested by Cohen (1988). The formula used to calculate effect size (Eta Squared, n^2) is shown below:

Table 1.4, 1.5 and Table 1.6: In order to compare the effect of Institutionalization and type of gender on the Mental Health of four groups of orphans; Institutionalized Boys, Institutionalized Girls, Non-Institutionalized Boys and Non-Institutionalized Girls, one way ANOVA was used. The results depicted that a significant difference exists between these four groups on their overall mental health [$F(3,396) = 3386.38$, $p < .001$]. On assessing the magnitude of this difference, the effect was found very large [Eta Squared ($\cdot^2$) = .962]. After finding a significant difference between the four groups of orphans on mental health, Post Hoc Tukey's test was applied to identify where the difference existed. The findings suggested that Institutionalization was an important factor affecting the mental health of these orphans. Moreover, when orphans were compared on their mental health on the basis of gender, a significant difference was found. The mean difference was significant in case of all the four groups of orphans, however this difference was higher when comparison was made on the basis of Institutionalization (MD = 56.92, 62.48) than when orphan groups were compared on gender basis (MD=18.90, 13,34). This implies that institutionalization has a stronger effect on the mental health of orphans as compared to gender difference. Furthermore, on observing the descriptive table (Table 1.3), it can be found out that Orphan Girls living in the institutions (M=72.25) showed the poorest mental health among all the four groups of orphans. The mental health of Non-Institutionalized Orphan Boys

$$\eta^2 = \frac{SS_{Between}}{SS_{Total}}$$

Table 1.4: Levels of Effect Size as per Cohen (1988)[15]

Effect Size	Eta Squared (η^2)
Small	0.02
Medium	0.13
Large	0.26

(Anxiety, Depression, Loss of Behavioural/ Emotional Control, General Positive Affect, Emotional Ties and Life satisfaction) and two Global Scales (Psychological Distress and Psychological Well-being). Using one way ANOVA test, all the four groups of orphans were compared to see whether Orphan hood, Institutionalization and type of gender had a significant effect on all these dimensions of Mental Health. On the first dimension

Table 1.5. One-way ANOVA results and effect size (η^2) among Institutionalized and Non-Institutionalized Orphans (Boys & Girls) on Mental Health and its dimensions

Variables		Sum of Squares	df	Mean Square	F	η^2
Mental Health	Between Groups	383167.28	3	127722.42	3386.38*	.962
	Within Groups	14935.72	396	37.71		
	Total	398103.00	399			
Anxiety	Between Groups	23552.40	3	7850.80	2906.91*	.956
	Within Groups	1069.49	396	2.70		
	Total	24621.89	399			
Depression	Between Groups	7975.60	3	2658.53	2253.52*	.944
	Within Groups	467.17	396	1.18		
	Total	8442.77	399			
Loss of Behavioural/ Emotional Control	Between Groups	29929.82	3	9976.60	3415.76*	.962
	Within Groups	1156.62	396	2.92		
	Total	31086.44	399			
General Positive Affect	Between Groups	27105.74	3	9035.24	4013.63*	.968
	Within Groups	891.45	396	2.25		
	Total	27997.19	399			
Emotional Ties	Between Groups	695.90	3	231.96	1232.34*	.903
	Within Groups	74.54	396	.18		
	Total	770.44	399			
Life Satisfaction	Between Groups	438.24	3	146.08	1048.17*	.888
	Within Groups	55.19	396	.13		
	Total	493.43	399			
Psychological Distress	Between Groups	380190.34	3	126730.11	21994.62*	.994
	Within Groups	2281.70	396	5.76		
	Total	382472.04	399			
Psychological Well-being	Between Groups	54746.10	3	18248.70	5786.28*	.977
	Within Groups	1248.90	396	3.15		
	Total	55995.00	399			

Note. *p <.001

and Girls (M=148.07, 134.73) was better than Institutionalized Orphan Boys and Girls. In one of the previous research studies it has been found out that owing to the parental deprivation, orphans experience a lot of psychiatric disorders like; Separation Anxiety Disorder, Depression, Obsessive-Compulsive Disorder, Panic Disorder and Post Traumatic Stress Disorder.[7]

The Mental Health Scale (MHI-38) utilized in the current study comprises of six sub-dimensions i.e. Anxiety, it was found out that Institutionalized Boys Girls and Non-Institutionalized Boys Girls showed a significant difference [F (3,396) = 2906.91, p < .001]. The effect size of this difference was found very large [Eta Squared (η^2) = .956]. After Post Hoc Tukey's Test, the findings revealed all the four groups of orphans showed a significant mean difference on anxiety when compared with each other and this difference was significant at .05 level. Furthermore, from the descriptive table (Table 1.3)

Table 1.6. Post Hoc Analysis (Tukey's Test) comparing means of Institutionalized and Non-Institutionalized Orphans (Boys & Girls) on Mental Health and its dimensions

Variables	I Group	J Group	MD (I-J)	SEM
Mental Health	Inst. Boys	Inst. Girls	18.90**	
	Inst. Boys	N. Inst Boys	56.92**	
	Inst. Girls	N. Inst. Girls	62.48**	
	N. Inst Boys	N. Inst. Girls	13.34**	.868
Anxiety	Inst. Boys	Inst. Girls	7.05**	
	Inst. Boys	N. Inst Boys	13.59**	
	Inst. Girls	N. Inst. Girls	13.76**	
	N. Inst Boys	N. Inst. Girls	6.88**	.232
Depression	Inst. Boys	Inst. Girls	4.10**	
	Inst. Boys	N. Inst Boys	7.96**	
	Inst. Girls	N. Inst. Girls	7.85**	
	N. Inst Boys	N. Inst. Girls	4.21**	.153
Loss of Behavioural/ Emotional Control	Inst. Boys	Inst. Girls	7.39**	
	Inst. Boys	N. Inst Boys	15.76**	
	Inst. Girls	N. Inst. Girls	15.30**	
	N. Inst Boys	N. Inst. Girls	7.85**	.241
General positive Affect	Inst. Boys	Inst. Girls	7.09**	
	Inst. Boys	N. Inst Boys	14.83**	
	Inst. Girls	N. Inst. Girls	14.94**	
	N. Inst Boys	N. Inst. Girls	6.98**	.212
Emotional Ties	Inst. Boys	Inst. Girls	.64**	
Inst. BoysInst. Girls	N. Inst Boys	N. Inst. Girls	2.77**	2.07**
	N. Inst Boys	N. Inst. Girls	1.34**	.061
Life Satisfaction	Inst. Boys	Inst. Girls	.66**	
	Inst. Boys	N. Inst Boys	1.99**	
	Inst. Girls	N. Inst. Girls	1.98**	
	N. Inst Boys	N. Inst. Girls	.67**	.052
Psychological Distress	Inst. Boys	Inst. Girls	9.99**	
	Inst. Boys	N. Inst Boys	60.92**	
	Inst. Girls	N. Inst. Girls	60.74**	
	N. Inst Boys	N. Inst. Girls	10.17**	.339
Psychological Well-being	Inst. Boys	Inst. Girls	13.04**	
	Inst. Boys	N. Inst Boys	18.33**	
	Inst. Girls	N. Inst. Girls	23.03**	
	N. Inst Boys	N. Inst. Girls	8.34**	.251

**The mean difference is significant at 0.05 level.

it can be observed that orphan girls (M=48.31) residing in orphanages experience increased levels of anxiety followed by Institutionalized Boys (M= 41.26). In case of orphans living with other family members, it was found out that orphan girls (M= 34.55) showed higher anxiety levels than orphan boys (M=27.67). In the current study, it was observed that girl orphans (Institutionalized & Non-Institutionalized) have higher anxiety levels than boy orphans (Institutionalized and Non-Institutionalized). Although, in comparison to Institutionalized orphans (Boys and Girls), Non-Institutionalized orphans (Boys and Girls) showed lower levels of anxiety. The previous researches revealed that the most common anxiety disorder which orphans in Kashmir suffer from is; The Separation Anxiety Disorder.[4] Another study conducted in Baghdad revealed that orphans residing in the different orphanages of Baghdad city experienced Mild, Moderate and Severe levels of Anxiety disorder. In the light of the above finding, it can be stated that parental deprivation plays an important role in aggravating the level of anxiety among orphans. Furthermore, the type of environment prevalent in orphanages adds and worsens the mental health of inmates. Most of the orphans losing their parents in a conflict are more prone to severe mental health issues. Also, different studies have

reported girls are more anxious than boys[16].

The second dimension of Mental Health scale is Depression. This is the most common mental disorder experienced by adolescents.[17] In the present study, four groups of orphans (Institutionalized Boys, Institutionalized Girls, Non-Institutionalized Boys and Non-Institutionalized Girls) were compared on this dimension of mental health i.e. Depression, using one way ANOVA technique. The difference was found significant [F (3, 396) = 2253.52, p < .001] between the four groups of orphans. Furthermore, the magnitude of this difference was found very large [Eta Squared (η^2) = .944]. The post hoc Tukey's test revealed that this difference was higher when comparison was made on the basis of Institutionalization (MD=7.96, 7.85) than on gender basis (MD=4.10, 4.21), both significant at .05 level. From the descriptive table (Table 3.3), it can be observed that orphan girls residing in orphanages (M=20.71) were more depressed than boys (M=16.61). Among those orphans living with other family members at home, girl orphans (M=12.86) experienced more depression than boys (M=8.65). And comparatively orphans at home experienced lesser depression than orphans living in orphanages. Kazim and Mohammad[18] conducted a study on the orphans of Baghdad city. The results found out that out of a sample of 50 orphans, 48% suffered from Mild Depression. However, no gender impact was found on the level of depression among these orphans.

The inability of an individual to control ones emotions/behaviour i.e. Loss of Behavioural/ Emotional Control, is the next dimension of this scale. The orphan groups were compared on this dimension using one way ANOVA and the difference was found significant [F (3,396) = 3415.76, p < .001]. The effect size was found very large [Eta Squared (η^2) = .962]. After Post Hoc Tukey's test, it was found out that the mean difference on this dimension was higher when orphan groups were compared on the basis of Institutionalization (MD= 15.76, 15.30) than on gender basis (MD= 7.39, 7.85), both significant at .05 level. Furthermore, from the descriptive table (Table 3.3) it can be observed that Loss of Behavioural/Emotional control was highest among Girls Institutionalized (M= 44.13) followed by Institutionalized boys (M= 36.74), Girls Non-Institutionalized (M=28.83) and Boys Non-Institutionalized (M=20.98). Thus, orphan boys and girls living in orphanages were unable to control their emotions and behaviour as compared to the boys and girls living with other family. In one of the previous researches, it was found out that of a sample of 60% male and 40% female orphans, female orphans were found emotionally weaker (72.5%), reporting disturbances in sleep (72.5%) and experienced shivering on hearing loud voices as compared to the male orphans (45.7%, 47.7%, 47.7%).[12] On the basis of the finding of the current study and the supported findings, it can be stated that proper training of the caregivers in these orphanages is very important in order to deal with the emotional and behavioural instabilities among orphans residing in orphanages. The role of parents and family life is significant in enriching the emotional health of a child. Since, these children lack such kind of family support; they are predisposed to different types of disorders, behavioural as well as emotional. The orphans under residential care have been found suffering from different kinds of emotional and behavioural problems.[19]

The other three sub-scales of the Mental Health scale are; General Positive Affect, Emotional Ties and Life satisfaction. One way ANOVA showed a significant difference between the four groups of orphans on the dimension i.e. General positive Affect [F (3, 396) = 4013.63, p < .001]. The effect size was found very large [Eta Squared (η^2) = .968]. From the post hoc Tukey's test results, it was observed that the mean difference was highest when orphan groups were compared on the basis of Institutionalization (MD=14.83, 14.94) as compared to the comparison made on the basis of the gender of orphans (MD=7.09, 6.98). From the descriptive table, it can be observed that Boys Non-Institutionalized (M=34.03) reported higher General positive Affect when compared to Girls Non-Institutionalized (M=27.05). Similarly, Boys Institutionalized (M=19.20) reported somewhat higher General Positive Affect as compared to Girls Institutionalized (M=12.11). On the whole, Boys were better off than girl orphans on General Positive Affect dimension while, Non-Institutionalized Orphan Boys and Girls depicted more positive emotions as compared to Institutionalized Orphan Boys and Girls. The next dimension of this scale is Emotional Ties on which a significant difference [F

(3,396) = 1232.34] was found on applying one way ANOVA and the effect size was found very large [Eta Squared (η^2) = .903]. The findings on post hoc Tukey's Test depicted that family ties with other family members in case of Non-institutionalized orphan boys and girls (M=5.55, 4.21) was better since they lived at homes with the different family members surrounding them. However, Institutionalized Orphan Boys and Girls (M=2.78, 2.14) residing in the institutions are completely devoid of the family love and care which might have resulted in their low rating on this dimension. The final sub-dimension of this scale is Life satisfaction. A significant difference was found between the four groups of orphans on this dimension [F (3,396) = 1048.17, p < .001] with a very large effect size [Eta Squared (η^2) = .888]. Post hoc Tukey's test revealed that overall the mean difference of all the four groups was low when compared to each other. However, from the descriptive table (Table 3.3), it can be observed that the life satisfaction of orphan boys and girls (M=3.79, 3.12) living in families was somewhat better than those orphan boys and girls living in orphanages (M=1.80, 1.14). The Attachment Theory propounded by Bowlby (1958) reveals that the need for a few warm, caring , socially and emotionally responsive adults during the early years of a child's life are significant for the later socio-emotional development and long-term mental health of children.[20] Since, orphans particularly those residing in orphanages lack such type of socio-emotional support, they become vulnerable to mental health disorders with delayed socio-emotional development.[21]

The Mental Health Scale (MHI-38) further comprises of two Global Scales i.e. Psychological Distress and Psychological Well-being. On comparing the four groups of orphans on these scales using one way ANOVA test, a significant difference was found both on Psychological Distress [F (3,396) = 21994.62, p < .001] and Psychological Well-being [F (3,396) = 5786.28, p < .001] scale. The magnitude of this difference was found very large on both the scales [Eta Squared (η^2) = .99, .97]. After applying the post hoc Tukey's test it was found out that the mean difference was highest on Psychological distress scale when Institutionalized Boys were compared with Non-Institutionalized Boys (MD= 60.92) and Institutionalized Girls with Non-Institutionalized Girls (MD= 60.74). However, when the comparison was made on gender basis, comparing Institutionalized Boys with Institutionalized Girls (MD= 9.99) and Non-Institutionalized Boys with Non-Institutionalized Girls (MD=10.17) the mean difference was found comparatively low. However, on the scale of Psychological Well-being, mean difference was highest when Institutionalized Girls were compared with Non-Institutionalized Girls (MD=23.03) and lowest when Non-Institutionalized Boys were compared with Non-Institutionalized Girls (MD= 8.34), though both differences were significant at .05 level. Thus, Institutionalization came out as a major factor affecting the overall mental health of orphans apart from gender.

Conclusion

In the end, it can be concluded that the overall mental health of the four groups of orphans was found poor. However, orphans residing in the different orphanages of Kashmir were found suffering from a lot of mental health disorders. As per the norms of the Mental Health Scale (MHI-38) and the scores obtained in the current study, it can be deduced that on the positive dimensions of this scale i.e. General positive Affect, Emotional Ties, Life Satisfaction and Psychological Well-being, Non-Institutionalized Orphan Boys scored better than other groups of orphans and Institutionalized Girls scored poorer when compared to other groups of orphans on the same dimensions. However, on the negative dimensions of the scale i.e. Anxiety, Depression, Loss of Behavioural/ Emotional Control and Psychological Distress, girls living in orphanages scored higher while Non-institutionalized Orphan Boys scored low on all these negative dimensions.

References

1. https://www.thecitizen.in/index.php/en/NewsDetail/index/1/5669/The-Struggle-Of-Orphans-In-Kashmir. Accessed on February 26, 2023.
2. Landry SH, Smith KE, Miller-Loncar CL, Swank PR. Predicting cognitive-language and social growth curves from early maternal behaviors in children at varying degrees of biological risk. Dev Psychol 1997; 33(6) : 1040.

3. https://www.pursuit-of-happiness.org/history-of-happiness/martin-seligman-psychology/. Accessed on February 26, 2023.
4. Bhatt AA, Rahman S, Bhatt NM. Mental health issues in institutionalized adolescent orphans. Int JIndian Psychol 2015; 3(1) : 57-77.
5. Hamid NS, Shah S.A.G. Mental Health, Emotional state and Coping strategies: A study of orphans of Kashmir Valley (Doctoral dissertation), 2013.
6. Margoob MA, Rather YH, Khan AY, et al. Psychiatric disorders among children living in orphanages-experience from Kashmir. JK Pract 2006; 13(1) : 53-55.
7. Dar MM, Hussain SK, Qadri S, Hussain SS, Fatima SS. Prevalence and pattern of psychiatric morbidity among children living in orphanages of Kashmir. Intl J Health Sci Res 2015; 5 (11) : 53-60.
8. Boruchovitch E, Mednick B.R. The meaning of health and illness: some considerations for health psychology. Psico-USF, 2002; 7(2) : 175-183.
9. Menninger KA. Human Mind. New York, 1945.
10. Schneide AA. Personal development and mental health, New York: Holt 1964.
11. https://www.britannica.com/science/emotion. Accessed on February 26, 2023.
12. Naqshbandi MM, Sehgal R, Hassan F. Orphans in orphanages of Kashmir and their psychological problems. Int NGO J 2012; 7(3) : 55-63.
13. https://www.amhocn.org/sites/default/files/publication_files/mental_health_inventory.pdf.
14. George D, Mallery P. Reliability analysis. SPSS for Windows, step by step: a simple guide and reference (14th ed.) Boston: Allyn & Bacon 2003; 222-232.
15. Cohen J. Statistical Power Analysis for the Behavioral Sciences (2nd ed.) New Jersey: Lawrence Erlbaum Associaties 1988.
16. Grills AE, Ollendick TH. Peer victimization, global self-worth, and anxiety in middle school children. J Clin Child Adolescent Psychol 2002; 31(1) : 59-68.
17. Mohamed SH, Kazim A A.Assessment of Psychological Status of Orphans in Orphanages in Baghdad City. J Nurs Sci 2016; 6(1), 121-129.
18. Kazim AA, Mohamed SH. Assessment of Psychological Status of Orphans in Orphanages in Baghdad City. Kufa J Nurs Sci 2016; l.6 : 121-129.
19. Gearing RE, MacKenzie MJ, Schwalbe CS, Brewer KB, Ibrahim RW. Prevalence of mental health and behavioral problems among adolescents in institutional care in Jordan. Psychiatr Serv 2013; 64(2) : 196-200.
20. Bretherton I. The origins of attachment theory: John Bowlby and Mary Ainsworth. Dev Psychol 1992; 28(5) : 759-775.
21. Michaud PA, Fombonne E. Common mental health problems. BMJ 2005; 330 : 835-838.

Original Article

Efficacy of cognitive training for children diagnosed with ADHD using Captain's Log

Deepak Gupta,[1] Nabanita Sengupta,[2] Eti Goel[3]
[1,2]Pediatric Psychiatry Services, Institute of Child Health, Sir Ganga Ram Hospital, New Delhi and [3]Centre for Child and Adolescent Wellbeing, New Delhi, India
Contact: Nabanita Sengupta, Email: navneeta.sengupta@gmail.com

ABSTRACT

Introduction*: ADHD is one of the most prevalent disorders among children in the current times. Practitioners use different methods to treat the same. Computer training programs are one such method which are gaining popularity day by day. The current research aims to test the efficacy of Captain's Log training program.* ***Method****: The sample consisted of 47 children diagnosed with ADHD who underwent a 20-hour training program using Captain's log. To cross validate the findings, their parents were also asked to respond to strength and difficulty questionnaire and executive functioning questionnaire.* ***Results****: Pre and post captain's log assessment result signifies the efficacy of computerised training program in the treatment of ADHD. However, ratings from the parents questioned the efficacy of the current results.* ***Conclusion:*** *The current study aimed to examine the efficacy of Captain's Log, a cognitive training program for children with ADHD. The results provided significant findings, however, there are some limitations worth noting.*

Keywords: *ADHD, Captains Log, Cognitive training program, Efficacy, Treatment.*

Introduction

There is substantial evidence that Attention deficit hyperactivity disorder (ADHD) with a prevalence rate of approximately 7% is one amongst other common disorders in the current times.[1] Inattention and/or impulsivity hyperactivity are key characteristics of this neurobiological disorder, which has an onset in childhood and could further progress to later life as an adolescent and adult,[2] if not diagnosed and treated on time. These marked symptoms could easily hamper development in terms of education,[3] emotionality,[4] social skills, self-esteem,[5] and etc. ADHD is significantly associated with poor health and wellbeing of patients and as well as their caregivers which include their parents and siblings,[6] indicating high psychosocial burden,[7] making treatment imperative. Researchers significantly highlight the role of impairment in executive functioning of individuals with ADHD.[8-10]

Executive functioning refers to the higher order functioning or top-down cognitive processes through which an individual learns, adapts and successfully overcomes everyday challenges.[8] Impairment in such can lead an individual suffer in overcoming demands of everyday life such as attention, critical thinking, and planning.[11] Broadly, executive functions can be easily categorized into three: Inhibition and Interference control, Working memory, and Cognitive flexibility (Diamond, 2013).[12] However, researchers, such as Dawson and Guare have emphasized studying them as 12 related yet different skills for a greater understanding and they are Response inhibition, Working memory, Emotional control, Sustained attention, Task initiation, Planning/ prioritization, Organization, Time management, Goal directed persistence, Flexibility, Metacognition, and Stress tolerance.[13] Further, ADHD is significantly associated with difficulties in social life.[7] Adults with ADHD are more likely, to behave as antisocial, prone to alcohol or drug abuse and would

have poor occupational functioning.[14] ADHD was found to be comorbid with anxiety, affective and conduct disorders.[7] Hay and colleagues found ADHD to be negativelyassociated with prosocial behavior.[15] ADHD was also found to be significantly associated with emotional problems.[16] As a child, one is expected to perform in academics, however, with ADHD, the task seems to be difficult, aggravating the issues further. Barkley summarized that, children with ADHD have high chance of learning disability affecting their academic performance.[17] In a country like India, usually, lower grade dents parental expectations which further leads to many other psychological issues for both child and as well as for their family.

Currently, pharmaceutical and psychological treatment is usually recommended for the individuals diagnosed with ADHD. Pharmaceutical treatment involves usage of psychostimulants or non-psychostimulants, which are usually the first line treatment.[18] However, due to issues like cost, long term benefits, adverse effect and most importantly the negative attitude have forced practitioners to look for alternatives.[18] Psychological treatments which involve social learning and behavior modification have been found to improve social skills and conduct issues. However, when it comes to transfer the learning to a different setting other than the intervention, it fails to gather large empirical evidence. Cognitive training on the other hand aims to target the core of ADHD and not just symptoms, which leads to "greater effect generalizations and transfers".[18]

Cognitive trainings aim to improve cognitive functioning with practice and/or intentional instructions.[19] Two types of cognitive trainings have been identified: Process based, and Strategy based.[18] First, works on implicit task instructions while the latter focuses on explicit task instructions. Although, both approaches seem to have different methodologies, they have a common ground in neural plasticity and re-alignment of brain structure with its different functions in response to environmental demands which improves learning and cognition.[20] Cognitive trainings have been found efficacious in decreasing activation, increasing activation, activation redistribution, and re-organizing of networks.[18] There are many cognitive training programs such as Aixtent, Cogmed, Cogniplus and Captain's Log to name a few. They tend to focus on different abilities, for example, Aixtent focuses on Attention, Captain's Log works on Attention, Working memory, Visuomotor function, and Problem solving.[18] Because different programs have different games which works on different abilities/skills, a decision support system is required.[21] A fully trained practitioner can decide which software and game to use after a proper diagnosis.

Despite its usefulness, not many practitioners have used Captain's log, raising a question on validity of the computer program. Kotwal and colleagues found evidence in support of Captain's Log program.[2] Rabinerand colleagues found attention of the children improved after cognitive training.[23] Captain's Log was also found to be effective in treating ADHD.[24] More recently, Yazdanbakhshand colleagues found improved behavioural symptoms in individuals with ADHD after 12 sessions of Captain's Log.[1] However, results were never cross validated by using others measures. Therefore, the current study extends the current literature by exploring the efficacy and validity of Captain's Log program. Moreover, to the best of our knowledge, no Indian studies have reported the efficacy of Captain's Log program.

Method

Ethical clearance was taken from Institutional Ethical Committee. Twenty-hour training was given on Captain's Log software to children diagnosed with ADHD by a practising child psychiatrist in Delhi, India. The subjects were assessed by the software before and after the training. Simultaneously, they were also assessed by the questionnaires filled by their parent.

Sample: A total of 47 individuals took part in the study. All the participants were briefed about the study and a prior written consent was taken from the parents of the child. There were 36 males and 11 females. The mean age of the participants was found to be 11.07 years. The age range was found to be 6 to 16 years. All the participants were not on any medication and no other comorbidity was found.

Measures

Computerised cognitive training software Captain's Log: To see the efficacy, the program itself assesses the user before the training and after the training. Nine domains are assessed namely;

Visual scanning identification, Auditory pattern recognition, Numeric perceptual recall, Visual memory identification, Sequential memory patterns, Working memory capacity, Auditory sequential memory, Selective comparison reasoning and Conceptual sequential patterns.

The Strengths and Difficulties Questionnaire (SDQ):[24] A 25-items questionnaire which assesses five dimensions namely, Emotional problems, Conduct problems, Hyperactivity problems, Peer problems, and Prosocial behaviour. A total impact score is also calculated by summing up the dimensions. The questionnaire is to be filled by parent and captures responses on a 3-point Likert scale where in 0 meant "Not true" and 2 meant Certainly true. The scale demonstrated a good reliability and validity and have been used widely including India.[25]

Executive skills Questionnaire (ESQ):[13] A 36-items questionnaire commonly used to assess 12 dimensions of executive functioning namely, Response Inhibition, Emotional Control, Sustained Attention, Organization, Flexibility, Goal-Directed Persistence, Working Memory, Task Initiation, Planning/Prioritization, Time Management, Metacognition and Stress Tolerance. This questionnaire was also filled by the respective parent of the child. The responses were captured on a 7-point Likert scale wherein 1 was given to "Strongly disagree" while 7 meant "Strongly agree".

Results

The results are shown in Table No 1. It can be clearly seen that there is a significant difference on all dimensions of Captain's Log assessment. On average, subjects scored better after 20 hours of training on Captain's log software. A significant difference ($t = 6.98$, $p < .01$) was observed from pre training ($M = 70.77$, $SD = 19.01$) to post training ($M = 83.72$, $SD = 13.29$) on Visual scanning identification. The mean values of pre training and post training on Selective comparison reasoning was found to be 59.66 and 72.77 with 17.22 and 14.92 standard deviations respectively. A significant difference ($t = 6.66$, $p < .01$) was also found on the same. On Auditory pattern recognition a significant difference ($t = 3.33$, $p < .01$) was observed from pre training ($M = 74.47$, $SD = 17.36$) to post training ($M = 80.17$, $SD = 15.47$). A significant difference ($t = 6.21$, $p < .01$) was observed from pre training ($M = 41.60$, $SD = 21.84$) to post training ($M = 60.06$, $SD = 21.08$) on Conceptual sequential pattern. On Numeric Perceptual Recall a significant difference ($t = 5.17$, $p < .01$) was observed from pre training ($M = 70.79$, $SD = 15.54$) to post training ($M = 78.79$, $SD = 12.51$). A significant difference ($t = 4.40$, $p < .01$) was observed from pre training ($M = 62.91$, $SD = 16.99$) to post training ($M = 74.02$, $Sd = 18.07$) on Visual memory identification. On Sequential memory pattern a significant difference ($t = 4.86$, $p < .01$) was observed from pre training ($M = 52.53$, $SD = 22.40$) to post training ($M = 67.98$, $SD = 20.18$). A significant difference ($t = 4.86$, $p < .01$) was observed from pre training ($M = 65.26$, $SD = 26.98$) to post training ($M = 83.06$, $Sd = 14.88$) on Working Memory Capacity. On Auditory Sequential Memory, a significant difference ($t = 6.12$, $p < .01$) was observed from pre training ($M = 39.23$, $SD = 28.91$) to post training ($M = 59.72$, $SD = 27.99$). The effect size of all the differences were found to be large. A graphical representation of the mean differences can be seen in Figure No. 1.

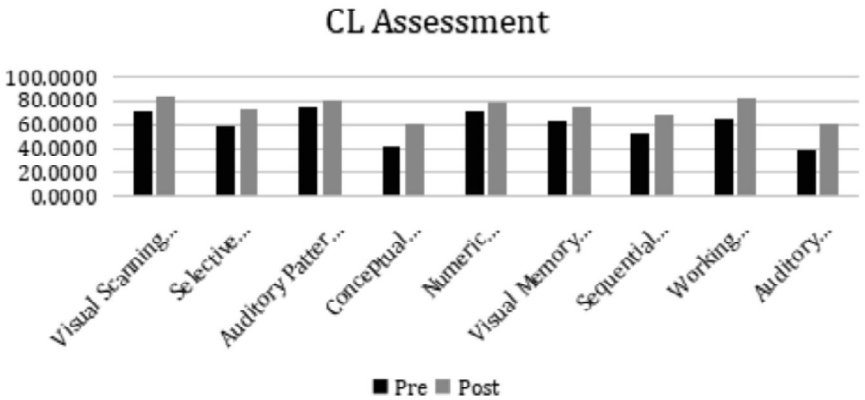


Fig. 1: Graphical representation of Pre and Post CL Assessment.

Table 1: Showing difference between pre and post test on variable.

	SKILLS	PRE-TEST		POST-TEST				
		M	SD	M	SD	T	P	d
CL	Visual Scanning Identification	70.77	19.01	83.72	13.29	6.98	.01	1
	Selective Comparison Reasoning	59.66	17.22	72.77	14.92	6.66	.01	.97
	Auditory Pattern Recognition	74.47	17.36	80.17	15.47	3.33	.01	.49
	Conceptual Sequential Pattern	41.60	21.84	60.06	21.08	6.21	.01	.90
	Numeric PerceptualRecall	70.79	15.54	78.79	12.51	5.17	.01	.75
	Visual Memory Identification	62.91	16.99	74.02	18.07	4.40	.01	.64
	Sequential Memory Pattern	52.53	22.40	67.98	20.18	4.86	.01	.71
	Working Memory Capacity	65.26	26.98	83.06	14.88	4.86	.01	.71
	Auditory Sequential Memory	39.23	28.91	59.72	27.99	6.12	.01	.89
ESQ	Response Inhibition	10.34	4.28	11.40	3.79	1.81	.08	.26
	Working Memory	11.74	4.77	13.11	3.97	2.03	.05	.30
	Emotional Control	11.02	7.53	10.43	3.32	.57	.57	.08
	Task Initiation	9.77	4.12	10.70	3.73	1.73	.09	.25
	Sustained Attention	7.74	3.80	9.89	4.06	4.82	.01	.70
	Planning	8.72	4.21	9.81	4.05	1.82	.08	.27
	Organization	9.09	5.32	10.06	4.76	1.85	.07	.27
	Time Management	10.04	4.34	11.30	4.51	3.34	.01	.49
	Flexibility	10.43	4.74	12.36	4.68	4.06	.01	.59
	Metacognition	9.26	4.55	10.66	4.15	2.85	.01	.42
	Goal-directed Persistence	9.94	4.72	10.68	4.41	1.80	.08	.26
	Stress Tolerance	11.23	5.47	12.26	4.78	1.68	.10	.25
SDQ	Emotional	3.51	2.14	3.09	2.16	1.07	.29	.16
	Conduct	3.34	1.93	3.28	2.04	.23	.82	.03
	Hyperactivity	6.96	1.90	5.85	2.22	3.48	.01	.51
	Peer Problems	4.26	2.02	3.40	1.88	2.87	.01	.42
	Prosocial Behaviour	6.23	2.46	7.02	2.18	2.33	.02	.34
	Impact Score	2.94	2.19	2.02	2.08	2.35	.02	.34

On parental measure of executive skills, a mixed result was observed. On Response inhibition, no significant difference ($t = 1.81$, $p = .08$) was observed from pre training ($M = 10.34$, $SD = 4.28$) to post training ($M = 11.40$, $SD = 3.79$). A significant difference ($t = 2.03$, $p = .05$) was observed from pre training ($M = 11.74$, $SD = 4.77$) to post training ($M = 13.11$, $SD = 3.97$) on Working Memory Capacity. On Emotional control, no significant difference ($t = .57$, $p = .57$) was observed from pre training ($M = 11.02$, $SD = 7.53$) to post training ($M = 10.43$, $SD = 3.32$). No significant difference ($t = 1.73$, $p = .09$) was observed from pre training ($M = 9.77$, $SD = 4.12$) to post training ($M = 10.70$, $SD = 3.73$) on Task initiation. On Sustained attention, a significant difference ($t = 4.82$, $p < .01$) was observed from pre training ($M = 7.74$, $SD = 3.80$) to post training ($M = 9.89$, $SD = 4.06$). No significant difference ($t = 1.82$, $p = .08$) was observed from pre training ($M = 8.72$, $SD = 4.21$) to post training ($M = 9.81$, $SD = 4.05$) on Planning dimension. On Organization dimension, no significant difference ($t = 1.85$, $p = .07$) was observed from pre training ($M = 9.09$, $SD = 5.32$) to post training ($M = 10.06$ $SD = 4.76$). A significant difference ($t = 3.34$, $p < .01$) was observed from pre training ($M = 10.04$, $SD = 4.34$) to post training ($M = 11.30$, $SD = 4.51$) on Time management. On Flexibility, a significant difference ($t = 4.06$, $p < .01$) was observed from pre training ($M = 10.34$, $SD = 4.74$) to post training ($M = 12.36$, $SD = 4.68$). Similarly, on Metacognition, a significant difference ($t = 2.85$, $p < .01$) was observed from pre training ($M = 9.26$, $SD = 4.55$) to post training ($M = 10.66$, $SD = 4.15$). No significant difference ($t = 1.80$, $p = .08$) was observed from pre training ($M = 9.94$, $SD = 4.72$) to post training ($M = 10.68$, $SD = 4.41$) on Goal directed persistence. Similarly, no significant difference ($t = 1.68$, $p = .10$) was observed from pre training ($M = 11.23$, $SD = 5.47$) to post training ($M = 12.26$, $SD = 4.78$) on Stress tolerance. As far as the effect sizes are concerned, large effect sizes were observed on

Sustained attention, Time management, and Flexibility. However, a medium to large effect sizes were observed on Working memory, while on others, small to medium effect sizes were observed. A graphical representation of the same is shown in Figure No. 2.

As far as dimensions of strength and difficulties questionnaire is concerned, a mixed result was found. On emotional dimension, no significant difference (t = 1.07, p = .29) was observed from pre training (M = 3.51, SD = 2.14) to post training (M = 3.09, SD = 2.16). Similarly, no significant difference (t = .23, p = .82) was observed from pre training (M = 3.34, SD = 1.93) to post training (M = 3.28, SD = 2.04) on conduct dimension. On Hyperactivity, a significant difference (t = 3.48, p < .01) was observed from pre training (M = 6.96, SD = 1.92) to post training (M = 5.85, SD = 2.22). Similarly, a significant difference (t = 2.87, p < .01) was observed from pre training (M = 4.26, SD = 2.02) to post training (M = 3.40, SD = 1.88) on peer problems. On Prosocial behavior, a significant difference (t = 2.33, p < .05) was observed from pre training (M = 6.23, Sd = 2.46) to post training (M = 7.02, SD = 2.18). Overall, a significant difference (t = 2.35, p < .05) was observed from pre training (M = 2.94, SD = 2.19) to post training (M = 2.02, SD = 2.08) on peer problems. A large effect size was observed on hyperactivity whereas, medium to high effect sizes were observed on Peer problems, prosocial behavior and total impact score. On emotional and conduct dimensions, low effect sizes were observed. A graphical representation of the same is shown in Figure 3.

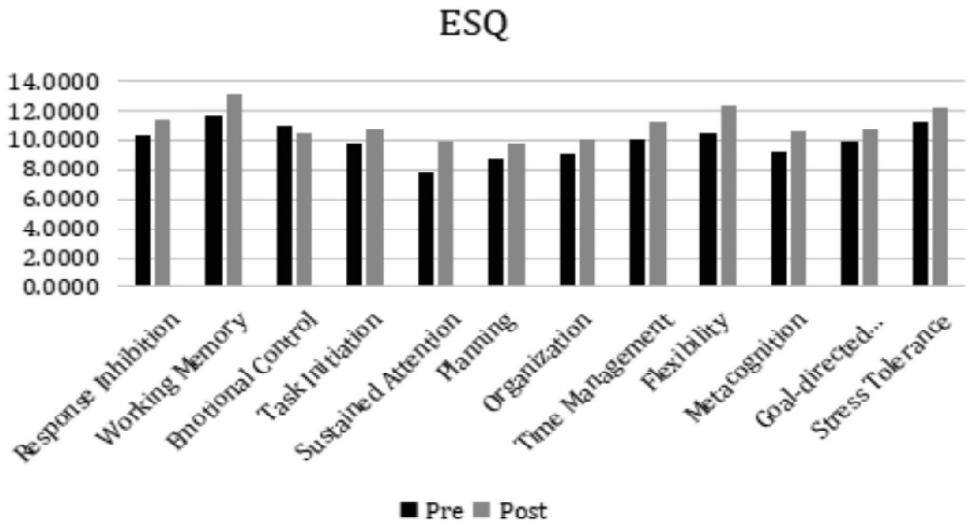


Fig. 2: Graphical representation of ESQ.

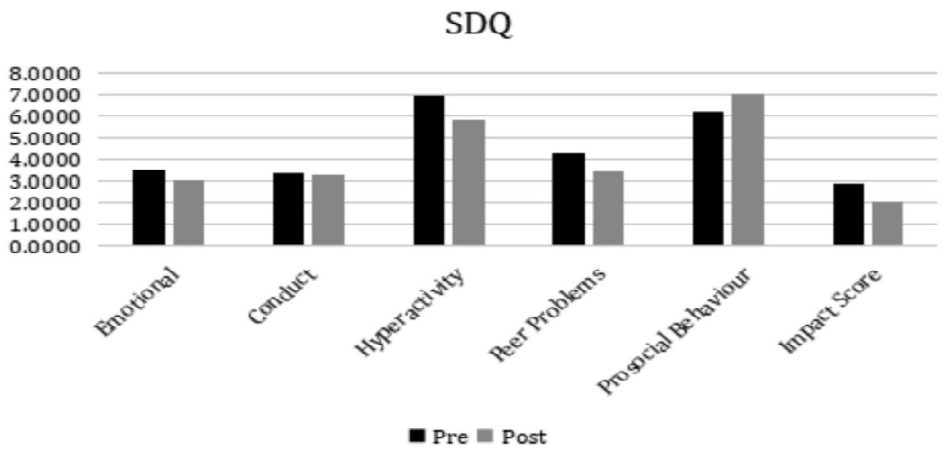


Fig. 3: Graphical representation of SDQ.

Discussion

The current research aimed to study the efficacy of a cognitive training program called Captain's Log. A 20-hour training was given to all the participants. The study is first of its kind as it also takes parent's perspective into account (ESQ and SDQ). The results showed that participants at an average improved on all domains of Captain's Log assessment. The results are in line with previous researches mentioned in the introduction. Further, 20-hour training program was found to have a significant effect on few domains of executive functioning and as well as on strengths and difficulties, which signifies partial transfer of learning, as ESQ and SDQ was reported by the parents. The program was not found to leave a significant impact on emotional and conduct domains of SDQ which largely can be attributed to Captain's Log program, as it doesn't claim to work on limbic system. However, a significant change was noted in pro-social behaviour and peer-problems, which can be attributed to decrease in impulsivity by increase in visual scanning. Results also signifies that no significant improvement was observed in Response inhibition, Emotional control, Task initiation, Planning, Organization, Goal directed persistence and stress tolerance domains of Executive skills questionnaire. The probable reason could be that 20-hour training program was not sufficient for the participants. The results also indicate partial transfer of learning as it was identified by other researchers[26,27] and more researches are required.[28] It can be concluded from the results that Captain's log program was partially efficacious in terms of transfer of learning.

Limitations and future directions

The current study aimed to examine the efficacy of Captain's Log, a cognitive training program for children with ADHD. The results provided significant findings, however, there are some limitations worth noting. The age of the participants varies from 6 to 16. Results from a homogeneous sample would have more inferencing power. Males outnumber females by a large margin. An equal number of representations from both the sex could provide more generalizable results. Future researchers can also plan a clinical randomised trial wherein all the three modes of treatments (Medication, psychotherapy and cognitive training) could be compared. Ratings from teachers and counsellors should also be taken which would establish the validity of the results.

References

1. Yazdanbakhsh K, Aivazy S, Moradi A. The effectiveness of response inhibition cognitive rehabilitation in improving the quality of sleep and behavioral symptoms of children with attention-deficit/hyperactivity disorder. J Kermanshah Univ Med Sci [Internet]. 2018; 22(2). Available from: http://dx.doi.org/10.5812/jkums.77114
2. Ramos-Quiroga JA, Montoya A, Kutzelnigg A, Deberdt W, Sobanski E. Attention deficit hyperactivity disorder in the European adult population: prevalence, disease awareness, and treatment guidelines. Curr Med Res Opin. 2013; 29(9) : 1093–104.
3. Loe IM, Feldman HM. Academic and educational outcomes of children with ADHD. J Pediatr Psychol 2007; 32(6) : 643–54.
4. van Stralen J. Emotional dysregulation in children with attention-deficit/hyperactivity disorder. Atten Defic Hyperact Disord 2016; 8(4) : 175–87.
5. Shaw-Zirt B, Popali-Lehane L, Chaplin W, Bergman A. Adjustment, social skills, and self-esteem in college students with symptoms of ADHD. J Atten Disord 2005; 8(3) : 109–20.
6. Peasgood T, Bhardwaj A, Biggs K, Brazier JE, Coghill D, Cooper CL, et al. The impact of ADHD on the health and well-being of ADHD children and their siblings. Eur Child Adolesc Psychiatry 2016; 25(11) : 1217–31.
7. Cuffe SP, Moore CG, McKeown RE. Prevalence and correlates of ADHD symptoms in the national health interview survey. J Atten Disord 2005; 9(2) : 392–401.
8. Schreiber JE, Possin KL, Girard JM, Rey-Casserly C. Executive function in children with attention deficit/hyperactivity disorder: the NIH EXAMINER battery. J Int Neuropsychol Soc 2014; 20(1) : 41–51.
9. Barkley RA. Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. Psychol Bull 1997; 121(1) : 65–94.
10. Pennington BF, Ozonoff S. Executive functions

and developmental psychopathology. J Child Psychol Psychiatry 1996; 37(1) : 51–87.
11. Anderson VA, Anderson P, Northam E, Jacobs R, Catroppa C. Development of executive functions through late childhood and adolescence in an Australian sample. Dev Neuropsychol 2001; 20(1) : 385–406.
12. Diamond A. Executive functions. Annu Rev Psychol 2013; 64(1) : 135–68.
13. Dawson P, Guare R: The Guilford practical intervention in the schools series.Executive skills in children and adolescents: A practical guide to assessment and intervention (2nd ed.). Guilford Press 2010.
14. Mannuzza S, Klein RG, Bessler A, Malloy P, LaPadula M. Adult psychiatric status of hyperactive boys grown up. Am J Psychiatry. 1998; 155(4) : 493–8.
15. Hay DF, Hudson K, Liang W. Links between preschool children's prosocial skills and aggressive conduct problems: The contribution of ADHD symptoms. Early Child Res Q 2010; 25(4) : 493–501.
16. Walcott CM, Landau S. The relation between disinhibition and emotion regulation in boys with attention deficit hyperactivity disorder. J Clin Child Adolesc Psychol 2004; 33(4) : 772–82.
17. Barkley RA. Attention-Deficit Hyperactivity Disorder: A handbook for diagnosis and treatment (2nd Ed.). New York, NY: Guilford Press 1998.
18. Sonuga-Barke E, Brandeis D, Holtmann M, Cortese S. Computer-based cognitive training for ADHD: a review of current evidence. Child Adolesc Psychiatr Clin N Am 2014; 23(4) : 807–24.
19. Jolles DD, Crone EA. Training the developing brain: a neurocognitive perspective. Front Hum Neurosci 2012; 6 : 76.
20. Willis SL, Schaie KW. Cognitive training and plasticity: theoretical perspective and methodological consequences. Restor Neurol Neurosci 2009; 27(5) : 375–89.
21. Ghazisaeedi M, Shahmoradi L, Niakan Kalhori SR, Bashiri A. Management of computerized cognitive training programs in children with ADHD: The effective role of decision support systems. Iran J Public Health 2018; 47(10) : 1611–2.
22. Kotwal DB, Burns WJ, Montgomery DD. Computer-assisted cognitive training for ADHD — a case study. Behav Modif 1996; 20 : 85–96. doi: 10.1177/01454455960201004.
23. Rabiner DL, Murray DW, Skinner AT, Malone PS. A randomized trial of two promising computer-based interventions for students with attention difficulties. J Abnorm Child Psychol. 2010; 38 : 131–142. doi: 10.1007/s10802-009-9353-x.
24. Goodman R. The Strengths and Difficulties Questionnaire: a research note. J Child Psychol Psychiatry 1997; 38(5) : 581–6.
25. Bhola P, Sathyanarayanan V, Rekha DP, Daniel S, Thomas T. Assessment of self-reported emotional and behavioral difficulties among pre-university college students in Bangalore, India. Indian J Community Med 2016; 41(2) : 146–50.
26. Johnstone SJ, Roodenrys S, Blackman R, Johnston E, Loveday K, Mantz S, et al. Neurocognitive training for children with and without AD/HD. Atten Defic Hyperact Disord 2012; 4(1) : 11–23.
27. Shalev L, Tsal Y, Mevorach C. Computerized progressive attentional training (CPAT) program: Effective direct intervention for children with ADHD. Child Neuropsychology 2007; 13 : 382–388.
28. Tajik-Parvinchi D, Wright L, Schachar R. Cognitive rehabilitation for attention deficit/hyperactivity disorder (ADHD): Promises and problems. J Can Acad Child Adolesc Psychiatry 2014; 23(3) : 207–17.

Original Article

A cross-sectional study to assess levels of anxiety, depression, insomnia, and stress in front-line health care workers rendering duties at a level-3 COVID-19 Care Centre

Arnav, Tarun Yadav, Seema Singh, Akul Gupta
Teerthanker Mahaveer Medical College and Research Centre, Moradabad
Contact: Tarun Yadav, E-mail: tystark565@gmail.com

ABSTRACT

Introduction: *The spread of COVID-19 across the globe was not less than a blitzkrieg. Ongoing pandemic posed an uncanny challenge to health care professionals, as there was no pre-existing treatment protocol and vaccine available. This led to higher stress levels and psychological distress amongst health care workers (HCWs).* ***Methodology:*** *A Cross-sectional questionnaire-based observational study was conducted involving 210 medical and para-medical staff who rendered COVID-19 duties, at a level-3 COVID-19 Care Centre, to assess their anxiety, depression, insomnia, and stress levels. For evaluating the psychological impacts among the HCWsHAM-A (Hamilton Anxiety Scale) and PSS (Perceived Stress Scale) scales were used. Data was collected through contactless Google forms and results were assessed using appropriate statistical analysis.* ***Results:*** *On analysis of data, prevalence of anxiety levels were found as mild - 89% (n=187), moderate - 8.6% (n=18), and severe - 2.4% (n=5). On comparing, doctors were found to have a relatively low mean anxiety score of 7.32 ± 7.46 as compared to 9.55 ± 7.57 of staff nurses. Prevalance of stress levels was found as low - 24.3% (n=51), moderate - 64.3% (n=135)and a high perceived level -11.4% (n=24). On comparing, doctors were found to have a higher mean stress score of 17.95 ± 7.44 as compared to 16.18 ± 3.14 of staff nurses. The insomnia prevalance was found to be as mild - 26.7% (n=56), moderate - 16.7% (n=35), and severe - 9.5% (n=20). On comparing, doctors were found to have a lower mean insomnia score of 0.80 ± 1.0 as compared to 1.82 ± 0.73 of staff nurses. Depressiveness prevalance was found to be mild - 26.2% (n=55), moderate - 13.3% (n=28)and severe - 4.3% (n=9). One participant reported a very severe level of depression & insomnia. On comparing, doctors were found to have a higher mean depression score as 0.72 ± 0.91 as compared to 0.32 ± 0.64 of staff nurses.* ***Conclusion:*** *Treating or taking care of the patients suffering from COVID-19 was an uphill task for HCWs. Fighting with a disease of a lesser-known nature resulted not only in physical stress but significant psychological distress as well. Thus, the findings of this study also underline the need for mental health support tailored for front line HCWs.*

Keywords: *Anxiety, COVID-19, Depression, Front-line workers, Health-careworkers (HCWs), Insomnia, Pandemic, Stress.*

Introduction

Occurring over the last century, the Spanish flu (1918-1920), the Asiatic flu (1956-1957), the Severe acute respiratory syndrome (SARS, 2002-2003), the "Swine" flu (2009), the Ebola (2013-2014) Pandemics and epidemics have been registered as an unfortunate part of human history affecting a large number of people worldwide.[1-3] Previous studies

done on the SARS and Ebola pandemics have shown that an extraordinary amount of pressure can be put on the health care workers (HCWs) due to the onset of an unexpected life-threatening disease.[4]

Again, mankind is witnessing an unprecedented time of pandemic affecting every human race present on the earth directly or indirectly. In Nov 2019 an unknown highly contagious lethal viral illness was reported in Wuhan, China which manifested as respiratory distress primarily. Soon on Jan 30th 2020, World Health Organization (WHO) acknowledged it as a world-wide Public Health Emergency. The contagion was identified as a member of the β-Corona Virus family sharing many symptoms of SARS-CoV-1,[5] and the resultant illness was recognized as SARS-CoV-2 and popularly known as COVID-19. Since then, the number of infected individuals has risen exponentially. As of 23rd Jan 2021 globally the count of COVID-19 patients has crossed approximately 98.76 million with 2.11 million deaths.[6] COVID-19 comprises clinical features ranging from asymptomatic carrier state to severe acute respiratory distress syndrome (ARDS) and multi-organ failure state.[7] The COVID-19 pandemic has affectednot only physical health but also caused a collapse of the global public health and social systems.[8] Many historians consider that the crisis is comparable to war.[9] Various Government agencies and Health Organizations implemented never seen strict pandemic prevention measures like lockdown, suspension of all non-essential activities, mandatory closure of educational institutions, domestic and/or international travel restrictions, etc. COVID-19 disease along with its prevention measures pushed the human race into an invisible crater of Psycho-socio-economic distress. Now every individual on the planet bears the mental brunt of this mysterious disease. But the amplitude of psychological impact over front-line workers is of the highest levels.

The absence of a vaccine, devoid of the evidence-based treatment protocol, and limited health care resources has burdened the medical staff and affiliated healthcare workers resulting in significant physical as well as psychological distress on them. Significant impacts on the physical and mental well-being are seen due to the increase in workload, improper personal equipment, the need to make ethically difficult decisions on rationing and care, nosocomial transmission, and physical exhaustion. Isolation, lack of social acceptance, increased risk or infections of family members, friends and relatives as well as radical, often unsettling modifications in the ways of working further compromises the HCWs' resilience. They are, therefore, principally vulnerable to several mental co-morbidities including depression, insomnia, and anxiety.[10,11] COVID-19 pandemic has proved to affect everyone directly or indirectly. Healthcare workers offering their duties on the front-line have been predisposed to a tremendous amount of mental as well as physical strain. There are many projects undertaken worldwide[12-20] to understand the impact on these professionals but still even after almost one year of the start of the pandemic not many observations have been published in India. Hence, this study was undertaken to assess the Psychological impact of the COVID-19 pandemic on front-line health care workers rendering duties at level-3 COVID-19 Care Centre. Most studies was focused on the mental health issues among health care professionals but our study was focused exclusively on the individuals involved in taking care of COVID-19 patients at tertiary care (Nodal) center.

Methodology

Aim: To assess the Psychological impact viz. anxiety, depression, insomnia, and stress on front-line HCWs rendering duties at level-3 COVID-19 Care Centre.

Study Design

A Cross-sectional Questionnaire-based observational study was conducted involving 210 medical and par-medical staff who rendered their duties at a tertiary care hospital attached to a medical college, a Level-3 COVID-19 care center which was inducted by the Government of Uttar Pradesh as COVID-19 Nodal center.

Method

A contactless approach was undertaken through Google-forms to record responses of participating individuals. Only those responses were included in the study in which participants selected the option of willful consent of voluntary participation in the study. Responses to our study were recorded between May 2020 and August 2020. The average duration

of services rendered in COVID-19 related clinical duties by the participants was around 3.25 months.

The survey extensively recorded socio-demographic characteristics like age, gender, marital status, level of education, and details of undertaken professional duties like nature of work, working hours, duration, and frequency of duties in the pandemic as frontline workers.

Assessment Scales- For evaluating the severity of depression, anxiety, insomnia, and stress among the HCWs a standard scoring questionnaire called HAM-A (Hamilton Anxiety Scale)[21] and PSS (Perceived Stress Scale)[22] scales were used. Both thescalesarewell-established scales to estimate adverseemotional status with defined score ranges and demonstrates diverse severity levels from normal to extremely severe.

In addition to the above-mentioned scales, other questions were also included to appraise the probable factors accountable for the stress, anxiety, insomnia, and depression as perceived by the participants during the current scenario of the COVID-19 pandemic.

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) version 23.0 software (SPSS Inc., Chicago, IL, USA) was employed for data entry and statistical analysis.

Results

Out of 210 participants, 188 were doctors and 22 were paramedical staff consisting of nurses and a lab technician. Gender distribution was almost equal with 101 males (48.1%) and 109 female subjects (51.9 %). The majority of them around 181 (86.2%) were in the age group of 21-30 years followed by 26 (12.4%) of 31-40 years age group, 2 (1%) of 41-50 years age group and only 1 (0.5%) was from 51-60 years age group (Table 1).

When the HAM-Ascalewas used it was found that a total of 187 participants (89%) presented with mild anxiety levels followed by 18 (8.6%) with moderate and 5 (2.4%) with severe anxiety levels.On comparing, doctors were found to have a slightly lessmean anxiety score of 7.32 ± 7.46 as compared to 9.55 ± 7.57 of staff nurses (Table 2 & 3).

On using the PSS scale, it was found that a total number of individuals who had a low level of stress score was 51 (24.3%), those with moderate and a high perceived level of stress score was 135 (64.3%) and 24 (11.4%) respectively. On comparing, doctors were found to have a higher mean stress score of17.95 ± 7.44 as compared to 16.18 ± 3.14 of staff nurses (Table 2 & 3).

When the level of insomnia among the participants was assessed it was found that 56 (26.7%) reported mild insomnia followed by 35 (16.7%) moderate and 20 (9.5%) severe insomnia. One participant reported a very severe level of loss of sleep. On comparing, doctors were found to have a lower mean insomnia score as 0.80 ± 1.0 as compared to 1.82 ± 0.73 of staff nurses (Table 2 & 3).

Analysis of depressiveness amongst the HCWs showed that55 (26.2%) reported mild depression

Table-1: Demographic and Social Characteristics

Characteristics	Number of HCWs	Percentage (%)
Age		
21-30 years	181	86.2
31-40 years	26	12.4
41-50 years	2	1.0
51-60 years	1	0.5
Gender		
Male	101	48.1
Female	109	51.9
Marital Status		
Married	46	21.9
Unmarried	164	78.1
Designation		
Doctor	188	89.5
Staff nurses	21	10.0
Lab technician	1	0.5

Table-2: Levels of anxiety, stress, Insomnia, and Depression among participants

	Staff nurse/LT (n=22)		Doctor (n=188)		Total	%
	n	%	n	%	210	100
Anxiety level						
Mild	19	86.4	168	89.4	187	89.0
Mild to moderate	1	4.5	17	9.0	18	8.6
Moderate to severe	2	9.1	3	1.6	5	2.4
Stress level						
Low stress	1	4.5	50	26.6	51	24.3
Moderate stress	21	95.5	114	60.6	135	64.3
High perceived stress	0	0.0	24	12.8	24	11.4
Insomnia						
Not present	1	4.5	97	51.6	98	46.7
Mild	5	22.7	51	27.1	56	26.7
Moderate	13	59.1	22	11.7	35	16.7
Severe	3	13.6	17	9.0	20	9.5
Very severe	0	0.0	1	0.5	1	0.5
Depressed mood						
Not present	17	77.3	100	53.2	117	55.0
Mild	3	13.6	52	27.7	55	26.2
Moderate	2	9.1	26	13.8	28	13.3
Severe	0	0.0	9	4.8	9	4.3
Very severe	0	0.0	1	0.5	1	0.5

Table 3: Mean scores for Stress, Anxiety, Insomnia and Depressed mood among participants

Category	Staff nurse/LT (n=22)	Doctor (n=188)
Stress score	16.18 ± 3.14	17.95 ± 7.44
Anxiety score	9.55 ± 7.57	7.32 ± 7.46
Insomnia score	1.82 ± 0.73	0.80 ± 1.0
Depressed mood	0.32 ± 0.64	0.72 ± 0.91

followed by 28 (13.3%) moderate and 9 (4.3%) severe insomnia. One participant reported a very severe level of depression. On comparing, doctors were found to have a higher mean depression score as 0.72 ± 0.91 as compared to 0.32 ± 0.64 of staff nurses (Table 2 & 3).

Discussion

As per literature restrictive measures such as social distancing, isolation, and quarantine have an emotive reaction to the pandemic as well as an impact on the psychological well-being of people.[1-3]

Emotional distress, maladaptive behaviors, and defensive responses[3] like depression, anxiety, boredom, loneliness, fear, frustration, anger, stress, and avoidance behaviors are some of the psychological reactions that have been widely observed in situations like pandemics. In modern times a new kind of syndrome "headline stress disorder", is observed which is characterized by the exaggerated stress response to endless news media reports causing physical symptoms such as palpitation and insomnia.[23] Higher stress levels were observed, during the pandemic, among SARS survivors (i.e., non-healthcare workers and health care workers) rather than the control subjects.[24] Even after one year they not only had elevated stress levels but also showed higher levels of psychiatric morbidity, anxiety, depression, and post-traumatic symptoms.

Researches done on the subject of the psychological response to quarantine during the Ebola outbreak proved previous results in which people reported anxiety-induced insomnia, anger, and fear.[25,26] The social stigma was also found to be a major issue.[27] A common sequela observed in Ebola survivors was anxiety, depression, and post-

traumatic stress disorders.[28] Higher stress levels and psychological distress were seen in HCWs than non-HCW survivors.(24)A profound sense of isolation, suffering, loneliness, sadness, and stigmatization was reported among the health care workers working on the front-lines.[29] Post-traumatic stress disorder, anxiety, depression, psychological distress, insomnia, and alcohol/drug misuse were reported in military populations that were deployed in the West African region.[30]

Researches[2,31] has reported the various experiences of staff in quarantine, those on active duty and those returning to work from leave due to sickness, regarding the psychological effects of infectious disease outbreaks like Pandemic Flu (H1N1) and Severe Acute Respiratory Syndrome (SARS). Challenges faced by the staff not only include the increase in workload that is caused by these outbreaks, but also working with frequently updated protocols, personal protective equipment (PPE), and the fear of the contagion for their families and themselves.

Due to the practice of infection control measures and the use of personal protective equipment (PPE) interpersonal issues emanate. Due to the use of PPE which covers most of the healthcare worker's faces and the staff not being able to spend much time with the patients, communication with the patients becomes difficult. While normally nursing takes place on a one-to-one basis, nurses are needed to treat multiple patients at the same time during an outbreak such as COVID-19.[32] This leads to them being called for deviating from their usual standards of treatment.[33] The staff also might often feel guilt that the patient had to 'die alone' as family and friends of the patient are not able to visit them.[34] Typical conventions for breaking the news of death are also not followed and the news may have to be broken over the phone or video calling.[35] Also, the freedom to collect the personal belongings of the deceased and viewing the body is not possible. Probably this was the reason due to which paramedical support staff showed higher insomnia and anxiety levels as compared to doctors in our study.

Few of the front-line workers have also incurred this infectious disease, some fell seriously ill and some succumbed to the illness.[36] Research has shown that guilt about leaving the front lines understaffed, the fear of infecting their friends and family, and the animosity among their roles[37] as parents or caregivers and healthcare professionals have been seen in the staff. The fact that they work in a close-knit team also causes exhaustion, boredom, and loneliness. There can be some healthcare professionals who, due to any underlying co-morbidities or pregnancy, might not be capable to work in those clinical settings where the exposure to the illness is high. And may have a feeling of guilt.[31] The staff is also needed to live away from their families and work for longer hours than normal, disturbing relationships and the liberty of rest breaks and days off. Just like the general public, staff and their supporting families also face the same socio-economic restriction and disturbance. They may also be discouraged by the difference in response exhibited by the different countries. The lines between work life and home life are also blurred by the constant news and social media coverage.[31]

Predominantly the study subjects were in between 21 to 40 years age group (98.6%). This was per the guidelines of the Ministry of Health to exclude or reduce the involvement of senior and very senior doctors as they come in thevulnerable age group. Age group predominance was in coherence with the observations of other conducted studies.[13,38-40] Our findings of psychological impact was also supported by the systematic review which suggested that psychological symptoms were more intense in younger health care professionals.[17] Similarly our study also revealed higher mean depression and stress levels as compared to nursing staff.

Limitations

The cross-sectional and uni-centric natures of the study are the primary limiting factorsthat limit the generalization of its results to a larger sample. Therefore, a longitudinal study with larger sample size and emphasizing diverse dimensions of mental health of health care professionals would be advantageous in overcoming these limitations.

Conclusion

Findings from our study reinforce our speculations that frontline HCWs are subjected to higher psychological stresses. Pandemics like COVID-19 prompt us to develop more astringent protocols helpful in managing the spread of contagious diseases more effectively. It is essential

to provide necessary interventions to reinforce the healthcare systems' capacity and augment psychological resilience.[41] Limiting the duty hours, maintaining proper resting areas, clear communication and precise rules for use of personal protective equipment, and specialized training in handling COVID-19 patients could reduce the anxiety coming from the perceived bewilderment and intractableness of the hazards involved. It is vital that Timely and appropriate provision of mental health support custom-tailored to the needs of HCWs through media or integrative teams, including mental health professionals, hotline teams.[42]

Refrences

1. Rubin GJ, Wessely S. The psychological effects of quarantining a city. BMJ. 2020; 368 : 313.
2. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet 2020; 395(10227) : 912–20.
3. Taylor S. The psychology of pandemics: preparing for the next global outbreak of infectious disease 2019.
4. Liu X, Kakade M, Fuller CJ, Fan B, Fang Y, Kong J, et al. Depression after exposure to stressful events: lessons learned from the severe acute respiratory syndrome epidemic. Compr Psychiatry 2012; 53(1) : 15–23.
5. Cui J, Li F, Shi Z-L. Origin and evolution of pathogenic coronaviruses. Nat Rev Microbiol 2019; 17(3) : 181–92.
6. COVID Live Update: 107, 103,009 Cases and 2,339,050 Deaths from the Coronavirus - Worldometer [Internet]. [cited 2021 January 23]. Available from: https://www.worldometers.info/coronavirus/
7. Singhal T. A Review of Coronavirus Disease-2019 (COVID-19). Indian J Pediatr 2020; 87(4) : 281–6.
8. Ayittey FK, Ayittey MK, Chiwero NB, Kamasah JS, Dzuvor C. Economic impacts of Wuhan 2019 nCoV on China and the world. J Med Virol 2020; 92(5) : 473–5.
9. List of wars by death toll (2019, accessed 26 March 2020). In: Wikipedia [Internet]. [cited 2021 May 4]. Available from: https://en.wikipedia.org/wiki/List_of_wars_by_death_toll_ (2019,_accessed_26_March_2020).
10. Lung FW, Lu YC, Chang YY, Shu B-C. Mental Symptoms in Different Health Professionals During the SARS Attack: A Follow-up Study. Psychiatr Q 2009; 80(2) : 107–16.
11. Wu P, Fang Y, Guan Z, Fan B, Kong J, Yao Z, et al. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. Can J Psychiatry Rev Can Psychiatr 2009; 54(5) : 302–11.
12. Huang JZ, Han MF, Luo TD, Ren AK, Zhou XP. [Mental health survey of medical staff in a tertiary infectious disease hospital for COVID-19]. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi Zhonghua Laodong Weisheng Zhiyebing Zazhi Chin J Ind Hyg Occup Dis 2020; 38(3) : 192–5.
13. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Netw Open 2020; 3(3) : e203976.
14. Liu S, Yang L, Zhang C, Xiang YT, Liu Z, Hu S, et al. Online mental health services in China during the COVID-19 outbreak. Lancet Psychiatry 2020; 7(4) : 17–18.
15. Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public – A systematic review and meta-analysis. Psychiatry Res 2020; 291 : 113190.
16. Conti C, Fontanesi L, Lanzara R, Rosa I, Porcelli P. Fragile heroes. The psychological impact of the COVID-19 pandemic on healthcare workers in Italy. PloS One 2020; 15(11) : e0242538.
17. Vizheh M, Qorbani M, Arzaghi SM, Muhidin S, Javanmard Z, Esmaeili M. The mental health of healthcare workers in the COVID-19 pandemic: A systematic review. J Diabetes Metab Disord 2020; 19(2) : 1967–78.
18. Kang L, Li Y, Hu S, Chen M, Yang C, Yang BX, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. Lancet Psychiatry 2020; 7(3):e14.
19. Cai H, Tu B, Ma J, Chen L, Fu L, Jiang Y, et al. Psychological Impact and Coping Strategies of Frontline Medical Staff in Hunan Between

January and March 2020 During the Outbreak of Coronavirus Disease 2019 (COVID-19) in Hubei, China. Med Sci Monit Int Med J Exp Clin Res 2020; 26:e924171-1-e924171-16.
20. Mohindra RRR, Suri V, Bhalla A, Singh SM. Issues relevant to mental health promotion in frontline health care providers managing quarantined/isolated COVID19 patients. Asian J Psychiatry 2020; 51 : 102084.
21. Hamilton M. The Assessment of Anxiety States by Rating. 32 Br J Med Psychol 1959; 50-55.
22. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav 1983; 24(4) : 385–96.
23. Dong M, Zheng J. Letter to the editor: Headline stress disorder caused by Netnews during the outbreak of COVID 19. Health Expect Int J Public Particip Health Care Health Policy 2020; 23(2) : 259–60.
24. Lee AM, Wong JGWS, McAlonan GM, Cheung V, Cheung C, Sham PC, et al. Stress and psychological distress among SARS survivors 1 year after the outbreak. Can J Psychiatry Rev Can Psychiat 2007; 52(4) : 233–40.
25. Caleo G, Duncombe J, Jephcott F, Lokuge K, Mills C, Looijen E, et al. The factors affecting household transmission dynamics and community compliance with Ebola control measures: a mixed-methods study in a rural village in Sierra Leone. BMC Public Health 2018; 18(1) : 248.
26. Desclaux A, Badji D, Ndione AG, Sow K. Accepted monitoring or endured quarantine? Ebola contacts' perceptions in Senegal. Soc Sci Med 2017; 178 : 38–45.
27. Pellecchia U, Crestani R, Decroo T, Van den Bergh R, Al-Kourdi Y. Social consequences of Ebola containment measures in Liberia. PLoS One 2015; 10 : e0143036.
28. Lötsch F, Schnyder J, Goorhuis A, Grobusch MP. Neuropsychological long-term sequelae of Ebola virus disease survivors - A systematic review. Travel Med Infect Dis 2017; 18 : 18–23.
29. McMahon SA, Ho LS, Brown H, Miller L, Ansumana R, Kennedy CE. Healthcare providers on the frontlines: a qualitative investigation of the social and emotional impact of delivering health services during Sierra Leone's Ebola epidemic. Health Policy Plan 2016; 31(9) : 1232–9.
30. Vyas KJ, Delaney EM, Webb-Murphy JA, Johnston SL. Psychological Impact of Deploying in Support of the U.S. Response to Ebola: A Systematic Review and Meta-Analysis of Past Outbreaks. Mil Med 2016; 181(11) : e1515–31.
31. Maunder R, Hunter J, Vincent L, Bennett J, Peladeau N, Leszcz M, et al. The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. CMAJ Can Med Assoc J J Assoc Medicale Can 2003; 168(10) : 1245–51.
32. Einav S, Hick JL, Hanfling D, Erstad BL, Toner ES, Branson RD, et al. Surge capacity logistics: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. Chest 2014; 146(4 Suppl):e17S-43S.
33. Christian MD, Devereaux AV, Dichter JR, Rubinson L, Kissoon N, Task Force for Mass Critical Care, et al. Introduction and executive summary: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. Chest 2014; 146(4 Suppl) : 8S-34S.
34. Straus SE, Wilson K, Rambaldini G, Rath D, Lin Y, Gold WL, et al. Severe acute respiratory syndrome and its impact on professionalism: qualitative study of physicians' behaviour during an emerging healthcare crisis. BMJ 2004; 329(7457) : 83.
35. Styra R, Hawryluck L, Robinson S, Kasapinovic S, Fones C, Gold WL. Impact on health care workers employed in high-risk areas during the Toronto SARS outbreak. J Psychosom Res 2008; 64(2) : 177–83.
36. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72/314 Cases From the Chinese Center for Disease Control and Prevention. JAMA 2020; 323(13) : 1239–42.
37. Tomlinson T. Caring for risky patients: duty or virtue? J Med Ethics 2008; 34(6) : 458–62.
38. AlAteeq DA, Aljhani S, Althiyabi I, Majzoub S. Mental health among healthcare providers during coronavirus disease (COVID-19) outbreak in Saudi Arabia. J Infect Public Health

2020; 13(10) : 1432–7.
39. Qureshi MFH, Mohammad D, Sadiq S, Abubaker ZJ, Kumari U, Devnani J, et al. A comparative cross-sectional analysis on prevalence of depression and associated risk factors among medical students and doctors of Karachi, Pakistan. Middle East Curr Psychiatry. 2020; 27(1) : 59.
40. Bernburg M, Vitzthum K, Groneberg D, Mache S. Physicians' occupational stress, depressive symptoms and work ability in relation to their working environment: A cross-sectional study of differences among medical residents with various specialties working in German hospitals. BMJ Open 2016; 6:e011369.
41. Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: address mental health care to empower society. Lancet Lond Engl 2020; 395(10224) : e37–8.
42. Chen Q, Liang M, Li Y, Guo J, Fei D, Wang L, et al. Mental health care for medical staff in China during the COVID-19 outbreak. Lancet Psychiatry 2020; 7(4) : e15–6.

Original Article

Association of Socio-Demographic Variables with Stress and Marital Life in Spouses of Patients with Schizophrenia

Akul Gupta,[1] Prerana Gupta,[1] Tarun Yadav,[2] Prashant Singh,[1] Abhilakshya Jyoti[1]
[1]Department of Psychiatry, Teerthankar Mahaveer Medical College & Research Centre, Moradabad, Uttar Pradesh-244001, India
[2]Department of Psychiatry, Rama Medical College, Hospital & Research Centre, Hapur, Uttar Pradesh, 245304, India
Contact: Akul Gupta, E-mail: dr.akulgupta@gmail.com

ABSTRACT

Introduction: *Schizophrenia is a common psychiatric disorder where spouses of patients experience higher level of perceived stress and marital adjustment problems are seen are more frequently. It is important to understand the perceived stress and quality of marital life of spouses of patients with these mental illnesses as resolution of marital problems can lead to overall improvement in the outcome of the illness. Most of the studies were done in western countries where socio cultural beliefs are different from those of eastern countries. These studies are also limited by not evaluating quality of marital life and perceived stress together. This study is designed to understand the marital functioning and stress related issues for better stability of marriage. Thus, we plan to study and understand the problems amongst these individuals so as to help psychiatrists in better screening of these individuals and plan early and suitable intervention.* ***Aims:*** *To assess and study the sociodemographic profile, perceived stress and marital adjustment of spouses of patients attending the psychiatric OPD of a tertiary care hospital.* ***Methods:*** *The study will be carried out in the Department of Psychiatry in Teerthanker Mahaveer Medical College and Research Centre, Moradabad. Spouses of patients of schizophrenia and bipolar disorder diagnosed according to ICD-11 Criteria attending the Psychiatry OPD of Teerthanker Mahaveer Medical college and Research Center. Written informed consent will be obtained from the subject. Semi-Structured Pro-forma will be applied for recording the socio-demographic data. Perceived stress will be assessed using the Sheldon Cohen Perceived Stress Scale (PSS-10). Marital adjustment will be assessed using the Locke-Wallace Marital adjustment test (MAT). The data will then be evaluated and computed for statistical analysis using Pearson's Chi-square test or Exact Fischer's Test for categorical variables and the t-test for continuous variables. The association between variables was estimated with the Pearson correlation coefficient* ***Results:*** *The enlisted subjects' mean (SD) age was 40.66 (11.58) years, with a frequency band of 18-70 years. The mean (SD) years of duration of marriage of the enrolled subjects were 21.4 (12.3) years with a range of 1-53 years. The mean (SD) score of PSS of the enrolled subjects was 18.4 (7.48) with a range of 5-39. The mean (SD) score of MAT of the enrolled subjects was 93.82 (23.75) with a range of 29-135. PSS score had a significant and negative correlation with the MAT score (r=-0.31, p-value 0.01). statistically significant negative correlation was observed between the duration of marriage (groups) with PSS (r=-0.56, p=0.00), whereas socio-economic score was negatively correlated with MAT score (r=-0.43, p=0.00). Furthermore, gender (r=0.58, p=0.00), religion (r=0.44, p=0.00), duration of marriage (years) (r=0.31, p=0.03), duration of marriage (groups) (r=0.45, p=0.00)*

and socio-economic status (r=0.35, p=0.01) were statistically significantly and positively correlated with MAT. ***Conclusion:*** *Schizophrenia is linked with higher stress, poor marital functioning, and poor quality of marriage in spouses. the PSS score was negatively correlated with the MAT score. There was statistically significant negative correlation was observed between age and duration of marriage with PSS score. However, age, gender, religion and duration of marriage were statistically significant and positively correlated with MAT.*

Keywords *Schizophrenia, Marital adjustment, Stress, Maladjustment, Spouse, Caregiver, Duration of marriage.*

Introduction

Marriage is a commitment where a person must meet a variety of social and emotional obligations.[1] "The Oxford Dictionary" describes marriage as a "recognized coalition of man and woman as husband and wife". It is a legally recognised vowed and consensual partnership. Marriage also serves as a socially acceptable manner of satisfying the basic human urge for sexual fulfilment, as well as a foundation for procreation and family formation.[1]

Schizophrenia is a mental illness characterised by a wide range of positive, negative, disorganised, emotional, and cognitive symptoms. Social, occupational, and personal dysfunction are caused by the neurocognitive deficiencies associated with this condition,[2] preventing the establishment of a harmonious relationship between the parties. Only a few researches have looked at the marital functioning and stress levels of spouses of schizophrenia patients. In the context of a shifting social fabric in which people are migrating away from joint families and toward nuclear families, spouses become the primary caregivers for patients with psychiatric diseases such as schizophrenia.

Hence, understanding the stress perceived by the married partners of patients with psychiatric disorders like schizophrenia and assessing the marital harmony in the couple is imperative. Little literature is available on this subject from countries like India with quite different sociocultural backgrounds from the Western world. Therefore, we intended to evaluate the quality of marriage and stress perceived by spouses of patients with schizophrenia.

Methodology

Aims

To assess and study the sociodemographic profile, perceived stress and marital adjustment of spouses of patients attending the psychiatric OPD of a tertiary care hospital in western U.P. To understand the Socio-Demographic profile of the enrolled participants based on various parameters. To compute associations and positive and negative correlations between various continuous and categorical variables using statistical analysis.

Inclusion Criteria

Spouses of patients of schizophrenia that were more than 18 years old attending the psychiatry OPD of TMMC and RC who were continuously with the patient since marriage and willing to give written informed consent were included in the study.

Exclusion Criteria

Spouses with any diagnosed physical illness/ psychiatric illness/substance abuse disorder were excluded. Spouses who were not the Primary Caregivers[3] of the patient will be excluded. Spouses of patients who were unstable (patients who had any exacerbations, relapses or > 50% hike in drug dose over the last 3 months) were be excluded.

Assessment Tools

Proforma: It consisted of a structured format to record certain socio-demographic variables regarding the spouse of patient, such as age, marital status, duration of marriage, sex, occupation, education, religion, socioeconomic status, family status, locality, and Perceived Stress Scale and Marital adjustment test scores.

Perceived Stress Scale (PSS-10)[4]: by Sheldon Cohen was used to assess the Perceived Stress. It's a quick and simple way to assess how stressful certain situations are in one's life. It has high validity and reliability. It is thus a useful tool for researching the implications of stress in the causation of disease and behavioural disorders.

Marital adjustment test (MAT)[5]: This scale was used to assess Marital adjustment by Wallace et al.

It has a good reliability coefficient of 0.84 and usually takes a few minutes to administer.

Statistical Analysis

The study data was analysed by using the statistical software SPSS version 23.0. Histograms were also plotted to visualize the pattern of outcomes. Pearson's Chi-square test or Exact Fischer's Test for categorical variables and the t-test for continuous variables were used to compare sociodemographic data collected with the assessed scores from the Perceived Stress Scale and Marital Adjustment test. The statistical significance was mentioned as a p-value less than 0.05. The association between variables was investigated with a scatter plot and estimated with the Pearson correlation coefficient (represented as r).

Results

Socio-Demographic Data

After the institutional ethical approval, an observational cross-sectional study was carried out in the department of Psychiatry at TMMC and RC, Moradabad, Uttar Pradesh, India. Fifty subjects were included in the present study representing the spouses of patients with Schizophrenia. Table 1. summarises the socio-demographic data collected from the study sample.

Table-1. Socio-Demographic Data

Variable Mean (SD)	**Groups**	**N**	**%**
	<30	7	14
Age (Years)	31–40	18	36
40.66 (11.58)	41–50	15	30
	>50	10	20
Gender	Male	28	56
	Female	22	44
Religion	Hindu	26	52
	Muslim	24	48
Socio Economic	Upper	0	0
Status	Upper Middle	3	6
	Lower Middle	5	10
	Upper Lower	35	70
	Lower	7	14
Duration of	≤5	2	4
Marriage (Years)	6-10	7	14
21.4 (12.3)	11-15	8	16
	>15	33	66

The highest proportion i.e. 36% of subjects were reported in the 31-40 years age group. The enlisted subjects' mean (SD) age was 40.66 (11.58) years, with a frequency band of 18-70 years. The highest proportion of males i.e. 56% of subjects were included in the study. More than half of the patients in the study group were Hindus, i.e. 52%.

Plant and Machine Operators and Assemblers as occupation was highly reported in 32% of the subjects. Illiterate educational status was highly reported in 26% subjects and INR 6,175-18,496 of monthly family income was highly reported in 50% of the study population. 70% with the highest proportion of subjects belonged to Upper Lower Socio-Economic Status.

The highest proportion of subjects were having greater than 15 years of married life. It was reported in 66% of the subjects in the study population. Overall, the mean (SD) years of duration of marriage of the enrolled subjects were 21.4 (12.3) years with a range of 1-53 years.

Assessed Data

Table 2. summarises the assessed data collected from the fifty subjects in the sample population using the Perceived Stress Scale and the Marital Adjustment Test.

Table-2. PSS-10 and MAT Data

Assessment Tools Mean (SD)	**Outcome**	**N**	**%**
	Low (0-13)	14	28
Perceived Stress (PSS Score)	Moderate (14-26)	26	52
18.4 (7.48)	High (27-40)	10	20
Marital Maladjustment (MAT Score)	Present (≤100)	30	60
93.82 (23.75)	Absent (>100)	20	40

Highest proportion of subjects were having moderate PSS scores. 52% of the subjects had a Moderate Perceived Stress Score followed by 28% having a Low and 20% with a High Perceived Stress Score. Overall, the mean (SD) score of PSS of the enrolled subjects was 18.4 (7.48) with a range of 5-39.

Of the subjects enrolled 60% had Marital Maladjustment with a score less than 100. 40% of the subjects had a MAT score more than 100, i.e. absent Marital Maladjustment. Overall, the mean (SD) score of MAT of the enrolled subjects was

93.82 (23.75) with a range of 29–135.

Correlation between PSS and MAT

The association between PSS and MAT score, as investigated with a scatter plot and estimated with the Pearson correlation coefficient (represented as r), revealed that the PSS score had a significant and negative correlation with the MAT score (r = –0.31, p-value 0.01), as shown in Figure 1.

Correlation of Socio-demographic Data with PSS and MAT Scores

We performed the correlation between socio-demographic characteristics and PSS and MAT, detailed in Table 3. There was statistically significant negative correlation was observed between the duration of marriage (groups) with PSS (r = -0.56, p = 0.00), whereas socio-economic score was negatively correlated with MAT score (r = -0.43, p = 0.00). Furthermore, gender (r=0.58, p=0.00), religion (r = 0.44, p = 0.00), duration of marriage (years) (r = 0.31, p = 0.03), duration of marriage (groups) (r = 0.45, p = 0.00) and socio-economic status (r = 0.35, p = 0.01) were statistically significantly and positively correlated with MAT.

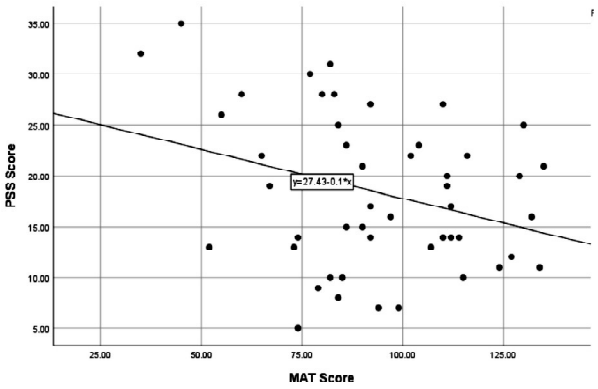


Fig. 1. Correlation between PSS and MAT score

Discussion

Schizophrenia is a severe mental disorders and is often associated with several negative consequences for patients, their families, and society at large[1]. With the rise of nuclear families over the last few decades, spouses often become the primary caregivers for patients with psychiatric disorders. Therefore, the concerns of the spouses need to be understood as this determines the continuation of the caregiver role of spouses. There is limited literature on the subject, especially in the Indian setup. Moreover, the little information available is from the West with different sociocultural factors related to marriage. As a result, it is critical to comprehend the marital issues that exist between the patients and their spouses. The current study assessed marital functioning (in the form of marital adjustment, quality of marriage and marital forgiveness), sexual satisfaction and sexual dysfunction in spouses of individuals with Schizophrenia.

The average age of patients' spouses in the group was 40.7 (SD-11.58) years. The current study's mean age of spouses of those with schizophrenia is comparable to previous Indian studies.

Table-3. Socio-Demographic Characteristics with PSS and MAT

Socio-Demographic Variable	Statistical Result	PSS Score	MAT Score
Age	r	-0.21	0.24
	p-value	0.14	0.10
Gender	r	-0.04	.58**
	p-value	0.77	0.00
Religion	r	0.06	.44**
	p-value	0.67	0.00
Duration of	r	-0.21	.31*
Marriage (Years)	p-value	0.15	0.03
Duration of	r	-.56**	.45**
Marriage (Groups)	p-value	0.00	0.00
Socio Economic Score	r	0.15	-.43**
	p-value	0.32	0.00
Socio EconomicStatus	r	-0.12	.35*
	p-value	0.39	0.01

* Correlation is significant at 0.05 level (2-tailed)
** Correlation is significant at 0.01 level (2-tailed)

In the study by Aggarwal S et al, it was 42.4 years and 40.9 years respectively.[6] Aggarwal S et al reported similar age profiles of patients with Schizophrenia and their spouses.[6]

Males outnumbered females among spouses in the study group. This suggests Schizophrenia was more common in females. This may also suggest that separation or divorce is more common when the male spouse suffers from Schizophrenia. Gender distribution in the Schizophrenia group was very similar to that reported in a study by Aggarwal et al[6] with nearly 55% being females and by Arun et al[7] with around 58% of patients being females. Traditionally, it was believed that there are no

significant gender differences in the incidence and prevalence of Schizophrenia. Although in the current study, there are no significant gender differences observed in the prevalence of Schizophrenia, the literature suggests higher incidence in males as compared with females. The difference in this observation in incidence and prevalence might be due to better treatment compliance in females and higher rates of suicide completion in males.

The Mean (SD) duration of marriage in the study group was 21.4 (12.3). This is in accordance with the higher mean age of spouses of patients with Schizophrenia seen in the current study, which suggests that in case of Schizophrenia, there may be increased marital maladjustment and poor marital quality from the onset of the illness, resulting in separation or divorce of spouses suffering from Schizophrenia in the earlier years of marriage.

Nearly 72% in the study group perceived moderate to high stress in this current study. Overall, the mean (SD) score of PSS of the enrolled subjects was 21.45 (8.03) with a range of 5-39. There are many studies on the psychological and social aspects of patients with Schizophrenia and their caregivers.[8,6,9] Previous studies from India have used different instruments for evaluating caregiver burden and psychological morbidity. The caregiver liability and relationship studies (Jungbauer et al. and Kumari et al.) indicate that the caregiver burden perceived by family members and spouses was similar.[10] Kumari et al Ranchi's report particularly evaluated the caregiver burden among partners of patients with schizophrenia and found a reasonable degree of caregiver burden on the spouses[11]. However, other Indian studies by Aggarwal et al and Kaushik and Bhatia et al suggest a higher perception of burden by female spouses.[12,6,13]

In this present study, marital maladjustment was estimated using the Marital adjustment test (MAT) score. Around 60% in the study group had marital maladjustment in the current study. Different studies have assessed marital adjustment in Schizophrenia using different scales like the Dyadic adjustment scale. Hence, the comparison with the findings reported in existing literature is difficult. However, the current study's outcomes are comparable to previous research. As a result, clinicians caring for patients with Schizophrenia must recognize and concentrate on issues of marital discord in dyads where one partner has Schizophrenia. Muke et al. evaluated by comparing schizophrenia patients' relationship quality to those with bipolar disorder and substance abuse. A poor marital adjustment was witnessed in 60% of Schizophrenia patients, which was lower than in 70% of Bipolar Disorder patients. The differences, however, were not statistically relevant.[14]

As expected, the PSS score was negatively correlated with the MAT score. In the study population, there was a significant negative correlation between the duration of marriage with PSS, whereas occupation, education, monthly income and socio-economic score were negatively correlated with MAT scores. Furthermore, gender, religion, duration of marriage, and socio-economic status were statistically significant and positively correlated with MAT.

Conclusion

Schizophrenia is linked with higher stress, poor marital functioning, and poor quality of marriage in spouses. Most of the spouses in the current study were middle-aged. There is slight female preponderance observed with Schizophrenia. Strikingly, only 3–5% of study subjects (spouses) were unemployed irrespective of their education status.

Nearly 72% in the Schizophrenia group perceived moderate to high stress. Around 60% in the study group had marital maladjustment.

As expected, the PSS score was negatively correlated with the MAT score. The degree of correlation was significant at the p-value < 0.05 level. Also, there was statistically significant negative correlation was observed between age and duration of marriage with PSS score. However, age, gender, religion and duration of marriage were statistically significant and positively correlated with MAT.

References

1. Srivastava A. Marriage as a perceived panacea to mental illness in India: Reality check. Indian J Psychiatry 2013; 55(Suppl 2) : S239–42.
2. Srinivasan TN, Padmavati R. Fertility and schizophrenia: evidence for increased fertility in the relatives of schizophrenic patients. Acta Psychiatr Scand 1997; 96(4) : 260–4.
3. Behere PB, Rao STS, Verma K. Effect of marriage on pre-existing psychoses. Indian J

Psychiatry 2011; 53(4) : 287–8.
4. Cohen S, Kamarck T, Mermelstein R. A Global Measure of Perceived Stress. J Health Soc Behav 1983; 24(4) : 385–96.
5. Locke HJ, Wallace KM. Short Marital-Adjustment and Prediction Tests: Their Reliability and Validity. Marriage Fam Living 1959; 21(3) : 251–5.
6. Aggarwal S, Grover S, Chakrabarti S. Comparison of Marital and Sexual Functioning of the Spouses of Patients with Schizophrenia and Depressive Disorders. J Psychosexual Health 2021; 3(2) : 160–70.
7. Arun CV. A study to assess the self care ability and mental status among schizophrenic patients undergoing occupational therapy in a selected psychiatric nursing home, Kottayam, Kerala. [Internet] [masters]. Annai J.K.K. Sampoorani Ammal College of Nursing, Komarapalayam; 2012 [cited 2022 Nov 16]. Available from: http://repository-tnmgrmu.ac.in/4405/
8. Chakrabarti S, Kulhara P, Verma SK. Extent and determinants of burden among families of patients with affective disorders. Acta Psychiatr Scand 1992; 86(3) : 247–52.
9. Raj L, Kulhara P, Avasthi A. Social Burden of Positive and Negative Schizophrenia. Int J Soc Psychiatry 1991; 37(4) : 242–50.
10. Jungbauer J, Wittmund B, Dietrich S, Angermeyer MC. The Disregarded Caregivers: Subjective Burden in Spouses of Schizophrenia Patients. Schizophr Bull 2004; 30(3) : 665–75.
11. Kumari S, Singh AR, Verma AN, Verma PK, Chaudhury S. Subjective burden on spouses of schizophrenia patients. Ind Psychiatry J 2009; 18(2) : 97–100.
12. Kumar P, Sharma N, Ghai S, Grover S. Perception about Marriage among Caregivers of Patients with Schizophrenia and Bipolar Disorder. Indian J Psychol Med 2019; 41(5) : 440–7.
13. Kaushik P, Bhatia MS. Burden and Quality of Life in Spouses of Patients with Schizophrenia and Bipolar Disorder. 2013 [cited 2022 May 7]; Available from: http://imsear.searo.who.int/handle/123456789/173431
14. Muke SS, Ghanawat GM, Chaudhury S, Mishra SK, Verma AN, Singh AR. Marital adjustment of patients with substance dependence, schizophrenia and bipolar affective disorder. Med J Dr DY Patil Vidyapeeth Univ 2014; 7(2) : 133.

Original Article

Psychiatric Morbidities in HIV Positive Patients on Anti-Retroviral Therapy

Anuj Mittal,[1] Prerna Sharma,[2] Varun Kalakoti[3]
[1,3]Department of Psychiatry, DDU Hospital, New Delhi
[2]AIBHAS, Amity University, Noida Campus, Uttar Pradesh, U.P.
Contact: Prerna Sharma, E-mail: prernascp16@gmail.com

ABSTRACT

Introduction: *India has the largest population of people living with HIV and AIDS (PLHA). Depression is one of the most common psychiatric disorders observed in HIV patients with the prevalence rates of 4% and 22%. Previous studies of individuals with HIV infection have found that those with psychiatric disorders are at elevated risk for HIV disease progression, poor medication adherence, clinical outcomes mortality and poor quality of life. The present study was designed to determine the prevalence of psychiatric morbidities in HIV positive patients on anti-retroviral therapy (ART).* ***Methodology****: The present study was conducted in the Department of Psychiatry, Deen Dayal Upadhyay Hospital, New Delhi. HIV positive patients on antiretroviral therapy (ART) referred to psychiatry department. Study was conducted for a period of 6 month. Psychiatric diagnosis was be made as per 1CD-10. BPRS and WHOQOL BREF were administered.* ***Results:*** *Mean age of the sample was 26 years (SD = ±4.4); 75% were males and remaining were 25% females. Of the total sample, 58% were educated up to class 10, 27% till class 12, 8% were graduates. 62% of the participants were married. Out of total sample, 41% were the persons with Depressive disorder , 28% were the persons with Dysthymic disorder, 16% were having Generalized Anxiety Disorder, 5% were with Psychosis(N=3) and rest 10% were the persons with substance use disorder.Study reveals the presence and absence of psychiatric morbidities among the HIV positive patients on ART. 85% of the sample had presence of various psychiatric illnesses.* ***Conclusion:*** *Keeping in view the high prevalence of psychiatric morbidities among persons with HIV, they need screening before starting and while on treatment.*

Keywords*: PLHA, Psychiatric morbidity, Symptom severity, Quality of life of marriage.*

Introduction

India has the largest population of people living with HIV and AIDS (PLHA).[1] The prevalence is more in women as compared to men.[2] HIV infection is usually characterized by the reduction of CD4 cells and by the presence of fever, breathlessness, cough, weight loss, anorexia, pallor, generalized weakness, etc.[3] Patients with HIV infection are at an increased risk of psychiatric illness than the general population.[4] However, the recognition of psychiatric manifestations is often is often difficult due to the complexity of the infection.[5] Depression is one of the most common psychiatric disorders observed in HIV patients with the prevalence rates of 4% and 22%.[6] A recent study conducted in South Wollo Ethiopia reported the 20% prevalence of depression among HIV patients[7] whereas another study reported the prevalence of 32% among HIV patients. In context of India, 25% prevalence of anxiety and 30% of depression has been reported among HIV patients. HIV infection per say maybe associated with psychotic symptoms. The presenting symptoms they are highly variable persecutory grandeur and somatic delusions are most common symptoms followed by auditory and visual hallucination and affective disturbances. Further the

untreated patients had more risk of development of depression and the presence of depression often delay in the initiation of ART among these patients. Previous studies of individuals with HIV infection have found that those with psychiatric disorders are at elevated risk for HIV disease progression, poor medication adherence, clinical outcomes mortality and poor quality of life.[12,13] HIV patients also find difficulty in negotiating disclosure of HIV status and coping with potential stigma which further add on challenge for those who treat and care for them,[14] ART also lead to neuro psychiatric complications especially NRTI and NNRTIs group of 6 currently marketed class of drugs.[15] It's been also said persons wit serious mental illnesses such as schizophrenia and major affective disorders are more likely to contract HIV related disease.[16] Therefore, various studies have been conducted across the world and in various parts of India to determine the prevalence of psychiatry comorbidities in HIV patient and quality of life in them. But no such study has been conducted in Delhi NCR (West zone) region on the HIV patient. The present study was designed to determine the prevalence of psychiatric morbidities in HIV positive patients on anti-retroviral therapy (ART).

AIM - To study the assessment of psychiatric morbidities in HIV positive patients on Anti-Retroviral Therapy.

Objectives

Primary

1. To study the prevalence of psychiatric morbidities in HIV positive patients on Anti-Retroviral Therapy (ART) referred to psychiatry department.
2. To study various types of psychiatric illness and their prevalence in HIV positive patients on ART referred to psychiatry department.

Secondary

1. To study the severity of psychiatric comorbidities in HIV positive patients on ART in this group.
2. To study the quality of life who has psychiatric comorbidities in HIV positive patients on ART in this group.

Method

Site: Department of Psychiatry, Deen Dayal Upadhyay Hospital, New Delhi.

Study Population: HIV positive patients on antiretroviral therapy (ART) referred to psychiatry department.

Time Frame: Study was conducted for a period of 6 month.

Method of Measurement Outcome of Interest

Variables measured were used

1. Psychiatric diagnosis was be made as per 1CD-10.
2. BPRS scale was administered.
3. WHOQOL BREF was administered.

Type of Study: Prospective study.

Sample Size 60 N = (Za/2)2 P(1-P) d2

where N is the required sample size/minimum sample size required for the study; Z is the standard normal distribution (Z = 1:96) with confidence interval of 95%, and a = 0:05; Proportion (P=46%) of in HIV patients taken from the published findings; Non-Response rate: 10%; Total margin of error: 5% Considering non-response rate of 10% (which is equal to 38 for this study).

Therefore, the final sample size was 60.

Inclusion Criteria

1. Age 18-60 years (any gender)
2. Participants who are HIV positive and on antiretroviral therapy For at least six months referred to psychiatry department.
3. Patients who are willing to give consent for study
4. On Antiretroviral therapy for more than 8 weeks duration.

Exclusion Criteria

1. Age Less than 18 years.
2. Bereavement within 3 months
3. Female patient in postpartum period (i.e 6 weeks after delivery)
4. Patients with known organic brain disease.
5. Patients who are on antipsychotic medication prior to diagnosis of HIV.

Material Used

1. Written informed consent was taken after explaining the procedure in detail in native

language to the patient.

2. Patients fulfilling the inclusions and exclusion criteria was taken up for this study.
3. A study Performa including various socio-demographic data (Age, Sex, Education level, Maritial status) and clinical variables (physical diagnosis, treatment history family history) was used. It also used to diagnose Psychiatric morbidities appropriately with help of psychiatrist. It was filled by the Interviewer after explaining in Native Language to the patient.
4. Psychiatric morbidities was diagnosed as per ICD-10.
5. Following Scales was used-
   (a) Study Performa.
   (b) Brief Psychiatric Rating Scale (BPRS).
   (c) WHOQOL BREF.

These Scales were filled by the Interviewer after explaining in Hindi to the Patient.

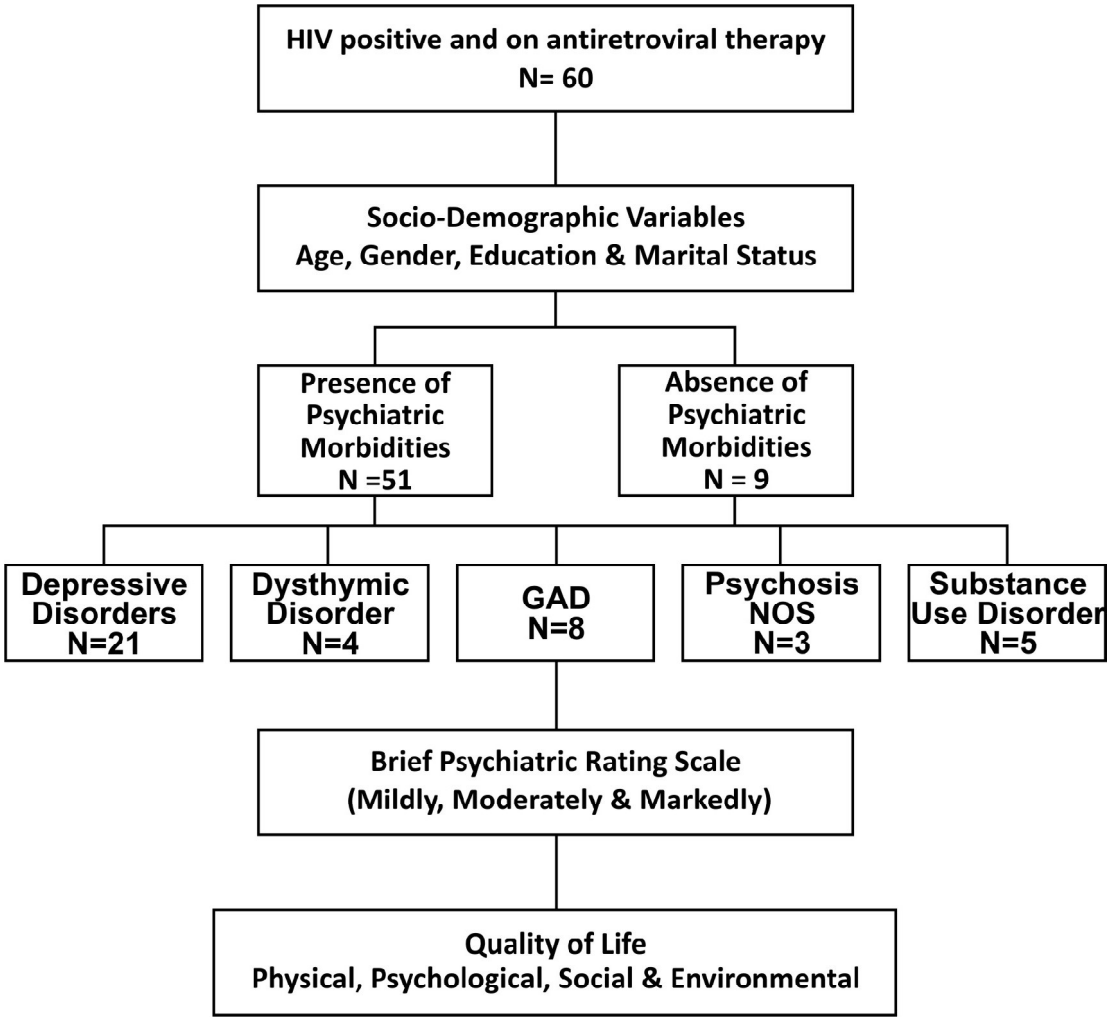
Procedure

A sample of 60 patients was taken from ART centre which are referred to psychiatry department (DDUH). Demographic profile of participants was recorded and psychiatric diagnosis was made according to ICD 10. Then BPRS and WHO QOL BREF scale was administered.

Statistical Analysis

Data analysis was performed using IBM SPSS 28 statistics. Descriptive statistics was presented as means with standard deviations (SDs), and frequency with proportions. One way ANOVA was used to see the significance of difference between different groups of psychiatric morbidities.

CONSORT



Results

Table-1: **Sociodemographic Profile of participants (N=60)**

Variables	Mean	SD	f(%)
Age	26	4.4	
Gender			
Male			45(75%)
Female			15(25%)
Others			0
Education			
Upto 10th Standard			35(58%)
Upto 12th Standard			17(27%)
Graduate			8(13%)
Post Graduate			0
Marital Status			
Unmarried			16 (27%)
Married			37 (62 %)
Separated /Divorced			5 (8%)
Widow			2 (3%)

Table 1 shows the descriptive analysis sample revealed that a total sample N 60, the Mean age of the sample was 26 years (SD = ±4.4). 75% (N = 45) were males and remaining were 25% (N = 15) females. Of the total sample, 58% were educated up to class 10 (N = 35), 27% till class 12 (N = 17), 8% were graduates (N = 13). In the marital status, 62% of the participants were married (N = 37), 27% were unmarried (N = 16), 8% were separated/ divorced (N = 5), whereas 3% were widow (N = 2).

Table-2: Presence of Psychiatric Disorder (N=60)

Psychiatric morbidities	f (%)
Present	51(85%)
Absent	9(15%)

Table 2 reveals about the presence and absence of psychiatric morbidities among the HIV positive patients on ART. 85% of the sample (N=51) had presence of various psychiatric illnesses whereas 15% reported none (N=9).

Table-3: Prevalence of Psychiatric morbidities (N=51)

Psychiatric morbidities	f (%)
Depressive Disorder	21(41%)
Dysthymic Disorder	14 (28%)
Generalized Anxiety Disorder	8 (16%)
Psychosis NOS	3 (5%)
Substance Use Disorder	5 (10%)

Table 3 shows the presence of various psychiatric illnesses, out of total sample (N = 51), 41% were the persons with Depressive disorder (N = 21), 28% were the persons with Dysthymic disorder (N = 14), 16% were the persons with Generalized Anxiety Disorder (N = 8), 5% of the sample were the persons with Psychosis (N = 3) and rest 10% were the persons with substance use disorder (N = 5).

Table 4 shows the severity of the psychiatric morbidities, in the Depressive disorders, out of 21 persons, 5 persons were mildly ill, 14 persons were moderately ill and 2 persons were markedly ill. In the Dysthymic disorders, out of 14 persons, 3 persons were mildly ill, 9 persons were moderately ill and 2 persons were markedly ill. Out of 8 persons in the GAD, 2 persons were mildly ill, 5 persons were moderately ill and 1 person was markedly ill. Out of 3 persons in the Psychosis NOS, 2 persons were mildly ill and 1 person was moderately ill. The highest mean in the mildly ill section were of persons with GAD (30.41). The highest mean in the moderately ill section were of persons with Depressive Disorders (38.68). The highest mean in the markedly ill section were of persons with Depressive disorders (59.78).

Table 5 shows the domains of quality of life on different groups of psychiatric morbidities. In the domain of physical quality of life persons with GAD (20.63) had the highest mean followed by Substance use disorder, Dysthymic Disorder, Depressive Disorder and Psychosis NOS. In the domain of psychological quality of life persons with GAD (19.75) has the highest mean followed by Substance use disorder, Dysthymic Disorder, Depressive Disorder and Psychosis NOS. In the domain of social relationship quality of life persons with GAD (9.50) has the highest mean followed by Substance use disorder, Dysthymic Disorder, Depressive Disorder and Psychosis NOS. In the domain of environment quality of life persons with GAD (23.93) has the highest mean followed by Substance use disorder, Dysthymic Disorder, Depressive Disorder and Psychosis NOS. Overall quality of life was better in the persons with GAD and followed by Substance use disorder, Dysthymic Disorder, Depressive Disorder and Psychosis NOS.

The difference among the groups namely Depressive Disorder, Dysthymic Disorder, GAD,

Table-4: Mean and SD of Severity of Symptoms on Brief Psychiatric Rating Scale (N=46)

Severity Level	Depressive disorders N=21			Dysthymic disorders N=14			GAD N=8			Psychosis NOS N=3		
	f	Mean	SD	f	Mean	SD	f	Mean	SD	f	Mean	SD
Mildly ill	5	29.43	5.98	3	25.78	2.51	2	30.41	6.1	1	29	0
Moderately ill	14	38.68	6.78	9	34.71	3.45	5	37.48	7.1	2	35.68	7.2
Markedly ill	2	59.78	9.81	2	57.23	8.1	1	55	0	0	0	0

Table-5: Mean and SD of Quality of Life on WHOQOL BREF (N= 51)

Variables	Groups	N	Mean	Std. Deviation
Physical Health	Depressive Disorder	21	14.86	4.02
	Dysthymic Disorder	14	16.21	3.98
	GAD	8	20.63	4.41
	Psychosis	3	14.00	3.61
	Substance Use	5	19.40	5.77
Psychological	Depressive Disorder	21	12.90	4.07
	Dysthymic Disorder	14	15.93	5.41
	GAD	8	19.75	5.04
	Psychosis	3	12.67	4.16
	Substance Use	5	17.60	3.44
Social Relationship	Depressive Disorder	21	7.14	2.20
	Dysthymic Disorder	14	7.86	2.80
	GAD	8	9.50	1.41
	Psychosis	3	6.33	2.52
	Substance Use	5	8.60	2.97
Environment	Depressive Disorder	21	15.48	3.79
	Dysthymic Disorder	14	18.21	5.96
	GAD	8	23.38	7.31
	Psychosis	3	16.00	6.00
	Substance Use	5	23.60	8.88
Quality of Life (Overall) Scores	Depressive Disorder	21	50.38	11.07
	Dysthymic Disorder	14	58.21	16.57
	GAD	8	73.25	16.66
	Psychosis	3	49.00	15.39
	Substance Use	5	69.20	20.74

Table-6: One way ANOVA for the difference among the different groups (Depressive Disorder, Dysthymic Disorder, GAD, Psychosis NOS & Substance Use Disorder) based on psychiatric comorbidities on their quality-of-life indicators

Variables	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Physical Health	Between Groups	254.702	4	63.676	3.555	0.013
	Within Groups	824.004	46	17.913		
Psychological	Between Groups	331.582	4	82.895	3.923	.008
	Within Groups	972.105	46	21.133		
Social Relationship	Between Groups	41.887	4	10.472	1.852	.135
	Within Groups	260.152	46	5.655		
Environment	Between Groups	529.918	4	132.479	4.034	.007
	Within Groups	1510.670	46	32.841		
QoL	Between Groups	3949.685	4	987.421	4.471	.004
	Within Groups	10159.610	46	220.861		

Psychosis NOS and Substance Use Disorder based on psychiatric comorbidities on their obtained scores of quality of life was found significantly different as it appeared from above table as the value found statistically significant (F = *4.47, P < .004)* for the overall scores of quality of life. The difference between different groups (Depressive Disorder, Dysthymic Disorder, GAD, Psychosis NOS and Substance Use Disorder) were also found statistically significant as the value found *F = 3.92 P < .0.013* on their scores of physical health indicator of quality of life. The difference between different groups were also found statistically significant as the value found *F = 4.034 P < .0.008* on their scores of psychological health indicator of quality of life. No difference was found among the groups on the indicator of social relationship. The difference between different groups were also found statistically significant as the value found *F = 3.55 P < .0.007* on their scores of environment indicator of quality of life.

Discussion

HIV itself is a very detrimental condition for the person, which results in various mental health problems if the people not get enough support and care these conditions further deteriorates. It has severe implication on the quality of life of the person and enhance vulnerability with regard his or her mental health conditions. In various previous epidemiologic studies on patients with HIV/AIDS revealed that the rates of psychiatric symptoms including depression, substance abuse, post-traumatic stress disorder, sleep disturbance, and psychosis are higher in the persons with HIV as compared with the normal population.[17-30]

The first Objective of the study was to evaluate the prevalence of psychiatric morbidities in HIV positive patients on Anti- Retroviral Therapy (ART). This objective has been verified with by computing frequency and percentage of persons with psychiatric morbidities. From the total sample 85% had presence of various psychiatric illnesses whereas 15% reported none. It is because of the having HIV/ AIDS in itself is a social stigma for the person which results in withdrawn behaviour, suicidal ideations, rumination of guilt, anxiety etc. In India, person with HIV are not accepted by the larger part of the society which made him/her vulnerable to indulge in substance abuse. In many research it hs been found that HIV/AIDS is highly correlated with poor mental health. The studies[31,32] found that there is a relation between HIV-related shame, stigma, and mental health functioning, including depressive symptoms, hopelessness, PTSD symptoms, loneliness and self-concept among persons with HIV. Armoon et al. 2022 found that HIV condition has been characterized as a disturbing experience and Persons with HIV may experience severe level of stigma which impacted the negative mental health disorders and various experiences, including emotional distress, depression, shame, anxiety, and suicidal ideation. Ahmed et al[33] also found in their study among HIV patients on ART that stigma and social support results into symptoms of anxiety and depression.

The second objective is to study various types of psychiatric illness and their prevalence in HIV positive patients on ART. This objective has been verified with by calculating the frequency and percentage of persons with various psychiatric morbidities based on the diagnosis made by the psychiatrist. The result was indicated that from the total sample, 41% were the persons with Depressive disorder, 28% were the persons with Dysthymic disorder, 16% were the persons with Generalized Anxiety Disorder, 5% of the sample were the persons with Psychosis NOS and rest 10% were the persons with substance use disorder. These are the common mental health issues which were found among the patients. These results were supported by various research studies.[34-38]

The third objective is to study the severity of psychiatric comorbidities in HIV positive patients on ART in this group. This objective was verified by using the mean and standard deviation based on the scoring system of brief psychiatric rating scale. The result was found that in terms of severity in the Depressive disorders, 5 persons were mildly ill, 14 persons were moderately ill and 2 persons were markedly ill. In the Dysthymic disorders, out of 14 persons, 3 persons were mildly ill, 9 persons were moderately ill and 2 persons were markedly ill. Out of 8 persons in the GAD, 2 persons were mildly ill, 5 persons were moderately ill and 1 person was markedly ill. Out of 3 persons in the Psychosis NOS, 2 persons were mildly ill and 1 person was moderately ill. These results were supported by

various studies, Bhatia and Munjal[35] found that rate of depression is patients with HIV is very high and detecting early and treatment help in the improving the quality of life. Desta et al. 2022 revealed similar result that there is high prevalence of depression among people living with HIV. Girma et al. 2021 was also found that among the patients with HIV, there was high prevalence of moderate severity of depression.

The fourth objective is to study the quality of life who has psychiatric comorbidities in HIV positive patients on ART in this group. This objective was verified with the help of computing mean, standard deviation of quality of life score and one way ANOVA was used to see the reliability of difference between different psychiatric morbidities groups. The result was found that all the groups were statistically significant differ from each other on the parameter of quality of life. Overall quality of life was better in the persons with GAD and followed by Substance use disorder, Dysthymic Disorder, Depressive Disorder and Psychosis NOS. Being HIV patient it is difficult for the person to get proper support, whether it is social or medical his or her neighbour or community discriminate him or her in many aspects which results in depression, anxiety and rumination of guilt and sometimes suicidal ideation. Persons with HIV who were depressed had significantly lower QOL than the subjects not suffering from depression, more so in the environment and social relationships domains.[38]

Limitation

Since the Brief Psychiatric Rating Scale (BPRS) used to access the severity of various psychiatric morbidities like Depression, Psychosis, Generalized Anxiety Disorder and Dysthymia, therefore the severity of substance use disorders cannot be accessed.

References

1. Jahagirdar D, Walters MK, Novotney A, Brewer ED, Frank TD, Carter A, Biehl MH, Abbastabar FI, Abhilash ES, Abu-Gharbieh E, Abu-Raddad L1. Global, regional, and national sex-specific burden and control of the HIV epidemic, 1990-2019, for 204 countries and territories: the Global Burden of Diseases Study 2019. The Lancet HIV 2021; 8(10) : 633-51.
2. Padyana M, Bhat RV, Dinesh AN. HIV in females: a clinic-epidemiology study. J Fam Med Pri Care 2013; 2(2) : 149.
3. Antwal M, Gurjar R, Chidrawar S, Pawar J, Gaikwad S, Panchal N, Kale V, Thakar M, Risbud A, Tripathy S. Clinical profile of HIV infected patients attending a HIV referral clinic in Pune, India. The Indian Journal of Medical Research 2014; 140(2) : 271.
4. Owe-Larsson B, Sall L, Salamon E, Allgulander C. HIV infection and psychiatric illness. Afr J Psychiatry 2009; 12(2) : 115-28.
5. Evans DL, Staab JP, Petitto JM, Morrison MF, Szuba MP, Ward HE, Wingate B, Luber MP, O'Reardon JP. Depression in the medical setting: biopsychological interactions and treatment considerations. J Clin Psychiatry 1999, 60(4) : 40-56.
6. Dube B, Benton T, Cruess DG, Evans DL. Neuropsychiatric manifestations of HIV infection and AIDS. J Psychiatr Neurosci 2005; 30(4) : 237-46.
7. Seid S, Abdu 0, Mitiku M, Tamirat KS. Prevalence of depression and associated factors among HIV/AIDS patients attending antiretroviral therapy clinic at Dessie referral hospital, South Wollo, Ethiopia. Int J Ment Health Syst 2020; 14(1) : 1-8.
8. Duko B, Toma A, Asnake S, Abraham Y. Depression, anxiety and their correlates among patients with HIV in South Ethiopia: An institution-based cross-sectional study. Front Psychiatry 2019; 10 : 290.
9. Marbaniang I, Sangle S, Nimkar S, Zarekar K, Salvi S, Chavan A, Gupta A, Suryavanshi N, Mave V. The burden of anxiety among people living with HIV during the COVID-19 pandemic in Pune, India. BMC Public Health 2020; 20(1) : 1-9.
10. Algoodkar S, Kidangazhiathmana A, Rejani PP, Shaji KS. Prevalence and factors associated with depression among clinically stable people living with H1V/AIDS on antiretroviral therapy. Indian J Psychol Med 2017; 39(6) : 789-93.
11. Camara A, Sow MS, Toure A, Sako FB, Camara I, Soumaoro K, Delamou A, Doukoure M. Anxiety and depression among HIV patients of the infectious disease department of Conakry University Hospital in 2018. Epidem Inf 2020;

148.
12. DeLorenze GN, Satre DD, Quesenberry Jr CP, Tsai AL, Weisner CM. Mortality after diagnosis of psychiatric disorders and co-occurring substance use disorders among HIV-infected patients. AIDS Patient Care and STDs. 2010; 24(11) : 705-12.
13. Collins PY, Holman AR, Freeman MC, Patel V. What is the relevance of mental health to HIV/AIDS care and treatment programs in developing countries? A systematic review. AIDS (London, England) 2006; 20(12) : 1571.
14. Brown JL, Ulibarri MD. The work of psychologists is crucial to end the HIV epidemic-Ending the HIV Epidemic: Addressing the HIV Care Continuum. Psychology and AIDS Exchange Newsletter 2020. https://www.apa.orapi/aidsiresourcesiexchange/
15. Treisman GJ, Soudry Neuropsychiatric effectsof HIV antiviral medications. Drug Saf 2016; 39(10) : 945-57.
16. Subedi S, Aich TK, Shah S, Thapa DK. Non-psychiatry consultant's attitude towards psychiatry: a study from Universal College of Medical Sciences, Nepal. J Univ Coll Med Sci 2013; 1(4) : 2-6.
17. Bachani D, Sogarwal R. National response to HIV/AIDS in India. Indian J Commun Med 2010; 35(4) : 469.
18. Paranjape RS, Challacombe SJ. HIV/AIDS in India: An overview of the Indian epidemic. Oral Dis 2016; 22 : 10-4.
19. Santhakumar A, Mathiyazhakan M, Jaganathasamy N, Ganesh B, Manikandan N, Padmapriya VM, Monika A, David JK, Kumar A, Arumugam E. Prevalence and Risk Factors Associated with HIV Infection among Pregnant Women in Odisha State, India. Int J Maternal Child Health AIDS 2020; 9(3) : 411.
20. Palchaudhuri R, Niggl M, Palmer CS. Eliminating HIV and AIDS in India: A roadmap to zero new HIV infections, zero discrimination and zero AIDS-related deaths. Indian J Med Res 2016; 144(6) : 789.
21. Arumugam E, Kangusamy B, Sahu D, Adhikary R, Kumar P, Aridoss S. Size Estimation of high-risk groups for H1V infection in India based on data from national integrated bio-behavioral surveillanceand targeted interventions. Indian J Public Health 2020; 64(5) : 39.
22. Palchaudhuri R, Niggl M, Palmer CS. Eliminating HIV and AIDS in India: A roadmap to zero new HIV infections, zero discrimination and zero AIDS-related deaths. Indian J Sex Transm Dis AIDS 2016; 144(6) : 789.
23. Brandt C, Zvolensky MJ, Woods SP, Gonzalez A, Safren SA, O'Cleirigh CM. Anxiety symptoms and disorders among adults living with HIV and AIDS: A critical review and integrative synthesis of the empirical literature. Clin Psychol Rev 2017; 51 : 164-84.
24. Helirnuth J, Colby D, Valcour V, Suttichorn D, Spudich S, Ananworanich 3, Prueksakaew Sailasuta N, Allen I, Jagodzinski LL, Slike B. Depression and anxiety are common in acute HIV infection and associate with plasma immune activation. AIDS Behav 2017; 21(11) 3238-46.
25. Moturnrna A, Negesa L, Hunduma G, Abdeta T. Prevalence and associated factors of common mental disorders among adult patients attending HIV follow up service in Harar town, Eastern Ethiopia: a cross-sectional study. BMC Psychol 2019; 70) : 1-9.
26. Tao J, Qian HZ, Kipp AM, Ruan Y, Shepherd BE, Amico KR, Shao Y, Lu H, Verrnund SH. Effects of depression and anxiety on antiretroviral therapy adherence among newly diagnosed HIV-infected Chinese MSM. AIDS. 2017; 31(3) : 401-6.
27. Basavaraj KH, Navya MA, Rashmi R. Quality of life in HIV/AIDS. Indian J Sex Transm Dis AIDS 2010; 31(2) : 75.
28. Bradley C. The WHO (ten) well-being index: A critique. Psychother Psychosom 1996; 65(6) : 331-3.
29. Overall JE, Gorham DR. The brief psychiatric rating scale. Psychol Rep 1962; 10(3) : 799-812.
30. Yee A, Ng BS, Hashim HM, Danaee M, Loh HH. Cultural adaptation and validity of the Malay version of the brief psychiatric rating scale (BPRS-M) among patients with schizophrenia in a psychiatric clinic. BMC Psychiatry 2017; 17(1) : 1-0.
31. Nabunya P, Namuwonge F. HIV-Related Shame, Stigma and the Mental Health Functioning of Adolescents Living with HIV: Findings from a

Pilot Study in Uganda. Child Psychiatry Hum Dev (2022). https://doi.org/10.1007/s10578-022-01374-z
32. Armoon B, Fleury MJ, Bayat AH. et al. HIV related stigma associated with social support, alcohol use disorders, depression, anxiety, and suicidal ideation among people living with HIV: a systematic review and meta-analysis. Int J Ment Health Syst 16, 17 (2022). https://doi.org/10.1186/s13033-022-00527-w
33. Ahmed A, Saqlain M, Umair MM, Hashmi FK, Saeed H, Amer M, Blebil AQ and Dujaili JA. Stigma, Social Support, Illicit Drug Use, and Other Predictors of Anxiety and Depression Among HIV/AIDS Patients in Pakistan: A Cross-Sectional Study. Front Public Health 2021; 9 : 745545. doi: 10.3389/fpubh.2021.745545
34. Nedelcovych MT, Manning AA, Semenova S, Gamaldo C, Haughey NJ, Slusher BS. The Psychiatric Impact of HIV. ACS chemical neuroscience 2017; 8(7) : 1432–1434. https://doi.org/10.1021/acschemneuro.7b00169
35. Bhatia MS, Munjal S. Prevalence of Depression in People Living with HIV/AIDS Undergoing ART and Factors Associated with it. J Clin Diagn Res 2014; 8(10) : WC01-4. doi: 10.7860/JCDR/2014/7725.4927.
36. Desta F, Tasew A, Tekalegn Y. et al. Prevalence of depression and associated factors among people living with HIV/AIDS in public hospitals of Southeast Ethiopia. BMC Psychiatry 2022; 22 : 557. https://doi.org/10.1186/s12888-022-04205-6
37. Girma D, Assegid S, Gezahegn Y. Depression and associated factors among HIV-positive youths attending antiretroviral therapy clinics in Jimma town, southwest Ethiopia. PLoS ONE 2021; 16(1) : e0244879. https://doi.org/10.1371/journal.pone.0244879
38. Deshmukh NN, Borkar AM, Deshmukh JS. Depression and its associated factors among people living with HIV/AIDS: Can it affect their quality of life? J Family Med Prim Care 2017; 6(3) : 549-553. doi: 10.4103/2249-4863.222016.

Original Article

Social Skills and Self Esteem in Adults with Psychogenic Non-Epileptic Seizures

Garima,[1] Vibha Sharma,[2] Aldrin Anthony[3]
Department of Clinical Psychology & Neurology, IHBAS
Contact: Vibha Sharma, E-mail: vibhakabir@rediffmail.com

ABSTRACT

Introduction: *Psychogenic nonepileptic seizures (PNES) are kept under "dissociative convulsions in the dissociative disorders" in ICD-10 and as "somatic symptom and related disorders—conversion disorder (functional neurological symptom disorder)" in DSM-5. The reason of the origin of it is psychological and they are also known as Pseudoseizures. It can be assumed that the personality constructs like social skills and self esteem plays an important role in it and requires special attention about it for management of PNES.* ***Aim:*** *The aim of the current study is to assess and compare the social skills and self esteem of Adults with PNES and Control Group and to find out the relationship between social skills and self esteem of Adults with PNES and control Group.* ***Methodology:*** *The study consisted of total 60 participants, 30 adults with PNES, 30 participants from the control group, with a cross sectional study design. The tools used for the study were: Vellore scale for social performance, Rosenberg self esteem scale.* ***Results:*** *Comparison and correlation among the social skills and self esteem was analyzed. Asignificant difference was found when the self esteem of male with PNES was compared with male of Control group and female with PNES was compared with female of control group. A significant difference was also analyzed between the social skills and self esteem of Adults with PNES and Control Group, and a positive correlation exists between the social skills and self esteem.* ***Conclusion:*** *Poor social skills and low self esteem plays a very significant role in the occurrence of PNES. Hence, a significant intervention might be planned for these domains for a better management plan.*

Keywords*: PNES, Pseudoseizures, Social skills, Self esteem.*

Introduction

Psychogenic nonepileptic seizures (PNES) are defined as "dissociative convulsions in the dissociative disorder" under ICD 10 and as "somatic symptom and related disorders-conversion disorder (functional neurological symptom disorder)" under DSM-5.[1] These are paroxysmal, compulsory changes in behavior, sensation, motor movement, mental processes (change in consciousness), or autonomic capability connected to an issue in the handling of mental or social functioning.[2] It is usually found between the age of 15 and 35 years, with approximately eighty percent patients as women.[3]

Social isolation is one of the perpetuating factors in the patients with PNES. Social interaction is important for the individual of all the ages. Whereas, Social Skills can be classified as the set of skills which an individual requires while interacting and communicating with each other. These skills are related to the societal norms and help people to understand that what attitudes and behaviors are normal, expected and acceptable in a situation.[4]

Researchers showed that the patients with PNES might have limited interpersonal skills and face problem while regulating their emotions.[5] They prefer to involve more in the indoor or solitary activities.[6,7]

Individuals with dissociative symptoms are prone to respond faster when being connected with rejection related words. This dysfunctional implicit self-evaluation might result in biased perceptions of other individual's towards themselves, provoking maladaptive social ways of behaving that can block the occurrence of events and maintenance of relationships in dissociative individual. People with additional dissociative symptoms answered quicker while matching self-pronouns with dismissal related words than with acknowledgment related words. The correlation between dissociation and this self rejection association remained significant when statistically controlling for unfavorable interpersonal experiences and for depression, anxiety and self esteem.[7]

This study is an attempt to understand whether social skills and self esteem may also be related to adults with Psychogenic Nonepileptic Seizures. It will be useful to assess the social skills and self esteem in Psychogenic Nonepileptic Seizures, because assessing these domains may help us in planning of effective management.

Objectives: To assess and compare the social skills and self esteem of Adults with PNES and Control Group and to find out the relationship between social skills and self esteem of Adults with PNES and control Group.

Material and Methods

The subjects for the study consists total 60 participants, 30 adults with PNES, 30 participants from the control group. For adults with PNES, adults above age 18 years, from either gender were taken. For the control Group, adult age 18 years and above, with either gender that scored below 12 were taken. Adults with the presence of any psychiatry/neurological illness, psychoactive substance abuse, Diagnosis of Intellectual Disability were excluded for both the groups. The study had a cross sectional design. Informed consent was taken from the participants and a self structured performa was used to collect the socio demographic details. Tools used for the study were: Vellore Assessment of Social Performance. It was developed by S. Thamaraiselvi, A. Priyadarshini, Namrata Arisalya, Reema Samuel, K. S. Jaco. The scale consists of 5 domains (Non-Verbal Social Skills, Verbal Social Skills, Receptive Social Competence Skills, Processing Social Competence Skills, Expressive Competence Skills) with 7 point scale, followed by 20 questions.[8] The another scale used for the study was Rosenberg Self Esteem Scale. The scale was developed by Morris Rosenberg. It consists of 10 questions, with 4 options.

Results

In the present study, comparison of social skills and self esteem of adults with PNES and control group was studied. As the data was non parametric, hence Mann Whitney U test was used to compare the social skills and self esteem between- Male of PNES and control group, female of PNES and control group. Correlation between social skills and self esteem in both the groups was seen using spearman correlation method. Results are shown in Table 1.

Table-1: Comparison of the Social Skills and Self Esteem

Variables		U Score	Z score
Social Skills	Male with PNES & Control Group	41	.07754
Social Skills	Female with PNES & Control Group	104	-1.70063
Self Esteem	Male with PNES & Control Group	25*	2.5044
Self Esteem	Female with PNES & Control Group	58.5*	-3.16061
Social Skills	Male and female with PNES	89	-.022628
Self Esteem	Male and female with PNES	70.5	-1.06352
Social Skills	Adults with PNES & Control group	102*	-5.13759
Self Esteem	Adults with PNES & Control group	46.5*	-5.95812

*Significance at p<.05

Comparison of Social Skills and Self Esteem: The overall results indicated that there is a significant difference exists when the self esteem of male with PNES was compared with male of Control group and female with PNES was compared with female of control group. A significant difference was also analyzed between the social skills and self esteem of Adults with PNES and Control Group.

Correlation between social skills and self esteem: The correlation coefficient (r) between social skills and self esteem for the adults was PNES was

p = 0.60 and the correlation for the control group was p = 0.80, with a positive correlation, indicating a high positive relationship between social skills and self esteem for the control group in comparison to Adults with PNES.

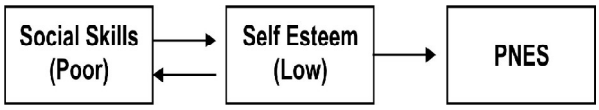
Discussion

Social Skills are important because they help us to interact with each other with predictability, so that we can understand each other in a better way. It allows an individual to express both positive and negative feelings in interpersonal situations. When social skills between male and female with PNES were compared, no significant difference was found. Hence, the chances of occurrence of PNES in both male and female are same. No significant difference was also seen between social skills between male with PNES and male of control group, female with PNES and female of control group. But when social skills of adults with PNES were compared with Control group, a significant difference was analyzed. Social isolation is one of the important perpetuating factors in the patients with PNES.[10] They have low social behavior[9] and involve more in the indoor or solitary activities,[6] with limited interpersonal skills.[5] These adults faces problem while interacting with others.

A significant difference was also observed in the self esteem of adults with PNES and control group. Although, when self esteem was compared among male and female with PNES, no significant difference was seen. But when it was compared between male with PNES and male of control group, female with PNES and female of control group, a significant difference was there. Researchers have indicated that adults with PNES have low self esteem. They see themselves as unworthy and always try to evaluate themselves negatively. Individuals with high self-esteem tend to be psychologically happy and relaxed,[11,12] whereas those with low self-esteem are psychologically unhappy and depressed.[13]

Individuals with high self esteem feel good about themselves, they are able to cope effectively with challenges and negative feedback, and they live in a social world in which they believe that people value and respect them. By contrast, people with low self esteem see the world through a more negative filter, and their general dislike towards the self establish perceptions of everything in their surroundings. Patients with dissociation have "need for self esteem".[14] There symptoms subside when the needs are fulfilled, whereas the symptoms increases in the patients where the problems remains unresolved. Patients with conversion disorder were found to have type D personality traits and low self esteem.[15]

In the present study, a positive correlation was analyzed between the social skills and self esteem in both adults with PNES and control group. There is a high positive correlation of the control group when compared with the Adults with PNES. Need of social skills, especially in the areas like impression management, playing various social roles, and communicating effectively may led to a positive social self image. Possession of social skills leads to a form of "social" self-efficacy-a belief in one's ability to master vivid social situations.[17,18] Hence, it can be assumed that there should be positive relationships between social skills and self esteem. Evidences also suggest that the social skills are positively correlated with the self esteem. A study revealed a positive correlation between the social skills and self esteem.[16]



So, overall on the basis of the present study, it can be concluded that the adults with PNES have limited social skills and self esteem. They tend to be socially isolated and face interpersonal issues which somewhere makes them feel unworthy and evaluate themselves negatively. It becomes the reason of their low self esteem. Due to lack of social skills and low self esteem, they are not able to interact with people and involve more in the solitary activities because of which do not get attention from people around them. Hence, they adopt the process of dissociation as it also helps them to get the attention from others and becomes the reason of occurrence of PNES.

References

1. Escobar JI, Dimsdale J. Somatic related disorders. In: Sadock BJ Sadock V Gregory M, eds. Kaplan & Sadock's comprehensive textbook of psychiatry. 10th ed. China: Wolters Kluwer 2018; 4684–4728.
2. LaFrance WC, Devinsky O. The treatment of nonepileptic seizures: historical perspectives and

future directions. Epilepsia 2004; 5(Suppl 2) : 15–21.
3. Shen W, Bowman ES, Markand O.N. Presenting the diagnosis of pseudoseizure. Neurology 1990; 40 : 756–759.
4. Patrick N.J. Social Skills for teenagers and adults with sperger Syndrome: London and Philadelphia: Jessica Kingsley Publisher 2008.
5. Rusch MD, Morris GL, Allen L, Lathrop L. Psychological Treatment of Nonepileptic Events. Epilepsy Behav 2001; 2(3) : 277–283.
6. Vaidya-Mathur U, Myers L, Laban-Grant O, Lancman M, Lancman M, Jones J. Socialization characteristics in patients with psychogenic nonepileptic seizures (PNES), Epilepsy Behav 2016; 56 : 59–65.
7. Chiu CD, Ho HL, Tollenaar MS. Relational self-evaluations in dissociation: Implicit self-rejection? Psychol Trauma 2022; 14(1) : 99–106.
8. Thamaraiselvi S, Priyadarshini A, Arisalya N, Samuel R, Jacob KS. Development and validation of Vellore Assessment of Social Performance among clients with chronic mental illness. Indian J Psychiatry 2020; 62 : 121–130.
9. Reuber M. Howlett S, Khan A, Grünewald R A. Non-epileptic seizures and other functional neurological symptoms: predisposing, precipitating, and perpetuating factors. Psychosomatics 2007; 48(3) : 230–238.
10. Bajestan SN, LaFrance WC. Jr. Clinical Approaches to Psychogenic Nonepileptic Seizures. Focus, American Psychiatric Publication 2016; 14(4) : 422–431.
11. Branden N. The six pillars of self-esteem. New York: Bantam Books 1994.
12. Taylor SE, Brown JD. Illusion and well-being: A social psychological perspective on mental health. Psychol Bull 1988; 103 : 193–210.
13. Tennen H, Affleck G. The puzzles of self-esteem: A clinical perspective. In R. F. Baumeister, (Ed.), Plenum Series in Social/Clinical Psychology 1993; 241–262.
14. Ishikura R, Tashiro N. Frustration and fulfillment of needs in dissociative and conversion disorders. Psychiatry Clin Neurosci 2002; 56(4) : 381–90.
15. Kazðan K A., Yýldýz S., Kurt O, Korkmaz S. Type D personality and self-esteem in conversion disorder: a casecontrol study. J Health Sci Med 2021; 4(6) : 816–823.
16. Riggio RE, Throckmorton B, Depaola SJ. Social skills and self esteem. Pers Individ Diff 1990; 11 : 799–804.
17. Bandura Albert. Self-Efficacy: Toward a Unifying Theory of Behavioral Change. Psycholol Rev 1977 : 84 : 191–215.
18. Helmreich R, Stapp J. Short forms of the Texas Social Behavior Inventory, an objective measure of self-esteem. Bull Psychonomic Soc 1974; 473–475.

Original Article

A study of Socio-demographic and Clinical Profile in Female patients with Dissociative (Conversion) Disorder

Neelu Yadav, Bajrang Lal, Tushar Jagawat, Vikas Gaur, Pankaj Tandon, Ritu Meena, Savita Jagawat, Hemant Chhabra

Department of Psychiatry and Clinical Psychology, NIMS Medical College & Hospital, Jaipur

Contact: Neelu Yadav, Email: neelu.yadav9@gmail.com

ABSTRACT

Background: *Dissociative (Conversion) disorder is a clinical dilemma for both neurologists and psychiatrists with a history that may date back to antiquity. It is also known as "functional neurological symptom disorder" and is defined as a Deficit of sensory or motor function that cannot be explained by a medical condition and that is preceded by conflicts or other stressors, indicating that the deficit is related to psychological factors.* ***Aim:*** *To study of socio-demographic and associated clinical profile in female patients with Dissociative (Conversion) disorder.* ***Material & Methods :*** *On the basis of inclusion and exclusion criteria, two hundred and forty four female patients between 18–50 age group who gave the informed consent for the study were included in the study. Diagnosis of Dissociative (conversion) disorder (CD) was made according to International classification of Mental and Behavioural disorders-10th version (ICD-10). General health questionnaire (GHQ-12). Hamilton Depression Rating Scale (HAM – D) for severity of Depression. Hamilton Anxiety Rating Scale (HAM–A) for severity of Anxiety, PSLES (Presumptive Stressful Life Events Scale) are applied to study socio-demographic and associated psychosocial stressors in female patients with Dissociative (Conversion) disorder.* ***Results:*** *This study reported that Conversion disorder was highly prevalent in younger age group (18–24 years) that is 45%, followed by 25–31 years (22%). Least affected age group was 46–50 (04%). Maximum number of patients belonged to the rural background (78%), urban were 53 (22%). Majority from the sample of the patients 101 (59%) are married, 41% are single. Followed by Students (35%) only 2% were employed. In this study majority (57%) had precipitating factor preceding conversion disorder, the most common subtype of Dissociative Disorder is Dissociative convulsion (35%), followed by Dissociative motor disorder (33%). It was reported that out of the sample population of CD patients 157 (64%) had psychiatric co-morbidity. Conversion disorder patients had 33 (14%) mild depression, 30(12%) had moderate depression. Conversion disorder patients 20 (08%) had mild anxiety and 04 (02%) had moderate anxiety. The biggest stressful event leading to CD was conflict with in laws (33%) followed by Family conflict (12.7%), Death of close family member (12.3%), break up with friend (11.48%).* ***Conclusion:*** *The primary factor in all cases of CD is stress and internal conflict. As in our study, CD was found to be more prevalent among younger age groups, hindu religion, married females, lower middle Socioeconomic Class, people belonging to rural Background, and those who have primary education, there are mostly psychosocial stressors preceding them. Most of them suffer from co morbid psychiatric disorder mainly anxiety and depression.*

Keywords: *Dissociative (conversion disorder), Females, Stressors, Anxiety, Depression.*

Introduction

Conversion disorder (CD) is a clinical dilemma for both neurologists and psychiatrists, with a history that may date back to antiquity.[1] The term "conversion disorder" was first used by renowned psychologist Sigmund Freud. He proposed that the symptoms of conversion disorder represent unconscious conflict.[2] Hippocrates also suggested that the "wandering uterus" was to blame for women's dissociation and called it "hysteria", yet with the advancement of science, the emphasis switched from these religious and spiritual notions to a scientific base.[3] In the Diagnostic and Statistical Manual of Mental Disorders (DSM)-V, the term "conversion" refers to the substitution of a somatic symptom for a suppressed idea. It is also known as "functional neurological symptom disorder" and is defined as a deficit of sensory or motor function that cannot be explained by a medical condition and that is preceded by conflicts or other stressors, indicating that the deficit is related to psychological factors.[4]

It usually starts in early adulthood and usually happens after a stressful event. Conversion symptoms are categorised as dissociative disorders in the 10th edition of the International Classification of Diseases (ICD) (e.g., dissociative motor disorder).[5] Evidently, it provides a significant portion of the population of psychiatric patients, especially in the developing nations, but its incidence has been declining in the western countries. Study of Clinical Correlations and Sociodemographic Profile in Conversion Disorder by various authors, a loss of the normal integration between memories of the past, identity awareness, present feelings, and control over bodily motions, with similar diagnostic criteria, is a common theme across dissociative (or conversion) disorders.[2,6]

Previous research has revealed relationships between conversion and a wide range of clinical traits, either with or without aetiological significance. It has been suggested that female sex, standing within the sibling group, low socioeconomic status, depression, personality disorders, and emotional stress are all linked to disorder. According to a review of the literature, women are more likely than men to experience conversion disorder globally, with a prevalence rate of about 20%.[7]

There are more girls than boys that suffer from conversion disorder.[8] Rural settings and impoverished nations are where dissociative disorder (conversion disorder) is more common. Conversion disorder, also known as dissociative disorder, can appear at any age, but it is thought to occur most frequently in people between the ages of 15 and 35, more common in those with poor socioeconomic status, less education, and less medical expertise.[9]

In India, conversion disorder is more common among young adults from low-income, joint homes and is disproportionately more common in women. Additionally, married housewives make up the greatest category of illiterates, whose prevalence has been found to be higher. The clinical manifestations of conversion disorder and sociodemographic factors, however, are less well understood in this area.[6]

This study aims to identify the various sociodemographic factors that are related to dissociative conversion disorder, psychosocial stressors that are associated with it, and the most typical clinical presentation that is related to it in patients with dissociative (conversion disorder) who present to the department of psychiatry.

Materials and Methods

The study was conducted with due permission from the scientific and the ethics committee, this observational cross sectional study was carried out in the department of psychiatry of a tertiary care hospital attached to a medical college. The study period was 18 months (January 2021 – June 2022).

A detailed survey on the female cases with Dissociative (conversion) disorder presenting to the psychiatry OPD and Emergency department was done after taking written informed consent from them.

The patients suffering from any organic disorders, epilepsy or any neurological condition or systemic Medical/Systemic illness, substance abuse and those who refuse to participate in the study were excluded from the study.

All of the included participants were first administered a semi-structured performa which was designed for taking the socio-demographic and clinical data followed by the assessment tools like General health questionnaire (GHQ-12), Hamilton Anxiety Rating Scale (HAM-A), Hamilton Depression Rating Scale (HAM-D) and Presumptive Stressful Life Event Scale (PSLES). Diagnosis of

Dissociative (conversion) disorder (CD) was made according to International classification of Mental and Behavioural disorders-10th version (ICD-10).

Results: The socio-demographic characteristics of the 244 patients are presenting in Table - 1.

Table-1: Socio-demographic variables of Participants

Variables		Number (n=244)	Percentage (%)
Age	18-24	110	45
	25-31	54	22
	32-38	32	13
	39-45	38	16
	46-50	10	04
Marital status	Single/widowed/divorced	101	41%
	Married	143	59%
Family type	Nuclear	52	21%
	Joint	177	73%
	Extended Nuclear	15	06%
Socio-Economic Status	Upper	17	7%
	Upper middle	22	9%
	Middle	35	14%
	Lower middle	100	41%
	Lower	70	29%
Religion	Muslim	09	04%
	Hindu	231	95%
	Sikh	04	01%
	Others	00	00%
Domicile	Rural	191	78%
	Urban	53	22%
Occupation	Unemployed	10	04
	Student	87	35
	Homemaker	143	59
	Employed	04	02
Level of education	Illiterate	27	11%
	Primary	64	26%
	Secondary	59	24%
	Senior secondary	54	22%
	Graduation and above	40	17%

Discussion

It was a cross-sectional study, consecutive sampling method with one-time assessment was adopted. The Observation drawn are as follows:

This study reported that Conversion disorder was highly prevalent in younger age group (18–24 years) that is 45%, followed by 25–31 years (22%). Least affected age group was 46–50 (04%). The majority of the patients in our study were under 25 years old, which was consistent with findings from earlier investigations.[6,10-12] According to a study by Shah,[13] the average patient age was 21.23 years, and the majority of patients (84.5%) were under the age of 30. It was determined that this age group was the most vulnerable. This might be due to the significant changes in schooling, marriage or relationships, occupation, and other life events that are happening to persons in this age range. inability to manage The majority of women in this age group get married in these communities and start new families; they also have to abide by the new family's rules and regulations and share the responsibility of taking care of their husbands' needs and the pressure to start their own families.

The maximum number of patients belonged to the rural background (78%) and urban were 53 (22%). Similar findings were made in the study by other authors.[6,14,15] Which discovered that most of the patients came from rural backgrounds. This may also be because most patients at this hospital come from rural areas because the hospital is located in a suburban area and is in close proximity to many villages.[16] However, fewer studies have reported a higher proportion of urban patients in their research, which contrasts with the majority of studies.[11] The

Table-2: Psychiatric Comorbidities, Clinical features, Subtypes of Dissociative (Conversion) Disorder, observed stressors and other factors

Variable		N = 244	Percentage (%)
Depression in conversion patients	No Depression	181	74%
	10–13 – Mild	33	14%
	14–17 – Moderate	30	12%
	>17 – Severe	00	00%
Anxiety in conversion patients	No Anxiety (< 7)	220	90
	8–14 – Mild	20	08
	15-23 – Moderate	04	02
	> 24 Severe	00	00
Psychiatric comorbidity	Yes	157	64
	No	87	36
Sub-type of dissociative (conversion) disorder	Dissociative amnesia	19	08%
	Dissociative Fugue	00	00%
	Dissociative stupor	05	02%
	Dissociative Trance Possession Disorder	18	07%
	Dissociative convulsion	85	35%
	Dissociative motor disorder	81	33%
	Dissociative anaesthesia and sensory loss	22	09%
	Mixed and other dissociative disorders	14	06%
Symptoms	Pseudo seizure	98	40
	Sensory symptoms	19	08
	Motor symptoms	90	37
	Mixed symptoms	37	15
Family history	Yes	28	11%
	No	216	89%
Precipitating factors	Present	140	57%
	Absent	104	43%
Stressors observed	Lack of child	5	2.05 %
	Death of close family member	30	12.3 %
	Marital conflict	19	7.7 %
	Conflict with in laws (other than over dowry)	33	13.5 %
	Broken engagement or love affair	19	7.7 %
	Major personal illness or injury	10	4.1 %
	Financial loss or problems	10	4.1 %
	Illness of family member	10	4.1 %
	Self or family member unemployed	04	1.6 %
	Lack of son	09	3.69 %
	Large loan	04	1.64 %
	Marriage of daughter or dependent sister	04	1.64 %
	Family conflict	31	12.7 %
	Break with friend	28	11.48 %
	Failure in examination	12	4.92 %
	Appearing for an examination of interview	05	2.05 %
	Getting married or engaged	05	2.05 %
	Trouble with neighbour	04	1.64 %
	Change in working condition or transfer	02	0.82 %
Duration of illness	0–6 month	110	45%
	6 month – 1 year	124	51%
	1 year and above	10	04%

study location was in an urban area with more educational facilities, which could be the cause.

According to the current study, the majority of patients (59%) were married, and every single one of them worked at home. These findings are comparable with previous studies[6, 12,14] where it was found that 76.25% of the patients were married, the fact that women enter a new milieu with marriage may be the cause. Poor adjustment With In-laws does havoc on their mind. The more frequent

occurrence among married women may be attributed to these stressful life circumstances in contrast to other study[11] which claims that dissociative (conversion) disorder is more prevalent in single people. Hysteria is reportedly widespread among married people, according to previous Indian studies.

In this study, nearly all of the married patients are homemakers (59%) and non-earning members. These results are in line with those of previous study,[17] which state that patients without personal income are more likely to suffer from conversion disorder, and that 87% of patients who had this illness were students. In contrast to our findings, Haamid[15] found that conversion disorder was more frequently seen in students (52.6%) and homemakers (23.7%). This could be as many patients in our study were campus students.

The majority of the survey participants (26%) had only completed their primary education up to the fifth grade. Similar findings were reported in studies by other studies[3,15,17] who found that dissociative (conversion) disorder is common among patients with only primary-level education. Pointing to a significant correlation between educational attainment and the likelihood of conversion. In contrast, patients with higher levels of education were shown to have higher prevalence rates in Datta's[18] study. Only 13.5% had completed college, while the majority had only completed high education, more patients (65.21%) were found to be illiterate. Similar study done by Kumar,[16] since educating a female is still a major problem in India, most people focus on educating a male child rather than a female child, making up the majority of the population (80%). As per our study, women only receive formal education at home and are typically only taught up to the first grade.

In this study, it was found that the majority of patients (100) 41%, belonged to the lower middle socioeconomic class, followed by the lower class, or 29%. Similar outcomes were observed in the study by Shah,[13] who included patients with a maximum percentage (53%) from lower medium socioeconomic status in their analysis. In other research, it was discovered that the majority of participants were from lower socioeconomic position, according to other studies.[6,11,14] This suggests that the epidemiology of conversion disorders is changing as a result of socioeconomic status.

Majority of the patients were from Joint family 73%, followed by Nuclear 21%.

In this study presence of precipitating stress factor, majority (57%) had precipitating factor preceding conversion disorder. family conflict was shown to be the most frequent precipitating factor in the study by Thapa.[19]

High rates of childhood physical, emotional, and sexual abuse have been identified among conversion disorder patients in western literature,[13] but not in Indian studies on conversion.[2] Our study found that childhood sexual abuse was prevalent at 6% and childhood physical abuse was prevalent at 9%. These findings were somewhat consistent with those of a Turkish study, which found that childhood physical abuse was prevalent at 8.9% and childhood sexual abuse was prevalent at 2.5% in their study population.[20] In contrast, a different study found that a very high percentage of sexual abuse (26.3%) and physical abuse (44.7%) occurred.

In this study the most common sub type of Dissociative Disorder is Dissociative convulsion (35%), followed by Dissociative motor disorder (33%), none were from Dissociative fugue.

It was reported that Out of the sample population of CD patients 157 (64%) had psychiatric comorbidity. Other studies in this line[3] found that Comorbid psychiatric disorder was observed in 61.81%, in which depressive disorders were seen in 43.64%, followed by mixed anxiety and depression in 14.55%, adjustment disorder, and anxiety. 14% were having mild depression and 12% moderate depression, but none were shown to have severe depression.

Conversion disorder patients had 33 (14%) mild depression, 30(12%) had moderate depression. The prevalence of depression in patients with dissociative disorders was 42 (84%), according to research by Alvi & Shah,[11,13] with the majority of cases having moderate depression.

In this study, conversion disorder patients 20 (08%) had mild anxiety and 04 (02%) had moderate anxiety. In contrast, several studies have found that patients with conversion disorder experience substantially higher levels of anxiety (35%, 60%).[10]

The biggest stressful event leading to CD was conflict with in laws (33%) followed by Family conflict (12.7%), Death of close family member (12.3%), break up with friend (11.48%). Conflict

with in-laws (26%) was the biggest stressor in study by Balram et al[21] out of 151 CD patients, who also had non-epileptic attacks, followed by the death of a family member (12%). While family conflict was shown to be the most frequent precipitating factor in the study by Thapa,[19] which compared 39 patients with 39 controls in a case-control study, the findings of our investigation are quite similar. Another research project by Reddy[3] Family conflicts (41.82%), education-related issues (29.09%), interpersonal issues (14.55%), marital problems (5.45%), money issues (3.64%), occupation-related issues (1.81%), death in the family (1.81%), and physical abuse (1.81%) were the main stressors identified in the study participants.

Limitations & suggestions

This study presents cross-sectional data from solely hospitalized cases. Therefore, we cannot be certain that the findings can be applied to the entire community. A small sample size was used. Therefore, we should exercise caution when extrapolating the findings to the entire population. There is no control group present. In this survey, the higher lower socioeconomic class group predominated. High socioeconomic status individuals may exhibit differently, thus we must use caution when extrapolating the findings to the community. Cross-sectional and non-blind evaluations of burden were conducted. Data was gathered from a caregiver for a single family. A number of burden-related mediators, including coping, appraisal, stated emotions, and social support, were not evaluated. This type of study should be done at community level also. Increase sample size in order to get more efficient results.

Conclusion

Conversion Disorder (CD) is particularly challenging to identify and treat since it typically has no physical or neurological aetiology. The majority of these instances are also neglected by a number of other fields, including medicine, neurology, and surgery. As a result, many individuals wait longer for their psychiatric care. The primary factor in all cases of CD is stress and internal conflict. As this field has not been well researched, the current study emphasizes the importance of awareness regarding the symptomatology and numerous Social and Demographic factors contributing to Conversion disorder. As in our study, CD was found to be more prevalent among younger age groups, Hindu religion, married female patients, lower middle Socio-economic Class, people belonging to rural Background, and those who have primary education, there are always psychosocial stressors preceding them. Most of them suffer from co-morbid psychiatric disorder including anxiety and depression. While temperamental characteristics including low sociability, low rhythmicity, low distractibility, strong emotionality, and high energy levels are typical in youngsters, neuroticism and emotionally unstable personality traits are more prevalent in adult patients. The goal of managing patients of CD with best treatment can only be achieved through awareness about the illness and socio-demographic variables among the society, Hospitals, and various treating Physicians and Surgeons.

References

1. Allin M, Streeruwitz A, Curtis V. Progress in understanding conversion disorder. Neuropsychiatric Dis Treat 2005; 1(3) : 205–9.
2. Bammidi R, Ravipati LP, Bashar MDA, Kumar KS. Clinical, sociodemographic profile and stressors in patients with conversion disorders: An exploratory study from southern India. Ind Psychiatry J 2020; 29(2) : 222–7.
3. Reddy LS, Patil NM, Nayak RB, Chate SS, Ansari S. Psychological Dissection of Patients Having Dissociative Disorder: A Cross-Sectional Study. Indian J Psychol Med 2018; 40(1) : 41–46.
4. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Arlington, VA: Am Psychiatr Press, Inc. 2013.
5. World Health Organization: ICD-10 Classification of Mental and Behavioral Disorders: Clinical Descriptions and Diagnostic Guidelines. Geneva:WHO 2002; 151-61.
6. Deka K, Chaudhury PK, Bora K, Kalita P. A study of clinical correlates and socio-demographic profile in conversion disorder. Indian J Psychiatry 2007; 49(3) : 205.
7. Beri D, Reddy KJ. An Overview of Conversion Disorder: Prevalence, Causes, and Treatment. Acta Sci Neurol 2020; 3(10) : 64-68.

8. Nimnuan C, Hotopf M and Wessely S. Medically unexplained symptoms: An epidemiological study across seven specialities. J Psychosom Res 2001; 51 : 361–367.
9. Snijders TJ, de Leeuw FE, Klumpers UM, Kappelle LJ, van Gijn J. Prevalence and predictors of unexplained neurological symptoms in an academic neurology outpatient clinic—an observational study. J Neurol 2004; 251(1) : 66–71.
10. Goffinet SJL, Beine A. Prevalence of dissociative symptoms in adolescent psychiatric inpatients. Eur J Trauma Dissociation 2018; 2(1) : 39–45.
11. Alvi T, Minhas FA. Type of Presentation of Dissociative Disorder and Frequency of Comorbid Depressive Disorder. JCPSP 2009; 19(2) : 113–116.
12. Choudhury S, Bhatia MS, Mallick SC. Hysteria in female hospital: Paper presented at 48th Annual National conference of Indian Psychiatr Soc 1996; 3225.
13. Shah SK. A study of clinico-demographic profile of patients with dissociative disorder. J Coll Med Sci Nepal 2012; 8(3) : 30–5.
14. Mascrenhas JJ, Krishna A, Pinto D. Clinical Patterns of Dissociative Disorder in In-Patients from Dakshina Kannada District across Two Decades: A Retrospective Study in a Tertiary Care Hospital. Int J Health Sci Res 2019; 9(8) : 60–7.
15. Ismail, Haamid, Qadri, Sabreena, Hussain, Arshad, Ismail, Nadia. Demographic and clinical characteristics of patients presenting with conversion disorder in a tertiary care hospital in north India. Int J Res Med Sci 2021; 9(2) : 535-37.
16. Kumar S, Tyagi S, Pardal PK. Co-relation of Socio-demographic Determinants with Dissociative Conversion Disorder. Int J Contemp Med Res 2020; 7(9) : 17-19.
17. Sar V. Epidemiology of Dissociative Disorders: An Overview. Epidemiol Res Int 2011; 1–8. Article ID 404538 | https://doi.org/10.1155/2011/404538
18. Datta A, Bhagabati D, Bera N, Kalita N. A Study of Socio-Demographic Variables of Patients Admitted with Dissociative Symptoms in a Tertiary Care Hospital. East J Psychiatry 2015; 18 (1) : 2-5.
19. Thapa R, Shyangwa PM. Dissociative disorders: A study of Clinico demographic Profile and associated Stressors. J Psychiatr Assoc Nepal 2014; 3(2) : 25–30.
20. Sar V, Akyuz G, Kundakci T, Kiziltan E, Dogan O. Childhood trauma, dissociation, and psychiatric comorbidity in patients with conversion disorder, Am J Psychiatry 2004; 161(12) : 2271–76.
21. Balram P. Conversion Disorder: Sociodemographic and Psychosocial correlates of patients presenting with nonepileptic events. Delhi Psychiatr J 2011; 4 : 88-91.

Psychomicrobiology

Mucormycosis: The Psychological impacts

N Ilanchezhiyan,[1] Shalini Malhotra,[2] Nirmaljit Kaur,[3] MS Bhatia,[4] S Patil,[5] P Kumar,[6] A Malhotra[7]

[1-3]Department of Microbiology, ABVIMS & Dr. RML Hospital, Delhi; [4]Department of Psychiatry, UCMS & GTB Hospital, Delhi; [5]ARMCH and Research Centre, Maharashtra; [6]CCRUM, New Delhi; [7]KIMSDU, Maharashtra

Contact: Shalini Malhotra, E-mail: drshalinimalhotra@yahoo.com

Introduction

A rare but serious fungal infection called mucormycosis, also called zygomycosis, is caused by fungus in the order Mucorales. This particular genus of moulds is frequently discovered in dirt, dead plants, and animal waste. These fungi's spores enter the body through the nose and sinuses, where they typically induce an illness that could be fatal. Lungs, eyes, the brain, and the skin are just a few of the body organs that mucormycosis can damage. The signs and symptoms can include fever, coughing, headache, facial pain, black lesions on the skin, and eyesight loss depending on where and how severe the infection is. Organ failure, sepsis, and death are just a few of the catastrophic problems that can arise from the infection's rapid progression.[1] Despite being relatively uncommon, mucormycosis has been linked to immunocompromised people, including those with uncontrolled diabetes, HIV/AIDS, organ transplants, and cancer.

According to recent research, COVID-associated mucormycosis, also known as CAM, has become more common in COVID-19 patients, particularly in those who already have pre-existing illnesses such diabetes, kidney or heart problems, and malnutrition. Unknown factors may be to blame for the rise in instances among COVID-19 patients, including the use of steroids and other immunosuppressive therapies in COVID-19 care.[2]

Mucormycosis recovery prospects are low despite early diagnosis and vigorous combination surgical and medicinal therapy. As there is virtually little morbidity connected with the treatment, mutilation and vision loss are the two main drawbacks of orbital exenteration.[3,4] But since so many patients already have irreparable blindness, survival should come first. The significance of psychosocial therapies in patients undergoing surgery for disfigurement has been evaluated in several research. Effective mental health management also shortens the length of therapy and speeds up postoperative recovery.

The initial diagnosis can be daunting, particularly for people with underlying illnesses or compromised immune systems. Stress, anxiety, and depression can result from the physical, mental, and financial strain associated with the condition's diagnosis, treatment, and long-term maintenance.[4] The affected people's psychological wellbeing may also be significantly impacted. In individuals with Mucormycosis and CAM, depression, anxiety, stress, low self-esteem, and suicidal thoughts were the most common psychiatric disorders.[5]The present work was undertaken in this context to correlate psychiatric illness and psychological impacts in patients of Mucormycosis and CAM.

Mucormycosis

Pathophysiology of Mucormycosis

Mucormycetes mould can enter a vulnerable host through the mouth, nose, or burned or damaged skin, causing infections in the gastrointestinal tract, skin, or rhino-orbito-cerebral region. Vascular thrombosis and potential tissue necrosis are also side effects of mucormycosis. According to studies, rhino cerebral mucormycosis is the most prevalent type of mucormycosis. Patients with leukaemia and uncontrolled diabetes are more likely to experience it. Rhino-cerebral Mucormycosis can sometimes develop to the central nervous system and be deadly. Lungs and sinuses could be the second-most common infection location. Over 60% of those who have lung infections die. [6-8]

In a severe case of COVID-19, a patient may experience immune system dysfunction with a

decline in lymphocyte counts and an exponential rise in inflammatory cytokines like IL-6, IL-1, IFN-, MCP-1, IP-10, IL-4, and IL-10, which can cause hyperinflammation in the lungs and, in some cases, cause death. Physicians recommended the use of immunosuppressants or steroids as a life-saving treatment in severely ill patients due to the severity of hyperinflammation or viral load. In addition to decreasing immunity and raising blood sugar levels in diabetes and non-diabetic patients, steroids also diminish lung inflammation.18 The doctors believe that immunosuppresed patients have a higher risk of developing mucormycosis or black fungus.[9-12]

The spike protein on the envelope of the severe acute respiratory syndrome coronavirus type 2 (SARSCoV-2) can attach to angiotensin converting enzyme type 2 (ACE-2) found in the pancreatic beta cells, lungs, kidney, and small intestine to allow entry. It's feasible that virus penetration into pancreatic cells will harm beta cells and cause an insulin shortage. Patients who have both hyperglycemia and ketoacidosis are more prone to mucormycosis mould infections. Treatment of Covid-19 patients with immunosuppressants puts them at high risk for developing mould infections because it creates malfunctioning phagocytes that are less able to kill intracellularly by oxidative and non-oxidative mechanisms. The pathophysiology of diabetic patients with ketoacidosis further revealed that hyperglycemia and an acidic pH (7.3-6.88) also cause higher levels of free iron in the serum, which is caused by iron release from the binding proteins. Additionally, Rhizopus arrhizus and Rhizopus oryzae, two Mucormycosis mould species, benefit from the free iron. Deferoxamine acts as an iron chelator, hence patients who receive it are also more likely to be attacked by Rhizopus species.[13-20]

According to studies, fungus siderophores have a stronger affinity for iron than deferoxamine, which enables them to readily release iron from the drug and give it to the fungus. It was also mentioned that adipose tissues from obese people release adipokines that alter glucose metabolism by producing excessive amounts of inflammatory cytokines (IL-6, IL-8, and TNF-). Reactive oxygen species (ROS) are also produced by mitochondria in obese patients' adipose tissues. Higher levels of ROS in a hyperglycemic state will result in more glycosylation and activated protein kinase C. As a result, Covid-19 patients who are obese are also more likely to contract Mucormycosis. Patients who have undergone bone marrow or solid organ transplants, have liver cirrhosis, or have neutropenia are also more likely to contract mucormycosis. Monocytes and neutrophils, which have the ability to inhibit mucormycetes mould, are less prevalent in these patients. [21-26]

Therefore, it may be concluded that a Covid patient who has less monocytes and neutrophils has a higher risk of contracting mucormycosis. Like previously mentioned, individuals with diabetic mellitus, ketoacidosis, lowered immunity, and those on immunosuppressants/corticosteroids like in the case of Covid-19 all increase the risk of developing mucormycosis mould.

Clinical features

Mucormycosis can affect different parts of the body, including the lungs, sinuses, brain, and skin. The clinical features of mucormycosis vary depending on the site of infection.

Rhino-orbito-cerebral mucormycosis (ROM) is the most common form of mucormycosis. It affects the sinuses and brain and is often seen in patients with uncontrolled diabetes or those who have undergone bone marrow transplantation. Symptoms of ROM include facial pain, swelling, fever, headache, and blurred vision. Blackening of the nasal mucosa or palate may also be seen.[27,28]

Pulmonary mucormycosis (PM) is another form of mucormycosis that affects the lungs. It is seen in patients with hematological malignancies, solid organ transplant recipients, and those on corticosteroid therapy. Symptoms of PM include fever, cough, chest pain, and shortness of breath.[27,28]

Cutaneous mucormycosis (CM) affects the skin and soft tissues. It is seen in patients with burns, trauma, or immunosuppression. Symptoms of CM include redness, swelling, and pain at the site of infection. The skin may turn black and become necrotic.[27,28]

Gastrointestinal mucormycosis (GIM) affects the gastrointestinal tract and is seen in patients with hematological malignancies or those who have undergone solid organ transplantation. Symptoms of GIM include abdominal pain, diarrhea, and gastrointestinal bleeding.[27,28]

Disseminated mucormycosis is the most severe form of mucormycosis and affects multiple organs.

It is seen in immunocompromised patients with uncontrolled diabetes, hematological malignancies, or solid organ transplantation. Symptoms of DM include fever, abdominal pain, respiratory distress, and altered mental status.[27,28]

Lab Diagnosis of Mucormycosis:

Microbiological Examination: The diagnosis of mucormycosis is often challenging due to its nonspecific symptoms and similarities to other diseases. Laboratory tests, including fungal culture and molecular diagnostic techniques, may help confirm the diagnosis.

Potassium hydroxide wet mount (KOH): It is a quick presumptive test for identifying the fungus infection. A tiny portion of the BAL or sputum from the removed tissue is maintained in 20% KOH, which dissolves the proteinaceous and other materials. By maintaining the mount at 37°C, we can hasten the dissolving process. The Mucorales hyphae show coenocytic broad aseptate/sparsely septate hyphae with right angle branching giving them a ribbon-like appearance in the KOH wet mount.[29] It's critical to distinguish the Aspergillus hyphae, which also causes rhinosinusitis and angioinvasion, from the Mucorales hyphae.

Culture: To identify the causal fungal pathogens and their antifungal susceptibility, culture is a crucial diagnostic tool. The most popular medium for growing the fungus pathogen is Sabouraud's Dextrose agar (SDA). Briefly, the received sample is divided into numerous tiny pieces, inoculated directly onto SDA and Potato dextrose agar (PDA), and then incubated at 25°C in BOD. At 25°–37°C, Mucorales grow quickly, with cottony, fluffy growth typically visible within 72 hours. Standard mycological techniques such as colony characteristics, morphological features on lactophenol cotton blue mount (LPCB), and growing at various temperatures are used to identify the causal fungal infection. The presence or lack of rhizoid, the length and branching pattern of the sporangiophore, the apophysis, the columella, the collarette, the form of the sporangium, the size and shape of the sporangiospores, and the zygospore are all morphological traits that may be seen on the LPCB mount. When reporting the cultivated fungal, caution should be used because it can be contaminated. Other supportive tests help with the diagnosis in such circumstances. The fundamental issue with the culture is its low sensitivity, as there is typically no growth in more than 50% of mucormycosis patients. This low culture positive could be caused by a number of variables, including sample collection, storage, and processing. The viability of Mucorales is impacted by sample storage at 4°C. The viability of these fungal pathogens is further impacted by the processing of tissue samples, such as grinding or homogenization. However, these problems can be easily resolved if the practitioner and the diagnostic laboratories have good communication. The primary cause of mucormycosis is *Rhizopus arrhizus (R. oryzae*). On SDA media, it grows quickly at room temperature and cottony, fluffy growth with black specks is seen, like salt paper. On the LPCB wet mount, a well-developed rhizoid with apophysis, collarette, hemispherical columella, and globose hyaline dark brown sporangium with many striated sporangiospores is seen in opposition to long, unbranched sporangiophores.[30]

Molecular techniques: These techniques are frequently employed to determine the pathogen responsible for the growth and to diagnose mucormycosis from clinical samples. To diagnose mucormycosis, a variety of molecular techniques are utilised, including semi-nested PCR, nested PCR with RFLP, real-time PCR targeting the ITS region, and specialised primers targeting a small number of mucoralean genera/species. The 18S ribosomal RNA gene is the most often targeted of them, although additional genes, including 28S rDNA, the mitochondrial gene rnl, the cytochrome b gene, and the CotH gene unique to Mucorales are also being targeted. After the targeted region has been amplified, it is sequenced to identify the fungus that is causing the problem. When traditional diagnostic tools are ineffective or the fungus load is minimal, these molecular techniques help with the diagnosis. Because molecular-based diagnostic methods cannot distinguish between the real pathogen/colonization or contamination, care should be given when interpreting their results. Only 54% (27/54) of the ROCM cases were verified by ITS2 amplification with subsequent sequencing. This indicates that amplification of various target genes may have varying outcomes for mucormycosis. In contrast, all 50 samples that underwent Mucorales-specific PCR amplified DNA were ultimately classified as Mucorales species.[33] Given that ITS 2 is found in all fungal species, this discrepancy might be the result of the amplification of every fungal component found in clinical samples. A non-specific sequence was most likely produced during amplification by generating the sequencing of every fungus found in clinical samples. The only creation of Mucorales-specific products, however, is produced by the amplification of Mucorales-specific PCR DNA. In non-sterile environments, choosing a panfungal target may lead to the identification of non-specific fungi, which is easily avoidable by choosing a specific target. Currently, qPCR using specific primers targeting the cytochrome b gene, 28S rDNA, and real-time quantitative PCR targeting the ITS1/ITS2 region with particular probes for R.

arrhizus, R. microsporus, and Mucor spp. are also being used to diagnosis the pathogenic Mucorales in fresh/ FFPE tissues.[31-33]

Histopathological analysis: Analysing the excised tissue's histopathology is crucial for identifying the fungi responsible for the tissue reactions and the tissue reactions themselves. In order to maintain the tissue's architecture, the excised tissue must be transported in a sterile container containing 10% formalin. The excised tissue is first given a physical examination, after which it is divided into several little pieces, which are then paraffin embedded through dehydration, clarifying, and infiltration. The embedded paraffin block is then divided into several 4 to 5 micrometre thick pieces and stained with hematoxylin and eosin (H&E) staining. Tissues from the suspected mucormycosis case exhibit necrosis, an inflammatory infiltration containing a high concentration of neutrophils, and fungal hyphae under a microscope. Basophilic, broad, aseptate, and with right-angle branching, the fungus hyphae develop.[34,35]

Other Stains

- *Calcofluor White (CFW) stain*: A non-specific fluorochrome dye that is frequently used to identify fungi in clinical samples. The presence of fungal components in clinical samples is made more obvious by the addition of KOH to the CFW stain.[36,37]
- *Hematoxylin and Eosin Staining*: The most used method for histopathological analysis is H & E staining. Hematoxylin and Eosin, two colours, are combined to create it. By recognising hyaline/phaeoid fungus, it illustrates the inflammatory response against fungal infections. This staining's primary flaw is its inability to pick up fungal infections in sporadic presence.
- *Periodic acid Schiff (PAS) staining*: PAS staining identifies the fungal cell wall's carbohydrate component, which is abundant in β 1–3, β 1–4 D glucan.
- *Grocott Gomori's Methenamine Silver staining (GMS) staining*: A special stain used to identify the presence of fungi in clinical samples. Given that it offers better contrast for screening, it is regarded as the best. The old and non-viable fungal organisms in tissue samples are also stained, in contrast to PAS. The fungal cell wall's carbohydrate (glucan) component, which has a dark and black appearance, is also visible with GMS staining.
- ***Serological test:*** To identify a fungal infection, galactomannan and D-glucan tests are frequently employed. With the exception of Mucormycosis and Cryptococcosis, this D-glucan test is thought of as a panfungal antigen test, whereas the Galactomannan test is specific for Aspergillosis. Due to the possibility of false positive galactomannan and D-glucan antigen results, these tests have a higher negative predictive value. Similar to this, a positive galactomannan and D-glucan test rules out the diagnosis of mucormycosis. Currently, Mucormycosis can be diagnosed by ELISA testing that targets the serum R. arrhizus, Rhizomucor-pusillus antibody, western immunoblotting targeting R. arrhhizus antigen, Cytoplasm, hyphae walls, and septate, of R. arrhizus WSSA. Recently, ELISA (ELISpot) or immunocytofluorimetric assays that target T cells that produce IFN specifically for Mucorales have been evaluated. In contrast to mice that were not infected with R. arrhizus, Kanako Sato et al. reported the presence of a distinct protein antigen, protein RSA of 23 kDa, in the serum and lung homogenates of infected mice in 2017. Being repeatedly exposed to Mucorales spores results in an antibody titre, making it difficult to diagnose Mucormycosis by a serological test. The sensitised T lymphocyte may be a crucial component of the mucormycosis diagnosis. Again, it can be difficult to tell the difference between a Mucorale colonisation and a real pathogen because these spores easily colonise non-sterile body sites.[38-44]

Other Tests

In addition to laboratory tests, imaging studies play an important role in the diagnosis of mucormycosis. Computed tomography (CT) and magnetic resonance imaging (MRI) of the affected area can provide information on the extent and severity of the infection. Imaging studies may also help to identify the location of the infection and guide the surgical intervention.[45]

Recent advances

Recent advancements in molecular biology technologies have made it possible to non-invasively diagnose mucormycosis. An 18S rRNA-based quantitative multiplex polymerase chain reaction (qPCR) targeting Mucor/Rhizopus, Lichtheimia, and Rhizomucor was developed by Million et al. This PCR technique was evaluated with the goal of detecting Mucorales DNA in the blood (serum) early in the course of the infection. 90% of patients had serum samples that the authors were able to identify as Mucorales DNA up to three days before mucormycosis was diagnosed.

Other approaches, such as immunohistochemistry, have also been investigated for the diagnosis of mucormycosis in addition to molecular approaches.

In a recent retrospective investigation, an anti-Aspergillus antibody and a commercial monoclonal antibody against R. arrhizus were used to evaluate immunohistochemistry on FFPE tissue samples. Included were 20 individuals with invasive aspergillosis and 13 patients with confirmed mucormycosis. Overall, mucormycosis has 100% sensitivity and 100% specificity.

Another Chinese study looked at the effectiveness of combining different methods to diagnose mucormycosis in FFPE tissue samples. Prior to DNA extraction, the authors used an advanced technique called LASER dissection. Three separate techniques were then applied, including (i) qPCR, (ii) fluorescence in situ hybridization with a Mucorales-specific molecular probe, and (iii) immunohistochemistry using a commercial anti-Rhizopus antibody.[46-48]

Treatment

Mucormycosis can be cured in four main ways: early diagnosis, elimination of risk factors, prompt antifungal treatment with surgical excision of all infected tissues, and adjuvant medicines. Due to the limited instruments available, early detection is suspect in 50% of instances and is only diagnosed after post-mortem. Imaging tests and nasal endoscopy can only be used to diagnose rhino-cerebral and cutaneous infections. Therefore, the patient must be investigated for mucormycosis using imaging techniques and a nasal endoscopy if a COVID-19 patient with diabetes reports headache and visual problems. In this situation, early discovery could prevent mortality because, in a later stage, the fungus could penetrate the skull and cause death. All predisposing variables must be eliminated or controlled in order to properly treat a mucormycosis illness. Since diabetes and ketoacidosis are the most common problems among Indian patients, lowering blood sugar levels and treating ketoacidosis may prevent mucorales from invading host tissues. Using sodium bicarbonate along with insulin may help to treat diabetic ketoacidosis, according to a study. Mucorales cannot invade host tissues when immunosuppressive medications, primarily steroids and deferoxamine, are used in moderation or not at all. The best course of action for mucormycosis is, if at all possible, the excision of affected tissues. But while this is simpler in some situations, such a cutaneous or rhino-cerebral infection, it is impossible to operate in many others, like lung sickness or when a virus has infected the cerebrum. An early surgical excision of the infected sinuses in rhino-cerebral mucormycosis prevents the infection from spreading to the eyes, leading to greater cure rates of 85%, according to a study. According to a study, mortality dropped from 70% to 14% when antifungal medicines were used during surgery. Amphotericin B was found to be the antifungal medication of preference in various investigations for the treatment of mucormycosis infection. To treat patients with brain infections, liposomal amphotericin B is most often used at doses ranging from 5 mg/g/day to 10 mg/kg/day due to its low toxicity and high CNS penetration.The length of Amphotericin B treatment, which was determined by the doctor based on the patient's underlying illness, is still not correctly recorded, though. According to some reports, Amphotericin B should be administered for at least three weeks, and if radiological and clinical improvements are seen, additional treatment with triazoles like posaconazole should be combined. Posaconazole has emerged as the most popular alternative to amphotericin B for the treatment of mucormycosis infection, according to studies.[49-51]

Psychiatric Disorders

Risk Factors – For Anxiety & Depression

- *Genetics:* Anxiety and Depression can be inherited from family members who have also experienced anxiety or other mental

health conditions.

- *Brain chemistry:* Imbalances in certain neurotransmitters, such as serotonin and dopamine, can lead to anxiety and Depression
- *Trauma:* Experiencing a traumatic event, such as abuse, violence, or a natural disaster, can lead to anxiety and Depression
- *Life changes:* Major life changes, such as moving, starting a new job, or going through a divorce, can cause anxiety and Depression.
- *Medical conditions:* Certain medical conditions, such as thyroid disorders or heart disease, can lead to anxiety and Depression.
- *Substance abuse:* Substance abuse can trigger anxiety, and withdrawal from drugs or alcohol can also cause anxiety and Depression.
- *Environmental factors:* Living in a stressful environment, such as a high-crime neighbourhood or a home with constant conflict, can lead to anxiety and Depression.
- *Personality traits:* People with certain personality traits, such as perfectionism or a tendency to worry excessively, may be more prone to anxiety and Depression.
- *Chronic stress:* Long-term stress can cause physical and emotional symptoms of anxiety and Depression.[52-57]

Anxiety

Anxiety is a common mental health condition that is characterized by feelings of worry, fear, and apprehension. It can be a normal response to stress or a specific situation, but when it becomes excessive and interferes with daily activities, it may be considered a clinical disorder.

Clinical features

The clinical features of anxiety can vary depending on the type of anxiety disorder, but some common symptoms include:[53,54]

- *Excessive worry or fear:* People with anxiety may have persistent and excessive worry or fear about a wide range of situations, such as social interactions, work, school, or health.
- *Physical symptoms:* Anxiety can also cause physical symptoms such as sweating, trembling, rapid heartbeat, shortness of breath, nausea, and dizziness.
- *Avoidance behavior:* People with anxiety may avoid situations or activities that trigger their symptoms, which can lead to social isolation and impairment in daily functioning.
- *Irritability:* Anxiety can also cause irritability and restlessness, making it difficult to concentrate or relax.
- *Sleep disturbances:* Anxiety can disrupt sleep patterns, causing difficulty falling or staying asleep, or waking up feeling tired and unrefreshed.
- *Panic attacks:* In some cases, anxiety can lead to panic attacks, which are sudden and intense episodes of fear or discomfort that can cause physical symptoms such as chest pain, sweating, and shaking.

Diagnosis of Anxiety disorder

Anxiety disorders are typically diagnosed through a combination of clinical interviews, self-report questionnaires, and observation of symptoms. Healthcare providers may use standardized assessments, such as the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), to guide their diagnosis.[53,54]

During a clinical interview, healthcare providers may ask about the individual's symptoms, medical history, and family history of mental illness. Self-report questionnaires may be used to assess the severity of anxiety symptoms and their impact on daily functioning.

Observation of symptoms may involve monitoring the individual's behavior, such as excessive worry or avoidance of certain situations. Physical exams and laboratory tests may also be conducted to rule out any underlying medical conditions that may be contributing to the anxiety symptoms.

Overall, the diagnosis of anxiety involves a comprehensive evaluation of the individual's symptoms and medical history to determine the most appropriate treatment plan.

Treatment

There are three types of treatment for anxiety:[54, 55]

- Psychotherapy. Cognitive behavioural

therapy and exposure response prevention are two types of therapy.

- Complementary medical practises. There are alternate approaches to cure your anxiety, such as mindfulness, yoga, and stress management techniques.
- Medication. Antidepressant and anti-anxiety medications.
  Benzodiazepines are among the medications that are frequently used to treat anxiety because they provide quick symptom relief, but their significant dependence risk makes them best avoided. Other anti-anxiety or anti-depressant drugs, like escitalopram, successfully change the chemistry of your brain to elevate mood and lessen stress.
  Selective serotonin uptake inhibitors (SSRIs), for example, are some other drugs that are frequently utilised. Common SSRIs include escitalopram, fluoxetine, and paroxetine.
- SNRIs, or selective norepinephrine reuptake inhibitors. Common SNRIs include venlafaxine and duloxetine.
- Antipsychotics. Antipsychotics like quetiapine and aripiprazole are widely used.
- Benzodiazepines. Common benzodiazepines include clonazepam and diazepam.
- Anxiolytics. A common anti-anxiety drug is buspirone.

Depression

Depression is a mental health disorder that is characterized by persistent feelings of sadness, hopelessness, and a loss of interest in activities that were once enjoyable.

Clinical features

The clinical features of depression can vary from person to person, but there are some common symptoms that are used to diagnose the condition. These include:[56,57]

- *Persistent sadness or low mood:* Individuals with depression may feel sad or low for most of the day, every day, for at least two weeks.
- *Loss of interest or pleasure in activities:* Individuals with depression may lose interest in activities they once enjoyed, such as hobbies, socializing, or sex.
- *Changes in appetite or weight:* Depression can cause changes in appetite or weight, leading to either significant weight loss or gain.
- *Sleep disturbances:* Depression can cause difficulty falling asleep, staying asleep, or waking up too early.
- *Fatigue or loss of energy:* Individuals with depression may feel tired or have low energy levels, even after getting enough sleep.
- *Feelings of worthlessness or guilt:* Individuals with depression may feel worthless or guilty, even if there is no rational reason for these feelings.
- Difficulty concentrating or making decisions: Depression can cause difficulties with concentration and decision-making, making it hard to focus on tasks.
- *Thoughts of death or suicide:* In severe cases, individuals with depression may have thoughts of death or suicide

Diagnosis of Depression

Depression is a mental health disorder characterized by feelings of sadness, hopelessness, and loss of interest in activities that were once enjoyable. The diagnosis of depression is made based on the criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) published by the American Psychiatric Association.[54,56]

Symptoms must persist for at least two weeks and include a depressed mood, loss of interest or pleasure in activities, significant weight loss or gain, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or guilt, difficulty concentrating or making decisions, and recurrent thoughts of death or suicide. These symptoms must cause significant distress or impairment in social, occupational, or other areas of functioning.

A thorough evaluation by a mental health professional is necessary to diagnose depression and rule out other medical or psychiatric conditions that may present with similar symptoms.

Treatment

Medications that are frequently used include:

- SSRIs (selective serotonin reuptake inhibitors)

- SNRIs (inhibitors of serotonin and norepinephrine reuptake)
- Antidepressants that are tricyclic and tetracyclic
- MAOIs (monoamine oxidase inhibitors) - Isocarboxazid, phenelzine, selegiline, etc[58]
- Psychotherapy
  Commonly referred to as "talk therapy,it has been demonstrated that psychotherapy is a successful treatment for reducing symptoms in patients with depression and other psychiatric diseases. Drug therapy is frequently used with psychotherapy. Psychotherapy comes in a wide variety of forms, and some people respond better to one form than another.
- CBT, or cognitive behavioural therapy
  In cognitive behavioural therapy (CBT), a therapist will look for unhealthy thought patterns and determine how they can be leading to negative behaviours, responses, and self-perceptions.
  DBT, or dialectical behaviour therapy
  Similar to cognitive behavioural therapy (CBT), dialectical behaviour therapy (DBT) emphasises acceptance rather than resistance to painful thoughts, feelings, and behaviours. According to the approach, a patient can recognise that change is possible and create a rehabilitation plan by acknowledging negative thoughts or emotions.
- Phototherapy
  White light can assist regulate your mood and lessen the effects of depression. Seasonal affective disorder, now known as major depressive disorder with seasonal pattern, is frequently treated with light treatment.
- ECT (electron convulsive treatment)
  It has been demonstrated that electroconvulsive therapy (ECT), which induces seizures using electrical currents, benefits those who suffer from clinical depression. It is prescribed to patients with severe depression or depression that is unresponsive to conventional therapies or antidepressant drugs[59]

Alternative therapies

- Meditation
- Acupuncture[59]

Association between Mucormycosis and Various Psychiatric illness:

Study 1: In a study conducted by Ahuja A, Samudra M. et al, which was a cross sectional, analytical study was performed in a tertiary care center in Western Maharashtra. The total no of cases taken for this study was 34. Majority of the study population consisted of males ($n = 24$; 70.6%), while 29.4% ($n = 10$) were females. The results revealed that a significant proportion of CAM patients reported depression (59.2%), anxiety (45.9%), low self-esteem (47%), and suicidal ideation (12.2%). The study found significant associations between depression and anxiety, self-esteem, and suicidal ideation. The researchers also found that patients who received antifungal treatment reported better psychological outcomes, including fewer symptoms of depression, anxiety, and suicidal ideation compared to those who did not receive the treatment.[60]

Study 2: Srivastava S, Beri N, Das G K, et al. published a research article on the Psychological Impact of Rhino-Orbital Mucormycosis During the Second Wave of COVID-19 Pandemic from South East Asian Country. It was a cross-sectional study using an online survey with validated questionnaires to evaluate anxiety, depression, and perceived stress. During the study period from July 2021 to September 2021, 54 patients of ROM from Guru Teg Bahadur Hospital (GTBH) were selected for the study. Thirty-four (62.95%) belonged to the male gender, and 20 (37.04%) were females. Higher frequencies of severe depression (28%), extremely severe anxiety (26%), and mild stress (17%) were noted in the study participants. Female participants reported higher levels of anxiety and perceived stress than their male counterparts. Participants who had undergone orbital decompression surgery had a significantly higher prevalence of depression and perceived stress compared to those who did not. The findings of this study suggest that ROM patients face significant psychological comorbidities, especially anxiety and depression, during the COVID-19 pandemic.[61]

Study 3: Ganiger FJ, Mugali S. et al conducted a cross-sectional study on Neuropsychiatric

manifestations in COVID-19 patients with Mucormycosis. 70 COVID-19 patients with mucormycosis were recruited in this study among which 72.9% were males and 27.1% were females. The diagnosis was made as per the International Classification of Diseases tenth revision (ICD-10). The study reported the prevalence of neuropsychiatric manifestations in the present study was 64.28%, among which 28.8% had Major depressive episodes, 40% had anxiety, 11% had substance use disorder, and 20% had delirium. 30% of Depressive episode patients had moderate suicidal intent, and 70% had mild suicidal intent The Major concern for symptoms was found to be the uncertainty of outcome, which was present in 29% of patients, followed by fear of death (25%), postoperative complications (19%), lack of knowledge (3%) and 22% of patients had multiple concerns.[62]

Psychological effects of Mucormycosis

In a study done by Rajesh K. Dase, Vyankatesh Solanke et al in MGM Medical college and Hospital Aurngabad [Maharashtra], India on 'The Quality of Life in Post- Mucormycosis Patients', most of the patients were diagnosed with mucormycosis within the 30 days of getting discharge from the hospital. The Quality of Life in Post- Mucormycosis Patients in term of Physical Health and Psychological health is most commonly affected due to surgical intervention and life-threatening diseases. Also, among these, social relationship and surrounding environment was affected and the mean domain scores were 49.62 and 58.03 respectively. The domain scores are based on *World Health Organization Quality of Life (WHOQOL) – BREF* analysis.[63]

Conclusion

Psychiatric illnesses have been found to be closely associated with Mucormycosis which is a severe fungal infection that can result in blindness, deformity, and even death. All of the aforementioned studies recommend psychiatric evaluation for all who have mucormycosis. Psychiatric evaluation should be initiated asap when there is a suspicion and patients should be educated about the nature and prognosis of their illnesses to lessen the severity and co-morbidity of neuropsychiatric conditions. After a surgical debridement or resection surgery for mucormycosis, psychiatric signs may directly accompany it. In order to ensure that patients with Mucormycosis continue to function as normal members of society, it is important to address the psychological effects of the disease, particularly after surgical treatment. Rehabilitation programmes and psychotherapy sessions should also be encouraged.

Additionally, people with psychiatric disorders may struggle to manage their health, which can result in poor cleanliness and increased exposure to environmental variables that can cause the emergence of fungal diseases like mucormycosis. They might also be more prone to put off getting medical help or have less access to it, which can make the infection worse. Therefore, it is essential that medical professionals are aware of the elevated risk of psychiatric diseases in patients with mucormycosis and take the necessary precautions for their prevention and treatment.

References

1. Gangneux JP, Lortholary O, Cornely OA, Pagano L. 9th Trends in Medical Mycology Held on 11-14 October 2019, Nice, France, Organized under the Auspices of EORTC-IDG and ECMM. J Fungi (Basel). 2019; 5(4) : 95. doi: 10.3390/jof5040095. PMID: 31597285; PMCID: PMC7807382
2. Kapur M. Why does India have so Many Cases of Post COVID Mucormycosis? Quartz India. Available from: https://qz.com/india/2012257/why-india-has-so-manycases-of mucormycosis or black fungus/. [Last acessed on 2023 May 21].
3. Patel A, Kaur H, Xess I, Michael JS, Savio J, Rudramurthy S, et al. A multi centre observational study on the epidemiology, risk factors, management and outcomes of mucormycosis in India. Clin Microbiol Infect 2020; 26 : 944.e9 15.
4. Mucormycosis. Ann Intern Med. 1980, 93:93-108. 10.7326/0003-4819-93-1-93
5. Wu T, Jia X, Shi H, Niu J, Yin X, Xie J, et al. Prevalence of mental health problems during the COVID-19 pandemic: A systematic review and meta-analysis. J Affect Disord 2021; 281 : 91–8.
6. Mohindra S, Mohindra S, Gupta R, Bakshi J, Gupta SK. Rhinocerebralmucormycosis: the

disease spectrum in 27 patients. Mycoses. 2007; 50 : 290–296. https://doi.org/ 10.1111/j.1439-0507.2007.01364.x
7. Rapidis AD. Orbitomaxillary mucormycosis (zygomycosis) and the surgical approach to treatment: perspectives from a maxillofacial surgeon. Clin Microbiol Infect 2009; 15 (Suppl. 5) : 98–102. https://doi.org/10.1111/j.1469-0691.2009.02989.x
8. Spellberg B, Edwards Jr J, Ibrahim A. Novel perspectives on mucormycosis: pathophysiology, presentation, and management. Clin Microbiol Rev 2005; 18(3) : 556–569. https://doi.org/10.1128/CMR.18.3.556-569.2005
9. Zhou Q, Chen V, Shannon CP, et al. Interferon-á2b treatment for COVID-19. Front. Immunol. 2020 May 15;11:1061. https://doi.org/10.3389/fimmu.2020.01061
10. 19 Song P, Li W, Xie J, Hou Y, You C. Cytokine storm induced by SARS-CoV-2. ClinicaChimica Acta. 2020; 509 : 280–287. https://doi.org/10.1016/j.cca.2020.06.017.
11. 20 Shang Y, Pan C, Yang X, et al. Management of critically ill patients with COVID-19 in ICU: statement from front-line intensive care experts in Wuhan, China. Ann. Intensive Care 2020; 10 : 73. https://doi.org/10.1186/S13613-020-00689-1.
12. 21 Pak J, Tucci VT, Vincent AL, Sandin RL, Greene JN. Mucormycosis in immunochallenged patients. J Emerg Trauma Shock. 2008; 1(2) : 106–113. https://doi. org/10.4103/0974-2700.42203.
13. Bourgonje AR, Abdulle AE, Timens W, et al. Angiotensin-converting enzyme 2 (ACE2), SARS-CoV-2 and the pathophysiology of coronavirus disease 2019 (COVID- 19). J Pathol 2020; 251 : 228–248. https://doi.org/10.1002/path.5471.
14. Zou X, Chen K, Zou J, Han P, Hao J, Han Z. The single-cell RNA-seq data analysis on the receptor ACE2 expression reveals the potential risk of different human organs vulnerable to Wuhan 2019-nCoV infection. Front Med 2020; 14 : 185–192. https:// doi.org/10.1007/s11684-020-0754-0.
15. Maertens J, Demuynck H, Verbeken EK, et al. Mucormycosis in allogeneic bone marrow transplant recipients: report of five cases and review of the role of iron overload in the pathogenesis. Bone Marrow Transplant 1999; 24 : 307–312. https:// doi.org/10.1038/sj.bmt.1701885.
16. Kontoyiannis DP, Wessel VC, Bodey GP, Rolston KV. Zygomycosis in the 1990s in a tertiary-care cancer center. Clin Infect Dis 2000; 30 : 851–856. https://doi.org/ 10.1086/313803.
17. Ahmadikia K, Hashemi SJ, Khodavaisy S, et al. The double-edged sword of systemic corticosteroid therapy in viral pneumonia: a case report and comparative review of influenza-associated mucormycosis versus COVID-19 associated Mucormycosis. Mycoses 2021; 1–11. https://doi.org/10.1111/myc.13256, 00.
18. Ibrahim AS, Spellberg B, Walsh TJ, Kontoyiannis DP. Pathogenesis of mucormycosis. Inflamm Res 2012; 54(S1) : S16–S22. https://doi.org/10.1093/cid/ cir865.
19. Locht MD, Boelaert JR, Schneider YJ. Iron uptake from ferrioxamine and from ferrirhizoferrin by germinating spores of Rhizopus microspores. Biochem Pharmacol 1994; 47 : 1843–1850. https://doi.org/10.1016/0006-2952(94)90314-x.
20. Boelaert JR, Locht MD, Cutsem JV, et al. Mucormycosis during deferoxamine therapy is a siderophore mediated infection: in-vitro and in-vivo animal studies. J Clin Invest 1993; 91 : 1979–1986. https://doi.org/10.1172/JCI116419.
21. Ouchi N, Parker JL, Lugus JJ, Walsh K. Adipokines in inflammation and metabolic disease. Nature Reviews Immunology 2011; 11(2) : 85–97. https://doi.org/10.1038/ nri2921.
22. Eder K, Baffy N, Falus A, Fulop AK. The major inflammatory mediator interleukin-6 and obesity. Inflamm Res 2009; 58(11) : 727–736. https://doi.org/10.1007/ s00011-009-0060-4.
23. Manna P, Jain SK. Obesity, oxidative stress, adipose tissue dysfunction, and the associated health risks: causes and therapeutic strategies. Metab Syndr Relat Disord 2015; 13(10) : 423–444. https://doi.org/10.1089/met.2015.0095.
24. Brownlee M. The pathobiology of diabetic complications: a unifying mechanism. Diabetes 2005; 54 : 1615–1625. https://doi.org/10.2337/diabetes.54.6.1615.
25. Prakash H, Chakrabarti A. Global epidemiology of mucormycosis. J Fungi 2019; 5 : 26. https://

doi.org/10.3390/jof5010026.
26. Persichino JG, Can AD, Van TT, Matthews MN, Filler SG. Invasive pulmonary mucormycosis and aspergillosis in a patient with decompensated hepatic cirrhosis. Med. Mycol. Case Rep 2018; 21 : 12–15. https://doi.org/10.1016/j.mmcr.2018.03.004.
27. Spellberg B, Edwards J Jr, Ibrahim A. Novel perspectives on mucormycosis: pathophysiology, presentation, and management. Clin Microbiol Rev 2005; 18(3) : 556-569.
28. Chakrabarti A, Singh R. Mucormycosis in India: unique features. Mycoses 2014; 57 Suppl 3 : 85-90.
29. Walsh TJ, Gamaletsou MN, McGinnis MR, Hayden RT, Kontoyiannis DP. Early clinical and laboratory diagnosis of invasive pulmonary, extrapulmonary and disseminated mucormycosis (zygomycosis) Clin Infect Dis 2012; 54 : S55–60. [PubMed] [Google Scholar]
30. de hoog GS, Guarro J, Gene× J, Figueras MJ. Eumycota, zygomycota: Explanatory Chapter and key to the genera. In:Atlas of Clinical Fungi. (2nd ed) 2000: 58–124. CentralbureauVoorSchimmelcultures, Universitat I Virgili. [Google Scholar]
31. Machouart M, Larche J, Burton K, Collomb J, Maurer P, Cintrat A, et al. Genetic identification of the×main opportunistic mucorales by PCR-restriction fragment length polymorphism. J Clin Microbiol 2006; 44 : 805–10. [PMC free article] [PubMed] [Google Scholar]
32. Springer J, Lackner M, Ensinger C, Risslegger B, Morton CO, Nachbaur D, et al. Clinical evaluation of a Mucorales-specific real-time PCR assay in tissue and serum samples. J Med Microbiol 2016; 65 : 1414–21. [PubMed] [Google Scholar]
33. Zaman K, Rudramurthy SM, Das A, Panda N, Honnavar P, Kaur H, et al. Molecular diagnosis of rhino-orbito-cerebral mucormycosis from fresh tissue samples. J Med Microbiol 2017; 66 : 1124–9. [PubMed] [Google Scholar]
34. Gamble M. The hematoxylin and eosin. In: Bancroft DJ, Gamble M, editors. Theory and Practice of Histological Techniques. 6th ed. New York: Elsevier 2008; 121–3. [Google Scholar]
35. Bartlett JH. Microorganisms. In: Bancroft DJ, Gamble M, editors. Theory and Practice of Histological Techniques. 6th ed. New York: Elsevier 2008; 320. [Google Scholar]
36. Monheit JE, Cowan DF, Moore DG. Rapid detection of fungi in tissues using calcofluor white and fluorescence microscopy. Arch Pathol Lab Med 1984; 108 : 616–8. [PubMed] [Google Scholar]
37. Gupta M, Chandra A, Prakash P, Banerjee T, Maurya OP, Tilak R. Fungal keratitis in north India;Spectrum and diagnosis by Calcofluor white stain. Indian J Med Microbiol 2015; 33 : 462–2. [PubMed] [Google Scholar]
38. Son HJ, Sung H, Park SY, Kim T, Lee HJ, Kim SM, et al. Diagnostic performance of the (1–3)-beta-D-glucan assay in patients with Pneumocystis jirovecii compared with those with candidiasis, aspergillosis, mucormycosis, and tuberculosis, and healthy volunteers. PloS One 2017; 12:e0188860. [PMC free article] [PubMed] [Google Scholar]
39. Dichtl K, Forster J, Ormanns S, Horns H, Suerbaum S, Seybold U, et al. Comparison of (1–3)-beta-D-Glucan and galactomannan in serum for detection of invasive aspergillosis: Retrospective analysis with focus on early diagnosis. J Fungi 2020; 6 : 253. [PMC free article] [PubMed] [Google Scholar]
40. Sandven PER, Eduard W. Detection and quantitation of antibodies against Rhizopus by enzyme-linked immunosorbent assay. APMIS 1992; 100 : 981–7. [PubMed] [Google Scholar]
41. Wysong DR, Waldorf AR. Electrophoretic and immunoblot analyses of Rhizopus arrhizus antigens. J Clin Microbiol 1987; 25 : 358–63. [PMC free article] [PubMed] [Google Scholar]
42. Jones KW, Kaufman L. Development and evaluation of an immunodiffusion test for diagnosis of systemic zygomycosis (mucormycosis): Preliminary report. Clin Microbiol 1978; 7 : 97–101. [PMC free article] [PubMed] [Google Scholar]
43. Potenza L, Vallerini D, Barozzi P, Riva G, Forghieri F, Zanetti E, et al. Mucorales-specific T cells emerge in the course of invasive mucormycosis and may be used as a surrogate diagnostic marker in high-risk patients. Blood 2011; 118 : 5416–9. [PubMed] [Google Scholar]

44. Sato K, Oinuma KI, Niki M, Yamagoe S, Miyazaki Y, Asai K, et al. Identification of a novel rhizopus-specific antigen by screening with a signal sequence trap and evaluation as a possible diagnostic marker of mucormycosis. Med Mycol 2017; 55 : 713–9. [PubMed] [Google Scholar]
45. Prabhakar A, Prabhakar N, Garg M, Kumar A. The Integral Role of Radiology in the Diagnosis and Management of COVID-19–Associated Mucormycosis Infections. Am J Trop Med Hyg 2022; 106(4) : 1022-1025. doi10.4269/ajtmh.21-1135
46. Liu X, Song Y, Li R. The use of combined PCR, fluorescence in situ hybridisation and immunohistochemical staining to diagnose mucormycosis from formalin-fixed paraffin-embeddedtissues. Mycoses 2021; 64 : 1460–1470.doi: 10.1111/myc.13382. [PubMed] [CrossRef] [Google Scholar]
47. Lu XL, Liu ZH, Shen YN, She XD, Lu GX, Zhan P, Fu MH, Zhang XL, Ge YP, Liu WD. Primary cutaneous zygomycosis caused by rhizomucorvariabilis: A new endemic zygomycosis? A case report and review of 6 cases reported from China. Clin. Infect Dis 2009; 49 : e39–e43. doi: 10.1086/600817. [PubMed] [CrossRef] [Google Scholar]
48. Lu XL, Najafzadeh MJ, Dolatabadi S, Ran YP, Gerrits van den Ende AH, Shen YN, Li CY, Xi LY, Hao F, Zhang QQ, et al. Taxonomy and epidemiology of Mucor irregularis, agent of chronic cutaneous mucormycosis. Persoonia 2013; 30 : 48–56. doi: 10.3767/003158513X665539. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
49. Cornely O, Arikan-Akdagli SE, Dannaoui E, Groll AH, Lagrou K, Chakrabarti A, et al. ESCMID and ECMM joint clinical guidelines for the diagnosis and management of mucormycosis 2013. Clin Microbiol Infect. 2014;20:5–26. [PubMed] [Google Scholar]
50. Gebremariam T, Gu Y, Singh S, Kitt TM, Ibrahim AS. Combination treatment of liposomal amphotericin B and isavuconazole is synergistic in treating experimental mucormycosis. J Antimicrob Chemother 2021; 76 : 2636–9. [PMC free article] [PubMed] [Google Scholar]
51. Chamilos G, Lewis RE, Kontoyiannis DP. Delaying amphotericin B-based frontline therapy significantly increases mortality among patients with hematologic malignancy who have zygomycosis. Clin Infect Dis 2008; 47 : 503–9. [PubMed] [Google Scholar]
52. Anxiety disorders [Internet]. Mayo Foundation for Medical Education and Research; 2018 [cited 2023 May 25]. Available from: https://www.mayoclinic.org/diseases-conditions/anxiety/symptoms-causes/syc-20350961
53. Anxiety disorders [Internet]. U.S. Department of Health and Human Services; [cited 2023 May 25]. Available from: https://infocenter.nimh.nih.gov/health-topics/anxiety-disorders
54. Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. (DSM-5). American Psychological Association; [cited 2023 May 25]. Available from: https://psycnet.apa.org/record/2013-14907-000
55. Bandelow B, Michaelis S, Wedekind D. Treatment of anxiety disorders. Dialogues Clin Neurosci. 2017; 19(2) : 93-107. doi: 10.31887/DCNS.2017.19.2/bbandelow. PMID: 28867934; PMCID: PMC5573566.
56. National Institute of Mental Health. Depression [Internet]. National Institute of Mental Health. 2019. Available from: https://www.nimh.nih.gov/health/topics/depression/index.shtml
57. Depression (Major Depressive Disorder) [Internet]. Mayo Clinic. Mayo Foundation for Medical Education and Research; 2022. Available from: https://www.mayoclinic.org/diseases-conditions/depression/symptoms-causes/syc-20356007
58. Swedish Council on Health Technology Assessment. Treatment of Depression: A Systematic Review [Internet]. Stockholm: Swedish Council on Health Technology Assessment (SBU); 2004 Mar. SBU Yellow Report No. 166/1+2+3. PMID: 28876724.
59. Gautam S, Jain A, Gautam M, Vahia VN, Grover S. Clinical Practice Guidelines for the management of Depression. Indian J Psychiatry. 2017; 59(Suppl 1) : S34-S50. doi: 10.4103/0019-5545.196973. PMID: 28216784; PMCID: PMC5310101.
60. Ahuja A, Samudra M, Prasad SP, Chaudhury

S, Bora S, Singh V, Dhore N. Correlates of depression, anxiety, self-esteem, and suicidal ideas in COVID-associated mucormycosis patients and the effects of treatment. Ind Psychiatr J 2021; 30(Suppl 1) : S75-S82. doi: 10.4103/0972-6748.328863. Epub 2021 Oct 22. PMID: 34908669; PMCID: PMC8611535.

61. Srivastava S, Beri N, Das GK, Sahu PK, Singh A, Sharma I. The Psychological Impact of Rhino-Orbital Mucormycosis During the Second Wave of COVID-19 Pandemic From South East Asian Country. Cureus 2023.
62. Ganiger F, Mugali J, Bijjal S, Ashitha R, Anirudh B. Neuropsychiatric manifestations in COVID-19 patients with mucormycosis presenting to tertiary care center- cross-sectional study. Kerala J Psychiatry [Internet]. 2021 Dec. 31 [cited 2023 May 25]; 34(2) : 149-54. Available from: https://kjponline.com/index.php/kjp/article/view/302
63. Dase RK, Solanke VM, Prince, Kadam R, Jadhav MS. The Quality of Life in Post-Mucormycosis Patient. Int J Innov Sci Res Tech 2022; 7(1) : 263-6.

Psychophysiotherapy

Posttraumatic Stress Disorder (PTSD) : A Psychophysiotherapeutic Approach

Jaswinder Kaur,[1] Megha Masaun,[2] Mansi Gupta,[3] M.S. Bhatia[4]
[1-3]Department of Physiotherapy, Dr. RML Hospital & ABVIMS, New Delhi
[4]Department of Psychiatry, UCMS & GTB Hospital, Delhi
Contact: Jaswinder Kaur, linktojk@yahoo.com

Posttraumatic Stress Disorder (PTSD) is a phenomenon in which a patient who experiences events of a potentially traumatic nature develops chronic symptoms that greatly impact on his social and occupational functioning. PTSD is an anxiety disorder and can be defined as a psychological response to the experience of an intense, traumatic event that is perceived as life-threatening, outside the range of usual human experience, or one that would be distressing to most people.[1,2] Individuals exposed to complex trauma, natural disasters, or different types of military trauma are at risk for post-traumatic stress disorder (PTSD).

Typical symptoms are recurrent intrusive memories (flashbacks) of the trauma as well as sleep disturbance, especially nightmares (usually of the traumatic event) from which the patient awakes in a state of anxiety, symptoms of autonomic arousal, emotional blunting and avoidance of situations which evoke memories of the trauma. Associated anxiety, depression and excessive use of alcohol or drugs frequently complicates the clinical picture[3] leading to functional impairment.[4] In addition to these psychological manifestations, individuals with PTSD exhibit higher rates of often dangerous physical health conditions such as obesity, diabetes, cardiovascular disease, and metabolic conditions.[5] Several physical and psychiatric conditions can co-occur with PTSD, such as depression,[6] anxiety, sleep disorders, chronic pain, obesity, and metabolic syndrome. There are also long-term neurological and health changes associated with PTSD,[8] such as hypothalamic–pituitary–adrenal axis dysfunction, impaired physical function, and enhanced risk of early functional aging.[9] According to the DSM-5, the diagnosis of PTSD is characterized by four broad symptom clusters that include intense reliving of the traumatic event through disruptive memories and nightmares, avoidance of reminders of the event, negative cognition and mood, and hyper arousal. The impact of PTSD is multi-faceted. In addition to the characteristic symptoms of PTSD, impaired cognitive performance and alterations in brain structure and functionare well-documented.[10,11]

Several pretrauma risk factors for PTSD have been identified in different populations. For most traumatic events, women showed greater risk for developing PTSD than men. Age, race, socio-economic, and marital status have not been strongly associated with risk for PTSD. Cognitive vulnerabilities like low IQ or previous history of head injury are associated with increased vulnerability for PTSD. Exposure to life stressors like childhood maltreatment etc prior to the index trauma has been associated with an increased risk for PTSD. A pretrauma history of mental disorders, especially mood and anxiety disorders and conduct disorder, is associated with PTSD.[12,13] Personality factors, such as neuroticism and avoidance coping, have been shown to be associated with increased risk for PTSD, while extraversion has been shown to be protective.[14] Numerous posttrauma risk factors for PTSD have been identified. Multiple studies have shown that a high heart rate (>95 bpm) at first presentation to an emergency department is a risk factor for PTSD among people with physical injury.[15] Acute high levels of pain have been linked to PTSD among patients with severe physical injury. There is a substantial body of evidence that PTSD and pain are often comorbid through mutual

maintenance. Asmundson et al suggested that pain is a reminder of the traumatic event that triggers flashbacks. PTSD symptoms, such as insomnia, reduce the threshold for pain.[16]

There is a bidirectional relationship between PTSD and poor physical health.[17] There are several rationales that physical activity may help improve PTSD symptomatically, including direct effects on depression, insomnia, cognitive dysfunction, pain, and fatigue.[18] It has also been suggested that regular physical activity can help improve brain structure and function, including regulating the hypothalamic–pituitary–adrenal axis, increasing cognition, stimulating neurogenesis, increasing neuroplasticity, and reducing inflammatory markers.[18] A review of the correlates of exercise participation among people with PTSD showed that symptom severity specially hyperarousal symptoms were associated with lower physical activity participation.[19]

Treatment

A number of treatments for PTSD exist, including psychological, pharmacological and physiotherapy management.

Pharmacological treatment. Selective serotonin receptor inhibitors (SSRI) and serotonin and nor epinephrine reuptake inhibitors are considered first-line pharmacological treatments for PTSD.[20] One systematic review found a low strength of evidence for alpha-blocking medications in treating PTSD.[21] Other agents sometimes used to augment PTSD treatment, such as the anticonvulsants and second-generation antipsychotics, are considered to have a low strength of evidence for efficacy.[21] Moreover, antipsychotics may cause side effects, including sedation and weight gain, that could be particularly problematic for patients.[22]

Psychological treatment includes various trauma-focused and non-trauma focused interventions. Trauma-focused treatments directly address memories and feelings related to the traumatic event. Few components of Psychological treatments are Exposure Therapy, Stress-Inoculation Training (SIT), Cognitive Therapy (CT), Cognitive Behavioral Therapy CBT) etc. Exposure Therapy consists of techniques designed to reduce anxiety and avoidance through confrontation with thoughts and objectively safe situations that otherwise elicit fear and avoidance. Most ET programs for PTSD combine imaginal exposure to the trauma memory with in vivo exposure to situations or other reminders of the traumatic event,[23,24] although some programs include only imaginal exposure.[25,26] Exposure are usually conducted according to a hierarchy, starting with exposure exercises that cause mild-to-moderate distress, and working up to the most difficult items. Stress-Inoculation Training (SIT)[27] focuses on training in general anxiety management techniques for three channels of fear and anxiety (i.e., physical, behavioral, and cognitive) and their application in response to PTSD symptoms thereby reducing anxiety and PTSD symptoms. Cognitive Therapy (CT) focuses on the interpretation of events rather than the events themselves as the source of emotional reactions.[28] Cognitive Behavioral Therapy (CBT) programs combine elements of psychoeducation and prolonged imaginal and in vivo exposure with SIT and CT have been found to be helpful in speeding recovery and preventing the development of chronic PTSD.

Although evidence-based psychological and pharmacological treatments are effective in treating symptoms of PTSD,[29] there are significant barriers associated with these options[30] including stigma, motivation, cost, and access to care. Psychological treatment for PTSD can be very challenging to receive for individuals who lack the financial resources, and/or easy access to a clinic or institution with trained trauma therapists to offer this specialized treatment. While exercise is not without its barriers, such as limited motivation, self-efficacy, or time, it is one intervention that is broadly accessible, low-cost, and could avoid the negative connotations associated with traditional mental health treatment approaches. The role of a Physiotherapist includes a holistic approach in management of PTSD along with prevention and treatment of pain, disorders of movement, mood changes, anxiety, depression associated with PTSD thereby increasing functionality and quality of life.

Physical Therapy treatments including various physical activities like aerobic exercises have been proved to improve various psychological illnesses including PTSD and associated anxiety and depression. These improvements are proposed to be caused by exercise-induced increase in blood circulation to the brain and by an influence on the hypothalamic-pituitary-adrenal (HPA) axis and,

thus, on the physiologic reactivity to stress.[31] This physiologic influence is probably mediated by the communication of the HPA axis with several regions of the brain, including the limbic system, which controls motivation and mood; the amygdala, which generates fear in response to stress; and the hippocampus, which plays an important part in memory formation as well as in mood and motivation.[32] There are various other hypothesis proposed for same but none of them is universally accepted. Thermogenic hypothesis[33] proposes that aerobic exercise creates an elevation in body temperature and temperature of brain stem and this produces a tranquilizing effect along with muscle tension reduction thereby producing beneficial impact on emotional states. Endorphin hypothesis is based on the observation that following vigorous exercise of one hour or more, there is an elevation of a special endogenous opiate (β, or beta, endorphin) which is said to be responsible for the "runner high" an elevation of mood following running or jogging or extended periods. Endocannabinoid hypotheis[33] suggests that cannabiniods do appear to operate both in the central nervous system and in peripheral nervous system and are reported to reduce anxiety, alter attention, and impair working memory, much like THC does. So. Although research is in the early phases, endocannabiods have been proposed as an alternative to endorphin as the possible mediator of the runners high, analgesic effect and beneficial psychological effects of exercise. The monoamine hypothesis[33] proposes that exercise results in increased brain availability of brain neurotransmitters such as serotonin, dopamine, and norepinephrine and hence result in reductions in depression and other negative emotional states.

Other hypotheses that have been proposed to explain the beneficial effects of physical activity on mental health include distraction, self-efficacy, and social interaction.[32]

Aerobic exercise has the potential to exert a positive impact on PTSD via both psychological and neurophysiological mechanisms, such as exposure and desensitization to internal arousal cues, enhanced cognitive function, exercise-induced neuroplasticity, normalization of hypothalamic pituitary axis (HPA) function, and reductions in inflammatory markers. Research suggests aerobic exercise, which improves cardio respiratory fitness, is an effective treatment for mental disorders through both physiological and psychological mechanisms, and may be comparable or superior to other common treatments, such as psychotherapy and pharmacology[33] Frida et al concluded that exercise has positive effects on secondary symptoms of PTSD, including depressive symptoms, sleep disturbances, and substance use disorder.[34] The 2007 Australian Guidelines for the Treatment of Adults with PTSD suggest that exercise may provide direct and indirect benefits in the treatment of PTSD.[35-37] This is further supported by the findings of Manger and Motta who assessed the impact of a 12-session aerobic-based program on symptoms associated with PTSD, anxiety and depression and found a significant reduction of the symptoms associated with the three conditions which was maintained at a 1-month follow up.[33]

Goals of physical therapy management for PTSD are to maintain safety of patient and others, reduce symptoms of distress, reduce hyperplasia arousal, reduce avoidance behavior, lessen the risk of relapse of symptoms address co-morbidities and improve psychosocial functioning and thereby improving quality of life. Important therapeutic exercises consist of Breathing Exercises, muscle relaxation exercises, aerobic exercises, stretching exercises, general mobility exercise and pain management by various physiotherapeutic modalities. regular exercises can contribute to positive physical health outcomes such as improved cardiovascular health, weight loss, better flexibility and mobility, reducing anxiety, depression, improving mood, better sleep thereby improving overall health and functionality. While structured group programs can be effective for individuals with serious mental illness, lifestyle changes that focus on the moderate-intensity activity throughout the day may be appropriate for most patients.

Challenges for exercising with PTSD

PTSD patients may be deterred from exercising because the resulting reactions like tachycardia, hypertension, and dyspnoea may occur that are similar to those that occur during PTSD episode. Hyperarousal occurring long after the trauma leaves patient feeling over reactive to anything that reminds them of the event (including sights, smells, sounds, or even words or lyrics) hence, PTSD patients may avoid stimulating activities, thereby increasing their risk for physical problems like obesity, heart disease,

chronic pain and diabetes. Moreover symptoms such as depression, excessive drinking, drug use and smoking — compound problems of low motivation and low energy levels, makes it more difficult to start and stay with a regular exercise program. Although exercise offers many benefits, its ability to spark hyperarousal can be problematic for people with PTSD. Physiotherapist should keep this in mind when structuring an exercise program.

Conclusion

PTSD is a common mental health problem that has a substantial impact on the individual and society. Physical therapy including aerobic exercises and physical activities has positive effects on both primary PTSD symptoms and the accompanying health conditions associated with the disorder. Significant positive effects of exercise have been reported for depressive symptoms, sleep, reduced substance abuse, and increased quality of life. Also, aerobic exercises, which improves cardio respiratory fitness, is an effective treatment for mental disorders through both physiological and psychological mechanisms, and may be comparable or superior to other common treatments, such as psychotherapy and pharmacology.

References

1. Zoellner LA, Rothbaum BO, Feeny NC. PTSD not an anxiety disorder? DSM committee proposal turns back the hands of time. Depress Anxiety 2011; 28(10) : 853-6.
2. Creamer M, Wade D, Fletcher S, Forbes D. PTSD among military personnel. Int Rev Psychiatry 2011; 23(2) : 160-5.
3. American Psychiatric Association. Diagnostics and Statistical Manual of Mental Disorders. Washington, DC: APA, 1994.
4. American Psychiatric Association. History of the Manual DSM-5. Richmond, VA: Am Psychiatr Assoc 2013; 461–462.
5. Rosenbaum S, Vancampfort D, Steel Z, Newby J, Ward PB, Stubbs, B. Physical activity in the treatment of post-traumatic stress disorder: a systematic review and meta-analysis. Psychiatr Res 2015; 230 : 130–136.
6. Breslau N, Davis GC, Andreski P, Peterson E: Traumatic events and posttraumatic stress disorder in an urban population of young adults. Arch Gen Psychiatry 1991; 48(3) : 216–22.
7. Boscarino JA: Posttraumatic stress disorder and physical illness: results from clinical and epidemiologic studies. Ann N Y Acad Sci 2004; 1032 : 141–53.
8. Jason E, Childress BS, Emily J, et al: Hippocampal volumes in patients with chronic combat-related posttraumatic stress disorder: a systematic review. J Neuropsychiatry Clin Neurosci 2013; 25(1) : 12–25.
9. Sherin JE, Nemeroff CB: Post-traumatic stress disorder: the neurobiological impact of psychological trauma. Dialogues Clin Neurosci 2011; 13(3) : 263–78.
10. Woon FL, Farrer TJ, Braman CR, Mabey JK, Hedges DW. A metaanalysis of the relationship between symptomseverity of posttraumatic stress disorder and executive function. Cogn Neuropsychiatry 2017; 22 : 1–16.
11. Miller DR, Hayes SM, Hayes JP, Spielberg JM, Lafleche G, Verfaellie M. Default mode network subsystems are differentially disrupted in posttraumatic stress disorder. Biol Psychiatry Cogn Neurosci Neuroimaging 2017; 2 : 363–71.
12. Cameron CM, Purdie DM, Kliewer EV, et al. Mental health: a cause or consequence of injury? A population-based matched cohort study. BMC Public Health 2006; 6 : 114.
13. Fauerbach JA, Lawrence J, Haythornthwaite J, et al. Preinjury psychiatric illness and postinjury adjustment in adult burn survivors. Psychosomatics 1996; 37 : 547–555.
14. Fauerbach JA, Lawrence JW, Fogel J, et al. Approach-avoidance coping conflict in a sample of burn patients at risk for posttraumatic stress disorder. Depress Anxiety 2009; 26(9) : 838–850.
15. Zatzick DF, Russo J, Pitman RK, et al. Re-evaluating the association between emergency department heart rate and the development of posttraumatic stress disorder: a public health approach. Biol Psychiatry 2005; 57 : 91–95.
16. Asmundson GJG, Coons MJ, Taylor S, et al. PTSD and the experience of pain: research and clinical implications of shared vulnerability and mutual maintenance models. Can J Psychiatry 2002; 47 : 930–937.
17. Carmassi C, Cordone A, Pedrinelli V, Dell'Osso

L. PTSD and cardiovascular disease: a bidirectional relationship. In: Govoni S, Politi P, Vanoli E, editors. Brain Heart Dynamics. New York: Springer International Publishing 2020; 355–76.
18. Hegberg NJ, Hayes JP, Hayes SM. Exercise intervention in PTSD: a narrative review and rationale for implementation. Front Psychiatry 2019; 10 : 133.
19. Vancampfort D, Richards J, Stubbs B, et al. Physical activity in peoplewith posttraumatic stress disorder: a systematic review of correlates. J Phys Act Health 2016; 13(8) : 910–8.
20. Department of Veterans Affairs, Department of Defense. VA/DOD clinical practice guideline for the management of posttraumatic stress disorder and acute stress disorder. Washington, DC: Department of Veterans Affairs, 2017.
21. Forman-Hoffman V, Jonas D, United S, et al. Psychological and pharmacological treatments for adults with posttraumatic stress disorder: a systematic review update. Comp Eff Rev 2018.
22. Reardon CL, Creado S. Psychiatric medication preferences of sports psychiatrists. Phys Sportsmed 2016; 44 : 397–402.
23. Foa EB, Dancu CV, Hembree EA, Jaycox LH, Meadows EA, Street GP. A comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. J Consult Clin Psychol 1999; 67 : 194–200.
24. Marks I, Lovell K, Noshirvani H, Livanou M, Thrasher S. Treatment of post-traumatic stress disorder by exposure and/or cognitive restructuring: A controlled study. Arch Gen Psychiatry 1998; 55 : 317-325.
25. Keane TM, Fairbank JA, Caddell JM, Zimmering RT. Implosive (flooding) therapy reduces symptoms of PTSD in Vietnam combat veterans. Behav Ther 1989; 20 : 245–260.
26. Tarrier N, Pilgrim H, Sommerfield C, et al. A randomized trial of cognitive therapy and imaginal exposure in the treatment of chronic posttraumatic stress disorder. J Consult Clin Psychol 1999; 67 : 13–18.
27. Meichenbaum D. Self instructional methods. In: Kanfer FH, Goldstein AP, eds. Helping People Change. New York, NY: Pergamon Press 1974; 357-391.'
28. Beck AT, Emery G Anxiety Disorders and Phobias: A Cognitive Perspective. New York, NY: Basic Books 1985.
29. Allison L. Mizzi1The Impact of Aerobic Exercise on Mood Symptoms in Trauma-Exposed Young Adults: A Pilot Study. Front Behav Neurosci May 2022 | Volume 16 | Article 829571.
30. Lancaster CL, Teeters JB, Gros DF, and Back SE. Posttraumatic stress disorder: overview of evidence-based assessment and treatment. J Clin Med 2016; 5 : 105.
31. Bjorkman F, Ekblom O. Physical Exercise as Treatment for PTSD: A Systematic Review and Meta-Analysis. Mil Med 2022; 187(9-10) : e1103-e1113. doi: 10.1093/milmed/usab497
32. Manger TA, Motta RW. The impact of an exercise program on posttraumatic stress disorder, anxiety, and depression. Int J Emerg Ment Health 2005; 7(1) : 49-57.
33. N Motta R. The Role of Exercise in Reducing PTSD and Negative Emotional States. Psychology of Health - Biopsychosocial Approach. Intech Open 2019.
34. Dickstein BD, Vogt DS, Handa S, Litz BT. Targeting self-stigma in returning military personnel and veterans: a review of intervention strategies. Mil Psychol 2010; 22 : 224.
35. Carek PJ, Laibstain SE, Carek SM. Exercise for the treatment of depression and anxiety. Int J Psychiatry Med 2011; 41 : 15–28. doi: 10.2190/PM. 41.1.c
36. Martinsen EW, Sandvik L, and Kolbjørnsrud OB. Aerobic exercise in the treatment of nonpsychotic mental disorders: an exploratory study. Nord J Psychiatry 1989; 43 : 521–529.
37. Australian Centre for Posttraumatic Mental Health. Australian guidelines for the treatment of adults with acute stress disorder and posttraumatic stress disorder. Melbourne, Vicoria: ACPMH 2007.

Drug Review

Minocycline in the Treatment of Major Depressive Disorder: A Review

Ayush Goel,[1] Rachna Gupta,[2] M.S. Bhatia[3]
Department of Pharmacology[1,2] & Psychiatry[3], University College of Medical Sciences & GTB Hospital, University of Delhi, New Delhi, India
Contact: Rachna Gupta, E-mail: drachnal@rediffmail.com

Introduction

Major depressive disorder (MDD) is a common, highly debilitating, recurrent mental health disorder affecting approximately 300 million people worldwide and has significant impact in terms of lack of productivity, impaired quality of life and suicidal thoughts.[1]

Approximately one-third of patients with MDD do not respond to available antidepressant drugs and 30% of patients meet the criteria for treatment-resistant depression, having no positive therapeutic response with two or more antidepressant medications[2] Treatment-resistant depression (TRD) is clinically defined as failure to achieve remission with two or more antidepressant trials with adequate dosing and duration in the subpopulation of patients with MDD.[3]

In clinical practice, treatment of TRD has become a major challenge for doctors.[4] In order to address this significant problem, research has been conducted in recent years to look for biological and clinical predictors of poor response, which may theoretically be used to tailor treatment regimens and escalate the identified patients sooner using more aggressive therapy algorithms.

Studies have shown that enhanced immune system activation is linked to the emergence of MDD and TRD among biological predictors.[5] A composite biomarker of inflammation, including Tumor Necrosis Factor, Interferon, Interleukin-1, Interleukin-6, and C-reactive protein, has been found to be higher among patients who did not respond to antidepressants compared to responders in multiple studies.[6,7]

Hence, targeting inflammation could be a promising strategy in the treatment of TRD. In recent years, on account of anti-inflammatory/immunomodulatory potential of minocycline clinical studies have evaluated the antidepressant effect of minocycline.

Minocycline

Minocycline is a second generation tetracycline antibiotic that is efficient against both gram-positive and gram-negative bacteria and has been used for 30 years as an antibiotic. There are alterations in carbons 7-9 on the D ring, similar to other semi-synthetic tetracyclines, to produce higher efficacy than earlier tetracyclines.[8]

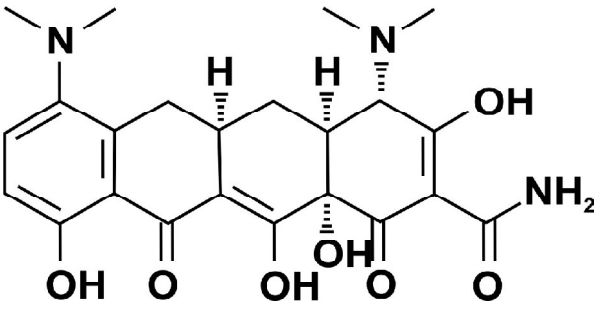


Fig. 1: Structure of minocycline

Anti-inflammatory action of Minocycline

Minocycline has good penetration into the central nervous system, which accounts for its neuroprotective ability.[9]

Minocycline has anti-inflammatory properties as it inhibits important inflammatory pathways - kynurenine (KYN) and p-38 pathways, which have an important role in the pathology of inflammation induced depression. In the KYN pathway, the indoleamine 2,3-dioxygenase, a crucial enzyme in the metabolism of the serotonin precursor trypto-

phan, is activated by inflammation followed by fall in serotonin levels and rise in the amount of neurotoxic metabolites.[10] Inflammatory activities enhance the expression and activity of the serotonin transporter through the p-38 pathway, which lowers the amount of free serotonin in the synaptic region and hence leads to depression.[11]

Additional mechanisms that may contribute to the anti-inflammatory, immunomodulatory, and neuroprotective properties of minocycline include: (1) inhibition of key immune response enzymes like inducible Nitric Oxide Synthase, matrix metalloproteinases, and secretory phospholipase A 2; (2) antiapoptotic properties via inhibition of caspase-1 and caspase-3 activation; enhancement of antiapoptotic Bcl-2 family proteins and inhibition of poly (AD-ribose)-polymerase-1.[12]

Action on microglial cells

It has been proposed that minocycline inhibits microglial activation. In the CNS the primary adaptive immune response is provided by microglia, resident macrophages in the brain. The capacity of minocycline to control immune cell activation and proliferation occurs on account of its effect on microglia. Activated microglia can impair neuroplasticity by inhibiting the proliferation of neural progenitor cells, and neurite outgrowth in cortical neurons. These effects are mitigated by minocycline due to its neuroprotective and antiapoptotic properties[8].

Minocycline also has direct effects on T cells, monocytes and macrophages, neutrophils and B cells, preventing their proliferation and reducing pro-inflammatory cascades and chemotaxis.[12]

Minocycline blocks the host innate immunity molecules Toll-like receptors-2, which are abundantly expressed on microglia and play a role in the transition of the microglia into an anti-inflammatory state.[13]

Pharmacokinetics

Minocycline, a tetracycline antibiotic is well absorbed after oral administration and widely distributed throughout most body fluids, bile, and tissues. Minocycline easily penetrates into the central nervous system. It also has the ability to deposit in fat for extended periods of time and has a volume of distribution of 0.14 to 0.7 L/kg.

Minocycline has a high protein binding capacity ranging from 55% to 96%. It undergoes hepatic metabolism to inactive metabolites and has a high bioavailability of 90% to 100%. The half-life ranges from 11 to 17 hours. The time to reach peak concentration varies depending on the form of the drug, ranging from 1 to 4 hours for capsule and pellet filled forms, 1 to 3 hours for tablets, and 3.5 to 4 hours for extended-release tablets. Minocycline is excreted primarily in urine (5% to 12% excreted unchanged) and feces (20% to 34%).[14,15]

Tolerability

Minocycline has been found to be well tolerated in clinical studies conducted for a variety of psychiatric diseases. However, there is concern about the possibility of development of antibiotic-resistant bacteria due to its long term use in patients with psychiatric disorders. Although minocycline has generally a low tendency to cause antibiotic resistance, evidence of antibiotic resistance as well as the mechanisms underlying it has been described.[16] Results from coming up long term studies might clarify this concern.

Contraindications

Hypersensitivity to tetracyclines

Clinical Trials with Minocycline (Table-1)

Six studies conducted over the years 2012 to 2022, to evaluate the effect of minocycline in treating MDD/TRD have produced mixed results, with some showing positive and others found no significant effect on symptoms.

Tsuyoshi Miyaoka et al, 2012 conducted a multicenter, open-label study with a sample size of 25 MDD patients with psychotic features aged between 20-60 years. The study found that adjunctive minocycline at a dose of 50 mg TDS for 6 weeks was effective in reducing depressive symptoms, as measured by the hamilton depression-21 (HAM-D-21) scale, with a mean reduction of 33.7 points from the baseline.[17]

Hamid Emadi-Kouchak et al. conducted a double-blind, placebo-controlled trial by recruiting 46 HIV patients from a single center with mild to moderate depression aged between 18-55 years. The study found that minocycline monotherapy at a dose of 100 mg BD for 6 weeks was effective in reducing

Table-1: Clinical trials with Minocycline

Author	Study Design	Duration	Sample Size (n)	Age Group	Mysocycline Dosing	Outcomes		Results
						Primary	Secondary	
Tsuyoshi Miyaoka, 2012	Multicenter open-label	6 weeks	25	20–60	Week 1: 50 mg BD Week 2-6: 50 mg TDS	HAM D-21, Response Rate, Number of patients who achieved > 50% reduction	BPRS, CGI	Mean (+SD) HAM D-21 was reduced to 6.7 $\pm$ 1.9 at week 6 from a base line value of 40.4 $\pm$ 2.5
Hamid Emadi-Kouchak, 2016	Parallel, randomized double-blind, placebo controlled trial	6 weeks	46	18–55	100 mg BD	HAM D-21		General linear model repeated measures showed significant effect for time x treatment interaction on the HDRS score during the trial course [F2,88) = 7.50, P = 0.001].
Olivia M Dean 2017	Parallel, randomized, double-blind, placebo-controlled trial	12 weeks	71	> 18	100 mg BD	MADRS	CGI-I, CGI-S PGI HAM-A Q-LES-Q-SF, Social & Occupational functioning	Based on mixed methods repeated measures analysis of variance at week 12, there was no significant difference in montgomery-Asberg depression Rating scale scores between groups However, there were significant differences, favouring the minocycline group at week 12 for other secondary outcomes
Muhammad I Husain, 2017	Parallel, randomized, double-blind, placebo controlled trial	12 weeks	41	18–65	Week 1-2: 100mg OD Week 3-12: 200mg OD	HAM D-21	CGI, PHQ-9, GAD-7, EQ-5D	A large decrease in HAMD scores was observed in the minocycline group compared to the placebo group (standardised effect size (ES) -121, $p < 0.001$)
Maria Antoneitta Nettis, 2021	Parallel, randomized, placebo-controlled trial	4 weeks	39	25-60	200 mg/day	HAM D-21	Inflammatory biomarkers, Beck depression Inventory, State and Trait Anxiety Inventory, clinical global Impression Scale, Snaith Hamilton Pleasure Scale, Perceived Stress Scale	Both the minocycline and placebo group showed significant improvement in HAM D-17 scores (bootstrapped t = 3.74, p = 0.008; t =
Julian Hellman-Regen, 2022	Parallel, randomized, double-blind, placebo controlled trial	6 weeks	168	18-75	100 mg BD	MADRS	Response (50% reduction in MADRS score), remission (MADRS score <9), Change on HAMD-17, Beck Depression Inventory (BDI), Clinical Global Impressions Scale (CGI-S), Trial Making Tests (TMT) A and B Symptom Checklist 90-R (SCL-90-R)	Minocycline treatment did not alter the Course of Depression severity compared with placebo as assessed by a decrease in MADRS scores over 6 weeks of treatment (1.46 [-1.04 to 3.96], P = .25)

depressive symptoms, as measured by the HAM-D-21 scale.[18]

A double-blind, multi-centric, placebo-controlled study with a sample size of 71 MDD patients over the age of 18 years by Olivia M. Dean et al described that the key outcome measure, the Montgomery-Asberg Depression Rating Scale (MADRS) scores, did not significantly differ between the two groups when minocycline was administered as an add on therapy at a dose of 100 mg BD for 12 weeks. However, for secondary outcomes such as CGI-I, CGI-S, PGI, HAM-A, Q-LES-Q-SF, social and occupational functioning, there were significant differences favoring the minocycline group.[19]

Muhammad I Husain carried out a multi-site, double-blind, placebo-controlled trial on 41 TRD patients with age group of 18 to 65 years. The results of the study showed that adjunctive minocycline at a dose of 200 mg OD for 12 weeks along with the ongoing antidepressant treatment was helpful in lowering depression symptoms as assessed by the HAM-D-21 scale, with a significant reduction in HAMD scores shown in the minocycline group compared to the placebo group.[20]

Maria Antonietta Nettis et al studied 39 TRD participants with age group of 25 and 60 years,which was a double-blind, placebo-controlled study. Minocycline was added to the ongoing treatment and given for 4 weeks at a dose of 200 mg/day. The primary outcome measure of HAM-D-17 scores did not significantly differ between the two groups.[21]

Julian Hellmann-Regen a multicenter, double-blind, placebo-controlled trial with 168 TRD patients with age group of 18 to 75 years. As determined by a decline in MADRS ratings over the course of treatment, the study discovered that adding minocycline to the ongoing treatment at a dose of 100 mg BD for 6 weeks had no effect on the severity of depression compared to placebo.[22]

Overall, there are conflicting findings regarding the effectiveness of minocycline in treating symptoms of MDD/TRD, with some studies observed beneficial effects whereas others found no appreciable effects. However, it should be considered that a small number of studies are available at present, with marked differences in inclusion and exclusion criteria and small sample sizes. These studies had patients from different ethnic and social background. Their study design and duration were not uniform. In addition, some studies used minocycline as monotherapy whereas others employed it as adjunctive therapy. The type of depression (i.e., severity, treatment resistance and presence of comorbidity) of the studies was also variable.

Conclusion

Minocycline (second generation tetracycline antibiotic) seems to be a potential drug in the treatment of MDD/TRD. It has anti-inflammatory, immunomudulatory and neuroprotective properties, and well tolerated. However, to confirm the anti-depressant actions of minocycline, long term studies with large sample size and standardized study design are required. Future research on the antidepressant effect of minocycline could involve patients with autoimmune disorders and inflammatory co-morbid conditions including diabetes, rheumatoid arthritis, cancer along with MDD.

References

1. Whiteford HA, Degenhardt L, Rehm J, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet 2013; 382 : 1575–1586.
2. Daly EJ, Singh JB, Fedgchin M, et al. Efficacy and safety of intranasal esketamine adjunctive to oral antidepressant therapy in treatment-resistant depression: a randomized clinical trial. JAMA Psychiatry 2018; 75 : 139–148.
3. Fava M. Diagnosis and definition of treatment-resistant depression. Biol Psychiatry 2003; 53(8) : 649-59.
4. Gibson TB, Jing Y, Carls GS, et al. Cost burden of treatment resistance in patients with depression. Am J Manag Care 2010; 16(5) : 370–377.
5. Nettis MA. Minocycline in Major Depressive Disorder: And overview with considerations on treatment-resistance and comparisons with other psychiatric disorders. Brain Behav Immun Health 2021; 17 : 100335.
6. Osimo EF, Baxter LJ, Lewis G, et al. Prevalence of low-grade inflammation in depression: a systematic review and meta-analysis of CRP levels. Psychol Med 2019; 49(12) : 1958–1970.
7. Osimo EF, Pillinger T, Rodriguez IM, et al.

Inflammatory markers in depression: a meta-analysis of mean differences and variability in 5,166 patients and 5,083 controls. Brain Behav Immun 2020; 87 : 901–909.
8. Garrido-Mesa N, Zarzuelo A, Galvez J: Minocycline: far beyond an antibiotic. Br J Pharmacol 2013; 169(2) : 337-52.
9. Soczynska JK, Mansur RB, Brietzke E, et al. Novel therapeutic targets in depression: minocycline as a candidate treatment. Behav Brain Res 2012; 235 (2) : 302–317.
10. Roman M, Irwin MR. Novel neuroimmunologic therapeutics in depression: a clinical perspective on what we know so far. Brain Behav Immun 2020; 83 : 7–21.
11. Miller AH, Raison CL Cytokines, p38 MAP kinase and the pathophysiology of depression. Neuropsychopharmacology 2006; 31(10) : 2089–2090.
12. Garrido-Mesa N, Zarzuelo A, Galvez J. What is behind the non-antibiotic properties of minocycline? Pharmacol Res 2013b; 67(1) : 18–30.
13. Facci L, Barbierato M, Marinelli C, et al. Toll-like receptors 2, -3 and -4 prime microglia but not astrocytes across central nervous system regions for ATP-dependent interleukin-1beta release. Sci Rep 2014; 4 : 6824.
14. Brogden RN, Speight TM, Avery GS. Minocycline: A review of its antibacterial and pharmacokinetic properties and therapeutic use. Drugs 1975; 9(4) : 251-291.
15. Zhanel GG, Homenuik K, Nichol K, et al. The glycylcyclines: a comparative review with the tetracyclines. Drugs 2004; 64(1) : 63-88.
16. Asadi A, Abdi M, Kouhsari E, et al. Minocycline, focus on mechanisms of resistance, antibacterial activity, and clinical effectiveness: back to the future. J Glob Antimicrob Resist 2020; 22 : 161–174.
17. Miyaoka T, Wake R, Furuya M, et al. Minocycline as adjunctive therapy for patients with unipolar psychotic depression: an open-label study. Prog Neuropsychopharmacol Biol Psychiatry 2012; 37(2) : 222-6.
18. Emadi-Kouchak H, Mohammadinejad P, Asadollahi-Amin A, et al. Therapeutic effects of minocycline on mild-to-moderate depression in HIV patients: a double-blind, placebo-controlled, randomized trial. Int Clin Psychopharmacol 2016; 31(1) : 20-6.
19. Dean OM, Kanchanatawan B, Ashton M, et al. Adjunctive minocycline treatment for major depressive disorder: A proof of concept trial. Aust NZ J Psychiatry. 2017; 51(8) : 829-840.
20. Husain MI, Chaudhry IB, Husain N, et al. Minocycline as an adjunct for treatment-resistant depressive symptoms: A pilot randomised placebo-controlled trial. J Psychopharmacol 2017; 31(9) : 1166-1175.
21. Nettis MA, Lombardo G, Hastings C, et al. Augmentation therapy with minocycline in treatment-resistant depression patients with low-grade peripheral inflammation: results from a double-blind randomised clinical trial. Neuropsychopharmacology 2021; 46(5) : 939-948.
22. Hellmann-Regen J, Clemens V, Grözinger M, et al. Effect of Minocycline on Depressive Symptoms in Patients With Treatment-Resistant Depression: A Randomized Clinical Trial. JAMA Netw Open 2022; 5(9) : e2230367.

Forensic Psychiatry

The Protection of Children from Sexual Offences Act, 2012 (POCSO)

Ministry of Law and Justice
(Legislative Department)
New Delhi, the 20th June, 2012/Jyaistha 30, 1934 (Saka)

The following Act of Parliament received the assent of the President on the 19th June, 2012, and is hereby published for general information:

The Protection of Children from Sexual Offences Act, 2012, [No. 32 of 2012] [19th June, 2012]

An Act to protect children from offences of sexual assault, sexual harassment and pornography and provide for establishment of Special Courts for trial of such offences and for matters connected therewith or incidental thereto.

Whereas clause (3) of article 15 of the Constitution, inter alia, empowers the State to make special provisions for children;

And Whereas, the Government of India has acceded on the 11th December, 1992 to the Convention on the Rights of the Child, adopted by the General Assembly of the United Nations, which has prescribed a set of standards to be followed by all State parties in securing the best interests of the child;

And Whereas it is necessary for the proper development of the child that his or her right to privacy and confidentiality be protected and respected by every person by all means and through all stages of a judicial process involving the child;

And Whereas it is imperative that the law operates in a manner that the best interest and well being of the child are regarded as being of paramount importance at every stage, to ensure the healthy physical, emotional, intellectual and social development of the child;

And Whereas the State parties to the Convention on the Rights of the Child are required to undertake all appropriate national, bilateral and multilateral measures to prevent—

(a) the inducement or coercion of a child to engage in any unlawful sexual activity;
(b) the exploitative use of children in prostitution or other unlawful sexual practices;
(c) the exploitative use of children in pornographic performances and materials;

And Whereas sexual exploitation and sexual abuse of children are heinous crimes and need to be effectively addressed.

Be it enacted by Parliament in the Sixty-third Year of the Republic of India as follows: —

Chapter-I
PRELIMINARY

Short title, extent and commencement

1. (1) This Act may be called the Protection of Children from Sexual Offences Act, 2012.
(2) It extends to the whole of India, except the State of Jammu and Kashmir.
(3) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.

Definitions

2. (1) In this Act, unless the context otherwise requires, —
(a) "aggravated penetrative sexual assault" has the same meaning as assigned to it in section 5;
(b) "aggravated sexual assault" has the same meaning as assigned to it in section 9;
(c) "armed forces or security forces" means armed forces of the Union or security forces or police forces, as specified in the Schedule;

(d) "child" means any person below the age of eighteen years;
(e) "domestic relationship" shall have the same meaning as assigned to it in clause
(f) of section 2 of the Protection of Women from Domestic Violence Act, 2005;
"penetrative sexual assault" has the same meaning as assigned to it in section 3;
(g) "prescribed" means prescribed by rules made under this Act;
(h) "religious institution" shall have the same meaning as assigned to it in the Religious Institutions (Prevention of Misuse) Act, 1988;
(i) "sexual assault" has the same meaning as assigned to it in section 7;
(j) "sexual harassment" has the same meaning as assigned to it in section 11;
(k) "shared household" means a household where the person charged with the offence lives or has lived at any time in a domestic relationship with the child;
(J) "Special Court" means a court designated as such under section 28;
(m) "Special Public Prosecutor" means a Public Prosecutor appointed under section 32.

(2) The words and expressions used herein and not defined but defined in the Indian Penetrative Penal Code, the Code of Criminal Procedure, 1973, the Juvenile Justice (Care and Protection of Children) Act, 2000 and the Information Technology Act, 2000 shall have the meanings respectively assigned to them in the said Codes or the Acts.

Chapter-II
SEXUAL OFFENCES AGAINST CHILDREN

A. Penetrative Sexual Assault and Punishment Therefor

3. A person is said to commit "penetrative sexual assault" if —
(a) he penetrates his penis, to any extent, into the vagina, mouth, urethra or anus of a child or makes the child to do so with him or any other person; or
(b) he inserts, to any extent, any object or a part of the body, not being the penis, into the vagina, the urethra or anus of the child or makes the child to do so with him or any other person; or
(c) he manipulates any part of the body of the child so as to cause penetration into the vagina, urethra, anus or any part of body of the child or makes the child to do so with him or any other person; or
(d) he applies his mouth to the penis, vagina, anus, urethra of the child or makes the child to do so to such person or any other person.

4. Whoever commits penetrative sexual assault shall be punished with imprisonment of either description for a term which shall not be less than seven years but which may extend to imprisonment for life, and shall also be liable to fine.

B. Aggravated Penetrative Sexual Assault and Punishment Therefor

5. (a) Whoever, beinga police officer, commits penetrative sexual assault on a child —
(i) within the limits of the police station or premises at which he is appointed; or
(ii) in the premises of any station house, whether or not situated in the police station, to which he is appointed; or
(iii) in the course of his duties or otherwise; or
(iv) where he is known as, or identified as, a police officer; or
(b) whoever being a member of the armed forces or security forces commits penetrative sexual assault on a child—
(i) within the limits of the area to which the person is deployed; or
(ii) in any areas under the command of the forces or armed forces; or
(iii) in the course of his duties or otherwise; or
(iv) where the said person is known or identified as a member of the security or armed forces; or
(c) whoever being a public servant commits penetrative sexual assault on a child; or
(d) whoever being on the management or on the staff of a jail, remand home, protection home, observation home, or other place of custody or care and protection established by or under any law for the time being in force, commits penetrative sexual assault

on a child, being inmate of such jail, remand home, protection home, observation home, or other place of custody or care and protection; or

(e) whoever being on the management or staff of a hospital, whether Government or private, commits penetrative sexual assault on a child in that hospital; or

(f) whoever being on the management or staff of an educational institution or religious institution, commits penetrative sexual assault on a child in that institution; or

(g) whoever commits gang penetrative sexual assault on a child.

Explanation — When a child is subjected to sexual assault by one or more persons of a group in furtherance of their common intention, each of such persons shall be deemed to have committed gang penetrative sexual assault within the meaning of this clause and each of such person shall be liable for that act in the same manner as if it were done by him alone; or

(h) whoever commits penetrative sexual assault on a child using deadly weapons, fire, heated substance or corrosive substance; or

(i) whoever commits penetrative sexual assault causing grievous hurt or causing bodily harm and injury or injury to the sexual organs of the child; or

(j) whoever commits penetrative sexual assault on a child, which —

(i) physically incapacitates the child or causes the child to become mentally ill as defined under clause (5) of section 2 of the Mental Health Act, 1987 or causes impairment of any kind so as to render the child unable to perform regular tasks, temporarily or permanently; or

(ii) in the case of female child, makes the child pregnant as a consequence of sexual assault;

(iii) inflicts the child with Human Immunodeficiency Virus or any other life threatening disease or infection which may either temporarily or permanently impair the child by rendering him physically incapacitated, or mentally ill to perform regular tasks; or

(k) whoever, taking advantage of a child's mental or physical disability, commits penetrative sexual assault on the child; or

(J) whoever commits penetrative sexual assault on the child more than once or repeatedly; or

(m) whoever commits penetrative sexual assault on a child below twelve years; or

(n) whoever being a relative of the child through blood or adoption or marriage or guardianship or in foster care or having a domestic relationship with a parent of the child or who is living in the same or shared household with the child, commits penetrative sexual assault on such child; or

(o) whoever being, in the ownership, or management, or staff, of any institution providing services to the child, commits penetrative sexual assault on the child; or

(p) whoever being in a position of trust or authority of a child commits penetrative sexual assault on the child in an institution or home of the child or anywhere else; or

(q) whoever commits penetrative sexual assault on a child knowing the child is pregnant, or

(r) whoever commits penetrative sexual assault on a child and attempts to murder the child; or

(s) whoever commits penetrative sexual assault on a child in the course of communal or sectarian violence; or

(t) whoever commits penetrative sexual assault on a child and who has been previously convicted of having committed any offence under this Act or any sexual offence punishable under any other law for the time being in force; or

(u) whoever commits penetrative sexual assault on a child and makes the child to strip or parade naked in public, is said to commit aggravated penetrative sexual assault.

6. Whoever, commits aggravated penetrative sexual assault, shall be punished with rigorous imprisonment for a term which shall not be less than ten years but which may extend to imprisonment for life and shall also be liable to fine.

C. Sexual Assault and Punishment therefor

7. Whoever, with sexual intent touches the vagina, penis, anus or breast of the child or makes the child touch the vagina, penis, anus or breast of such person or any other person, or does any other act with sexual intent which involves physical contact without penetration is said to commit sexual assault.
8. Whoever, commits sexual assault, shall be punished with imprisonment of either description for a term which shall not be less than three years but which may extend to five years, and shall also be liable to fine.

D. Aggravated Sexual Assault and Punishment therefor

9. (a) Whoever, being a police officer, commits sexual assault on a child —
   (i) within the limits of the police station or premises where he is appointed; or
   (ii) in the premises of any station house whether or not situated in the police station to which he is appointed; or
   (iii) in the course of his duties or otherwise; or
   (iv) where he is known as, or identified as a police officer; or
   (b) Whoever, being a member of the armed forces or security forces, commits sexual assault on a child —
   (i) within the limits of the area to which the person is deployed; or
   (ii) in any areas under the command of the security or armed forces; or
   (iii) in the course of his duties or otherwise; or
   (iv) where he is known or identified as a member of the security or armed forces; or
   (c) whoever being a public servant commits sexual assault on a child; or
   (d) whoever being on the management or on the staff of a jail, or remand home or protection home or observation home, or other place of custody or care and protection established by or under any law for the time being in force commits sexual assault on a child being inmate of such jail or remand home or protection home or observation home or other place of custody or care and protection; or
   (e) whoever being on the management or staff of a hospital, whether Government or private, commits sexual assault on a child in that hospital; or
   (f) whoever being on the management or staff of an educational institution or religious institution, commits sexual assault on a child in that institution; or
   (g) whoever commits gang sexual assault on a child.

Explanation — when a child is subjected to sexual assault by one or more persons of a group in furtherance of their common intention, each of such persons shall be deemed to have committed gang sexual assault within the meaning of this clause and each of such person shall be liable for that act in the same manner as if it were done by him alone; or

   (h) whoever commits sexual assault on a child using deadly weapons, fire, heated substance or corrosive substance; or
   (i) whoever commits sexual assault causing grievous hurt or causing bodily harm and injury or injury to the sexual organs of the child; or
   (j) whoever commits sexual assault on a child, which —
   (i) physically incapacitates the child or causes the child to become mentally ill as defined under clause (/) of section 2 of the Mental Health Act, 1987 or causes impairment of any kind so as to render the child unable to perform regular tasks, temporarily or permanently; or
   (ii) inflicts the child with Human Immunodeficiency Virus or any other life threatening disease or infection which may either temporarily or permanently impair the child by rendering him physically incapacitated, or mentally ill to perform regular tasks; or
   (k) whoever, taking advantage of a child's mental or physical disability, commits sexual assault on the child; or
   (l) whoever commits sexual assault on the child more than once or repeatedly; or
   (m) whoever commits sexual assault on a child

below twelve years; or

(n) whoever, being a relative of the child through blood or adoption or marriage or guardianship or in foster care, or having domestic relationship with a parent of the child,or who isliving in the same or shared household with the child, commits sexual assault on such child; or

(o) whoever, being in the ownership or management or staff, of any institution providing services to the child, commits sexual assault on the child in such institution; or

(p) whoever, being in a position of trust or authority of a child, commits sexual assault on the child in an institution or home of the child or anywhere else; or

(q) whoever commits sexual assault on a child knowing the child is pregnant; or

(r) whoever commits sexual assault on a child and attempts to murder the child; or

(s) whoever commits sexual assault on a child in the course of communal or sectarian violance; or

(t) whoever commits sexual assault on a child and who has been previously convicted of having committed any offence under this Act or any sexual offence punishable under any other law for the time being in force; or

(u) whoever commits sexual assault on a child and makes the child to strip or parade naked in public, is said to commit aggravated sexual assault.

10. Whoever, commits aggravated sexual assault shall be punished with imprisonment of either description for a term which shall not be less than five years but which may extend to seven years, and shall also be liable to fine.

E. Sexual Harassment and Punishment Therefor

11. A person is said to commit sexual harassment upon a child when such person with sexual intent,—

(i) utters any word or makes any sound, or makes any gesture or exhibits any object or part of body with the intention that such word or sound shall be heard, or such gesture or object or part of body shall be seen by the child; or

(ii) makes a child exhibit his body or any part of his body so as it is seen by such person or any other person; or

(iii) shows any object to a child in any form or media for pornographic purposes; or

(iv) repeatedly or constantly follows or watches or contacts a child either directly or through electronic, digital or any other means; or

(v) threatens to use, in any form of media, a real or fabricated depiction through electronic, film or digital or any other mode, of any part of the body of the child or the involvement of the child in a sexual act; or

(vi) entices a child for pornographic purposes or gives gratification therefor.

Explanation — Any question which involves "sexual intent" shall be a question of fact.

12. Whoever, commits sexual harassment upon a child shall be punished with imprisonment of either description for a term which may extend to three years and shall also be liable to fine.

Chapter-III
USING CHILD FOR PORNOGRAPHIC PURPOSES AND PUNISHMENT THEREFOR

13. Whoever, uses a child in any form of media (including programme or advertisement telecast by television channels or internet or any other electronic form or printed form, whether or not such programme or advertisement is intended for personal use or for distribution), for the purposes of sexual gratification, which includes —

(a) representation of the sexual organs of a child;

(b) usage of a child engaged in real or simulated sexual acts (with or without penetration);

(c) the indecent or obscene representation of a child, shall be guilty of the offence of using a child for pomographic purposes.

Explanation — For the purposes of this section, the expression "use a child" shall include involving a child through any medium Tike print, electronic, computer or any other technology for preparation, production, offering, transmitting, publishing, facilitation and distribution of the pornographic material.

14. (1) Whoever, uses a child or children for pornographic purposes shal] be punished with

imprisonment of either description which may extend to five years and shall also be liable to fine and in the event of second or subsequent conviction with imprisonment of either description for a term which may extend to seven years and also be liable to fine.

(2) If the person using the child for pornographic purposes commits an offence referred to in section 3, by directly participating in pornographic acts, he shall be punished with imprisonment of either description for a term which shall not be less than ten years but which may extend to imprisonment for life, and shall also be liable to fine.

(3) If the person using the child for pornographic purposes commits an offence referred to in section 5, by directly participating in pornographic acts, he shall be punished with rigorous imprisonment for life and shall also be liable to fine.

(4) If the person using the child for pornographic purposes commits an offence referred to in section 7, by directly participating in pornographic acts, he shall be punished with imprisonment of either description fora term which shall not be less than six years but which may extend to eight years, and shall also be liable to fine.

(5) If the person using the child for pomographic purposes commits an offence referred to in section 9, by directly participating in pornographic acts, he shall be punished with imprisonment of either description for a term which shall not be less than eight years but which may extend to ten years, and shall also be liable to fine.

15. Any person, who stores, for commercial purposes any pornographic material in any form involving a child shall be punished with imprisonment of either description which may extend to three years or with fine or with both.

Chapter-IV
ABETMENT OF AND ATTEMPT TO COMMIT AN OFFENCE

16. A person abets an offence, who —

First — Instigates any person to do that offence; or

Secondly — Engages with one or more other person or persons in any conspiracy for the doing of that offence, if an act or illegal omission takes place in pursuance of that conspiracy, and in order to the doing of that offence; or

Thirdly — Intentionally aids, by any act or illegal omission, the doing of that offence.

Explanation I. — A person who, by wilful misrepresentation, or by wilful concealment of a material fact, which he is bound to disclose, voluntarily causes or procures, or attempts to cause or procure a thing to be done, is said to instigate the doing of that offence

Explanation II. — Whoever, either prior to or at the time of commission of an act, does anything in order to facilitate the commission of that act, and thereby facilitates the commission thereof, is said to aid the doing of that act

Explanation III — Whoever employ, harbours, receives or transports a child, by means of threat or use of force or other forms of coercion, abduction, fraud, deception, abuse of power or of a position, vulnerability or the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of any offence under this Act, is said to aid the doing of that act.

17. Whoever abets any offence under this Act, if the act abetted is committed in consequence of the abetment, shall be punished with punishment provided for that offence.

Explanation — An act or offence is said to be committed in consequence of abetment, when it is committed in consequence of the instigation, or in pursuance of the conspiracy or with the aid, which constitutes the abetment.

18. Whoever attempts to commit any offence punishable under this Act or to cause such an offence to be committed, and in such attempt, does any act towards the commission of the offence, shall be punished with imprisonment of any description provided for the offence, for a term which may extend to one-half of the imprisonment for life or, as the case may be, one-half of the longest term of imprisonment provided for that offence or with fine or with both.

Chapter-V
PROCEDURE FOR REPORTING OF CASES

19. (1) Notwithstanding anything contained in the Code of Criminal Procedure, 1973, any person (including the child), whe has apprehension that an offence under this Act is likely to be committed or has knowledge that such an offence has been committed, he shall provide such information to, —
    (a) the Special Juvenile Police Unit; or
    (b) the local police.
    (2) Every report given under sub-section (1) shall be —
    (a) ascribed an entry number and recorded in writing;
    (b) be read over to the informant;
    (c) shall be entered in a book to be kept by the Police Unit.
    (3) Where the report under sub-section (1) is given by a child, the same shall be recorded under sub-section (2) in a simple language so that the child understands contents being recorded.
    (4) In case contents are being recorded in the language not understood by the child or wherever it is deemed necessary, a translator or an interpreter, having such qualifications, experience and on payment of such fees as may be prescribed, shall be provided to the child if he fails to understand the same.
    (5) Where the Special Juvenile Police Unit or local police is satisfied that the child against whom an offence has been committed is in need of care and protection, then, it shall, after recording the reasons in writing, make immediate arrangement to give him such care and protection (including admitting the child into shelter home or to the nearest hospital) within twenty-four hours of the report, as may be prescribed.
    (6) The Special Juvenile Police Unit or local police shall, without unnecessary delay but within a period of twenty-four hours, report the matter to the Child Welfare Committee and the Special Court or where no Special Court has been designated, to the Court of Session, including need of the child for care and protection and steps taken in this regard.
    (7) No person shall incur any liability, whether civil or criminal, for giving the information in good faith for the purpose of sub-section (1).
20. Any personnel of the media or hotel or lodge or hospital or club or studio or photographic facilities, by whatever name called, irrespective of the number of persons employed therein, shall, on coming across any material or object which is sexually exploitative of the child (including pornographic, sexually-related or making obscene representation of a child or children) through the use of any medium, shall provide such information to the Special Juvenile Police Unit, or to the local police, as the case may be.
21. (1) Any person, who fails to report the commission of an offence under sub-section (1) of section 19 or section 20 or who fails to record such offence under sub-section (2) of section 19 shall be punished with imprisonment of either description which may extend to six months or with fine or with both.
    (2) Any person, being in-charge of any company or an institution (by whatever name called) who fails to report the commission of an offence under sub-section (1) of section 19 in respect of a subordinate under his control, shall be punished with imprisonment for a term which may extend to one year and with fine.
    (3) The provisions of sub-section (1) shall not apply to a child under this Act.
22. (1) Any person, who makes false complaint or provides false information against any person, in respect of an offence committed under sections 3, 5, 7 and section 9, solely with the intention to humiliate, extort or threaten or defame him, shall be punished with imprisonment for a term which may extend to six months or with fine or with both.
    (2) Where a false complaint has been made or false information has been provided by a child, no punishment shall be imposed on such child.
    (3) Whoever, not being a child, makes a false complaint or provides false information against a child, knowing it to be false,

thereby victimising such child in any of the offences under this Act, shall be punished with imprisonment which may extend to one year or with fine or with both.

23. (1) No person shall make any report or present comments on any child from any form of media or studio or photographic facilities without having complete and authentic information, which may have the effect of lowering his reputation or infringing upon his privacy.

(2) No reports in any media shall disclose, the identity of a child including his name, address, photograph, family details, school, neighbourhood or any other particulars which may lead to disclosure of identity of the child: Provided that for reasons to be recorded in writing, the Special Court, competent to try the case under the Act, may permit such disclosure, if in its opinion such disclosure is in the interest of the child.

(3) The publisher or owner of the media or studio or photographic facilities shall be jointly and severally liable for the acts and omissions of his employee.

(4) Any person who contravenes the provisions of sub-section (1) or sub-section (2) shall be liable to be punished with imprisonment of either description for a period which shall not be less than six months but which may extend to one year or with fine or with both.

Chapter-VI
PROCEDURES FOR RECORDING STATEMENT OF THE CHILD

24. (1) The statement of the child shall be recorded at the residence of the child or at a place where he usually resides or at the place of his choice and as far as practicable by a woman police officer not below the rank of sub-inspector.

(2) The police officer while recording the statement of the child shall not be in uniform.

(3) The police officer making the investigation, shall, while examining the child, ensure that at no point of time the child come in the contact in any way with the accused.

(4) No child shall be detained in the police station in the night for any reason.

(5) The police officer shall ensure that the identity of the child is protected from the public media, unless otherwise directed by the Special Court in the interest of the child.

25. (1) If the statement of the child is being recorded under section 164 of the Code of Criminal Procedure, 1973 (herein referred to as the Code), the Magistrate recording such statement shall, notwithstanding anything contained therein, record the statement as spoken by the child:
Provided that the provisions contained in the first proviso to sub-section (1) of section 164 of the Code shall, so far it permits the presence of the advocate of the accused shall not apply in this case.

(2) The Magistrate shall provide to the child and his parents or his representative, a copy of the document specified under section 207 of the Code, upon the final report being filed by the police under section 173 of that Code.

26. (1) The Magistrate or the police officer, as the case may be, shall record the statement as spoken by the child in the presence of the parents of the child or any other person in whom the child has trust or confidence.

(2) Wherever necessary, the Magistrate or the police officer, as the case may be, may take the assistance of a translator or an interpreter, having such qualifications, experience and on payment of such fees as may be prescribed, while recording the statement of the child.

(3) The Magistrate or the police officer, as the casemay be, may, in the case of a child having a mental or physical disability, seek the assistance of a special educator or any person familiar with the manner of communication of the child or an expert in that field, having such qualifications, experience and on payment of such fees as may be prescribed, to record the statement of the child.

(4) Wherever possible, the Magistrate or the police officer, as the case may be, shall ensure that the statement of the child is also recorded by audio-video electronic means.

27. (1) The medical examination of a child in respect of whom any offence has been committed under this Act, shall, notwith-

standing that a First Information Report or complaint has not been registered for the offences under this Act, be conducted in accordance with section 164A of the Code of Criminal Procedure, 1973.

(2) In case the victim is a girl child, the medical examination shall be conducted by a woman doctor.

(3) The medical examination shall be conducted in the presence of the parent of the child or any other person in whom the child reposes trust or confidence.

(4) Where, in case the parent of the child or other person referred to in sub-section (3) cannot be present, for any reason, during the medical examination of the child, the medical examination shall be conducted in the presence of a woman nominated by the head of the medical institution.

Chapter-VII
SPECIAL COURTS

28. (1) For the purposes of providing a speedy trial, the State Government shall in consultation with the Chief Justice of the High Court, by notification in the Official Gazette, designate for each district, a Court of Session to be a Special Court to try the offences under the Act:
Provided that if a Court of Session is notified as a children's court under the Commissions for Protection of Child Rights Act, 2005 or a Special Court designated for similar purposes under any other law for the time being in force, then, such court shall be deemed to be a Special Court under this section.

(2) While trying an offence under this Act, a Special Court shall also try an offence [other than the offence referred to in sub-section (1)], with which the accused may, under the Code of Criminal Procedure, 1973, be charged at the same trial.

(3) The Special Court constituted under this Act, notwithstanding anything in the Information Technology Act, 2000, shall have jurisdiction to try offences under section 67B of that Act in so far as it relates to publication or transmission of sexually explicit material depicting children in any act, or conduct or manner or facilitates abuse of children online.

29. Where a person is prosecuted for committing or abetting or attempting to commit any offence under sections 3, 5, 7 and section 9 of this Act, the Special Court shall presume, that such person has committed or abetted or attempted to commit the offence, as the case may be unless the contrary is proved.

30. (1) In any prosecution for any offence under this Act which requires a culpable mental state on the part of the accused, the Special Court shall presume the existence of such mental state but it shall be a defence for the accused to prove the fact that he had no such mental state with respect to the act charged as an offence in that prosecution.

(2) For the purposes of this section, a fact is said to be proved only when the Special Court believes it to exist beyond reasonable doubt and not merely when its existence is established by a preponderance of probability.

Explanation — In this section, "culpable mental state" includes intention, motive, knowledge of a fact and the belief in, or reason to believe, a fact.

31. Save as otherwise provided in this Act, the provisions of the Code of Criminal Procedure, 1973 (including the provisionsas to bail and bonds) shall apply to the proceedings before a Special Court and for the purposesof the said provisions, the Special Court shall be deemed to be a Court of Sessions and the person conductinga prosecution before a Special Court, shall be deemed to be a Public Prosecutor.

32. (1) The State Government shall, by notification in the Official Gazette, appoint 4 Special Public Prosecutor for every Special Court for conducting cases only under the provisions of this Act.

(2) Aperson shall be eligible to be appointed as a Special Public Prosecutor under sub-section (1) only if he had been in practice for not less than seven years as an advocate.

(3) Every person appointed as a Special Public Prosecutor under this section shall be deemed to be a Public Prosecutor within the meaning of clause (w) of section 2 of the

Code of Criminal Procedure, 1973 and provision of that Code shall have effect accordingly.

Chapter-VIII
PROCEDURE AND POWERS OF SPECIAL COURTS AND RECORDING OF EVIDENCE

33. (1) A Special Court may take cognizance of any offence, without the accused being committed to it for trial, upon receiving a complaint of facts which constitute such offence, or upon a police report of such facts.

(2) The Special Public Prosecutor, or as the case may be, the counsel appearing for the accused shall, while recording the examination-in-chief, cross-examination or re-examination of the child, communicate the questions to be put to the child to the Special Court which shall in turn put those questions to the child.

(3) The Special Court may, if it considers necessary, permit frequent breaks for the child during the trial.

(4) The Special Court shall create a child-friendly atmosphere by allowing a family member, a guardian, a friend or a relative, in whom the child has trust or confidence, to be present in the court.

(5) The Special Court shall ensure that the child is not called repeatedly to testify in the court.

(6) The Special Court shall not permit aggressive questioning or character assassination of the child and ensure that dignity of the child is maintained at all times during the trial.

(7) The Special Court shall ensure that the identity of the child is not disclosed at any time during the course of investigation or trial:

Provided that for reasons to be recorded in writing, the Special Court may permit such disclosure, if in its opinion such disclosure is in the interest of the child.

Explanation — For the purposes of this sub-section, the identity of the child shall include the identity of the child's family, school, relatives, neighbourhood or any other information by which the identity of the child may be revealed.

(8) In appropriate cases, the Special Court may, in addition to the punishment, direct payment of such compensation as may be prescribed to the child for any physical or mental trauma caused to him or for immediate rehabilitation of such child.

(9) Subject to the provisions of this Act, a Special Court shall, for the purpose of the trial of any offence under this Act, and shall try such offence as if it were a Court of Session, and as far as may be, in accordance with the procedure specified in the Code of Criminal Procedure, 1973 for trial before a Court of Session.

34. (1) Where any offence under this Act is committed by a child, such child shall be dealt with under the provisions of the Juvenile Justice (Care and Protection of Children) Act, 2000.

(2) If any question arises in any proceeding before the Special Court whether a person is a child or not, such question shall be determined by the Special Court after satisfying itself about the age of such person and it shall record in writing its reasons for such determination.

(3) No order made by the Special Court shall be deemed to be invalid merely by any subsequent proof that the age of a person as determined by it under sub-section (2) was not the correct age of that person.

35. (1) The evidence of the child shall be recorded within a period of thirty days of the Special Court taking cognizance of the offence and reasons for delay, if any, shall be recorded by the Special Court.

(2) The Special Court shall complete the trial, as far as possible, within a period of one year from the date of taking cognizance of the offence.

36. (1) The Special Court shall ensure that the child is not exposed in any way to the accused at the time of recording of the evidence, while at the same time ensuring that the accused is in a position to hear the statement of the child and communicate with his advocate.

(2) For the purposes of sub-section (1), the Special Court may record the statement of a child through video conferencing or by

utilising single visibility mirrors or curtains or any other device.

37. The Special Court shall try cases in camera and in the presence of the parents of the child or any other person in whom the child has trust or confidence:
Provided that where the Special Court is of the opinion that the child needs to be examined at a place other than the court, it shall proceedto issue a commission in accordance with the provisions of section 284 of the Code of Criminal Procedure, 1973.
38. (1) Wherever necessary, the Court may take the assistance of a translator or interpreter having such qualifications, experience and on payment of such fees as may be prescribed, while recording the evidence of the child.
(2) If a child has a mental or physical disability, the Special Court may take the assistance of a special educator or any person familiar with the manner of communication of the child or an expert in that field, having such qualifications, experience and on payment of such fees as may be prescribed to record the evidence of the child.

Chapter-IX
MISCELLANEOUS

39. Subject to such rules as may be made in this behalf, the State Government shall prepare guidelines for use of non-governmental organisations, professionals and experts or persons having knowledge of psychology, social work, physical health, mental health and child development to be associated with the pre-trial and trial stage to assist the child.
40. Subject to the proviso to section 301 of the Code of Criminal Procedure, 1973 the family or the guardian of the child shall be entitled to the assistance of a legal counsel of their choice for any offence under this Act:
Provided that if the family or the guardian of the child are unable to afford a legal counsel, the Legal Services Authority shall provide a lawyer to them.
41. The provisions of sections 3 to 13 (both inclusive) shall not apply in case of medical examination or medical treatment of a child when such medical examination or medical treatment is undertaken with the consent of his parents or guardian.
42. Where an act or omission constitute an offence punishable under this Act and also under any other law for the time being in force, then, notwithstanding anything contained in any law for the time being in force, the offender found guiltyof such offence shall be liable to punishment only under such law or this Act as provides for punishment which is greater in degree.
43. The Central Government and every State Government, shall take all measures to ensure that —
(a) the provisions of this Act are given wide publicity through media including the television, radio and the print media at regular intervals to make the general public, children as well as their parents and guardians aware of the provisions of this Act;
(b) the officers of the Central Government and the State Governments and other concerned persons (including the police officers) are imparted periodic training on the matters relating to the implementation of the provisions of the Act.
44. (1) The National Commission for Protection of Child Rights constituted under section 3, or as the case may be, the State Commission for Protection of Child Rights constituted under section 17, of the Commissions for Protection of Child Rights Act, 2005, shall, in addition to the functions assigned to them under that Act, also monitor the implementation of the provisions of this Act in such manner as may be prescribed.
(2) The National Commission or, as the case may be, the State Commission, referred to in sub-section (1), shall, while inquiring into any matter relating to any offence under this: Act, have the same powers as are vested in it under the Commissions for Protection of Child Rights Act, 2005.
(3) The National Commission or, as the case may be, the State Commission, referred to in sub-section (1), shall, also include, its activities under this section, in the annual report referred to in section 16 of the Commissions for Protection of Child Rights

Act, 2005.

45. (1) The Central Government may, by notification in the Official Gazette, make rules for carrying out the purposes of this Act.

(2) In particular, and without prejudice to the generality of the foregoing powers, such rules may provide for all or any of the following matters, namely:—

(a) the qualifications and experience of, and the fees payable to, a translator or an interpreter, a special educator or any person familiar with the manner of communication of the child or an expert in that field, under sub-section (4) of section 19; sub-sections (2) and (3) of section 26 and section 38;

(b) care and protection and emergency medical treatment of the child under sub-section (5) of section 19;

(c) the payment of compensation under sub-section (8) of section 33;

(d) the manner of periodic monitoring of the provisions of the Act under sub-section (1) of section 44.

(3) Every rule made under this section shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or both Houses agree that the rule should not be made, the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule.

46. (1) If any difficulty arises in giving effect to the provisions of this Act, the Central Government may, by order published in the Official Gazette, make such provisions not inconsistent with the provisions of this Act as may appear to it to be necessary or expedient for removal of the difficulty:
Provided that no order shall be made under this section after the expiry of the period of two years from the commencement of this Act.

(2) Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament.

THE PROTECTION OF CHILDREN FROM SEXUAL OFFENCES (AMENDMENT) ACT, 2019

No. 25 of 2019

[5th August, 2019]

An Act further to amend the Protection of Children from Sexual Offences Act, 2012

Be it enacted by Parliament in the Seventieth Year of the Republic of India as follows:

1. (1) This Act may be called the Protection of Children from Sexual Offences (Amendment) Act, 2019.

(2) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.

2. In the Protection of Children from Sexual Offences Act, 2012 (hereinafter referred to as the principal Act), in section 2,—

(a) in sub-section (1), after clause (d), the following clause shall be inserted, namely:

(da) "child pornography" means any visual depiction of sexually explicit conduct involving a child which include photograph, video, digital or computer generated image indistinguishable from an actual child, and image created, adapted, or modified, but appear to depict a child;

(b) in sub-section (2), for the words, brackets and figures "the Juvenile Justice (Care and Protection of Children) Act, 2000", the words, brackets and figures "the Juvenile Justice (Care and Protection of Children) Act, 2015" shall be substituted.

3. In the principal Act, section 4 shall be renumbered as section 4(1) thereof and —
   (a) in sub-section (1) as so renumbered, for the words "seven years", the words "ten years" shall be substituted;
   (b) after sub-section (1), the following sub-sections shall be inserted, namely:—
   "(2) Whoever commits penetrative sexual assault on a child below sixteen years of age shall be punished with imprisonment for a term which shall not be less than twenty years, but which may extend to imprisonment for life, which shall mean imprisonment for the remainder of natural life of that person, and shall also be liable to fine.
   (3) The fine imposed under sub-section (1) shall be just and reasonable and paid to the victim to meet the medical expenses and rehabilitation of such victim."
4. In section 5 of the principal Act, —
   (1) in clause (j), —
   (A) in sub-clause (i), the word "or" occurring at the end shall be omitted;
   (B) in sub-clause (iii), the word "or" occurring at the end shall be omitted;
   (C) after sub-clause (iii), the following sub-clause shall be inserted, namely:—
   "(iv) causes death of the child; or";
   (II) in clause (s), for the words "communal or sectarian violence", the words "communal or sectarian violence or during any natural calamity or in similar situations" shall be substituted.
5. For section 6 of the principal Act, the following section shall be substituted, namely:—
   6. (1) Whoever commits aggravated penetrative sexual assault shall be punished with rigorous imprisonment for a term which shall not be less than twenty years, but which may extend to imprisonment for life, which shall mean imprisonment for the remainder of natural life of that person, and shall also be liable to fine, or with death.
   (2) The fine imposed under sub-section (1) shall be just and reasonable and paid to the victim to meet the medical expenses and rehabili-tation of such victim."
6. In section 9 of the principal Act,—
   (i) in clause (s), for the words "communal or sectarian violance", the words "communal or sectarian violence or during any natural calamity or in any similar situations" shall be substituted;
   (ii) after clause (u), the following clause shall be inserted, namely:—
   "(v) whoever persuades, induces, entices or coerces a child to get administered or administers or direct anyone to administer, help in getting administered any drug or hormone or any chemical substance, to a child with the intent that such child attains early sexual maturity;".
7. For section 14 of the principal Act, the following section shall be substituted, namely:—
   "14. (1) Whoever uses a child or children for pornographic purposes shall be punished with imprisonment for a term which shall not be less than five years and shall also be liable to fine, and in the event of second or subsequent conviction with imprisonment for a term which shall not be less than seven years and also be liable to fine.
   (2) Whoever using a child or children for pornographic purposes under sub-section (1), commits an offence referred to in section 3 or section 5 or section 7 or section 9 by directly participating in such pornographic acts, shall be punished for the said offences also under section 4, section 6, section 8 and section 10, respectively, in addition to the punishment provided in sub-section (1)."
8. For section 15 of the principal Act, the following section shall be substituted, namely:—
   "15. (1) Any person, who stores or possesses pornographic material in any form involving a child, but fails to delete or destroy or report the same to the designated authority, as may be prescribed, with an intention to share or transmit child pornography, shall be liable to fine not less than five thousand rupees, and in the event of second or subsequent offence, with fine which shall not be less than ten thousand rupees.
   (2) Any person, who stores or possesses pornographic material in any form involving a child for transmitting or propagating or displaying or distributing in any manner at any time except for the purpose of reporting, as may be prescribed, or for use as evidence in court, shall

be punished with imprisonment of either description which may extend to three years, or with fine, or with both.

(3) Any person, who stores or possesses pornographic material in any form involving a child for commercial purpose shall be punished on the first conviction with imprisonment of either description which shall not be less than three years which may extend to five years, or with fine, or with both, and in the event of second or subsequent conviction, with imprisonment of either description which shall not be less than five years which may extend to seven years and shall also be liable to fine."

9. In section 34 of the principal Act, for the words, brackets and figures "the Juvenile Justice (Care and Protection of Children) Act, 2000", the words, brackets and figures "the Juvenile Justice (Care and Protection of Children) Act, 2015" shall be substituted.

10. In section 42 of the principal Act, for the figures, letter and words "376E or section 509 of the Indian Penal Code", the figures, letters and words "376E, section 509 of the Indian Penal Code or section 67B of the Information Technology Act, 2000" shall be substituted.

11. In section 45 of the principal Act, in sub-section (2), clause (a) shall be re-lettered as clause (ab) thereof and before clause (ab) as so re-lettered, the following clauses shall be inserted, namely:—

"(a) the manner of deleting or destroying or reporting about pornographic material in any form involving a child to the designated authority under sub-section (1) of section 15;

(aa) the manner of reporting about pornographic material in any form involving a child under sub-section (2) of section 15".

Case Report

The dynamics between corticosteroids and antipsychotics in a patient with mesangioproliferative glomerulonephritis - A case report

Gauri Gupta, Poonam Bharti, Aman Bharti, Tanu K. Singh
Department of Psychiatry, Maharishi Markandeshwar Institute of Medical Sciences and Research (MMDU), Mullana, Ambala, Haryana, India
Contact: Gauri Gupta, E-mail: gauri404f@gmail.com

Introduction

Corticosteroids are very commonly prescribed among both hospitalized and outpatient medical and surgical patients. While many common endocrine and pathological side effects of corticosteroids are well understood. The incidence, presentation, and treatment of neuropsychiatric manifestations have not been commonly characterized and studied. Most practitioners are familiar with the term of 'steroid induced psychosis' but the course of the affective and behavioral symptoms can vary from patient to patient.[1]

We present a case of corticosteroid induced psychosis, a challenge in maintaining the equilibrium between the mainstay of treatment for the patient with corticosteroids and antipsychotics.

Case report

We report a case of a 55 year old woman who was under treatment from the nephrology department at MMIMSR, Mulana, Ambala. She was on treatment for mesangioproliferative glomerulonephritis for approximately 2–3 years and prescribed prednisolone. The patient had a past history of admission under nephrology department for deterioration of symptoms and kidney function tests. Then an increase in the dose of prednisolone from 40 mg/day to 80 mg/day resulted in increase in the psychosis for the patient.

She was referred to the psychiatry OPD for suspiciousness towards her family members, sleep disturbances. Delusion of reference, persecution was present as active psychopathology. She was admitted under psychiatry department and given risperidone 1 mg/day with symptomatic management for sleep disturbances. Diagnosis of substance/medication induced psychotic disorder was made considering DSM-V. The dose of risperidone was increased from 1mg/day to 3 mg/day. Furthermore, the nephrology team advised against any further dose titration and prednisolone was resumed at 40 mg/day.

Conclusion

Corticosteroid induced psychiatric symptoms are not uncommon in clinical practice. Only a handful of detailed evaluation studies are present on the topic of neuropsychiatric manifestations of corticosteroids.

However, careful monitoring of psychotic symptoms and the co-existing medical condition should be done to prevent further exacerbations. Consultation liason with the departments involved is necessary for the maintainance of equilibrium between corticosteroids and antipsychotics.

The patient was maintained well at risperidone 3 mg/day with prednisolone at 40 mg/day. Close monitoring of the patient and evaluation of psychotic symptoms was done on follow ups.

Discussion

Corticosteroids are used to manage a host of medical conditions and prescribed because of their ability to suppress inflammatory processes and the immune system such as inflammatory diseases like

asthma and rheumatoid arthritis and their immunosuppressive effect is used in autoimmune diseases like SLE and organ transplant.[2]

Clinical benefit can be derived from these agents, it's also important for clinicians to be cognizant of associated adverse effects-increased risk of infection, leukocytosis, hyperglycemia, psychiatric manifestations such as steroid-induced psychosis.[3]

Manic episodes constitute the most common manifestations of corticosteroid-induced neuropsychiatric disorder, accounting for about half of all referrals. Psychotic symptoms are prominent among those with mania, in 30% to 40% patients. Literature suggests that patients diagnosed with steroid-induced mania are likely to demonstrate psychotic features than patients with nonsubstance induced mania. Persecutory delusions, auditory hallucinations, disorganized behaviors are prevalent psychotic symptoms.[4]

References

1. Gable M, Depry D. Sustained corticosteroid-induced mania and psychosis despite cessation: A case study and brief literature review. Int J Psychiatr Med 2015; 50(4) : 398–404.
2. Czock D, Keller F, Rasche FM, Häussler U. Pharmacokinetics and pharmacodynamics of systemically administered glucocorticoids. Clin Pharmacokinet 2005; 44 : 61–98.doi:10.2165/00003088-200544010-00003.
3. Liu D, Ahmet A, Ward L, et al. A practical guide to the monitoring and management of the complications of systemic corticosteroid therapy. Allergy Asthma Clin Immunol 2013; 9 : 30. doi:10.1186/1710-1492-9-30.
4. Judd LL, Schettler PJ, Brown ES, et al. Adverse consequences of glucocorticoid medication: psychological, cognitive, and behavioral effects. Am J Psychiatry 2014; 171 : 1045–1051.

Case Report

An unusual presentation: Paranoid Schizophrenia with Anorexic Symptoms in a female patient

Tushar Jagawat, Priyanka Bhardwaj, Ritu Meena, Pankaj Tandon, Savita Jagawat, Yashika Gupta

Department of psychiatry and clinical psychology, NIMS Medical College Hospital, Jaipur

Contact: Yashika Gupta, Email: yg000055@gmail.com

Introduction

Schizophrenia and anorexia nervosa are two distinct psychiatric disorders commonly observed in psychiatric OPD across the globe.[1] Their co-morbidities are relatively infrequent with only a few published case reports. Paranoid schizophrenia is a subtype of schizophrenia characterised by prominent delusions of persecution and auditory hallucination. Anorexia nervosa is an eating disorder characterised by an intense fear of gaining weight, a distorted body image and severe restriction of food intake leading to significant weight loss.[2]

In this case report, we present the details of a 29-year-old female diagnosed with paranoid schizophrenia who exhibited anorexic features. The purpose of this report is to contribute to the existing literature on the topic and facilitate a discussion surrounding the unique presentation.

Case Report

The patient was a 29-year-old female Ms. X divorced from middle socioeconomic status who was brought for psychiatric evaluation by her parents with complaints of suspiciousness, disturbed sleep, aggressive behavior, irritability, hearing voices, and refusal to eat. The first symptom, the mother noticed was almost 8 years back when she became extremely suspicious about the family members talking very little to them. Her mother noticed social withdrawal. When prevented from leaving home she often became aggressive and destroyed household property. She used to attack her family members with chili powder in her pockets. She used to throw phones in water, cut clothes, and break glass utensils from the kitchen. At other times she would withdraw to her room, and would not talk to anyone. Her personal hygiene and care also deteriorated. Later on, she started hearing voices and seeing Goddess Kali who would tell her that everything would be alright. Initially, she got fearful but then she thought it was a result of her extreme worship and prayers. She used to hate her family members and would behave inappropriately by slapping her mother, and relatives at times. The emergence of anorexic symptoms occurred later in the course of the illness. She used to stop eating when she felt that she is gaining weight. She used to keep seeing her reflection in a mirror to notice whether she is putting on weight. Her diet was very restricted as she used to eat low-calorie food. She used to exercise for about half an hour including yoga apart from walking, so that she does not put on weight. No episodes of binge eating were reported. She used to just taste the food cooked by her mother with 1-2 bites and did not have proper meals. At times she threw the food away stating that she was not hungry.

During the physical examination, the patient's thin-built physique was observed accompanied by normal vital signs. Her secondary sexual characteristics well developed. In terms of mental status examination she initially displayed guarded behaviour and primarily exhibited irritability. The patient exhibited preoccupations with auditory hallucinations indicating the presence of voices in her head.

Notably, she had an idea of being overweight despite being overtly thin appearance. She adamantly denied having any psychiatric illness and vehemently rejected any suggestions regarding her underweight status. Her BMI was 16 with a height of 165cm and weight of 43.5 kg which highlights the seriousness of anorexic symptoms. Blood investigations yielded normal results. The history and mental status examination observed supplemented the diagnosis of paranoid schizophrenia with anorexic symptoms. Delusion of persecution was evident in addition to auditory and visual hallucinations. Family history is suggestive of psychiatric illness in her uncle's sons and her aunt. Clinical features of anorexic symptoms with paranoid schizophrenia are rare. In the current case, anorexic symptoms occurred later after the onset of schizophrenia. All the biochemical parameters were normal.it is crucial to closely monitor the patient's physical health and nutritional status due to the severe malnutrition associated with anorexia nervosa.

Discussion

To the best of our knowledge and belief, there is a scarcity of case reports documenting the co-occurrence of paranoid schizophrenia with anorexic symptoms in Indian literature. In the above-described case, the patient initially exhibited symptoms such as suspiciousness, hallucinatory behavior, and aggression followed by the development of anorexic features.

The literature review indicates that there are intricate connections between psychotic disorders and eating disorders. There are differing perspectives regarding the relationship between these two sets of disorders. Some researchers argue that eating disorders and psychosis are separate disorders that can mutually influence each other. Conversely, others suggest that both disorders are different expressions of a shared underlying illness process. In addition to these perspectives, Lyon and Silber proposed an interesting hypothesis in 1989.[5] They suggested that anorexia and schizophrenia exist on a continuum with schizophrenia at one end and neurosis and personality disorders at the opposite end. This hypothesis implies that there may be overlapping features or shared vulnerabilities between anorexia and schizophrenia while also acknowledging distinctions between the two disorders.

The dysfunction of the salience network region of the brain in schizophrenia and eating disorders suggests potential commonalities in their underlying neurobiology.[3] Preliminary evidence suggests that there are similarities' in a dopaminergic pathway abnormalities between individuals with eating disorders and patients with schizophrenia.[4] Both conditions involve dysregulation in the dopaminergic system which is responsible for various aspects of brain function. The specific nature and extent of these abnormalities may differ between these two disorders. Further research is needed to explore these implications for intervention strategies.

References

1. Cri'an C, Androne B, Barbulescu LD, Suciu BD. Nexus of delusions and overvalued ideas: A case of comorbid schizophrenia and anorexia in the view of the new ICD-11 classification system. Am J Case Rep 2021; 23 : e933759. doi: 10.12659/AJCR.933759.
2. Brodrick BB, Jacobs MA, McAdams CJ. Psychosis in anorexia nervosa: A case report and review of the literature. Psychosomatics 2020; 61(2) : 181–7.
3. Imran N, Rumesa F, Jamil F. Comorbid schizophrenia and anorexia nervosa in an adolescent male. Pakistan J Med Sci 2018; 34(5).
4. Kethawath S, Bheemireddy R, Pingali S, Molanguri U. Early-onset anorexia nervosa with psychotic symptoms: A case report. Indian J Psychiatry 2021; 63(4) : 403.

Book Review

Deewasanjali

By Dr. Tushar Jagawat "Saadgi"
Contact: tusharjagawat@yahoo.com

"Deewasanjali" is a novel, unique attempt by a renowned Psychiatrist with a vast experience in the field of Mental health and De-Addiction. In this Compiled Hindi poetry book he has discussed a wide range of medical, mental health, and various socio-cultural issues through the Lens of poetry. This book provides an insight into the persona of the poet and tells us about his simplicity which is evident in his simple understanding language and easy compositions. However, despite being simple, his powerful grasp on the wide range of national and international issues of public interest ranging from medical, mental health, addiction, socio-cultural topics is quite evident in this exceptional work.

"Deewasanjali" is a collection of about 150 Hindi poems on various International and national days of general public interest which includes medical and other social issues. The poems are written in monthly, date wise topics, in which public Awareness has been given the utmost importance. Each poem begins with a brief introduction of the issues, reasons for problem, impact on self and society, Prevention and solutions in organized order. The poems provide a introspection and insight into the sensitive and burning issues for the society and motivate the readers to understand the gravity of global issues and importance of the various DAY'S.

Overall the poetry book makes an interesting read and is recommended for a wide ranging audience. It will make its reader feel happy, motivated, Learning, and rejuvenated. In the stressful and polluted environment, role of each citizen has explained by simple, feasible manner and book works as a guide to positive health and active contributions in the green and clean, healthy and happy society.

The book was recently released at a function on the occasion of Doctors' Day by Jaipur Medical Association.

M.S. Bhatia[1]
Aparna Goyal[2]
Department of Psychiatry,
[1]UCMS & GTB Hospital and [2]IHBAS, Delhi-110095

Forthcoming Events

Please link to following websites:

- https://conference-service.com/conferences/psychiatry.html
- https://waset.org/psychiatry-conferences
- https://psychiatry.psychiatryconferences.com/
- https://www.rcpsych.ac.uk/events
- https://allconferencealert.net/topics/psychiatry.php
- https://www.mdlinx.com/psychiatry/conference.cfm

Interesting Articles

- Hoppen T, Lindemann A, Morina N. Safety of psychological interventions for adult post-traumatic stress disorder: Meta-analysis on the incidence and relative risk of deterioration, adverse events and serious adverse events. The British Journal of Psychiatry 2022; 221(5) : 658-667. doi:10.1192/bjp.2022.111
- Watson A, Harrison L, Preti A, Wykes T, Cella M. Cognitive trajectories following onset of psychosis: A meta-analysis. The British Journal of Psychiatry 2022; 221(6) : 714-721. doi:10.1192/bjp.2022.131
- Maguire A, Kent L, O'Neill S, O'Hagan D, O'Reilly D. Impact of the COVID-19 pandemic on psychotropic medication uptake: Time-series analysis of a population-wide cohort. The British Journal of Psychiatry 2022; 221(6) : 748-757. doi:10.1192/bjp.2022.112
- Paljärvi T, Tiihonen J, Lähteenvuo M, Tanskanen A, Fazel S, Taipale H. Mortality in psychotic depression: 18-year follow-up study. The British Journal of Psychiatry 2023; 222(1) : 37-43. doi:10.1192/bjp.2022.140
- Rocheteau E. On the role of artificial intelligence in psychiatry. The British Journal of Psychiatry 2023; 222(2) : 54-57. doi:10.1192/bjp.2022.132
- Fancourt D, Steptoe A, Bu F. Psychological consequences of long COVID: Comparing trajectories of depressive and anxiety symptoms before and after contracting SARS-CoV-2 between matched long- and short-COVID groups. The British Journal of Psychiatry 2023; 222(2) : 74-81. doi:10.1192/bjp.2022.155
- Rasmussen M, Poulsen G, Videbech P, Wohlfahrt J, Melbye M. Endocrine disease history and the risk of postpartum depression. The British Journal of Psychiatry 2023; 222(3) : 119-124. doi:10.1192/bjp.2022.173
- Erlangsen A, Qin P, Madsen T, Hawton K, Osler M, Hjorthøj C, Nilsson S. Association between SARS-CoV-2 infection and self-harm: Danish nationwide register-based cohort study. The British Journal of Psychiatry 2023; 222(4) : 167-174. doi:10.1192/bjp.2022.194
- Parellada M, Andreu-Bernabeu A, Burdeus M, et al. In Search of Biomarkers to Guide Interventions in Autism Spectrum Disorder: A Systematic Review. Am J Psychiatry 2023; 180 (1); 23-40
- Crone C, Fochtmann LJ, Attia E, et al. The American Psychiatric Association Practice Guideline for the Treatment of Patients With Eating Disorders. Am J Psychiatry 2023; 180(2) : 167-171
- Jha MK, Mathew SJ. Pharmacotherapies for Treatment-Resistant Depression: How Antipsychotics Fit in the Rapidly Evolving Therapeutic Landscape. Am J Psychiatry 2023; 180(3) : 190-199
- Elbau IG, Lynch CJ, Downar J, et al. Functional Connectivity Mapping for rTMS Target Selection in Depression. Am J Psychiatry 2023; 180(3) : 230-240
- Zeng Y, Suo C, Yao S, et al. Genetic Associations Between Stress-Related Disorders and Autoimmune Disease. Am J Psychiatry 2023; 180(4) : 294-304
- Riblet NB, Matsunaga S, Lee Y, et al. Tools to Detect Risk of Death by Suicide: A Systematic Review and Meta-Analysis. J Clin Psychiatry 2023; 84(1) : 21r14385
- Hock RS, Feeney A, Iovieno N, et al. Rapidity of Symptom Improvement With Intranasal Esketamine for Major Depressive Disorder: A Systematic Review and Meta-Analysis. J Clin Psychiatry 2023;

84(1) : 21r14086

- Deligiannidis KM, Citrome L, Huang M, et al. Effect of Zuranolone on Concurrent Anxiety and Insomnia Symptoms in Women With Postpartum Depression. J Clin Psychiatry 2023; 84(1) : 22m14475
- Costa JD, Very E, Rousseau V, Virolle J, et al. Comparative Effects of 30 Antipsychotics on Risk of Catatonia: An Analysis of the WHO Pharmacovigilance Database. J Clin Psychiatry 2023; 84(1) : 21m14238
- Feeney A, Hoeppner BB, Freeman MP, et al. Effect of Concomitant Benzodiazepines on the Antidepressant Effects of Ketamine: Findings From the RAPID Intravenous Ketamine Study. J Clin Psychiatry 2023; 84(1) : 22m14491
- Bröms G, Hernandez-Diaz S, Huybrechts KF, et al. Atomoxetine in Early Pregnancy and the Prevalence of Major Congenital Malformations: A Multinational Study. J Clin Psychiatry 2023; 84(1) : 22m14430
- Sabé M, Pallis K, Solmi M, Crippa A, Sentissi O, Kaiser S. Comparative Effects of 11 Antipsychotics on Weight Gain and Metabolic Function in Patients With Acute Schizophrenia: A Dose-Response Meta-Analysis. J Clin Psychiatry 2023; 84(2) : 22r14490
- Benca RM, Krystal A, Chepke C, Doghramji K. Recognition and Management of Obstructive Sleep Apnea in Psychiatric Practice. J Clin Psychiatry 2023; 84(2) : 22r14521
- Citrome L, Durgam S, Edwards JB, Davis RE. Lumateperone for the Treatment of Schizophrenia: Number Needed to Treat, Number Needed to Harm, and Likelihood to Be Helped or Harmed. J Clin Psychiatry 2023; 84(2) : 22r14631
- Han Xu, Yang Du, Qiong Wang, Lizhi Chen, Juan Huang, Yin Liu, Chunyang Zhou, Biao Du. Comparative efficacy, acceptability, and tolerability of adjunctive anti-inflammatory agents on bipolar disorder: A systemic review and network meta-analysis. Asian Journal of Psychiatry 2023; 80 : 103394,ISSN 1876-2018,https://doi.org/10.1016/j.ajp.2022.103394.
- Tikka SK; Godi SM, Siddiqui AM, Garg S. Evidence from Indian studies on safety and efficacy of therapeutic transcranial magnetic stimulation across neuropsychiatric disorders- A systematic review and meta-analysis. Indian Journal of Psychiatry 2023; 65(1) : 18-35. | DOI: 10.4103/indianjpsychiatry.indianjpsychiatry_572_22
- Sarkhel S, Vijayakumar V, Vijayakumar L. Clinical Practice Guidelines for Management of Suicidal Behaviour. Indian Journal of Psychiatry 2023; 65(2) : 124-130. | DOI: 10.4103/indianjpsychiatry.indianjpsychiatry_497_22
- Clinical Practice Guidelines for Management of Various Psychiatric Disorder. Read from Indian Journal of Psychiatry 2023; 65(2).

Annual Awards

Delhi Psychiatric Society Annual Awards

(Rules & Regulations)

1. **Dr. Ravi Pande Memorial Award for Young Psychiatrist:**
   a) The original research done by a young Psychiatrist below 40 years of age
   b) It should be unpublished and not elsewhere submitted
   c) The paper is to be presented at the time of CME/Annual Conference
   d) 70% marks are for written evaluation and 30% for presentation
   e) Presenter and at least 50% of co-authors must be full members of the Society
   f) Consent is required from all authors

2. **Dr. Saadgi Jagawat Memorial Award for Female Postgraduate Student:**
   a) The original research done by a female postgraduate (MD/DNB/DM)
   b) Certificate of doing PG is required from the Head/ Institution
   c) It should be unpublished and not elsewhere submitted
   d) The paper is to be presented at the time of CME/Annual Conference
   e) 70% marks are for written evaluation and 30% for presentation
   f) Presenter (PG student) and at least 50% of co-authors must be full members of the Society
   g) Consent is required from all authors

3. **Dr. Ravi Nehru Memorial Award for Best Published Paper:**
   a) Published work in the field of Neuropsychiatry or Neuropsychology
   b) Principal Author and at least 50% of co-authors should be members of the Society at the time of publication
   c) The published work should be in the previous 2 years (i.e., for 2022 Award, July 2019 to June 2021)
   d) Consent is required from all authors

4. **Dr. J.S. Neki Memorial Best Poster Award:**
   a) Based on Original research
   b) It should be unpublished and not elsewhere submitted
   c) The poster is to be presented at the time of CME/Annual Conference
   d) Presenter and at least 50% of co-authors must be full members of the Society
   e) Consent is required from all authors

5. **Dr. H.C. Raheja Memorial Oration Award:**
   a) The oration award will be declared in advance at every annual conference of the society.
   b) Any Life Full Member of the society can propose the name of any other Life Fellow of the society for the oration award. The proposal including four copies of the bio-data of the nominee must be submitted to the Chairperson, Awards Committee by a date determined by the Executive Council of DPS.
   c) The proposal must be accompanied by a written consent of the nominee.
   d) To be eligible for the award, the nomination shall be assessed on the following criteria:
      i) Contribution to the service and development of psychiatry in India - 30 marks
      ii) Contribution to the Delhi Psychiatric Society - 30 marks

iii) Contribution to teaching, training and research in Psychiatry - 20 marks
iv) Overall seniority in Psychiatry, recognition, and standing amongst fellow Psychiatrists in India - 20 marks

e) The speaker can choose any topic for the oration. He shall intimate the title of the oration to the chairperson awards committee prior to the conference.

6. Dr. N.K. Bohra Memorial Psychiatrist of the Year Award:

a) Any Life Full Member of the society can propose the name of any other Life Fellow of the society for the award. The proposal including four copies of the bio-data of the nominee must be submitted to the Chairperson, Awards Committee by a date determined by the Executive Council of DPS.
b) The nominee must have contributions to the service and development of psychiatry in India; Contribution to the Delhi Psychiatric Society and overall seniority in Psychiatry, recognition, and standing amongst fellow Psychiatrists
c) Age above 60 years
d) Name will be finalized by the executive council of DPS in consultation with Awards Committee

General Rules

- Awards are open for Full members of the society
- Kindly submit 4 copies of Full paper (3 copies to Chairman) and 1 copy to the Coordinator/ General Secretary along with a soft copy.
- The award papers will become the property of the Delhi Psychiatric Society and shall be published in the Delhi Psychiatry Journal with the necessary editorial corrections
- Names (along with email and contact numbers) of Chairperson and Coordinator and last dates will be announced

Guidelines

Instructions to Authors

Aims and Scope of the Journal

This journal is aimed to help in the academic development of its readers. To accomplish the objectives we publish following sections in the journal: Original articles, reviews, view points, short reports, case reports letters and newer developments.

Prior Publication

All the articles are published in this journal with the understanding that they have never been published or accepted in any journal previously or submitted to any other journal simultaneously. However, publication of abstracts in conference's abstract book will not be considered as prior publication if such abstracts are limited to 300 words. It includes all kind of printed material (whether scientific or not), symposia, panel discussion, paper/poster presentation, workshops etc. If author/s are submitting any other paper with overlapping content to any other journal, they must inform the editor with the explanation of the differences in the paper.

Submission of the manuscript

Manuscripts should **preferably be submitted online** at the journal's account: dps_journal@yahoo.co.in or manbhatia1@rediffmail.com. Receiving of the manuscript will be acknowledged within no more than ten working days, failing which authors are free to submit it elsewhere. However, it is advisable that they make sure that the mail has not returned and recipient mail-id is filled correctly. Authors who want to submit hard copy of manuscripts must send 2 copies along with CD to editorial office – Department of Psychiatry UCMS and GTB Hospital, Dilshad Garden, Delhi-110095 (India).

Authorship

All persons designated as authors must qualify authorship criteria. It implies that all the authors have participated sufficiently to take the public responsibility of the content. Authorship credit should be based on substantial contributions to (1) conception and design or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, and on (3) final approval of the version to be published. Conditions 1, 2, and 3 must all be met. Participation solely in the acquisition of funding or the collection of data does not justify authorship. Other persons involved in the study may be acknowledged at the end of the manuscript.

It is the responsibility of the principal author or author who is submitting the manuscript to inform all the co-authors regarding submission and revision of manuscript. Editor or society is not responsible for any conflict of interest arising out of manuscript.

Conflict of Interest disclosure

While submitting the manuscript authors should provide details regarding conflict of interests in the covering letter. It involves financial grant for the study, paid consultancies, stock ownership or other equity interests, patent ownership, royalties from rating scales, inventions, therapy methods, and funds for travel. At the Editor's discretion, this information may be shared with reviewers. Such involvements will not be grounds for automatic rejection of the manuscript.

Copyright transfer

After the receiving of the article is acknow-ledged, authors are expected to submit *copyright transfer form* via regular mail or scanned e-mail within next seven working days, failing which manuscript could not be processed further. It may result in delay in review and hence final decision on the article. Copyright transfer form is provided and it should

be signed by all authors. Signature of the co-authors will be responsibility of correspon-ding author.

Review Process

All the articles will be peer reviewed, and name of the reviewers and authors will be kept confidential. Authors will be supplied comments of the reviewers along with the decision on the manu-script.

Type of articles and word limit

We publish review articles, original articles, case reports in the field of psychiatry and allied branches e.g., neuropsychiatry, adult psychiatry, child psychiatry, geriatric psychiatry, psychosomatics, addiction, forensic psychiatry, newer developments etc.

Review articles are invited from the experts of the fields only and authors wish to send the review article must take the written permission of the editor beforehand. Word limit for review article is 5000 words with maximum of 50 references.

Original articles must not exceed 3000 words with maximum 30 references and should contain original unpublished research.

Care reports should not exceed 1000 words and a maximum of 10 references.

Setting of Manuscripts

All the pages must be numbered starting from title page. The manuscript should be typed on A4 size paper with 1 inches margin and should be double-spaced. All abbreviations should be mentioned when they first appear in the text as well as on the abstract page below key words.

Title Page

Title page must contain type of article, title and running title not exceeding 40 characters on the top of it. In the byline authors name (last name, first name followed by initials of middle name) and highest academic qualifications must be mentioned. Department and institution to which the work should be attributed should be mentioned below authors name.

Following it, name, address, telephone number and e-mail address of the corresponding author must be mentioned.

Total number of words in the text (excluding abstract and references), total number of tables, figures should be mentioned thereafter.

Any acknowledgement (if any) must be cited at the bottom of this page.

It must be made sure that following pages does not have any information that may disclose the identity of the authors/institution to which the work is attributed.

Second page

It should contain title of the manuscript, abstract and at least three key words. Abstract should be structured in following sections: introduction; objectives, method, results and conclusions.

Start each of following section on a separate page.

Introduction: State the object of research with reference to previous work.

Methods: Describe methods in sufficient detail so that the work can be duplicated, or cite previous descriptions if they are reality available.

Results: Describe results clearly, concisely, and in logical order. We possible give the range, standard deviation, or mean error, and significance of differences between numerical values.

Discussion: Interpret the result and relate them to previous work in the field.

Tables : All tables must be created using the table function in a word processor program and also must conform to a one - (3.25") or two-column (6.5") format. Prepare each table with a title above and and any description below the table. Tables should be self-explanatory and should not duplicate textual material. They must be numbered and cited in consecutive order in the text, and must have a short title. Tables consisting of more than 10 columns are not acceptable. Previously published tables must have a signed permission from the publisher and complete reference data so that appropriate credit can be given. Tables must be given after references while sending the manuscript.

Figure : As far as possible, figures should be black and white. They should contain title and should be numbered. They should be mentioned in text according to their number.

References: Delhi Psychiatry Journal complies with the reference style given in "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (see Ann Intern Med 1997; 126 : 36-47 or online at http://www.acponline.org). References should be cited in Vancouver style in the

manuscript. In the text they should be cited by superscript Arabic numerals and in references they should be cited in the order of their appearance in the text. First 3 authors should be cited (followed by et al. if more than 3 authors and their name should be in following sequence: Last name followed by initials of first and middle names. Each author's name should be separated by comma. It should be followed by title of manuscript, journal's name as cited in index medicus, year of publication, volume, issue and page number.

For clarification see following reference styles.

Sample citations

According to our previous work,[1,3-8,19]
The Patient's were studied as follows.[3,4]

Sample References

- **Articles**
  1. Roest AM, Zuidersma M, de Jonge P. Myocardial infarction and generalised anxiety disorder : 10-year follow up. Br J Psychiatry 2012; 200 : 324–329.
  2. Bremner JD, Shearer KD, McCaffery PJ. Retinoic acid and affective disorders: The evidence for an association. J Clin Psychiatry 2012; 73 : 37–50.
- **Book**
  1. Stahl SM. The Prescriber's Guide (Stahl's Essential Psychopharmacology, 4th ed. Cambridge, U.K.: Cambridge University Press, 2011.
- **Chapter of a book**
  1. Blacker D. Psychiatric Rating Scales In: Sadock BJ, Sadock VA, editors. Kaplan and Sadock's Comprehensive Text Book of Psychiatry. Vol. I. Philadelphia: Lippincott Williams and Williams; 2000. pp 755-782.

Personal communication and unpublished data should not be used for the reference.

Proofing

After acceptance, paper will be sent to authors for proof reading. It is the responsibility of the authors to check the proof and return them within three working days. At this stage content of the manuscript can not be changed. Failure to send proofs in due time may result in delay in the publication of manuscript.

INDEXING

Delhi Psychiatry Journal (Print ISSN: 0971-9571: e-version ISSN: 0975-4113) is **INDEXED** in

- Indian Citation Index
- Google Scholar
- medIND (Indian Medlar by National Informatic Centre; a project of ICMR, Govt. of India)
- Index Medicus (by WHO for South East Asia Region)
- Indian Science Abstracts
- UGC approved list of Journals
- k-hub.in
- UGC List of Periodicals
- Index Copernicus International (Index Copernicus Value (ICV) 2018 = 88.70)
- National Library of Medicine (NLM) list

The Journal Can be accessed from :

Website: http://www.delhipsychiatricsociety.com
Kindly send your **submissions** by E-mail to: dps_journal@yahoo.co.in **OR** manbhatia1@rediffmail.com

DELHI PSYCHIATRIC SOCIETY

(Regd. No. S/ 25490 /94)

MEMBERSHIIP FORM

NAME : .....

AGE : .....

SEX : .....

QUALIFICATION : .....

CURRENT PROFESSIOINAL AFFILIATION & ADDRESS (with Telephone numbers)

.....

.....

.....

.....

RESIDENTIAL ADDRESS (With telephone numbers, E-mail address)

.....

.....

CATEGORY OF MEMBERSHIHP APPLIED FOR : (LIFE FULL MEMBER)

CURRENT MEMBERSHIP FEE :

- Mental Health Professionals/Non-mental Health Professionals: Life member: Rs. 10,000/-

Proposed By:

Name:…….....Signature……...

Seconded By:

Name…….....Signature……

Gen. Secretary

DR. PANKAJ KUMAR

THE HEALERS PSYCHIATRY & DENTAL CENTRE

D-215 (Basement), Vivek Vihar Phase-I, (Below South Indian Bank), New Delhi-110095

Mobile : 9999959044 E-mail: thealers.pc@gmail.com

For any further query please do not hesitate to call General Secretary

DECLARATION

I hereby declare that I agree to abide by the rules and regulations of **DELHI PSYCHIATRIC SOCIETY**

Name:…… Signature…….....

Date……..