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A Cross Sectional Study to Evaluate the Factors Influencing Drug Adherence in Psychiatric Patients on Psychotropic Medications

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Abstract

Background: Psychiatric disorders, a group of prevalent brain disorders involving complex disturbances in socio-cognitive functioning, are one of the leading causes of disability. The consequences of non-adherence to prescribed medications by psychiatric patients are grave for psychiatric patients. To evaluate the factors affecting drug adherence in psychiatric patients on psychotropic medications. **Material and Methods:** A cross-sectional study was carried out in the outpatient psychiatric department of Rajindra Government Medical College and Hospital, tertiary care hospital over a period of 1 year. Total 150 patients diagnosed with Psychiatric disorders as per ICD 10, in the age group more than 18 years (both males and females) were included in the study who are already taking any psychotropic medication (any medication capable of affecting the mind, emotions and behavior) for more than one month. Medication Adherence Rating Scale (MARS) was used to assess medication adherence in psychiatric patients. All the observations thus made were statistically analyzed using appropriate tests. **Results:** Out of 150 patients, 95 (63.33%) were adherent and 55 (36.66%) were non-adherent to their prescribed medications. There was a significant association between type of family (p=0.001), bought to OPD by some relative (p=0.001), education (p=0.037), income (p=0.042), adverse effects (p=0.001) and adherence. **Conclusion:** The overall incidence of medication non-adherence in patients with mental illness was 36.6%. Numerous patients related and drug related factors contributed to the medication non-adherence. Several strategies are needed to be developed and implemented to improve medication adherence to achieve a better therapeutic outcome in patients with mental illness.

Keywords: Psychiatric Patients, Psychotropic Medications

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Introduction

Psychiatric disorder is defined as a clinically significant behavioural or psychological syndrome or pattern that occurs in an individual and that is associated with present distress or disability or with a significantly increased risk of suffering death, pain, disability, or important loss of freedom. [that is] considered a manifestation of behavioural, psychological, or biological dysfunction in the individual"[1]

Mental disorders are a significant contributor to disability in the general population.[2]

Neuropsychiatric disorders are the third leading cause of global disease burden.[3]

In 2017, there were 197.3 million people with mental disorders in India, comprising 14.3 per cent of the total population of the country. Mental disorders contributed 4.7 per cent of the total DALYs in India in 2017, compared with 2.5 per cent in 1990.[4]

In 2019, 1 in every 8 people, or 970 million people around the world were living with a mental disorder, with anxiety and depressive disorders the most common. In 2020, the number of people living with anxiety and depressive disorders rose significantly because of

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the COVID-19 pandemic. Initial estimates show a 26% and 28% increase respectively for anxiety and major depressive disorders in just one year.[5]

Seven of the top 20 most disabling medical conditions in the world are illnesses treated by psychiatrists, with depression number two on this list. Patients diagnosed with one of these chronic disabling disorders die, on average, 25 years earlier than the general population. The top three causes of death in young adults are frequently complications of psychiatric disorders including suicide, homicide, and accidents.[6]

Ministry officials state that majority of those committing suicide, mainly suffer from depression or mental illness. In India 68% of suicide attributed to mental health and substance use disorder. Studies suggest, individual with depression has risk of suicide 20 times higher that an individual without.[7] Evidence has consistently shown that patients with mental illness have greater physical health morbidity and mortality compared to general population. Many factors have been implicated and include a generally unhealthy lifestyle, side effects of medication, and inadequate physical healthcare. Psychiatric patients are more likely to smoke tobacco, have less inclination to exercise and are prone to poor dietary habits and obesity. Patients suffering from depression are twice as likely to develop type 2 diabetes mellitus, prevalence of stroke is threefold higher and of myocardial infarction is fivefold higher than people without depression.[8]

Mental illness results from a complex interplay between genetic and environmental factors.[9] Genome- wide association studies have identified more than a hundred variants associated with severe mental illness.[10]

Strong relationships between adverse social environment and mental illness have been identified. Environmental factors which are associated with mental illness include Pregnancy risk factors namely malnutrition, Infection and heavy metals, Perinatal risk factors namely Preterm birth, season of birth and birth complications, Childhood environment namely Urbanicity, poverty, maltreatment and bullying, gender and Drug use in adolescence.[10]

The Diagnostic and Statistical Manual of Mental Disorders, And International classification of diseases are diagnostic criterion for psychiatric disorders. [11]

The Journal of the American Medical Association clearly shows the high prevalence and burden of mental disorders globally which despite available treatments remain largely untreated.[12] Medication adherence is a key issue in the prevention of relapse, morbidity and mortality in the patients with psychiatric disorders. [13]

Studies have revealed that Drug attitude and medication nonadherence plays an important role in worsening of clinical condition in psychiatric patients.[14]

Medication adherence is defined by the World Health Organization as "the degree to which the person’s behavior corresponds with the agreed recommendations from a health care provider." Adherence signifies that the patient and physician collaborate to improve the patient’s health by integrating the physician’s medical opinion and the patient’s lifestyle, values and preferences for care. [15]

Medication adherence among patients with severe mental disorders is a complex issue determined by a multitude of factors, such as treatment effect, patient insight, attitudes toward medication, financial and emotional support from family members, income situation, side effects, cultural context, level of therapeutic alliance with therapists, and aftercare environment after discharge. It is a key factor that determines performance in managing severe mental disorders as well as an important indicator of the overall quality of care.[16]

Poor adherence to appropriately prescribed medication is a global challenge for psychiatrists.[17] It is common and is a significant concern in terms of both individual health and medical healthcare costs.[18] Inadequate adherence to prescribed psychiatric medications has been found to be associated with poorer outcomes for patients, including the early return of symptoms within the expected duration of a current episode (relapse) or new episodes

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(recurrence) following initial short-term improvement or remission, as well as hospital admissions. There are various methods to measure adherence.[ ] Direct methods include observing patients taking medications and measuring drug or metabolite concentrations in the blood or urine. Indirect methods include asking patients, patient diaries, refill rates, pill counting, monitoring for clinical response, electronic monitoring devices, and patient scales or surveys. Most widespread adherence scales used ,The Medication Adherence Questionnaire, the Medication Adherence Rating Scale (MARS), brief Adherence Rating scale(BARS), the Self-efficacy for Appropriate Medication Use Scale (SEAMS).[19] Mental disorders are just as disabling as physical diseases. There is a bidirectional relationship between mental disorders and physical diseases, with one increasing the odds of onset of the other.[20] Compliance of patient is necessary for the success of treatment and poor adherence to treatment is a major roadblock to the better quality of life. SSRI, SNRI, Antipsychotics, Mood stabilisers are common drugs used to treat psychiatric illness. However, there is paucity of studies examining treatment non-adherence and its associated factors among patients with mental disorders. Hence, for determining the magnitude of medication non-adherence which is popularly called as an 'invisible epidemic', the present study was done to investigate the factors impacting the medication adherence among patients with psychiatric disorders.

Material and Methods

The present study was conducted by Department of Pharmacology, Government Medical College, Patiala, in association with Outpatient Department of Psychiatry of Government Medical College and Rajindra Hospital, Patiala. Total 150 patients with Psychiatric illness were evaluated after having fulfilled the inclusion and exclusion criteria, in the Cross-sectional study.

Inclusion Criteria

All patients diagnosed with Psychiatric disorders as per ICD 10, in the age group equal or more than 18 years (both males and females) were be included in the study who are already taking any psychotropic medication (any medication capable of affecting the mind, emotions and behavior) for more than one month.

Exclusion Criteria

1. Patients falling in the age category less than 18 years
2. Patients with history of critical illness.
3. Patients on magico-religious treatment.
4. Known case of dementia.
5. Patients from whom reliable history of illness cannot be obtained.
6. Patients with the history of suicidal tendency, suicidal ideation and suicidal attempts.

A cross-sectional observational study was conducted over a period of 1 year in patients suffering from psychiatric disorders attending psychiatric OPD in Government Medical College & Rajindra Hospital, Patiala after obtaining approval from Ethical Committee. Written informed consent was obtained from each enrolled patient and all were interviewed. 150 patients with diagnosed psychiatric disorders as per ICD-10 guidelines and receiving at least one psychotropic medication for more than one month were selected applying inclusion - exclusion criteria. To assess the extent of medication adherence, MARS (Medication Adherence Rating Scale) was used. MARS is a self-questionnaire of 10 questions in which responses are recorded to the best describes the patient's behaviour and attitude towards prescribed psychotropic medications. It is a ten item questionnaire which is answered in the form of True/False. It assigns a score of +1 (positive view of medication usage) and score of 0 (negative view of medication usage), allowing total score ranging between 0-10. Patient is asked to respond to the statements in the questionnaire by circling the answer which best

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describes their behaviour or attitude towards their medication during the past week. Scores classified as adherent ranging from 6-10 scale points and non-adherent ranging from 0-5 scale points.[21]
Side effects of both groups recorded in a diary. Data collected was entered into a pretested semi-structured proforma for the study, and was statistically analysed using appropriate tests. The results were eventually tabulated and graphically represented.

Results
A total of 150 psychiatric patients were enrolled in the study. Out of 150 patients, 95 patients were found to be adherent group and 55 were found to be non-adherent group.

Table 1: ?

Gender	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
Female	45	47.37%	33	60%	78	52%
Male	50	52.63%	22	40%	72	48%
Total	95	100%	55	100%	150	100%
X^2	5.054					
p value	0.080					

[Table 1] shows, that in adherent group male constituted 52.63% (n=50) and females constituted 47.37 % (n=45) and in Non-adherent group, male constituted 40% (n=22) and females constituted 60% (n=33). Statistical analysis shows that there were no significant difference (p>0.05).

Table 2: Age group

Age Group (Years)	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
18-29	13	13.67%	12	21.82%	25	16.67%
30-39	20	21.05%	12	21.82%	32	21.33%
40-49	20	21.05%	15	27.27%	35	23.33%
50-59	17	17.89%	10	18.18%	27	18%
≥60	25	26.32%	6	10.91%	31	20.67%
Total	95	100%	55	100%	150	100%
Mean±SD	46.87±15.26		42.25±13.22		45.18±14.67	
Median	44.00		44.00		44.00	
Range	18-82		18-75		18-82	
t-test	1.874					
p value	0.063					

[Table 2] shows, that In adherent group individuals between age group of 18-29 years were 13.67% (n=13) , 30-39 years were 21.05% (n=20), 40-49 years were also 21.05% (n=20), 50-59 years were 17.89% (n=17) and more than 60 years were 26.32% (n=25)adherent and in Non-adherent group, individuals between age group of 18-29 years were 21.82% (n=12) , 30-39 years were 21.82% (n=12), 40-49 years were also 27.27% (n=15), 50-59 years were 18.18% (n=10) and more than 60 years were 10.91% (n=06) were non adherent. Statistical analysis shows that there were no significant difference between adherent and non-adherent

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group (p>0.05).

Table 3: Came to OPD

Came to OPD	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
Alone	15	15.79%	42	76.36%	57	38%
With family member	80	84.21%	13	23.64%	93	62%
Total	95	100%	55	100%	150	100%
X^2	67.004					
p value	0.001					

[Table 3] shows, that in Adherent group the individuals who came to Psychiatry OPD alone were 15.79% (n= 15) and who came with family member were 84.21% (n= 80) adherent and in non- Adherent group the individuals who came to Psychiatry OPD alone were 76.36% (n= 42) and who came with family member were 23.64% (n=13) non adherent. Statistical analysis shows that there were significant difference between adherent and non-adherent group (p<0.05).

Table 4: Type of Family

Type of Family	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
Joint	79	83.16%	15	27.27%	94	62.67%
Nuclear	16	16.84%	40	72.73%	56	37.33%
Total	95	100%	55	100%	150	100%
X^2	21.731					
p value	0.001					

[Table 4] shows, that in Adherent group the individuals who belong to Joint family were 83.16% (n= 79) and the individuals who belong to nuclear family were 16.84% (n= 16) adherent and in non- Adherent group the individuals who belong to Joint family were 27.27% (n= 15) and the individuals who belong to nuclear family were 72.73% (n= 40) non-adherent. Statistical analysis shows that there were significant difference between adherent and non-adherent group (p<0.05).

Table 5: Marital Status

Marital Status	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
Unmarried	17	17.89%	20	36.36%	37	24.67%
Married	74	77.89%	32	58.18%	106	70.67%
Widow	3	3.16%	3	5.45%	6	4%
Divorced	1	1.05%	0	0%	1	0.67%
Total	95	100%	55	100%	150	100%
X^2	12.610					
p value	0.062					

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[Table 5] shows, that in Adherent group the unmarried individuals were 17.89% (n= 17), Married individuals were 77.89% (n=74),Widow individuals were 3.16% (n=3) and Divorced individuals were 1.05% (n=1) adherent and in non-adherent group unmarried individuals were 36.36% (n= 20),Married individuals were 58.18% (n=32),Widow individuals were 5.45% (n=3) and Divorced individuals were 0% (n=0) non-adherent. Statistical analysis shows that there were no significant difference between adherent and non-adherent group ($p>0.05$).

Table 6: Area

Area	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
Rural	45	47.37%	26	47.27%	71	47.33%
Urban	50	52.63%	29	52.73%	79	52.67%
Total	95	100%	55	100%	150	100%
X^2	4.274					
p value	0.118					

[Table 6] shows, that in Adherent group individuals from Rural area were 47.37% (n=45) and from urban area were 52.63% (n= 50) adherent and in non-adherent group individuals from Rural area were 47.27% (n=26) and from urban area were 52.73% (n= 29) non- adherent. Statistical analysis shows that there were no significant difference between adherent and non-adherent group ($p>0.05$).

Table 7: Education of Patient

Education of patient	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
Illiterate	28	29.47%	28	50.91%	56	37.33%
Upto 8^{th}	10	10.53%	1	1.82%	11	7.33%
Upto 12^{th}	34	35.79%	17	30.91%	51	34%
Graduation	21	22.11%	9	16.36%	30	20%
Master	2	2.11%	0	0%	2	1.33%
Total	95	100%	55	100%	150	100%
X^2	92.494					
p value	0.037					

[Table 7] shows, in Adherent group, 29.47% (n=28) patients were illiterate, 10.53% (n=10) patients were educated upto 8^{th} , 35.79% (n=34), 22.11% (n=21) and 2.11% (n=2) patients were educated upto 12^{th} , Graduation and Master respectively and in non-adherent group 50.91% (n= 28) patients were illiterate , 1.82% (n=1) patients were educated upto 8^{th}, 30.91% (n=17), 16.36 (n=9) and 0% (n=0) patients were educated upto 12^{th} , Graduation and Master respectively. Statistical analysis shows that there were significant difference between adherent and non-adherent group ($p<0.05$).

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Table 8: Income of Patient

Income	Adherent		Non-Adherent		Total	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
Nil	7	7.37%	4	7.27%	11	7.33%
≤10000	7	7.37%	1	1.82%	8	5.33%
10001-20000	10	10.53%	16	29.09%	26	17.33%
20001-30000	16	16.84%	13	23.64%	29	19.33%
30001-40000	20	21.05%	9	16.36%	29	19.33%
>40000	35	36.84%	12	21.82%	47	31.33%
Total	95	100%	55	100%	150	100%
Mean±SD	39367.42±24017.30		31727.27±18077.46		36566.67±22270-88	
t-test	2.047					
p value	0.042					

[Table 8] shows, that in Adherent group, the income of 7.37% (n=7) patients was nil, of 7.37% (n=7) patients was ≤10000, of 10.53% (n=10), 16.84% (n=16), 21.05% (n=20) and 36.84% (n=35) patients was 10001-20000, 20001-30000, 30001-40000, >40000 respectively and , in non-adherent group the income of 29.09% (n=16) patients was, nil, of 1.82% (n= 1) patients was ≤10000, of 29.09% (n=16), 23.64% (n=13), 16.36% (n=9), 21.82% (n=12) patients was 10001-20000, 20001-30000, 30001-40000, >40000 respectively. Statistical analysis shows that there were significant difference between adherent and non-adherent group ($p<0.05$).

Table: 9 Side effects

Side Effects	Patients	Percentage
Acidity	4	2.67%
Back Pain	1	0.67%
Bodyache	2	1.33%
Dryness Of Mouth	1	0.67%
EPS	1	0.67%
Excessive Sleep	6	4%
Headache	6	4%
Increased Urination	1	0.67%
Sedation	3	2%
Sedation+ Vertigo	1	0.67%
Sweating	1	0.67%
Swelling of Face	1	0.67%
Tired	4	2.67%
Tired+ Excessive Sleep	2	1.33%
Vertigo	4	2.67%
Weight Gain	2	1.33%
Nil	110	73.33%
Total	150	100%

[Table 9] shows, out of 150 patients, 73.33%(n=110) shows no side effect, while 2.67% (n=4) shows acidity, 0.67% (n=1) shows back pain, 1.33% (n=2) shows Body ache, 0.67% (n=1) shows dryness of mouth, 0.67% (n=1) shows EPS, 4% (n=6) shows excessive sleep,

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4% (n=6) shows headache, 0.67% (n=1) shows increased urination, 2% (n=3) shows sedation, 0.67% (n=1) shows sedation and vertigo, 0.67% (n=1) shows sweating, 0.67% (n=1) shows swelling of face, 2.67% (n=4) shows tired, 1.33% (n=2) shows tiredness with excessive sleep, 2.67% (n=4) shows vertigo and 1.33% (n=2) shows weight gain.

Table 9.1: ?

Side Effects	Adherent		Non-Adherent	
	Patients	Percentage	Patients	Percentage
Present	4	4.21%	36	65.45%
Absent	91	95.79%	19	34.55%
Total	95	100%	55	100%
X^2	79.443			
p value	0.001			

[Table 9.1] shows, 4.21% (n=4) patients presenting with Side effects were adherent while 65.45% (n=36) patients presenting with side effects were non-adherent and 95.79% (n=91) patients presenting with no side effects were adherent while 34.55% (n=19) patients presenting with no side effects were non-adherent. Statistical analysis shows that there were significant difference ($p<0.05$).

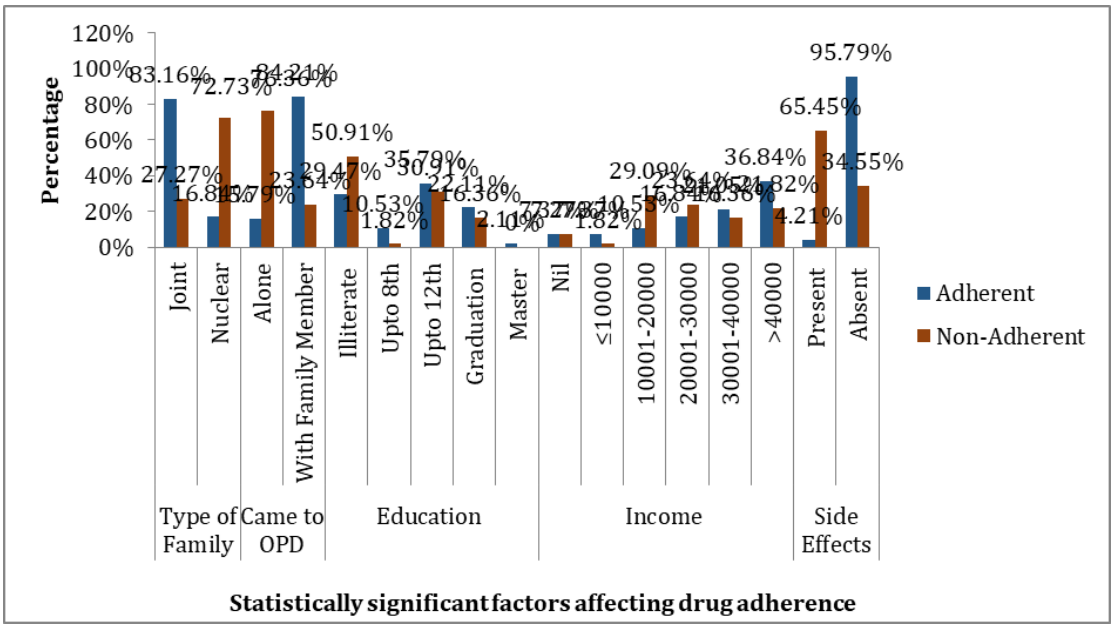

Figure 1: ?

Figure 1 shows, the statistically significant factors which were influencing drug adherence in psychiatric patients on psychotropic medications.

Discussion

"Psychiatric disorder is clinically recognizable set of symptoms or behaviours associated in most cases with distress and with interference with personal functions"[1]

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According to the World Health Organization (WHO), mental health disorders are one of the leading causes of disability worldwide. Three of the ten leading causes of disability in people between the ages of 15 and 44 are mental disorders, and the other causes are often associated with mental disorders.[22]

There are number of factors that contributed to therapeutic non-compliance. These factors could be categorized to patient-cantered factors, therapy-related factors, social and economic factors, healthcare system factors, and disease factors.[23]

In present study, the incidence of non-adherence in psychiatric patients was high (36.6%) owing to several reasons including patient related and medication related factors. There was no statistically significant association between age, gender and medication adherence in our study population. This finding was similar to the results of study by Lucca JM et al.[24]

In present study there were no significant association between marital status, area and medication adherence.

Social factors, which can play an important role in creating, maintaining, and promoting health, have been a major role in incidence, prevalence and persistence of the disease. In this respect, it is very important to pay attention to social factors influencing mental health, and perceived social support is one of those factors.[25]

In the present study, the individuals who came to OPD with family member were 84.21% (n= 80) adherent while who came alone were 23.64% (n=13) non adherent. Present study also shows, that 83.16% (n=79) belonging to joint family were adherent to the medication while 72.73% (n=40) belonging to the nuclear family were non-adherent to the medication.

Harandi TF, Taghinasab MM and Nayeri TD (2017) conducted a meta-analysis in which the mean of effect size of the 64 studies in the fixed-effect model and random-effect model was obtained respectively as 0.356 and 0.330, which indicated the moderate effect size of social support on mental health.[25]

Luca et al.,(2015) also agreed that Lack of support from their family was one of the most important reasons for the patients to discontinue treatment and follow-up. It is well-documented that patients who are receiving direct care from the family members adhere well to therapy.[24]

Socioeconomic status has remained an important factor in the maintenance of general health outcomes especially mental health. Socioeconomic status is the social standing or class of an individual or group. Socioeconomic status is often seen as an integration of education, income, and occupation.[26] In present study, illiterate individuals were found to be more non-adherent as compared to well-educated individuals. Present study also showed that the patients earning Rs. 20,000 or more than Rs. 20,000 were found to be more adherent as compared to the patients earning less than Rs. 20,000. Gohar Y, Talib Y and Mehmood N. conducted a study on total of 1564 participants in which Psychiatric diagnosis was confirmed, according to ICD-10 criteria. In this study, the medicine adherence was compared with socioeconomic status, and education using the t-test. This study showed, the degree of compliance and adherence of patients pertaining to low socioeconomic status was clinically comparable to high socioeconomic status while study finding show high ratio in non-compliance with patients having no formal education. The difference was statistically significant (p=0.00).[26]

In our study, 95.79% (n=91) patients presenting with no adverse effects were adherent while 65.45% (n=36) patients presenting with adverse effects were non-adherent. Luca et al., (2015) supported the finding as in this study The second most frequently reported reason for nonadherence was the side effects of the medications.[24]

There were a few limitations in this study. There is a chance of information bias as people with mental illness are less likely to give accurate information about nonadherence compared to physically ill patients. Medication adherence was measured using a self-reported

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behavioural measure that is by questionnaires. Adherence to medications could be overestimated by this method as we did not use any objective method, such as pill count, to confirm the accuracy of self-reported medication adherence. As the study is from a single centre and involved a smaller sample size, the study findings could not be generalized.

Conclusion

Incidence of nonadherence in psychiatric patients was 36%. Patient-related and drug-related reasons were found to be the major causes of medication nonadherence. So, prescriber should address adherence to psychiatric medications as a priority goal by assessing patient knowledge and attitudes about medications during the treatment. Some other Strategies are also needed to be developed and implemented to address non-adherence variables in order to improve medication adherence, and thereby achieve a better therapeutic outcome in psychiatric patients.

References

1. Department of Mental Health and Substance Abuse, International Advisory Group for the Revision of ICD-10 Mental and Behavioural Disorders. A conceptual framework for the revision of the ICD-10 classification of mental and behavioural disorders. World Psychiatry. 2011 Jun; 10(2): 86–92. doi: 10.1002/j.2051-5545.2011.tb00022.x. PMID: 21633677; PMCID: PMC3104876.
2. Alonso J, Mortier P, Auerbach RP, Bruffaerts R, Vilagut G, Cuijpers P,et al. Severe role impairment associated with mental disorders: Results of the WHO World Mental Health Surveys International College Student Project. Depress Anxiety. 2018 Sep;35(9):802-814. doi: 10.1002/da.22778. Epub 2018 May 30. PMID: 29847006; PMCID: PMC6123270.
3. Noori HR, Mervin LH, Bokharaie V, Durmus Ö, Egenrieder L, Fritze S,et al. Systemic neurotransmitter responses to clinically approved and experimental neuropsychiatric drugs. Nat Commun. 2018 Nov 8;9(1):4699. doi: 10.1038/s41467-018-07239-1. PMID: 30410047; PMCID: PMC6224407.
4. Ahuja A. Understanding The Burden Of Mental Disorders In India [Internet]. NDTV-Dettol Banega Swasth Swachh India. 2021 Sep 28 [cited 2022 Aug 25]. Available from: https://swachhindia.ndtv.com/understanding-the-burden-of-mental-disorders-in-india-63129/
5. World Health Organisation. Fact Sheet Mental disorders [Internet]. World Health Organisation; 2022 jun 8. [cited 2022 Aug 25]. Available from: https://www.who.int/news-room/fact-sheets/detail/mental-disorders
6. First MB. Treatment of mental illness. In: MSD Manual [Internet].2022 April [cited 2022 Aug 27].Available from:https://www.msdmanuals.com/home/mental-health-disorders/overview-of-mental-health-care/treatment-of-mental-illness
7. Ritchie H, Roser M. Mental health, Our world in data, 2018 apr, https://ourworldindata.org/mental-health
8. Latoo J, Mistry M, Dunne F, Physical morbidity and mortality in people with mental illness, Bjmp.org, 2013, https://www.bjmp.org/content/physical-morbidity-and-mortality-people-mental-illness.
9. Gray L, Hannan AJ. Dissecting cause and effect in the pathogenesis of psychiatric disorders: genes, environment and behaviour. Curr Mol Med. 2007 Aug;7(5):470-8. doi: 10.2174/156652407781387064. PMID: 17691962.
10. Uher R, Zwicker A. Etiology in psychiatry: embracing the reality of poly-gene-environmental causation of mental illness. World Psychiatry. 2017 Jun;16(2):121-9. doi: 10.1002/wps.20436. PMID: 28498595; PMCID: PMC5428165.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 07, 2022

11. American Psychiatric association. About DSM-5-TR[Internet].Wshington: American Psychiatric Association; 2022 [cited 2022 Aug 29]. Available fom: https://www.psychiatry.org/psychiatrists/practice/dsm/about-dsm
12. WHO world mental health surveys find mental disorders are widespread, disabling and often go untreated,who.int, 2 june,2004, https://www.who.int/mediacentre/news/notes/2004/np14/en/.
13. Ramesh M, Christudas M, Gupta B, Undela K, Isaac N, Ram D. Assessment of impact of pharmacophilia and pharmacophobia on medication adherence in patients with psychiatric disorders: A cross-sectional study. Indian Journal of Pharmacology. 2016;48(6):701.
14. Ganesan S, Selvaraj N, Dass V, Jayabalan N, Rajamohammad M, Anandan I. Assessment of drug attitude, medication adherence and quality of life among psychiatric patients in South Indian population: a cross sectional study. International Journal of Basic & Clinical Pharmacology. 2018;8(1):61-67. doi:http://dx.doi.org/10.18203/2319-2003.ijbcp20185159
15. Jimmy B, Jose J. Patient medication adherence: measures in daily practice. Oman Med J. 2011 May;26(3):155-9. doi: 10.5001/omj.2011.38. PMID: 22043406; PMCID: PMC3191684.
16. Deng M, Zhai S, Ouyang X, Liu Z, Ross B. Factors influencing medication adherence among patients with severe mental disorders from the perspective of mental health professionals. BMC Psychiatry. 2022 Jan 7;22(1):22. doi: 10.1186/s12888-021-03681-6. PMID: 34996394; PMCID: PMC8740063.
17. De Las Cuevas C, de Leon J. Self-Report for Measuring and Predicting Medication Adherence: Experts' Experience in Predicting Adherence in Stable Psychiatric Outpatients and in Pharmacokinetics. Patient Prefer Adherence. 2020 Oct 9;14:1823-1842. doi: 10.2147/PPA.S242693. PMID: 33116427; PMCID: PMC7555336.
18. Cea-Calvo L, Marín-Jiménez I, de Toro J, Fuster-RuizdeApodaca MJ, Fernández G, Sánchez-Vega N, Orozco-Beltrán D. Different Associations of Intentional and Non-Intentional Non-Adherence Behaviors with Patient Experience with Healthcare and Patient Beliefs in Medications: A Survey of Patients with Chronic Conditions. Patient Prefer Adherence. 2020 Dec 14;14:2439-2450. doi: 10.2147/PPA.S281985. PMID: 33363360; PMCID: PMC7754618.
19. Stacey M.Lavsa, Ashley Holzworth, Nicole T. Ansani, Selection of a validated scale for measuring medication adherence. JAPha. 2011 Jan 01;51(1):90-94. DOI:https://doi.org/10.1331/JAPhA.2011.091
20. Hu Y, Huang Y, Wang L, Liu Z, Wang L, Yan J, Zhang M, Lv P, Guan Y, Ma C, Huang Z, Zhang T, Chen H. Disability and Comorbidity of Mood Disorders and Anxiety Disorders With Diabetes and Hypertension: Evidences From the China Mental Health Survey and Chronic Disease
21. Kane J, Kissling W, Lambert T, Parellada E, Adherence rating Scales, easacommunity.org, http://www.easacommunity.org/files/Medication%20Adherence%20Scale.pdf.
22. Merikangas KR, Nakamura EF, Kessler RC. Epidemiology of mental disorders in children and adolescents. Dialogues Clin Neurosci. 2009;11(1):7-20. doi: 10.31887/DCNS.2009.11.1/krmerikangas. PMID: 19432384; PMCID: PMC2807642.
23. Jin J, Sklar GE, Min Sen Oh V, Chuen Li S. Factors affecting therapeutic compliance: A review from the patient's perspective. Ther Clin Risk Manag. 2008 Feb;4(1):269-86. doi: 10.2147/tcrm.s1458. PMID: 18728716; PMCID: PMC2503662.
24. Lucca J M, Ramesh M, Parthasarathi G, Ram D. Incidence and factors associated with medication nonadherence in patients with mental illness: A cross-sectional study. J

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 07, 2022

Postgrad Med [Internet] 2015 [cited 2022 Oct 14];61:251-6. Available from: https://www.jpgmonline.com/text.asp?2015/61/4/251/166514

25. Harandi TF, Taghinasab MM, Nayeri TD. The correlation of social support with mental health: A meta-analysis. Electron Physician. 2017 Sep 25;9(9):5212-5222. doi: 10.19082/5212. PMID: 29038699; PMCID: PMC5633215.
26. Yasirah G, Uroosa T and Nasir M. Factors affecting treatment compliance in psychiatric setting. Pakistan Journal of Neurological Sciences (PJNS). 2020 Dec;15 (4). Available from: https://ecommons.aku.edu/pjns/vol15/iss4/5