WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.453
Volume 14, Issue 23, 693-705. Research Article ISSN 2277–7105

SOCIODEMOGRAPHIC AND CLINICAL OUTCOMES OF BIPOLAR DISORDER AMONG ADULT PATIENTS IN BEHAVIORAL MEDICINE DEPARTMENT AT SULTAN QABOOS UNIVERSITY HOSPITAL, OMAN

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Article Received on 27 Oct. 2025,
Article Revised on 17 Nov. 2025,
Article Published on 01 Dec. 2025,

https://doi.org/10.5281/zenodo.17745204

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How to cite this Article: Yousif Obaid*, Ghusoon Al-Qassabi, Shatha Al Ghammari. (2025). Sociodemographic and Clinical Outcomes Of Bipolar Disorder Among Adult Patients In Behavioral Medicine Department At Sultan Qaboos University Hospital, Oman. World Journal of Pharmaceutical Research, 14(23), 693–705.

ABSTRACT

Aim and objectives: This study aimed to highlight sociodemographic and clinical outcomes of bipolar disorder among adult patients treated in the Behavioral Medicine department at Sultan Qaboos University Hospital (SQUH), Oman. **Methods:** The study was a single-center retrospective cross-sectional study conducted at the Department of Behavioral Medicine at Sultan Qaboos University Hospital (SQUH), Oman. The study included 265 adult patients treated for bipolar disorder (BD) in the hospital in the period from January 2012 to December 2022. Data were analyzed with SPSS version 27. Descriptive statistics, bar charts, pie charts, and the Pearson correlation test were used for data analysis. The data collected included age, gender, number of admissions, comorbidities, and prescribed medications. **Results:** During the period of the study, 265 patients were diagnosed and treated with Bipolar disorder BD, (40.4%) were males and (59.6%) were females. The mean age (± standard deviations) was 34.26± 10.915 years. (38.9%) patients attended the outpatient clinic whereas (61.1%) had been admitted to the department wards at least once due to relapses. The majority were admitted with manic relapses (76.5%), compared to females, males were more likely to be hospitalized with mania, while females were more likely to be hospitalized with depression. Equal numbers of patients had Hypertension or Diabetes Mellitus type 2 (5.3%). 40.8% of the patients had monotherapy treatment and 59.2% had polytherapy. The

predominant class of medication prescribed for patients with bipolar disorder at SQUH is atypical antipsychotics. **Conclusion:** This is the first study to report the sociodemographic and clinical outcomes of BD in Oman. The clinical features and outcomes of BD appear to be comparable with previously published studies. By identifying key factors contributing to hospital admissions and gender and age-specific trends in presentations this research contributes to the optimization of patient care by reducing the burden of BD relapses and improving long-term treatment outcomes.

KEYWORDS: Bipolar disorder, Outcome assessment, Behavioral medicine, University medical city, SQUH, Oman medical specialty board, Oman.

INTRODUCTION

1.1 Background

Bipolar disorder (BD), previously called Manic-depressive illness (Mayoclinic, 2022), is a chronic mental illness that affects a significant portion of the population. People with bipolar disorder experience periods of intense emotional highs and euphoria, known as manic or hypomanic episodes, as well as periods of profound sadness or hopelessness and loss of interest, called depressive episodes. These episodes are highly variable in severity, duration, and frequency.

Episodes can last for days, weeks, or even months and can cause significant disruption in daily functioning (Vedanarayanan *et al.* 2019). The first episode of bipolar disorder typically occurs in adolescence or early adulthood and can be manic or hypomanic, depressive symptoms, or a mixed state of the two (Wang *et al.*, 2021).

BD identification is typically made by a psychiatrist or a mental health profession based on clinical observation of its symptoms since there are no avalable diagnostic laboratory tests and biomarkers that can diagnose BD (Treuer & Tohen, 2020).

Since BD is a lifelong illness it is treated by managing its symptoms to stabilize the patient's mood and prevent relapses (Geddes & Miklowitz, 2013). Treatment consists of different medications including mood stabilizers such as Lithium, Sodium Valproate, carbamazepine, and lamotrigine. As well as antipsychotics such as Olanzapine, Risperdal, Quetiapine, Clozapine, Aripiprazole, and Haloperidol. Anti-anxiety, Antidepressant-antipsychotic, and antidepressants medications can also be prescribed (Mayoclinic, 2022), although

antidepressants are used cautiously in BD due to the risk of switching. Treatment differs following each patient's symptoms and can be mono or polytherapy. Even though the development of these medications is growing exponentially, morbidity and mortality are still high, mostly because of drug nonresponse (Perugi et al., 2017). In these cases other treatments can be added depending on the patient's condition, this may include Depote medications, Electroconvulsive therapy (ECT).

Depote therapy is a long-term treatment of BD disorder that includes the usage of a Depot (long acting antipsychotic) medication. It is used in certain conditions where the patient experiences episodes very frequently, mostly manic episodes (Behan, 2020). This group of medications is mainly reserved for patients with poor compliance with oral medications.

The disorder is associated with various outcomes including relapses, functional decline, increased rates of suicide, substance abuse, and medical comorbidities. Many medical comorbidities are associated with BD. These might include mental disorders such as anxiety, eating disorders, and autism (McElroy, 2004), and medical comorbidities like Diabetes mellitus, Hypertension, Hyperlipidemia, and many others. Relapse refers to the reoccurrence of illness after the patient recovered, resulting in the deterioration of their psychiatric condition. Relapses lead to the need for hospitalization of the patients due to their psychotic state, increased risk of suicide, and delayed psychological recovery (Belete et al., 2020). The magnitude of relapses and other outcomes of BD differ across various studies. According to one study that monitored patients over time, approximately 48.5% of individuals with bipolar disorder had a relapse, 34.7% of those who had relapses were characterized by manic episodes, while 13.8% involved the development of depressive, hypomanic, or mixed episodes (Belete et al., 2020).

There are many studies similar and others that focus on other outcomes across the world but there are none conducted in Oman. Overall there is a huge shortage of data related to BD in the Middle East compared to Western countries.

1.2 AIM AND RATIONALE

This study aimed to highlight sociodemographic and clinical outcomes of bipolar disorder among adult patients treated in the behavioral medicine department at Sultan Qaboos University Hospital (SQUH) from 2012-2022. As the first study on bipolar disorder outcomes in Oman, it is anticipated that the results of this study could help in a better understanding of

the sociodemographic and clinical outcomes of bipolar disorder. Furthermore, it is hoped that these insights future strategic planning and management of bipolar disorder patients in SQUH.

1.3 Specific objectives

1. To estimate and compare percentages of bipolar disorder cases in males and females of different ages.
2. To correlate sociodemographic and clinical outcomes including number of admissions, characteristics of admission relapse episode (manic, depressive or mixed), number and type of medications taken, medical comorbidities (Hypertension (HTN), Diabetes mellitus (DM), Dyslipidemia (DLP), Hyperthyroidism).

MATERIALS AND METHODS

2.1 Setting and Design

The study was a single-center retrospective cross-sectional study conducted at the Department of Behavioral Medicine at Sultan Qaboos University Hospital (SQUH), Oman. The study included adult patients treated for bipolar disorder (BD) in the hospital in the period from January 2012 to December 2022.

2.2 Ethical consideration

Approval to conduct the study was granted by the Medical and Research Ethics Committee (MREC) at the College of Medicine and Health Sciences (COMHS) (MERC #3023).

Additionally, authorization was sought from the Hospital Information System (HIS) department to access the medical records of the patients involved in the study. The research adhered to ethical guidelines including patient confidentiality, and data was only used for the research purpose. No verbal or written consent was taken since it is a retrospective study.

2.3 Sample size

This study included 265 patients diagnosed with bipolar disorder according to the Statistical Manual of Mental Disorders (DSM-5) criteria from January 2012 to December 2022. It included all adult patients aged between 18-60 years old and of both genders. All included patients had received pharmacotherapy and had at least one follow-up appointment in the behavioral medicine department at SQUH**.** Exclusion criteria included patients aged under 18 and above 60 years, as well as patients with missing major data.

2.4 Data collection

Data were collected from the Hospital Information System (TrackCare®) at SQUH. The collection of data started with a list of patient's medical record numbers (MRN). The collected data included demographics (gender, age), number of hospitalizations due to bipolar disorder and characteristics of admissions (mania or depression), comorbidities present (Hypertension (HTN), Diabetes mellitus type2 (DM), Dyslipidemia (DLP) and Hyperthyroidism). Collected data also included the number and types of medications prescribed for each patient including mood stabilizers, typical antipsychotics, atypical antipsychotics, antidepressants, and depot medications.

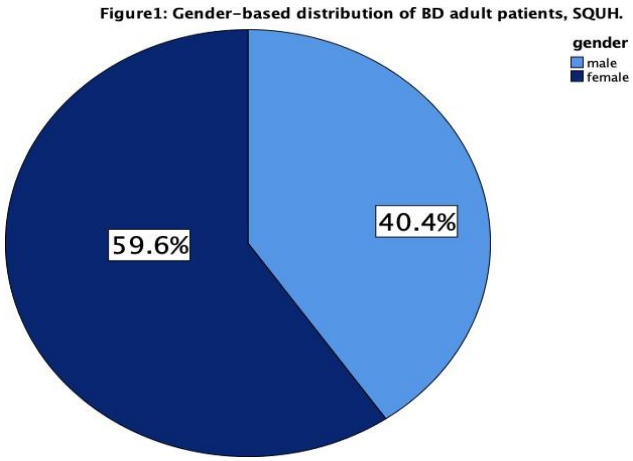
2.5 Statistical analysis

All the collected data were recorded and analyzed using Statistical Package for Social Science (IBM SPSS version 27) and all the variables were categorized as mentioned. Descriptive statistics were used for categorical variables (Frequency, mean, SD, bar, and pie charts). The Pearson correlation test was used to evaluate the association of the categorized variables. A p-value less than 0.05 was considered significant.

RESULTS

3.1 Demographics

In this study, the profiles of 900 patients were screened and a total number of 265 patients fulfilled the inclusion criteria. We collected data from all 265 BD patients. Among the 265 BD patients, 107 (40.4%) were males and 158 (59.6%) were females. The age of these patients ranged from 18 to 60 years, with a mean of 34.26 ± 10.915 years. *Figure 1* demonstrates the female: male percentages among patients with bipolar disorder (BD) attending SQUH.



3.2 Clinical profile

1. Attendance at the behavioral medicine department

Figure 2 shows the nature of patients who attended the behavioral medicine department, 103 (38.9%) patients had only attended the outpatient clinic throughout their treatment period whereas 167 (61.1%) had been admitted to the department wards at least once due to relapses. *Table 1* shows the frequencies of admissions of the 167 inpatients.

Figure 2: Patterns of patient attendance to the behavioral medicine department, SQUH.

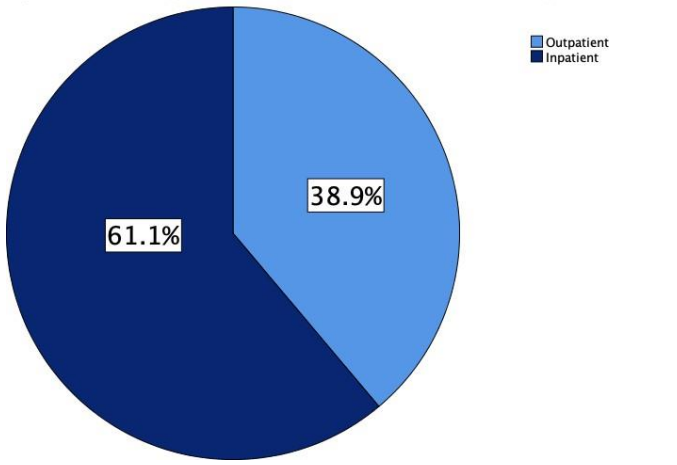


Table 1: Frequencies of admissions of BD inpatients, SQUH.

Frequency			Percent	Valid Percent	Cumulative Percent
Valid	0	103	38.9	38.9	38.9
	1	81	30.6	30.6	69.4
	2	43	16.2	16.2	85.7
	3	22	8.3	8.3	94.0
	4	6	2.3	2.3	96.2
	5	5	1.9	1.9	98.1
	6	3	1.1	1.1	99.2
	7	1	.4	.4	99.6
	12	1	.4	.4	100.0
	Total	265	100.0	100.0	

Those 162 hospitalized inpatients were divided into three groups depending on the characteristics of their relapse. The majority were admitted with manic relapses 124 (76.5%), whereas 34 (21.0%) were admitted with depressive relapses, and 4 (2.5%) presented mixed symptoms. *Figure 3* shows that compared to females males were more likely to be hospitalized with mania, while females were more likely to be hospitalized with depression.

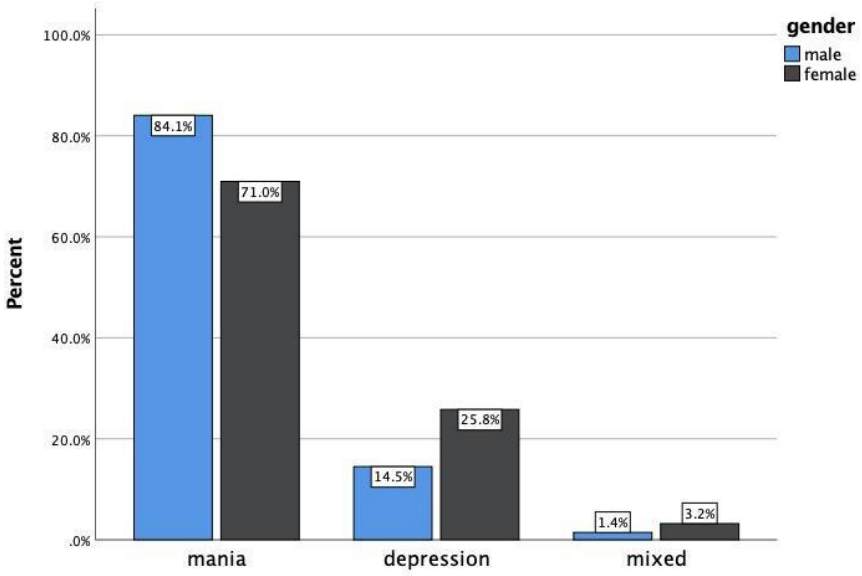


Figure3: characteristic of admission relative to gender

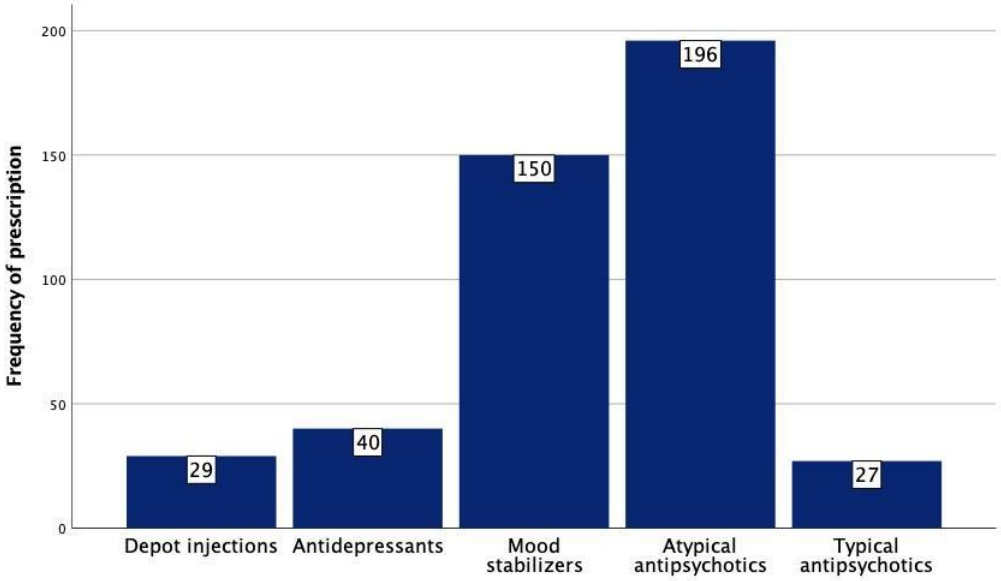
2. Medical comorbidities

Bipolar disorder patients presented with variable medical comorbidities. Equal numbers of patients had Hypertension or Diabetes Mellitus type2 (5.3% of all patients), followed by Dyslipidemia (3.0%), then Hyperthyroidism (2.6%). The mentioned comorbidities were studied in this section using pearson correlation test. A significant relation was found between age of patients and number of comorbidities they were diagnosed with (P= 1.4941E-14). **(elaborate more e.g. the older the patient the more are the comorbidities?)**

3.3 Treatment

Regarding the treatment regimen, patients were treated with a variety of medications including antipsychotics (typical, and atypical), antidepressants, mood stabilizers, and depot long-acting injections. These medications were taken either as monotherapy with only one type or as polytherapy. 40.8% of the patients had monotherapy treatment and 59.2% had polytherapy. The predominant class of medication prescribed for patients with bipolar disorder at SQUH is atypical antipsychotics, in which 73.9% of patients were prescribed at least once. This is followed by mood stabilizers, antidepressants, depot injections, and finally, typical antipsychotics.

Figure4: Frequencies of BD medications prescription, SQUH.



The association between the number of taken medications with age and frequency of admission was estimated using the Pearson correlation test, it showed significant relations with a p-value of 0.006 and 0.001, respectively).

It's also important to highlight the correlation between frequent usage of antidepressants and lower prevalence of Hyperthyroidism (P=.004), as well as Dyslipidemia (P=.01).

Table 2 shows that 3 drug classes were significantly associated with a lower frequency of admissions to the wards of the behavioral medicine department; Mood stabilizers, Antidepressants, and depot-injected medications with p values 0.007, 0.025, and 0.000009, respectively.

Table 2: ***Association of drug classes with frequency of admissions to the department.***

Drug class	***P value (2-tailed)***
Typical antipsychotics	0.1
Atypical antipsychotics	0.8
Mood stabilizers	0.007
Antidepressants	0.025
Depots	0.000009

Appendix1 includes more details about drugs used.

DISCUSSION

To our knowledge, the present study is the first in Oman to comprehensively analyze the clinical outcomes and sociodemographic characteristics of patients with bipolar disorder. A notable gender disparity was observed, with 40.4% being male and 59.6% being female,

which is opposed to Saudi Arabia and UAE where males had bipolar disorder more than females (57.8%, and 56.8% respectively). The observed gender disproportionality in BD prevalence at SQUH raises intriguing questions regarding potential underlying factors contributing to this disparity. Sociocultural influences, genetic predispositions, and healthcare-seeking behaviors may all play essential roles in the observed demographics of BD patients. The mean age of the population studied was around 34.26 (s.d. = 10.92) which was slightly higher than the Emirati and Saudi populations, 32.5 (s.d. = 11.72) and 32 (s.d. = 0.4), respectively. (Abdel Aziz et al., 2021) (Abumadini, 2019).

The findings highlighted the significant burden of relapse-related hospitalizations among BD patients in which 61.1% of the patients had experienced at least one hospital admission due to relapse, underscoring the need for effective relapse prevention strategies and community-based support services. The predominance of manic relapses among hospitalized inpatients emphasizes the importance of early detection and intervention for manic symptoms to mitigate the risk of acute exacerbations and hospital admissions. Furthermore, the observed gender differences in hospitalization patterns suggest variations in the clinical presentation of BD between males and females in SQUH, in which males present with more acute manic symptoms, whereas females were more prone to hospitalization for depression. This is consistent with studies made in Ethiopia and China. (Fekadu et al., 2006) (Wang et al., 2021).

With regards to the comorbidities, Hypertension and Diabetes Mellitus type2 are the most prevalent (5.3% each), followed by Dyslipidemia (3.0%) and Hyperthyroidism (2.6%). The relationship between bipolar disorder (BD) and these medical comorbidities appears to be bidirectional and could be influenced by immune system dysfunction. Therefore, focusing on interventions that target metabolic-inflammatory pathways may lead to enhanced outcomes for individuals with BD (SayuriYamagata et al., 2017). Furthermore, the wide range of functioning burdens of general medical comorbidity suggests the integration of psychiatric treatment for bipolar disorder patients in primary settings. Not to forget, the observed correlation between age with comorbidity burden and the number of prescribed medications suggests that aging may exacerbate the complexity of care in BD patients.

In this study, BD patients at SQUH received diverse treatment regimens, encompassing a range of medication classes. While a substantial proportion of patients receive polytherapy (59.2%), monotherapy remains prevalent among a significant subset (40.8%). Atypical antipsychotics were the predominant class of medication prescribed, with 73.9% of patients.

followed by mood stabilizers, antidepressants, depot injections, and typical antipsychotics. These findings underscore the complexity of pharmacological management in BD and highlight the need for individualized treatment approaches tailored to patient-specific characteristics and clinical presentations.

Many previous studies suggested the influence of atypical antipsychotic drugs in exacerbating cardiovascular comorbidities such as hypertension (Kilbourne et al., 2010), as well as increasing the frequency of relapses (Kronfol et al., 2015). However, in our study, there was no significant association between atypical antipsychotics with neither hypertension nor frequency of admission. On the contrary, there was a significant relation between lower frequency of admissions and antidepressants(P=.O25), mood stabilizers(P=.007), and depot injections(P=.000009). The rationale behind this finding could be multifaceted. Depot injections, also known as long-acting injectable antipsychotics, offer several advantages over oral medications, particularly in populations with adherence challenges like individuals with bipolar disorder. Overall, this significant association suggests that incorporating long-acting injectables into the treatment regimen for bipolar disorder may be a beneficial strategy for reducing hospitalizations and improving overall patient care.

CONCLUSION

In conclusion, this study provides valuable insights into the clinical outcomes and sociodemographic characteristics of BD patients at SQUH's Behavioral Medicine Department. In a sample of 265 adult BD patients, 59.6% are females with a mean age of 34.26 (s.d. = 10.92).

Males experience more manic relapses and females experience more depressive relapses. The most commonly used medications were atypical antipsychotics (73.9%). The most common medical comorbidity is hypertension and diabetes type 2, followed by dyslipidemia then hyperthyroidism. By identifying key factors contributing to hospital admissions and gender and age-specific trends in presentations this research contributes to the optimization of patient care by reducing the burden of BD relapses and improving long-term treatment outcomes.

Limitations

There are limitations to this study that require consideration. As with other retrospective cross- sectional studies, this study was affected by the limited availability of some data in the medical records, especially comorbidities which were often missing from the clinical notes.

Moreover, many demographic data were difficult to obtain such as marital and economic status. In addition, being a single-center study limits the generalizability of the findings.

Future work

Additional studies in Oman including Al-Masara Hospital are needed to achieve generalizable results. It is also recommended for future studies to change into prospective cohort design to prevent missing data as well as establish causality in the association investigated.

ACKNOWLEDGMENTS

I would like to thank my research supervisor (Dr. Yousif Obaid) for his guidance throughout the study period. My sincere thanks to Dr. Shatha Al-Gammari for her assistance in data collection, Dr. Hana Al-Sumri, and Dr. Sanjay Jaju for their help in statistical analysis.

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Appendix

1- Frequency and percentages of drug perscription in BD treatment in behavioural medicine depertment, SQUH.

Drug	Frequency	Percentage
Olanzapine	92	34.70%
Sodium Valproate	92	34.70%
Quetiapine	39	14.70%
Lithium	38	14.30%
Aripiprazole	36	13.60%
Risperdone	28	10.60%
Paliperidone depot	23	8.70%
Procyclidine	20	7.50%
Clonazepam	16	6%
Haloperidol	14	5.30%
Lamotrigine	14	5.30%
Chlorpromazine	11	4.20%
Carbamazepine	10	3.80%
Fluoxetine	9	3.40%
Mirtazapine	7	2.60%
Paroxetine	6	2.30%
Escitalopram	6	2.30%
Venlafaxine	6	2.30%
Lorazepam	6	2.30%
Sertraline	4	1.50%
Haloperidol Depot	4	1.50%
Promethazine	4	1.50%
Diazepam	3	1.10%
Fluphenazine	2	0.80%
Flupentixol depot	2	0.80%
Amitriptyline	1	0.40%
Citalopram	1	0.40%
Hydroxyzine	1	0.40%
Lurasidone	1	0.40%

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