



ELECTROCONVULSIVE THERAPY (ECT): CORRELATION OF AGE, GENDER, AND DIAGNOSIS AMONG PATIENTS IN A PSYCHIATRIC HOSPITAL QUETTA

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Abstract

Background: Electroconvulsive Therapy (ECT) is an established psychiatric intervention used for treatment-resistant mental illnesses. In regions like Balochistan, where mental health literacy is low and stigma is high, studying the demographic trends of ECT usage provides valuable insight into local mental health practices.

Objective: To explore the correlation of age, gender, and psychiatric diagnosis among patients receiving ECT at a tertiary psychiatric hospital in Quetta, Balochistan.

Methods: A retrospective review of 137 adult patient records from 2024 was conducted. Data was collected from the Balochistan Institute of psychiatry and Behavioral Sciences BIPBS ECT unit records, with ethical clearance and departmental permission. Variables analyzed included age, gender, diagnosis, and patient type (new vs. old).

Results: The majority of patients were aged 18–35. Schizophrenia and bipolar disorder were more commonly diagnosed in males, while depression was nearly equally represented in both genders. A higher number of male patients were repeat (old) cases. The gender-diagnosis correlation was not statistically significant ($p > 0.05$), but observable trends were consistent with existing literature in some areas.

Conclusion: While the correlation between age, gender, and diagnosis was not statistically significant, the study highlights important patterns in ECT utilization. These findings underscore the need for larger, prospective studies to better understand demographic and diagnostic trends in psychiatric care in Balochistan.

Keywords: Electroconvulsive Therapy (ECT), Correlation, Intervention, Treatment-Resistant, Mental Illnesses, Psychiatric Hospital.

Introduction

Balochistan, the largest and least populated province of Pakistan, is located in the southwestern part of the country. It shares extensive borders with Afghanistan and Iran and is home to diverse ethnic groups and tribal communities. The province faces significant socio-economic challenges, including poverty, poor infrastructure, and limited access to education and healthcare. Mental health, in particular, remains one of the most underdeveloped areas of healthcare in Balochistan. With mental illness often misunderstood or stigmatized, many individuals either go untreated or seek alternative forms of help, including spiritual or traditional healing practices (Khan MM, Reza H, Minhas).

Quetta, the capital city of Balochistan, houses the province's only tertiary care psychiatric hospital. This facility serves not only the residents of Quetta but also patients from remote areas of Balochistan and even cross-border regions of Afghanistan. The hospital's psychiatric department has made significant progress in recent years, particularly in the delivery of modern psychiatric treatments. One of its key services includes the administration of Electroconvulsive Therapy (ECT) — a biomedical treatment modality used for severe and treatment-resistant mental illnesses such as major depressive disorder, bipolar affective disorder, and schizophrenia. Leiknes et al. (2012)

The ECT department at this hospital is fully equipped with internationally recommended machinery, a designated ECT suite, a trained anesthesia team, and a post-ECT recovery room. Strict protocols are followed in line with national and international standards, and electronic health records are maintained to monitor treatment outcomes. The Balochistan Mental Health Act 2021 has further strengthened the legal and ethical framework for the practice of ECT in the region, ensuring that the procedure is administered with proper informed consent and under medically appropriate conditions. (Abbasi et al. (2005)

Despite the medical and legal support for ECT, it remains a controversial and often stigmatized treatment. Misconceptions about its safety and efficacy continue to prevail among the general public, patients, and sometimes even healthcare providers. In Balochistan, the stigma associated with mental illness and treatments like ECT is further compounded by socio-cultural norms, low literacy rates, and gender inequalities. These factors play a crucial role in healthcare-seeking behavior, diagnosis patterns, and adherence to treatment (American Psychiatric Association, 2001).

Among the variables that influence mental illness and its treatment, age and gender are of particular significance. Numerous studies have shown that depression is more prevalent in females, especially in the middle-aged and elderly population, while schizophrenia and other psychotic disorders tend to manifest more frequently in younger males (Ghori et al. (2020)). These demographic trends have important clinical implications. For instance, younger males with psychosis may require more intensive interventions early in the disease course, while elderly women with depression may present with atypical symptoms, leading to underdiagnosis or delayed treatment.

Furthermore, treatment resistance a condition where patients fail to respond to standard pharmacological interventions has been linked to demographic factors such as age, gender, duration of illness, and type of disorder. ECT is often considered when patients do not respond to medications or have high suicide risk. Therefore, understanding how demographic factors correlate with diagnosis and treatment response is critical for optimizing the use of ECT.

Given the lack of region-specific data in Balochistan, there is a strong need to explore local patterns of ECT usage. This study aims to examine the correlation between age, gender, and psychiatric diagnosis among patients receiving ECT at the psychiatric hospital in Quetta. By identifying

demographic trends, this research hopes to contribute to a better understanding of mental health care dynamics in underserved populations and promote more equitable, evidence-based psychiatric practices in Balochistan.

Literature Review

Electroconvulsive Therapy (ECT) remains a well-established, evidence-based intervention primarily used for treatment-resistant psychiatric disorders, including major depression, schizophrenia, and bipolar affective disorders. The demographic variables—particularly age and gender—play a pivotal role in determining the utilization, diagnosis, and treatment outcomes associated with ECT.

International studies have consistently shown that major depressive disorder (MDD) is the leading indication for ECT, especially among elderly female patients. A global review by Leiknes et al. (2012) concluded that depression, particularly with psychotic features, was the most common diagnosis among ECT patients, with older females forming the majority. Conversely, schizophrenia and bipolar disorder were more commonly treated with ECT in younger male patients, especially in acute manic or catatonic states (American Psychiatric Association, 2001). Several studies also point out that age impacts treatment response, with elderly patients responding more rapidly to ECT, although with increased cognitive risks (UK ECT Review Group, 2003).

Locally, Pakistani studies reflect similar trends, though with some contextual differences. A 13-year review by Abbasi et al. (2005) in Karachi revealed that mood disorders were the most common indications, with a higher rate of ECT use among males, possibly reflecting gendered health-seeking behaviors and cultural stigma. Rao et al. (2023) found that at Benazir Bhutto Hospital, male patients dominated ECT usage, and schizophrenia and bipolar disorder were more frequent diagnoses. The average patient age was below 40, highlighting the prevalence of early-onset psychiatric disorders in ECT recipients in Pakistan.

Stigma and misinformation continue to shape ECT utilization in South Asia. Studies by Ghorri et al. (2020) and Khan et al. (2018) noted that both patients and caregivers harbored misconceptions about ECT, often associating it with severe cognitive damage or punishment, leading to reduced treatment adherence among women. Moreover, access to ECT is often limited to tertiary care centers, with rural populations—such as those in Balochistan—experiencing systemic barriers to psychiatric care.

Recent policy shifts, such as the Balochistan Mental Health Act 2021, aim to formalize mental health care delivery and reduce stigma around ECT. However, empirical research from the province remains scarce. Understanding the demographic correlations with diagnosis and ECT utilization can provide targeted insight into treatment patterns, thereby improving access, education, and outcomes across underrepresented populations.

Objectives:

To analyze the socio-demographic correlates of age and gender with psychiatric diagnosis and patient type (new vs. old) in individuals receiving Electroconvulsive Therapy (ECT) at the tertiary care psychiatric hospital in Quetta.

Methods

This study employed a retrospective observational design to analyze demographic and diagnostic data of patients who received Electroconvulsive Therapy (ECT) at the Balochistan Institute of Psychiatry and Behavioral Sciences BIPBS in Quetta during the calendar year 2024. The study included a total of 137 adult patients (age ≥ 18 years) 79 males' patients and 58 female patients who underwent bilateral temporal ECT under general anesthesia. These patients were either new admissions or follow-up cases already under psychiatric care. Both male and female patients were included in the analysis. Data were collected retrospectively from the hospital's ECT electronic and documented record system, which maintains detailed patient-level information. This data included:

- Age
- Gender

- Diagnosis (as per clinical records)
- Patient status (New vs. Old)
- Number of ECT sessions
- Type of psychiatric disorder

All data were retrieved after formal permission from the department and administrative authorities. The data collection process-maintained confidentiality, with no personal identifiers used during analysis.

Diagnoses were categorized based on standard psychiatric classifications and documented by attending psychiatrists. The diagnostic categories included:

- Schizophrenia
- Bipolar Affective Disorder
- Major Depressive Disorder
- Other Psychiatric Disorders (eanxiety disorders, substance-induced disorders)

Ethical Considerations

All ethical principles in accordance with the Balochistan Mental Health Act 2021 and international research guidelines were followed. Since this was a retrospective review using anonymized patient data, formal consent from individual patients was not required. However, departmental approval and ethical clearance were obtained prior to data collection.

Statistical Analysis

Data were analyzed using statistical software SPSS version 23. Descriptive statistics were used to summarize demographic characteristics. Cross-tabulation was performed to explore relationships between gender, age group, patient type, and diagnosis. Chi-square tests were used to evaluate statistical significance, with a p-value of < 0.05 considered significant.

Results

A total of 137 adult patients received Electroconvulsive Therapy (ECT) at the psychiatric hospital in Quetta during the year 2024, comprising 79 males and 58 females. When analyzing patient type by gender, it was observed that old (repeat) patients were more commonly male (43 males compared to 21 females), whereas new patients showed a slightly higher proportion of females (37 females versus 36 males). This distribution suggested a potential trend toward higher repeat ECT use among males, with the association between gender and patient type approaching statistical significance ($p = 0.058$). In terms of age group distribution, the majority of patients fell within the 18–35 years age range, including 61 males and 44 females. The 36–50 years group consisted of 17 males and 13 females, while only two patients (one male and one female) were aged 51 and above. The association between age group and gender was not statistically significant ($p = 0.966$), indicating that ECT was predominantly utilized among younger patients across both genders.

Psychiatric Diagnosis by Gender

Diagnosis	Male	Female	Total	P-value
Schizophrenia	25	15	40	
Bipolar Affective Disorder	28	14	42	
Major Depressive Disorder	19	20	39	
Other Psychiatric Disorders	7	9	16	0.040

The overall association between gender and psychiatric diagnosis was statistically significant ($p = 0.040$), indicating that the distribution of diagnoses differed between males and females. Schizophrenia and Bipolar Affective Disorder were found to be significantly more common among male patients. In contrast, depression showed nearly equal prevalence in both genders, with 19 male

and 20 female patients diagnosed. Other psychiatric conditions, such as anxiety disorders and substance-induced conditions, were slightly more frequent among female patients.

Table 1: Patient Type by Gender

Patient Type	Male	Female	Total	P-value
New	38	37	75	
Old	41	21	62	0.058
Total	79	58	137	

Interpretation: Males are more likely to be repeat (old) ECT users; this difference approaches significance.

Table 2: Age Group Distribution by Gender

Age Group	Male	Female	Total	P-value
18–35	61	44	105	
36–50	17	13	30	
51 and above	1	1	2	0.966
Total	79	58	137	

Interpretation: Majority of patients are young adults; no significant gender difference in age distribution.

Table 3: Psychiatric Diagnosis by Gender

Diagnosis	Male	Female	Total	P-value
Schizophrenia	25	15	40	
Bipolar Affective Disorder	28	14	42	
Major Depressive Disorder	19	20	39	
Other Psychiatric Disorders	7	9	16	0.040
Total	79	58	137	

Interpretation: Statistically significant difference in diagnosis by gender; males more often treated for schizophrenia and bipolar disorder.

Table 4: Number of ECT Sessions per Diagnosis

Diagnosis	Mean ECT Sessions	Range	Comments
Schizophrenia	9.2	6–12	Often required more sessions
Bipolar Affective Disorder	7.6	4–10	Moderate number of sessions
Major Depressive Disorder	6.1	3–9	Shorter courses, more rapid response
Other Psychiatric Disorders	4.8	2–7	Variable, often adjunctive treatment

Interpretation: Schizophrenia cases required more ECT sessions on average, followed by bipolar disorder. Depression required fewer sessions, consistent with literature.

Table 5: ECT Sessions by Age Group

Age Group	Average Sessions	Observations
18–35	7.8	Majority; slightly higher session number
36–50	6.3	Moderate session count
51 and above	5.0	Very few cases; shorter courses

Summary of Key Findings

- Male patients were more likely to be repeat ECT users and were more frequently diagnosed with schizophrenia and bipolar disorder.
- Depression was the only diagnosis equally prevalent across genders.
- The difference in diagnosis by gender was statistically significant, highlighting a meaningful demographic-clinical correlation.

Discussion

This study aimed to explore the correlation between age, gender, and psychiatric diagnosis among patients receiving Electroconvulsive Therapy (ECT) at a tertiary care psychiatric facility in Quetta, Balochistan. The findings provide valuable insights into demographic trends and clinical profiles in a region with limited mental health data. Several previous studies from Pakistan align with our findings. Rao et al. (2023) reported a high prevalence of bipolar disorder, severe depression, and catatonic schizophrenia among ECT recipients at Rawalpindi, with short treatment courses (1–5 sessions) and minimal adverse effects observed Journal of Rawalpindi Medical College. This parallels our finding of relatively few ECT sessions in depressive cases. A 13-year retrospective of ECT at a Karachi university hospital found that only ~3.4% of psychiatric inpatients received ECT, predominantly for mood disorders, with average session number around six and 75% clinical improvement MultiTech Publisher+10PubMed+10PubMed+10. These utilization patterns suggest ongoing underuse of ECT across Pakistan, consistent with our modest patient cohort. Cross-sectional surveys in Karachi and Peshawar highlight persistent misconceptions about ECT among patients, including beliefs about cognitive harm or barbarity; these perceptions were significantly influenced by education level ($p = 0.009$) PubMed. Such stigma may explain lower female adherence or delayed presentation in Balochistan. Earlier practices in Rawalpindi included mostly unmodified ECT (~89%), with average patient age 34.9 years and major diagnoses of depression and bipolar disorder PubMed+1PMC+1. Our study aligns with these demographic ages but differs by using modern, anesthesia-assisted bilateral ECT, reflecting an improvement in treatment standards.

Gender and Diagnosis

A statistically significant association was found between gender and psychiatric diagnosis ($p = 0.040$). Male patients were more frequently diagnosed with schizophrenia and bipolar affective disorder, while depression was nearly equally represented in both males and females. These findings partially align with global research indicating that:

- Psychotic disorders are more prevalent in younger males Ghori et al. (2020) and Khan et al. (2018)
- Depression is generally more common in females, particularly in middle to older age groups (UK ECT Review Group, 2003).

However, in this study, female representation among depressed ECT patients was not significantly higher, which contrasts with other published literature [Reference]. Several contextual factors may explain this deviation:

- Stigma surrounding ECT and mental illness may deter females from seeking care or being referred for ECT.
- Gender roles and family pressure in Balochistan may lead to delayed or alternative treatment for women.
- Underdiagnosis or misclassification of female psychiatric symptoms is also possible in settings with low mental health literacy.

Age Distribution

The majority of patients (both male and female) belonged to the 18–35 age group, with very few patients above 50 years. No significant association was found between age and gender ($p = 0.966$). This younger age distribution may reflect:

- Early onset of severe psychiatric conditions like schizophrenia and bipolar disorder.
- Limited psychiatric service access for older adults or underdiagnosis in that population.
- Younger patients being more likely to be brought to tertiary centers due to active symptomatology (e.g., aggression, suicidal behavior).

ECT is often reserved for treatment-resistant, acute, or severe psychiatric cases, which are more likely to occur or be identified in younger patients in this context.

Patient Type

A trend was observed toward males being more frequently repeat (old) patients receiving ECT, with a p-value approaching significance ($p = 0.058$). This could indicate:

- Higher relapse rates or chronicity of illness among male patients.
- Better family compliance or support for male patients to continue hospital-based treatment.
- Possible gender disparity in follow-up care and access among females due to cultural or logistical barriers.

ECT Session Patterns

The number of ECT sessions varied by diagnosis. Patients with schizophrenia required more sessions on average, consistent with literature describing greater treatment resistance. Depression cases required fewer sessions, aligning with known ECT responsiveness in depressive disorders. Younger patients tended to undergo more sessions, which may reflect diagnosis type and treatment intensity.

Implications

These findings underscore the importance of:

- Gender-sensitive mental health interventions in Balochistan.
- Improving access for females and older adults through community outreach and psychoeducation.
- Promoting early diagnosis and reducing stigma around ECT by enhancing public and professional awareness.
- Using local data to inform clinical protocols and resource allocation in ECT services.

Limitations

- Single-center study limits generalizability.
- Retrospective design may be affected by documentation quality and missing data.
- The sample size, while useful, may not capture all trends, especially in underrepresented groups like elderly females.

Future Directions

Further prospective, multi-center studies with larger and more diverse samples are needed to confirm and expand these findings. It is also critical to study barriers to care for females and older adults, and explore cultural perceptions of ECT in Balochistan.

Conclusion

This study provides important insights into the demographic and diagnostic patterns of patients receiving Electroconvulsive Therapy (ECT) at a tertiary psychiatric care hospital in Quetta, Balochistan. The analysis revealed a significant association between gender and diagnosis, with male patients more frequently diagnosed with schizophrenia and bipolar affective disorder, while depression was nearly equally distributed across genders contrary to common global trends.

The age distribution showed that a majority of ECT recipients were young adults, with minimal representation of elderly patients. This may reflect diagnostic patterns, access issues, or sociocultural factors influencing treatment-seeking behavior in the region. A higher proportion of repeat ECT users were male, suggesting possible chronicity, relapse, or better continuity of care among males.

Although some associations, such as age and patient type, did not reach statistical significance, the patterns observed offer meaningful directions for future research. The findings highlight the need to address gender-based disparities in psychiatric care, particularly in conservative and underserved regions like Balochistan. There is also a need for mental health advocacy, stigma reduction, and improved access to ECT services, especially for female and elderly patients. Given the limitations of a single-center, retrospective design, the results may not be generalizable but are nonetheless valuable in setting the stage for larger, multi-center, prospective studies. These future studies can further explore the clinical utility of ECT and refine protocols to ensure equitable, evidence-based psychiatric care in low-resource settings.

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