

Exploring the Relationship between Residence, and Income on Psychological Distress among Individuals with Idiopathic Epilepsy in Delhi NCR Hospital Settings, India

Abstracts

Aims: This study investigates the prevalence and role of demographic factors in psychological distress in epileptic patients.

Study design: The study employs a nonexperimental research design to investigate the prevalence and demographic effect.

Method: Total 199 epileptic patients from the Delhi and National Capital Region, using convenient sampling were applied. Demographic information, including gender, age, education, marital status, occupation, income, and family type, and psychological distress scale (Keseler-10) were administered. Frequency distribution, percentage, chi-square, t-test, one-way ANOVA and two-way ANOVA used to analyse data.

Results: A significant differences was found on severe psychological distress in terms of gender, educational qualification and social economic status. Patients with high school education and lower social economical status patients manifested more psychological distress. Whereas, mean scores of psychological distresses found significant on the level of educational qualification and social economic status. The interaction between income and residence highlighted that rural participant in the low social economic status group showed the highest levels of distress.

Conclusion: These findings highlight the multifaceted nature of psychological distress among idiopathic epileptic patients, emphasizing the importance of addressing educational and economic disparities. These results emphasize the crucial role of socioeconomic and educational factors in mental health, highlighting the need for targeted interventions and support systems to address psychological distress in idiopathic epileptic patients.

Keywords: Psychological Distress, Idiopathic Epilepsy, Socioeconomic Status (SES), Gender Difference Education Levels

1. Introduction

Epilepsy, a chronic neurological disorder characterized by recurrent seizures, impacts approximately 50 million people worldwide, cementing its position as one of the most prevalent neurological conditions globally (World Health Organization, 2019). While its neurological manifestations are widely recognized, the psychological burden borne by individuals with epilepsy remains profound and multifaceted. Psychological distress in epileptic patients is not merely a by-product of the disease; it significantly influences their quality of life, adherence to treatment, and overall well-being.

Psychological distress in individuals with epilepsy often manifests through a spectrum of emotional and mental health challenges, including anxiety, depression, irritability, low self-esteem, and emotional

instability (Kanner, 2011). Notably, people with epilepsy face a 2–5 times higher likelihood of developing psychiatric disorders, with one in three patients receiving a lifetime psychiatric diagnosis (Mula et al., 2021). Tellez-Zenteno et al. (2007) highlighted that 20–30% of individuals with epilepsy experience depression, while 10–25% suffer from anxiety disorders, with risk factors including seizure type, frequency, and lack of seizure control.

Depression emerges as one of the most prevalent mental health challenges among epileptic patients. Kanner (2003) identified it as a common comorbidity, affecting 20–55% of individuals depending on study populations and methodologies. Similarly, Johnson et al. (2004) reported depression prevalence at 23.1% and anxiety at 18.1%, both of which were significantly linked to a diminished quality of life. Barry et al. (2007) further explored bipolar disorder in this population, revealing symptoms in 12% of epileptic patients compared to 1–2% in the general population. Gilliam et al. (1997) noted that one-third of patients identified mood disturbances as a significant concern, while Jacoby et al. (1994) observed depression in 21% of individuals with recurrent seizures.

The mechanisms underlying the connection between epilepsy and psychological distress remain elusive, yet several contributing factors have been identified. Social stigma surrounding epilepsy, particularly in certain cultural settings, often leads to social withdrawal and isolation, exacerbating psychological distress (Baker et al., 1999). Moreover, side effects of antiepileptic drugs (AEDs) can amplify mood disturbances, with some AEDs directly affecting the central nervous system, resulting in heightened feelings of depression and anxiety (Pugh et al., 2021).

1.1. Demographic Influences on Psychological Distress

Demographic variables, including gender, education, marital status, and socioeconomic status (SES), play pivotal roles in shaping psychological outcomes among epileptic patients. Gender disparities are particularly striking, with women exhibiting higher rates of depression and anxiety than their male counterparts. These differences may stem from variations in coping mechanisms, hormonal fluctuations, and societal expectations (Kanner, 2011).

Educational attainment also significantly influences psychological distress. Lower education levels correlate with heightened distress, likely due to limited health literacy, misconceptions about epilepsy, and fewer coping resources. Individuals with less education often face stigma and barriers to healthcare, further compounding their emotional challenges (Kwon & Park, 2021). Reduced educational opportunities also restrict employment prospects, intensifying socioeconomic stressors that exacerbate psychological difficulties (Taylor et al., 2011).

Marital status serves as another critical factor in psychological well-being. Supportive relationships offer emotional stability, security, and practical assistance, which can mitigate psychological distress (Umberson et al., 2013). However, the clinical aspects of epilepsy are often negatively associated with

marital satisfaction, with some studies indicating a limited understanding of how epilepsy affects partners and families (Tedrus, Fonseca, & Pereira, 2015; Kinariwalla & Sen, 2016).

Social support is indispensable for managing epilepsy-related challenges. Unalan et al. (2015) emphasized the importance of instrumental support, which ranked high among coping strategies. Addressing emotional needs, fostering positive reinterpretation, and creating structured support systems are crucial in reducing the negative impacts of dysfunctional coping mechanisms. Elliott et al. (2009) further argued that SES significantly affects health outcomes, underscoring the necessity of integrating psychological well-being into comprehensive epilepsy care.

Financial constraints also pose significant challenges, often limiting access to healthcare and heightening the emotional burden on patients and their families. Allers et al. (2015) observed that epilepsy imposes a substantial economic strain, with uncertainty surrounding the adequacy of insurance coverage. Seid et al. (2018) found that caregivers in low- and middle-income settings face less mental distress when supported by strong social networks, though stigma and poor support remain key risk factors.

1.2. Addressing the Multidimensional Needs of Epileptic Patients

The high prevalence of psychological distress in individuals with epilepsy underscores the importance of considering demographic factors in tailoring interventions. Women, for example, may benefit from gender-specific mental health strategies, while individuals from lower SES backgrounds require greater access to resources that enhance coping and resilience. Addressing the stigma surrounding epilepsy, particularly in cultural contexts where it remains deeply entrenched, could significantly alleviate the psychological burden on patients (Baker et al., 2001).

This study endeavours to explore the prevalence of psychological distress among epileptic patients and analyse the influence of demographic factors such as gender, education, marital status, social and economic status, and family type on distress severity. By examining these variables, we aim to illuminate the unique needs of this population and contribute to the development of holistic care models that address both the physical and psychological dimensions of epilepsy.

2. Method

The study employs a nonexperimental research design to investigate the characteristics and psychological profiles of epileptic patients.

2.1. Sample

This study included 199 people with idiopathic epilepsy. The participants were chosen using convenient sampling, a method where researchers select individuals who are easily accessible. Out of the 199 participants, 111 were men (55.8%), and 88 were women (44.2%). The average age of the participants

was 27.65 years. This group represented a mix of young and middle-aged adults. The sampling method made it easier to include participants, giving useful information about mood disorders in people with idiopathic epilepsy.

2.2. Material and Procedure

Permission was obtained from the management of various hospitals in the Delhi NCR region. This ensured compliance with institutional and ethical guidelines for research involving human participants. Each participant was provided with detailed information about the study's objectives, procedures, potential risks, and benefits. Written informed consent was obtained from all participants, ensuring their voluntary participation and the confidentiality of their data. Data collection was conducted over a period of 30 months, from January 2022 to June 2024, in hospitals and clinics located in the Delhi NCR region. This extended timeframe allowed the researchers to capture a comprehensive dataset across various locations. Participants completed a personal datasheet, which recorded essential demographic and clinical information, including name, age, gender, marital status, occupation, qualification, family types etc. Clinical Information included duration of the disease, frequency of seizures, time elapsed since the initiation of treatment.

The Kessler Psychological Distress Scale (K10) was administered to evaluate the psychological distress levels among participants. The K10 is a widely used, validated self-report measure consisting of 10 items, rated on a 5-point scale. It assesses the frequency of nonspecific psychological distress symptoms experienced in the past four weeks. Collected data were carefully reviewed and organized to ensure completeness and accuracy. Each participant was assigned a unique identifier to maintain confidentiality. All data were entered into SPSS (Statistical Package for the Social Sciences), version 21, for statistical analysis. Double-entry verification was used to minimize errors during the data entry process. Frequency distribution, percentage, and chi-square test used to explore the prevalence of psychological distress. Descriptive and inferential statistics such as mean, standard deviation, t test, one way ANOVA and two-way ANOVA used to examine the demographic variables effect on psychological distress in idiopathic patients.

3. Results

3.1. Prevalence of Psychological Distress

The table-1 presents the relationship between various demographic variables (Gender, Education, Marital Status, Residence, Job, Income, and Family Type) and the levels of severity (Normal, Mild,

Table-1: *Prevalence of Psychological Distress in epileptic patients*

| Variables | Normal | Mild | Moderate | Severe | Total | χ^2 |
|------------------|--------|-------|----------|--------|--------|----------|
| Gender | | | | | | |
| Male | 12 | 15 | 38 | 46 | 111 | 7.72* |
| % | 10.8% | 13.5% | 34.2% | 41.4% | 100.0% | |
| Female | 17 | 19 | 18 | 34 | 88 | |
| % | 19.3% | 21.6% | 20.5% | 38.6% | 100.0% | |
| Education | | | | | | |

| | | | | | | |
|--------------------------|-------|-------|-------|-------|--------|---------|
| High School % | 3 | 7 | 17 | 27 | 54 | 16.16** |
| | 5.6% | 13.0% | 31.5% | 50.0% | 100.0% | |
| Intermediate % | 8 | 14 | 26 | 29 | 77 | |
| | 10.4% | 18.2% | 33.8% | 37.7% | 100.0% | |
| Graduation % | 18 | 13 | 13 | 24 | 68 | |
| | 26.5% | 19.1% | 19.1% | 35.3% | 100.0% | |
| Marital Status | | | | | | |
| Unmarried % | 7 | 16 | 24 | 35 | 82 | 8.61 |
| | 8.5% | 19.5% | 29.3% | 42.7% | 100.0% | |
| Married % | 20 | 15 | 24 | 32 | 91 | |
| | 22.0% | 16.5% | 26.4% | 35.2% | 100.0% | |
| Others % | 2 | 3 | 8 | 13 | 26 | |
| | 7.7% | 11.5% | 30.8% | 50.0% | 100.0% | |
| Residence | | | | | | |
| Rural % | 18 | 26 | 40 | 57 | 141 | 1.61 |
| | 12.8% | 18.4% | 28.4% | 40.4% | 100.0% | |
| Urban % | 11 | 8 | 16 | 23 | 58 | |
| | 19.0% | 13.8% | 27.6% | 39.7% | 100.0% | |
| Job | | | | | | |
| Govt % | 7 | 6 | 5 | 11 | 29 | 8.73 |
| | 24.1% | 20.7% | 17.2% | 37.9% | 100.0% | |
| Private % | 9 | 16 | 31 | 30 | 86 | |
| | 10.5% | 18.6% | 36.0% | 34.9% | 100.0% | |
| Business % | 13 | 12 | 20 | 39 | 84 | |
| | 15.5% | 14.3% | 23.8% | 46.4% | 100.0% | |
| Social Economical Status | | | | | | |
| Low SES % | 3 | 5 | 24 | 39 | 71 | 28.29** |
| | 4.2% | 7.0% | 33.8% | 54.9% | 100.0% | |
| Middle SES % | 10 | 15 | 17 | 28 | 70 | |
| | 14.3% | 21.4% | 24.3% | 40.0% | 100.0% | |
| High SES % | 16 | 14 | 15 | 13 | 58 | |
| | 27.6% | 24.1% | 25.9% | 22.4% | 100.0% | |
| Family Types | | | | | | |
| Nuclear % | 14 | 14 | 18 | 29 | 75 | 2.36 |
| | 18.7% | 18.7% | 24.0% | 38.7% | 100.0% | |
| Joint % | 15 | 20 | 38 | 51 | 124 | |
| | 12.1% | 16.1% | 30.6% | 41.1% | 100.0% | |

Note: *Significant at $p < 0.05$ **Significant at $p < 0.01$

Moderate, and Severe) of a dependent variable. Chi-square (χ^2) values are calculated to determine whether there is a statistically significant association between the variables and the levels of severity. For males, the majority of respondents are in the Severe category (41.4%), followed by Moderate (34.2%), Mild (13.5%), and Normal (10.8%). Among females, a considerable proportion is also in the Severe category (38.6%), but their distribution across other levels is more balanced, with Moderate at 20.5%, Mild at 21.6%, and Normal at 19.3%. The chi-square value ($\chi^2 = 7.72$, $p < .05$) indicates a statistically significant difference in severity levels between males and females.

For individuals with a high school education, the majority fall into the Severe category (50%), indicating a clear trend of increasing severity with lower education levels. Among those with an intermediate education, the distribution is more varied, with the highest percentage in the Moderate category (33.8%) and a substantial proportion in the Severe category (37.7%). Graduates show a relatively even distribution across all categories, although the Severe category remains prominent (35.3%). The chi-square value ($\chi^2 = 16.1$, $p < .01$) demonstrates a highly significant relationship between education levels and severity.

For unmarried individuals, the majority are in the *Severe* category (42.7%), followed by *Moderate* (29.3%), *Mild* (19.5%), and *Normal* (8.5%). Among married individuals, a higher proportion is also in the *Severe* category (35.2%), but the distribution across other categories is more balanced. For those categorized as "Others," the *Severe* category is the most prominent (50%), suggesting that individuals outside traditional marital categories may experience higher severity levels. The chi-square value ($\chi^2 = 8.61$, $p > .05$) indicates no statistically significant relationship between marital status and severity.

Among rural respondents, the majority fall into the *Severe* category (40.4%), followed by *Moderate* (28.4%), *Mild* (18.4%), and *Normal* (12.8%). Urban respondents show a similar trend, with the *Severe* category being the largest (39.7%); however, the distribution across the other categories is slightly more balanced. The chi-square value ($\chi^2 = 1.61$) indicates no statistically significant association between residence and severity levels. For individuals with government jobs, most respondents fall into the *Severe* category (37.9%), with relatively balanced percentages across the other categories. Among those in private jobs, a substantial proportion is in the *Moderate* (36%) and *Severe* (34.9%) categories, indicating higher levels of severity compared to other job groups. In the business category, the *Severe* group is dominant (46.4%), followed by *Moderate* (23.8%). The chi-square value ($\chi^2 = 8.73$, $p > .05$) suggests no significant relationship between job type and severity levels.

For income levels (SES), respondents in the low SES group primarily fall into the *Severe* category (54.9%), demonstrating a strong link between lower income and higher severity. Among those in the middle SES group, severity levels are more evenly distributed, but the *Severe* category remains prominent (40%). For individuals in the high SES group, a smaller proportion falls into the *Severe* category (22.4%), indicating that higher income is associated with lower severity. The chi-square value ($\chi^2 = 28.29$, $p < .01$) highlights a highly significant relationship between income and severity levels.

In terms of family types, a substantial proportion of respondents from nuclear families falls into the *Severe* category (38.7%), followed by *Moderate* (24%), *Mild* (18.7%), and *Normal* (18.7%). Similarly, respondents from joint families also show the highest percentage in the *Severe* category (41.1%). The chi-square value ($\chi^2 = 2.36$) indicates no significant association between family type and severity levels.

Table-2 presents the comparison of demographic variables for psychological distress score. The mean scores between male ($M = 27.56$, $SD = 6.27$) and female ($M = 26.86$, $SD = 7.89$) respondents revealed no statistically significant difference, $t(197) = 0.69$, $p > .05$. Unmarried respondents ($M = 27.91$, $SD = 6.40$) had a higher mean score than married respondents ($M = 26.04$, $SD = 7.26$), but the difference was not statistically significant, $t(171) = 1.78$, $p > .05$. Respondents from joint families ($M = 27.60$, $SD = 6.78$) had a slightly higher mean score than those from nuclear families ($M = 26.67$, $SD = 7.41$). The difference was not statistically significant, $t(197) = 0.91$, $p > .05$. Respondents with a high school education had the highest mean score ($M = 29.00$, $SD = 5.77$), followed by those with intermediate education ($M = 27.52$, $SD = 6.62$), and graduates ($M = 25.56$, $SD = 8.01$). This difference was statistically significant, $F(2, 196) = 3.81$, $p < .05$. Rural respondents ($M = 27.29$, $SD = 6.79$) had a

slightly higher mean score compared to urban respondents ($M = 27.16$, $SD = 7.62$), but the difference was not statistically significant, $t(197) = 0.12$, $p > .05$. Respondents in business ($M = 27.76$, $SD = 7.03$) had the highest mean score, followed by those in private jobs ($M = 27.21$, $SD = 6.54$) and government jobs ($M = 25.90$, $SD = 8.33$). The difference was not statistically significant, $F(2, 196) = 1.55$, $p > .05$. Respondents in the low SES group had the highest mean score ($M = 29.94$, $SD = 5.54$), followed by the middle SES group ($M = 26.76$, $SD = 6.98$), and the high SES group ($M = 24.55$, $SD = 7.60$). This difference was statistically significant, ($F(2, 196) = 10.62$, $p < .01$).

Table-2: Mean SD and t-value/F-value of psychological distress of idiopathic epileptic patients in terms of demographic variables.

| | N | Mean | Std. Deviation | t-value/F value |
|---------------------------------|-----|-------|----------------|-----------------|
| Gender | | | | |
| Male | 111 | 27.56 | 6.265 | .69 |
| Female | 88 | 26.86 | 7.890 | |
| Marital Status | | | | |
| Unmarried | 82 | 27.91 | 6.395 | 1.78 |
| Married | 91 | 26.04 | 7.263 | |
| Family Types | | | | |
| Nuclear | 75 | 26.67 | 7.406 | .913 |
| Joint | 124 | 27.60 | 6.782 | |
| Education | | | | |
| High School | 54 | 29.00 | 5.766 | 3.81* |
| Intermediate | 77 | 27.52 | 6.621 | |
| Graduation | 68 | 25.56 | 8.010 | |
| Residence | | | | |
| Rural | 141 | 27.29 | 6.786 | .12 |
| Urban | 58 | 27.16 | 7.620 | |
| Nature of Job/Profession | | | | |
| Govt | 29 | 25.90 | 8.334 | 1.55 |
| Private | 86 | 27.21 | 6.539 | |
| Business | 84 | 27.76 | 7.031 | |
| Social Economical Status | | | | |
| Low SES | 71 | 29.94 | 5.542 | 10.62** |
| Middle SES | 70 | 26.76 | 6.983 | |
| High SES | 58 | 24.55 | 7.595 | |

Note: *Significant at $p < 0.05$ **Significant at $p < 0.01$

For rural respondents, the mean score was highest in the low SES group ($M = 30.44$, $SD = 5.76$) and decreased for middle SES ($M = 26.88$, $SD = 6.41$) and high SES ($M = 22.55$, $SD = 6.29$) groups. The overall mean for rural respondents was $M = 27.29$ ($SD = 6.79$) based on 141 participants. For urban respondents, the low SES group had a mean score of $M = 28.35$ ($SD = 4.60$), followed by the middle

SES group ($M = 26.29$, $SD = 9.19$) and high SES group ($M = 26.85$, $SD = 8.40$). The overall mean for urban respondents was $M = 27.16$ ($SD = 7.62$) based on 58 participants (Table-3).

Table-3: Mean, and SD of Psychological Distress in terms of rural and urban epileptic patients

| Residence | Income | Mean | Std. Deviation | N |
|-----------|------------|-------|----------------|-----|
| Rural | Low SES | 30.44 | 5.755 | 54 |
| | Middle SES | 26.88 | 6.413 | 56 |
| | High SES | 22.55 | 6.287 | 31 |
| | Total | 27.29 | 6.786 | 141 |
| Urban | Low SES | 28.35 | 4.595 | 17 |
| | Middle SES | 26.29 | 9.194 | 14 |
| | High SES | 26.85 | 8.402 | 27 |
| | Total | 27.16 | 7.620 | 58 |

Table-4: Summary of Two-Way ANOVA (Residence: Rural and Urban X Income: Lower, Middle and Higher)

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|--------------------|-------------------------|-----|-------------|-------|------|
| Residence | 11.161 | 1 | 11.161 | .254 | .615 |
| Income | 605.887 | 2 | 302.944 | 6.899 | .001 |
| Residence * Income | 306.701 | 2 | 153.351 | 3.492 | .032 |
| Error | 8475.283 | 193 | 43.913 | | |
| Total | 157541.000 | 199 | | | |
| Corrected Total | 9757.437 | 198 | | | |

a. R Squared = .131 (Adjusted R Squared = .109)

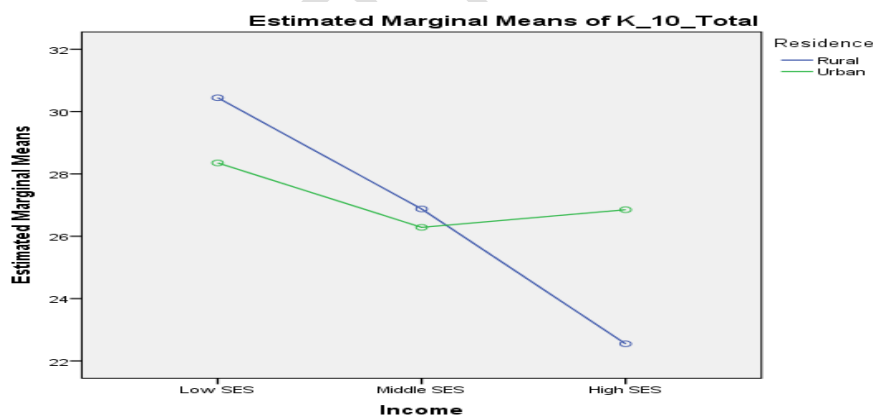


Figure 1: Graphical presentation of mean scores of psychological distress in terms of SES and Residence in idiopathic epileptic patients

The results of the analysis of variance (ANOVA) for the factors of residence, income, and their interaction on the dependent variable are presented in Table-4. The main effect of residence was not statistically significant, $F(1, 193) = 0.254$, $p = .615$, indicating that residence (rural vs. urban) does not

have a significant effect on the dependent variable. The main effect of income was statistically significant, ($F(2, 193) = 6.899, p = .001$), suggesting that different income levels (low, middle, high SES) significantly influence the dependent variable. The interaction between residence and income was statistically significant, ($F(2, 193) = 3.492, p = .032$), indicating that the relationship between residence and the dependent variable differs across different income levels.

4. Discussion

The findings of this study highlight several significant relationships and patterns between demographic variables and psychological distress levels, shedding light on factors that contribute to the prevalence and severity of psychological distress in different populations.

4.1. Gender Differences in Psychological Distress

The analysis revealed that males are more likely to experience severe psychological distress compared to females, with 41.4% of males falling into the severe category, compared to 38.6% of females. The statistically significant chi-square value ($\chi^2 = 7.72, p < .05$) supports this finding. Although females displayed a more balanced distribution across severity levels, the relatively high proportion in the severe category suggests that psychological distress affects both genders substantially. This finding aligns with prior research suggesting gender-based differences in coping strategies and mental health outcomes.

4.2. Education and Psychological Distress

Education emerged as a critical determinant of psychological distress. Individuals with only a high school education demonstrated the highest severity levels (50%), and the trend showed decreasing severity with increasing education levels. The significant chi-square value ($\chi^2 = 16.1, p < .01$) underscores the impact of education on psychological distress. This pattern suggests that higher education may serve as a protective factor, potentially providing individuals with better problem-solving skills, access to resources, and social support networks.

4.3. Marital Status and Psychological Distress

Although unmarried individuals exhibited higher severity levels (42.7%) compared to their married counterparts (35.2%), the chi-square analysis ($\chi^2 = 8.61, p > .05$) did not indicate a statistically significant relationship. This may suggest that marital status alone is not a strong predictor of psychological distress, but it is possible that other mediating factors, such as social support, contribute to the observed differences.

4.4. Residence and Psychological Distress

The comparison between rural and urban respondents showed no significant difference in psychological distress levels ($\chi^2 = 1.61$). However, rural respondents reported a slightly higher overall prevalence of severe distress (40.4%) compared to urban respondents (39.7%). This finding implies that residence

alone may not significantly influence distress but could interact with other factors like income and access to mental health resources.

4.5. Employment Type and Psychological Distress

Although the chi-square analysis ($\chi^2 = 8.73$, $p > .05$) indicated no significant relationship between job type and severity levels, individuals in business and private jobs displayed higher levels of severe distress compared to those in government jobs. This trend may reflect differences in job security, workload, and financial stability across employment sectors.

4.6. Income and Psychological Distress

Income demonstrated a significant impact on psychological distress, with lower SES groups experiencing the highest levels of severity (54.9%). The chi-square value ($\chi^2 = 28.29$, $p < .01$) confirmed this relationship, emphasizing the vulnerability of low-income individuals to severe distress. This finding aligns with established evidence linking financial strain to mental health challenges, as lower SES groups often face greater barriers to accessing mental health resources.

4.7. Family Type and Psychological Distress

The analysis did not reveal a significant association between family type and severity levels ($\chi^2 = 2.36$). However, both nuclear and joint family respondents exhibited a high prevalence of severe distress, suggesting that family structure alone may not adequately buffer against psychological distress.

4.8. Psychological Distress Scores

The t-test and ANOVA analyses further clarified the findings. While gender, marital status, residence, and family type did not show statistically significant differences in mean psychological distress scores, education and income levels did. Specifically, individuals with lower education levels and lower income reported higher mean scores, indicating greater distress. The interaction effect between residence and income was also significant ($F(2, 193) = 3.492$, $p = .032$), suggesting that the relationship between residence and psychological distress varies by income level. For rural respondents, psychological distress was highest in the low SES group, whereas urban respondents showed a more balanced distribution across income levels.

5. Conclusion

The study reveals significant insights into the prevalence and determinants of psychological distress across various demographic factors. Gender showed a statistically significant relationship with severity levels, with a higher proportion of males in the severe distress category compared to females, though mean scores for distress between genders did not differ significantly. Education emerged as a critical determinant, with lower educational attainment strongly associated with higher severity and mean distress scores, indicating the protective role of higher education. Marital status revealed that unmarried

individuals experienced greater psychological distress, though the association was not statistically significant. Residence (rural vs. urban) did not have a significant impact on distress levels or mean scores, suggesting a uniform prevalence across these settings. Employment type and family structure showed no significant associations with severity or distress scores, although individuals in private jobs and nuclear families demonstrated slightly higher distress levels. Income levels significantly influenced psychological distress, with low socioeconomic status (SES) strongly linked to higher severity and mean scores, highlighting economic factors as a key predictor of distress. The interaction between residence and income also revealed significant differences, suggesting that the effects of income on distress vary depending on residential settings. These findings emphasize the multifaceted nature of psychological distress and the importance of addressing educational, economic, and social factors to mitigate its impact.

5.1. Implications and Future Directions

These findings have significant implications for mental health interventions and policies. First, targeted efforts are needed to address the mental health needs of low SES groups, particularly in rural areas. Programs focusing on financial support, education, and access to affordable mental health services could mitigate the burden of psychological distress in these populations. Second, the protective role of education highlights the importance of promoting higher education as a means to enhance mental well-being. Finally, gender-specific mental health programs could address the unique stressors and coping strategies of males and females.

Future research should explore the role of mediating factors such as social support, coping mechanisms, and access to mental health resources. Additionally, longitudinal studies could provide insights into how demographic variables influence psychological distress over time.

Ethical Approval and Consent:

Ethical Approval:

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

Consent

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

References

- Allers, K., Essue, B.M., Hackett, M.L. *et al.* The economic impact of epilepsy: a systematic review. *BMC Neurol* **15**, 245 (2015). <https://doi.org/10.1186/s12883-015-0494-y>
- Baker GA, Brooks J, Buck D, et al. (1999). The stigma a of epilepsy: A European perspective. *Epilepsia*. 1999;41(1):98–104. doi: 10.1111/j.1528-1157.2000.tb01512.x.
- Barry, J., Lembke, A., & Gisbert, P. A. (2007). Affective disorders in epilepsy. In A. B. Ettinger & A. M. Kanner (Eds.), *Psychiatric issues in epilepsy: A practical guide to diagnosis and treatment* (pp. 203–247). Philadelphia, PA: Lippincott Williams & Wilkins.
- Elliott, J.O., Charyton, C., Lu, B. & Moore, J.L. (2009). Serious psychological distress and health outcomes for persons with epilepsy in poverty, *Seizure*, **18**(5) 332–338. <https://doi.org/10.1016/j.seizure.2008.11.003>.
- Gilliam, F., Kuzniecky, R., Faught, E., Black, L., Carpenter, G., & Schrodt, R. (1997). Patient-validated content of epilepsy-specific quality-of-life measurement. *Epilepsia*, **38**(2), 233–236. <https://doi.org/10.1111/j.1528-1157.1997.tb01102.x>
- Jacoby, A. (1994). Felt versus enacted stigma: A concept revisited: Evidence from a study of people with epilepsy in remission, *Social Science & Medicine*, **38**, (2), 269–274, [https://doi.org/10.1016/0277-9536\(94\)90396-4](https://doi.org/10.1016/0277-9536(94)90396-4).
- Johnson, E. K., Jones, J. E., Seidenberg, M., & Hermann, B. P. (2004). The relative impact of anxiety, depression, and clinical seizure features on health-related quality of life in epilepsy. *Epilepsia*, **45**(5), 544–550. <https://doi.org/10.1111/j.0013-9580.2004.47003.x>
- Kanner A. M. (2003). Depression in epilepsy: prevalence, clinical semiology, pathogenic mechanisms, and treatment. *Biological psychiatry*, **54**(3), 388–398. [https://doi.org/10.1016/s0006-3223\(03\)00469-4](https://doi.org/10.1016/s0006-3223(03)00469-4)
- Kanner A. M. (2011). Depression and epilepsy: A bidirectional relation?. *Epilepsia*, **52 Suppl 1**, 21–27. <https://doi.org/10.1111/j.1528-1167.2010.02907.x>
- Kinariwalla, N., & Sen, A. (2016). The psychosocial impact of epilepsy on marriage: A narrative review. *Epilepsy & Behavior*, **63**, 34–41. <https://doi.org/10.1016/j.yebeh.2016.07.026>
- Kwon, O. Y., & Park, S. P. (2014). Depression and anxiety in people with epilepsy. *Journal of clinical neurology (Seoul, Korea)*, **10**(3), 175–188. <https://doi.org/10.3988/jcn.2014.10.3.175>
- Mula, M., Kanner, A. M., Jetté, N., & Sander, J. W. (2021). Psychiatric comorbidities in people with epilepsy. *Neurology: Clinical Practice*, **11**(2), e112–e120. <https://doi.org/10.1212/CPJ.000000000000087>
- Pugh, M. J., Kennedy, E., Gugger, J. J., Mayo, J., Tate, D., Swan, A., Kean, J., Altalib, H., Gowda, S., Towne, A., Hinds, S., Van Cott, A., Lopez, M. R., Jaramillo, C. A., Eapen, B. C., McCafferty, R. R., Salinsky, M., Cramer, J., McMillan, K. K., Kalvesmaki, A., ... MINUTE Study Group (2021). The Military Injuries: Understanding Post-Traumatic Epilepsy Study: Understanding Relationships among Lifetime Traumatic Brain Injury History, Epilepsy, and Quality of Life. *Journal of neurotrauma*, **38**(20), 2841–2850. <https://doi.org/10.1089/neu.2021.0015>

- Seid, S., Demilew, D., Yimer, S., & Mihretu, A. (2018). Prevalence and associated factors of mental distress among caregivers of patients with epilepsy in Ethiopia: A cross-sectional study design. *Psychiatry Journal*, 2018, Article 2819643, 8 pages. <https://doi.org/10.1155/2018/2819643>
- [Taylor, R. S.](#) , Sander, J. W., Taylor, R. J. and Baker, G. A. (2011) Predictors of health-related quality of life and costs in adults with epilepsy: a systematic review. *Epilepsia*, 52(12), pp. 2168-2180. (doi: [10.1111/j.1528-1167.2011.03213.x](https://doi.org/10.1111/j.1528-1167.2011.03213.x))
- Tedrus, G.M.A.S, Fonseca, L.C. & Pereira, R.B. (2015). Marital status of patients with epilepsy: Factors and quality of life. *Seizure*, 27, 66-70, <https://doi.org/10.1016/j.seizure.2015.02.028>.
- Tellez-Zenteno, J. F., Patten, S. B., Jetté, N., Williams, J., & Wiebe, S. (2007). Psychiatric comorbidity in epilepsy: a population-based analysis. *Epilepsia*, 48(12), 2336–2344. <https://doi.org/10.1111/j.1528-1167.2007.01222.x>
- Thompson, P., & Upton, D. (1992). The impact of chronic epilepsy on the family. *Seizure*, 1(1), 43-48. [https://doi.org/10.1016/1059-1311\(92\)90054-5](https://doi.org/10.1016/1059-1311(92)90054-5)
- Umberson, D., Thomeer, M.B., Williams, K. (2013). Family Status and Mental Health: Recent Advances and Future Directions. In: Aneshensel, C.S., Phelan, J.C., Bierman, A. (eds) Handbook of the Sociology of Mental Health. Handbooks of Sociology and Social Research. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-4276-5_20
- Unalan D, Soyuer F, Basturk M, Ersoy AO, Elmali F, Ozturk A. (2015). Perceived social support systems` and depression`s effects on attitudes regarding coping strategies for the disease in patients with epilepsy. *Neurosciences (Riyadh)*. 20(1):17-26.
- Wada, K., Iwasa, H., Okada, M., Kawata, Y., Murakami, T., Kamata, A., Zhu, G., Osanai, T., Kato, T., & Kaneko, S. (2004). Marital status of patients with epilepsy with special reference to the influence of epileptic seizures on the patient's married life. *Epilepsia*, 45 Suppl 8, 33–36. <https://doi.org/10.1111/j.0013-9580.2004.458011.x>
- World Health Organization. (2019). Epilepsy. *World Health Organization*. <https://www.who.int/news-room/fact-sheets/detail/epilepsy>