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INCIDENCE OF DEPRESSION IN THE ATTENDANTS OF STROKE PATIENTS IN HOSPITAL BASE PATIENTS

Original Research

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ABSTRACT

Background: Stroke is a leading cause of long-term disability and emotional distress, significantly impacting not only survivors but also their caregivers. The emotional burden of caregiving often predisposes attendants to depression, particularly when coupled with the patient's functional dependence. Despite the significant role caregivers play in patient rehabilitation, depression among attendants remains under-recognized and under-researched, especially in low-resource settings. Early detection and management of caregiver depression are crucial for optimizing patient and caregiver outcomes.

Objective: To determine the incidence of depression among attendants of stroke patients admitted to a hospital-based setting.

Methods: This cross-sectional observational study was conducted over six months in the Department of Medicine at CMH Lahore. A total of 77 attendants of stroke survivors, providing care for more than six months, were enrolled using a consecutive non-probability sampling technique. Depression was assessed using the Hamilton Depression Rating Scale (HDRS), while the functional status of stroke survivors was evaluated using the Barthel Index. Data were collected through face-to-face interviews and follow-up phone calls. Numerical variables were presented as means and standard deviations, and categorical variables as frequencies and percentages. Statistical associations were analyzed using appropriate tests, with a significance level set at $p \leq 0.05$.

Results: Among the 77 attendants, 31 (40.2%) were males and 46 (59.7%) were females, with a mean age of 36 ± 3 years. Depression was diagnosed in 61 (79.2%) attendants, further categorized as possible depression in 14 (22.9%), mild to moderate depression in 31 (50.8%), and severe depression in 16 (26.2%). Depression severity was inversely correlated with the Barthel Index, with scores below 20 commonly seen in severe cases. Depression prevalence was significantly associated with female gender ($p=0.05$), lower educational attainment ($p=0.04$), lower monthly income ($p=0.03$), nuclear family structure, and marital status.

Conclusion: Depression among attendants of stroke patients is highly prevalent and influenced by multiple sociodemographic factors. Screening and addressing caregiver depression is vital for the well-being of both caregivers and stroke survivors, and strategies should be developed to provide timely psychological support.

Keywords: Activities of Daily Living, Caregivers, Depression, Incidence, Stroke, Stroke Rehabilitation, Survivors.

INTRODUCTION

Stroke, also referred to as a cerebrovascular accident, stands as one of the leading causes of mortality and long-term disability globally. It ranks as the second most common cause of death and the third major cause of disability-adjusted life years (DALYs) lost worldwide (1). Alarmingly, over the past decade, the global burden of stroke has increased considerably, with reported rises of 70% in incidence, 44% in mortality, and 32% in DALYs (2). This surge is notably more pronounced in developing regions, particularly in South Asian countries, where approximately 86% of stroke-related deaths and 81% of DALYs are recorded in low-income settings (3). Pakistan mirrors this trend, with a 2011 study estimating an annual stroke incidence of 250 per 100,000 population (4). The underlying pathology of most strokes involves thrombosis or embolism within cerebral vessels, commonly originating from cardiac chambers and migrating to occlude critical brain territories (5). Clinical manifestations vary according to the vascular territory affected and may include dysarthria, hemianopia, neglect, vertigo, impaired consciousness, hemiparesis, or ataxia (6). Beyond the immediate physical sequelae, stroke survivors frequently endure a range of neuropsychiatric complications such as post-stroke depression, cognitive impairment, emotional lability, sleep disturbances, and heightened anxiety. A meta-analysis indicated that approximately 42% of stroke survivors experience symptoms of post-traumatic stress disorder (PTSD) following an acute cerebrovascular event (7).

Recovery from stroke extends beyond clinical management to encompass comprehensive caregiving support. However, caregiving is often physically and emotionally taxing, imposing substantial psychological strain on caregivers. Studies reveal that the mental health of caregivers is significantly impacted, with 40.2% of caregivers experience mild to moderate depression while attending to stroke survivors (8). In Pakistan, local data suggest that nearly 24% of attendants of stroke patients manifest symptoms of depression in varying degrees (9). The assessment of caregiver burden and depression has been facilitated by validated tools such as the Patient Health Questionnaire-9 (PHQ-9), Zarit Burden Interview-22 (ZBI-22), and the Short Portable Mental Status Questionnaire, which offer standardized methods for evaluating psychological morbidity among caregivers. Moreover, the caregiving role often disrupts occupational responsibilities, leading to reduced work productivity and financial instability. A study documented that 32% of caregivers reported work restrictions, while 9% experienced absenteeism, highlighting the broader socioeconomic impact of stroke caregiving (10). Stroke survivors' dependency on their attendants for routine activities compounds this burden, creating a cyclical challenge that affects both parties' quality of life. Given the rising incidence of stroke and its profound implications not only for survivors but also for their caregivers, it becomes imperative to investigate the mental health outcomes among those providing care. Therefore, the objective of this study is to determine the incidence of depression among attendants of stroke patients in a hospital-based setting, aiming to bridge the existing gap in local data and inform targeted interventions for caregiver support.

METHODS

Following the approval from the Ethical Review Board of Combined Military Hospital (CMH), Lahore, Pakistan, a cross-sectional observational study was conducted among attendants of stroke patients. The study population comprised caregivers attending to stroke survivors at CMH Lahore. The sample size was calculated to be 77 participants, using the WHO sample size calculator, based on an expected prevalence of 27.4% severe depression symptoms among caregivers (11), with a 95% confidence level and a 10% absolute precision. Participants were recruited through consecutive non-probability sampling. All participants were assessed after obtaining informed written consent. The inclusion criteria encompassed attendants of either gender aged between 18 and 60 years, with no previous psychiatric illness, attending to a stroke patient for more than two months, and providing care for a stroke survivor with a stroke duration exceeding one year. Only single, unpaid family members acting as primary caregivers were included. Participants unwilling to provide consent, those outside the specified age range, with known psychiatric history, attending to stroke patients with a stroke duration less than one year, involving multiple caregivers, or professional (paid) caregivers were excluded from the study. Demographic information was recorded, including age, gender, educational background, occupation, monthly income, family structure, and marital status. The psychological status of the caregivers was evaluated using the Hamilton Depression Rating Scale (HDRS) (12), a validated tool employing a 5-point rating system (0–4) across various symptom domains. The total HDRS score ranged from 0 to 78, with interpretation thresholds set as follows: a score of <8 indicating no depression, 8–17 suggesting possible depression, 18–24 reflecting mild to moderate depression, and >24 indicating severe depression. The functional status of stroke survivors was concurrently assessed using the Barthel

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Index, which measures ten activities of daily living. The Barthel Index total score of 80 points was categorized as follows: 60 points indicating minimal dependence, 40 points partial dependence, 20 points severe dependence, and less than 20 points complete dependence.

Data collection was conducted by the primary investigator through direct face-to-face interviews. In cases where information was incomplete or clarification was needed, supplementary data collection was performed via telephone interviews. Each interview spanned approximately 20 to 25 minutes. Participant anonymity and confidentiality were strictly maintained throughout the study process. Data entry and analysis were carried out using SPSS version 27.0. Numerical variables, including age, duration of caregiving, and total HDRS scores, were presented as means with standard deviations. Categorical variables, such as gender, caregiver-patient relationship, educational status, and depression classification levels, were expressed as frequencies and percentages. Stratification of data was performed according to age, gender, relationship to the patient, and education level. Associations between depression classification and categorical variables (gender, caregiver relationship, and education) were analyzed using the Chi-square test. Independent sample t-tests were utilized to compare mean HDRS scores across gender, while one-way ANOVA was employed to assess differences in HDRS scores based on caregiver relationship and education level. Pearson's correlation coefficient was calculated to determine the strength of association between total HDRS scores and the duration of caregiving. A p-value of ≤ 0.05 was considered statistically significant for all inferential tests.

RESULTS

A total of 77 attendants were enrolled in the study, with 31 (40.2%) males and 46 (59.7%) females. The mean age of participants was 36 ± 3 years. Depression was observed in 61 (79.2%) attendants, while 16 (20.7%) attendants did not exhibit depressive symptoms. Among those with depression, 14 (22.9%) were classified as having possible depression, 31 (50.8%) had mild to moderate depression, and 16 (26.2%) suffered from severe depression based on the Hamilton Depression Rating Scale (HDRS). The severity of depression was inversely correlated with the functional status of stroke survivors as assessed by the Barthel Index. In attendants without depression, the most common Barthel Index score for their respective patients was 70 in 14 (87.5%) cases. Among those with possible depression, a Barthel Index score of 65 was observed in 10 (71.4%) cases. Attendants with mild to moderate depression were associated with stroke survivors having a Barthel Index of 50 in 26 (83.3%) cases. In those suffering from severe depression, 13 (81.5%) of the corresponding stroke survivors had a Barthel Index of less than 20, indicating severe functional dependence. Gender-wise distribution of depression revealed a higher prevalence among females. Out of 61 attendants diagnosed with depression, 46 (59.7%) were females and 15 (19.5%) were males, demonstrating a statistically significant association (p=0.05). Educational background was another significant factor. Among those with depression, 31 (50.8%) had completed only matriculation, 21 (34.4%) were graduates, and 9 (14.7%) held master's degrees, with education level showing a significant relationship with depression (p=0.04).

Monthly income was strongly associated with depression severity. In attendants exhibiting mild to moderate depression, 24 (77.4%) belonged to households earning less than 50,000 PKR per month (p=0.05). Severe depression was more prevalent among attendants with a monthly income below 30,000 PKR, reported in 8 (51.1%) cases (p=0.03). Family structure also influenced depression levels, with a greater proportion of depression observed among attendants belonging to nuclear families, accounting for 47 (77.0%) of the affected individuals. Marital status demonstrated a notable association with depression incidence. Among attendants with depression, 43 (70.4%) were married, highlighting the potential interpersonal strain and communication challenges faced by spouses during caregiving (p=0.04).

Table 1: Demographic Details of Study Participants

Variable	Value
Gender (Male)	31 (40.2%)
Gender (Female)	46 (59.7%)
Mean Age (years)	36 Â± 3

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Table 2: Depression Levels Among Attendants

Depression Level	Number of Attendants (n=77)	Percentage (%)
No Depression	16	20.7
Possible Depression	14	18.2
Mild to Moderate Depression	31	40.2
Severe Depression	16	20.7

Table 3: Barthel Index Correlation with Depression

Depression Level	Barthel Index (most common score)	Number of Patients
No Depression	70	14 (87.5%)
Possible Depression	65	10 (71.4%)
Mild to Moderate Depression	50	26 (83.3%)
Severe Depression	<20	13 (81.5%)

Table 4: Education Level and Depression

Education Level	Number with Depression	Percentage (%)
Matriculation	31	50.8
Graduation	21	34.4
Master	9	14.7

Table 5: Income Group and Depression Severity

Monthly Income Group	Mild to Moderate Depression (n=31)	Severe Depression (n=16)
<30k PKR	-	8 (51.1%)
30k-50k PKR	24 (77.4%)	-
>50k PKR	-	-

Table 6: No. of attendants with Depression: n=61 (total No. n=77) (Hamilton Scale)

No/negative for Depression	Possible Depression	Mild to Moderate Depression	Severe Depression
16	14	31	16

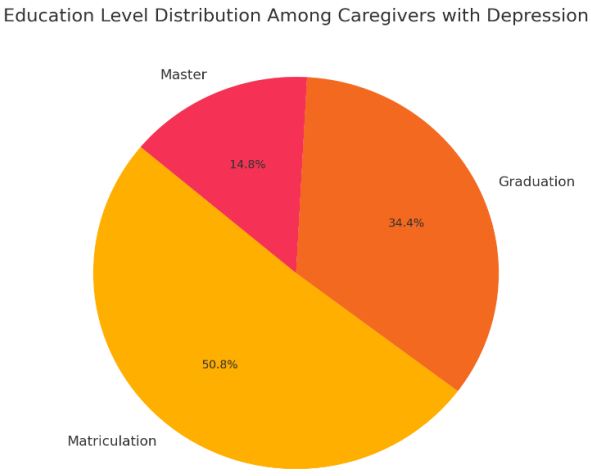

Figure 1 Education Level Distribution Among Caregivers with Depression

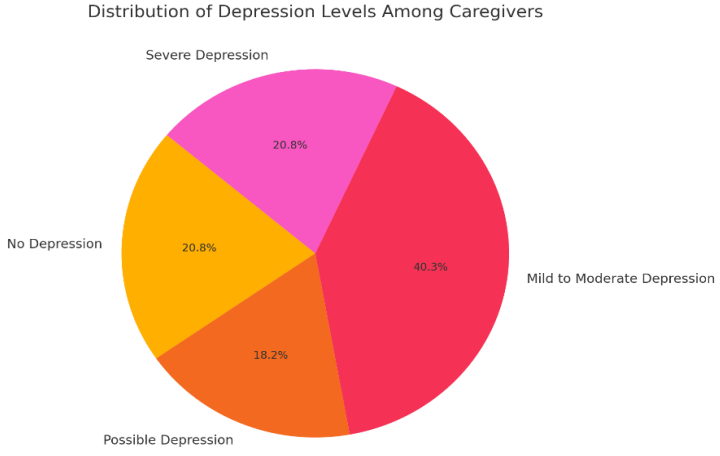

Figure 2 Distribution of Depression Levels Among Caregivers

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DISCUSSION

Stroke remains a major contributor to severe physical disability and emotional instability, leading survivors to develop a considerable reliance on family members and support networks. The caregiving role is associated with significant psychological and physical demands, which places attendants at increased risk of developing depressive symptoms. In the current study, the incidence of depression among caregivers was notably high, affecting 79.2% of attendants. These findings highlight the substantial mental health burden faced by caregivers of stroke survivors, further underscoring the importance of addressing caregiver needs in comprehensive stroke rehabilitation strategies. The results of this study align with findings from previous research conducted in a Malaysian tertiary care setting where depression was observed in 18.5% of caregivers, with increased prevalence linked to caregiving durations exceeding six months (13). Although the incidence reported in that study was lower than the current findings, methodological differences, sample size variations, and sociocultural factors could account for the discrepancies. Similarly, another study reported that 49% of caregivers experienced mild depression and 17% moderate to severe depression, with caregiving status posing a 3.7-fold increased risk of depressive symptoms compared to non-caregivers (14). The higher incidence rate in the present study may reflect the compounded impact of economic constraints, limited support structures, and higher functional dependency among stroke survivors in the local population (15).

Gender appeared to play a significant role, with a higher proportion of female caregivers exhibiting depressive symptoms. This pattern is consistent with findings from studies among Chinese family caregivers where women, particularly during the first six months following a stroke, were more vulnerable to emotional and psychological stress (16,17). Furthermore, functional dependency of stroke survivors, as measured by the Barthel Index, was inversely correlated with caregiver depression severity. Attendants of patients with greater functional impairments showed markedly higher rates of severe depression, a trend corroborated by studies assessing caregiver burden through instruments such as the Zarit Burden Interview and Oberst Caregiving Burden Scale (18). Educational level, monthly income, and family structure also emerged as significant determinants of caregiver depression. Lower educational attainment and lower household income were associated with higher depression rates, reflecting the additional economic hardships and reduced access to coping resources among these groups. These findings mirror observations from a local study conducted at a tertiary hospital in Pakistan, where depression was positively correlated with financial hardship, limited educational background, and being a sole caregiver (19). In the current study, attendants from nuclear families demonstrated a higher prevalence of depression compared to those from joint family systems, possibly reflecting reduced shared caregiving responsibilities and limited emotional support.

While the present study contributes valuable insights into the psychological burden of caregiving in a local context, it also carries inherent limitations. The relatively small sample size and single-center study design restrict the generalizability of the findings to the broader population. Additionally, the cross-sectional nature of the study precludes causal inferences regarding the relationship between caregiving duration and depression severity. The study did not explore the impact of relationship type (e.g., spouse, child, sibling) on depression levels, nor did it differentiate between different caregiving intensities, which could have provided a more nuanced understanding of the risk factors involved. Nevertheless, this study's strengths lie in its structured assessment using validated scales such as the Hamilton Depression Rating Scale and Barthel Index, ensuring objective measurement of both psychological outcomes and functional status of stroke survivors. The direct face-to-face interview method further minimized response biases and enhanced data quality. Future research should aim to recruit larger, multicenter samples and adopt longitudinal designs to capture the dynamic evolution of caregiver depression over time. Comparative studies evaluating formal versus informal caregiving, as well as intervention-based studies targeting caregiver support, could offer practical solutions for mitigating caregiver burden. Additionally, incorporating qualitative methodologies could yield deeper insights into the subjective experiences of caregivers, which are often missed by quantitative assessments (20). In conclusion, the findings reaffirm that depression among caregivers of stroke patients represents a significant public health concern that warrants greater recognition and intervention. The emotional and psychological well-being of caregivers must be integrated into stroke rehabilitation frameworks to ensure better outcomes for both patients and their families.

CONCLUSION

The present study highlights that depression is a significant and prevalent issue among attendants of stroke survivors, with female caregivers particularly vulnerable. Factors such as educational background, family structure, and monthly income were closely associated with the likelihood of developing depressive symptoms. These findings emphasize the urgent need for early screening and timely psychological support for caregivers, ensuring their mental well-being is preserved. Addressing caregiver depression is crucial

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not only for their own health but also to enhance the quality of care provided to stroke survivors, ultimately facilitating better rehabilitation outcomes and a smoother return to functional independence for patients.

AUTHOR CONTRIBUTION

Author	Contribution
Muhammad Sohail Babar Khan*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Zunaisha Imran	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Hamna Chughtai	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Aniqa Mushtaq	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Arslan Ahmed	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Waleed Asif Khurshid	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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