Burden among Primary caregivers and its association with severity of Disability in patients with Schizophrenia: A Cross-sectional study

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Abstract

Background: Caregivers of individuals with schizophrenia play a crucial role in providing support, but they frequently experience significant levels of stress and burden due to the demanding nature of caregiving responsibilities. **Objectives:** To estimate the magnitude of caregiver burden in the primary caregivers of patients with schizophrenia; and to find out the association between severity of disability in patients with schizophrenia and caregiver burden. **Methods:** This was a hospital-based analytical cross-sectional study involving patients diagnosed with Schizophrenia and their primary caregivers ($n = 72$) attending the Psychiatry, OPD of a tertiary healthcare facility in Puducherry. PANSS, IDEAS, and BAS were used to assess the severity of illness and burden among primary caregivers, respectively. **Results:** The mean ages of schizophrenia patients and primary caregivers were 39.2 years and 43.1 years, respectively. The proportion of females among patients was 54.2% and that among primary caregivers was 65.3%. The mean (SD) IDEAS global disability score among people with schizophrenia was 7.1 ± 2.6, while the total PANSS score was 51.8 ± 11.4. The mean (SD) burden assessment schedule scores among caregivers were 72.9 ± 13.2. Caregiver burden was notably higher among those over 40 yrs, living in urban areas, literate, employed, of lower or middle socioeconomic status, and from nuclear families ($P < 0.05$). However, gender, religion, marital status, and substance use did not affect burden ($P > 0.05$). Caregivers experiencing burden had patients with higher illness severity and disability, as indicated by elevated PANSS and IDEAS scores ($P < 0.05$). Moreover, caregiver age ($r = 0.147$), patient illness severity ($r = 0.261$), treatment duration ($r = 0.351$), and various aspects of patient disability ($r = 0.383$) showed positive correlations with caregiver burden. **Conclusion:** The caregiver burden is significantly correlated with patient illness severity, disability, and treatment duration, particularly affecting older caregivers and those from specific socioeconomic backgrounds. The findings underscore the considerable challenges faced by caregivers in supporting individuals with schizophrenia and highlight the need for targeted interventions and support services to reduce caregiver burden and enhance patient outcomes.

Keywords: Caregiver burden, disability, India, Schizophrenia

Introduction

Schizophrenia, a severe and chronic psychiatric disorder characterized by disruptions in perception, cognition, language, emotion, behavior, and life-related functions, affects approximately 1.0% of the population in the United States.[1] In India, the Global Burden of Disease (GBD) estimate showed a point prevalence of 0.3% for schizophrenia.[2] The prevalence of schizophrenia and schizophrenia spectrum disorder is 0.3% and 0.7%, in southern states.[3] Despite being equally prevalent among men and women, the onset typically occurs earlier in men.[4] This disorder significantly impacts productivity and psychosocial functioning, often leading to disability and functional decline, which can profoundly affect various aspects of an individual's

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Received: 21-08-2024 **Revised:** 07-10-2024
Accepted: 14-10-2024 **Published:** 25-03-2025

Access this article online

Quick Response Code:

Website:
http://journals.lww.com/JFMPC

DOI:
10.4103/jfmpc.jfmpc_1439_24

How to cite this article: George S, Dinesh AJ, Melody MA. Burden among Primary caregivers and its association with severity of Disability in patients with Schizophrenia: A Cross-sectional study. J Family Med Prim Care 2025;14:908-14.

life such as personal relationships, employment, and social integration.[5] Approximately a quarter of the individuals classified as "schizophrenia stable patients" exhibited moderate to severe levels of disability, with 22.6% classified as moderate and 1.6% as severe, meeting the criteria for certifiable disability according to IDEAS.[6]

The burden is the extent to which caregivers perceive that caregiving has had a negative impact on their emotional, social, financial, physical, and spiritual functioning.[7] Caregivers of individuals with schizophrenia play a crucial role in providing support, but they often experience high levels of stress and burden due to the demanding nature of caregiving responsibilities.[8] The burden on the family of schizophrenia patients encompasses a range of psychosocial and emotional challenges, including disruptions in household routines, strained family and social relationships, changes in work and leisure activities, and impacts on physical health.[9] This burden is multifaceted, encompassing both objective factors such as the patient's symptoms and socio-demographic characteristics, as well as subjective elements relating to the caregiver's emotional responses and distress.[10]

Given the profound impact of caregiver burden on the caregiver's well-being and the quality of care provided to the patient, it is essential to explore and address these challenges effectively. While numerous studies have examined the caregiver burden in schizophrenia, there remains a paucity of research specifically focusing on the primary caregiver burden and its relationship to disability in India. Disability, stemming from the functional deficits caused by schizophrenia, represents a potentially modifiable factor through pharmacological and psychological interventions.[11] By targeting these functional impairments and providing appropriate support to caregivers, it may be possible to alleviate caregiver burden and improve treatment outcomes for individuals with schizophrenia. Additionally, addressing caregiver distress through psychological interventions can further mitigate the burden experienced by caregivers, ultimately contributing to better overall outcomes for both patients and their families.

Against this background, the objectives of the present study were to estimate the magnitude of caregiver burden in the primary caregivers of patients with schizophrenia; and to find out the association between severity of disability in patients with schizophrenia and caregiver burden.

Materials and Methods

This hospital-based analytical cross-sectional study, conducted in India between September 2022 and October 2023, involved patients who were presenting to the outpatient clinic of the Department of Psychiatry at Aarupadai Veedu Medical College, a tertiary healthcare center in Puducherry. The study received approval from Aarupadai Veedu Medical College's Institutional Human Ethics Committee (IHEC) in Puducherry. The participants were given the Participant Information Sheet in their native language, and its contents were verbally explained, and they were enrolled after getting informed consent. All the patients aged more than 18 years of age, fulfilling ICD 10 diagnostic criteria for schizophrenia, with a minimum duration of illness of 6 months, and attending the outpatient department with the primary caregiver were enrolled in the present study. Individuals more than 18 years of age, a member of the patient's family who has been the most active in their care and responsibilities, and who had resided with the patient for at least six continuous months immediately before data collection were considered caregivers.[10] However, patients with comorbid psychiatric illness or major neurocognitive disorders and intellectual disability were excluded from the study. Also, caregivers for multiple patients with mental illness; caregivers with physical or mental disorders that may impair patient care and cooperation during interviews; and paid caregivers for patient care were not included in this study.

We computed the minimum required sample size to be 144–72 patients and 72 caregivers – considering the prevalence of burden among caregivers to be 7.3% using $n = [Z^2 \times p \times (1 - p)]/E^2$.[12] The patients and caregivers were enrolled using nonprobability sampling – convenience sampling technique – owing to feasibility. The study utilized a purpose-designed, semi-structured, pretested questionnaire. A detailed history and mental status examination of the patients were conducted, followed by the collection of sociodemographic characteristics for both patients and their primary caregivers. The Indian Disability Evaluation and Assessment Scale (IDEAS) was used to screen patients for disabilities, while the PANSS scale was used to gauge the severity of their sickness and the Burden Assessment Schedule (BAS) was used to assess the burden among primary caregivers.

Statistical analysis: The data obtained in the present study was manually entered into Microsoft Excel, coded, recoded, and analyzed using SPSS v23. Utilizing frequencies and percentages, the category variables were summarized. Standard deviation and/or median were used to summarize continuous variables. An association between independent and dependent research variables was examined using the Chi-square test and the independent "t" test. The IDEAS Global disability ratings and caregiver burden scores were compared using Pearson's correlation coefficient. P value less than 0.05 was used to determine statistical significance.

Results

The study included 72 primary caregivers with a mean age of 43.1 years (SD = 11.4). Among them, 34.7% ($n = 25$) were male, and 65.3% ($n = 47$) were female. In terms of residence, 45.8% ($n = 33$) lived in rural areas, while 54.2% ($n = 39$) resided in urban areas. The religious distribution showed that 79.2% ($n = 57$) were Hindu, 9.7% ($n = 7$) were Christian, and 11.1% ($n = 8$) were Muslim. Educationally, 4.2% ($n = 3$) were illiterate, whereas 95.8% ($n = 69$) were literate. Employment status indicated that 25.0% ($n = 18$) were unemployed and 75.0% ($n = 54$) were employed. Regarding marital status, 31.9% (*n* = 23) were unmarried, 56.9% (*n* = 41) were married, and 11.1% (*n* = 8) were widowed, separated, or divorced [Table 1]. Substance use was reported by 29.2% of primary caregivers.

Clinical characteristics of patients with schizophrenia: The mean (SD) IDEAS global disability score among patients with schizophrenia was 7.1 ± 2.6 – self-care-related disability was 0.7 ± 0.4; interpersonal activity was 0.9 ± 0.5; communication and understanding was 1.4 ± 0.7; and work-related disability was 1.5 ± 0.8. The mean (SD) positive score among patients with schizophrenia was 9.1 ± 2.7; the negative score was 16.2 ± 7.6; and the general psychopathology score was 26.5 ± 5.4. Overall, the mean (SD) total PANSS score in the present study among patients with schizophrenia was 51.8 ± 11.4.

Burden among primary caregivers of patients with schizophrenia: The mean (SD) burden assessment schedule scores among primary caregivers of schizophrenia patients was 72.9 ± 13.2 [Figure 1].

Factors associated with burden among primary caregivers of schizophrenia patients: The results of tests of association showed that the burden of caregiving schizophrenia patients was significantly higher among caregivers more than 40 years of age compared to caregivers less than or equal to 40 years of age (74.5% vs 11.8%); significantly higher among caregivers of urban residence, in comparison with those from rural areas (65.5% vs 17.6%); significantly higher among literate caregivers, in comparison with illiterate (100% vs 82.3%); significantly higher among employed caregivers, in comparison with unemployed (92.7% vs 17.6); However, the burden of caregiving schizophrenia patients did not vary by gender, religion, marital status and substance use [Table 2].

Table 1: Distribution of primary caregivers of patients with schizophrenia

		Primary caregivers *n*=72	
		n	**%**
Age (in years) Mean (SD)		43.1 (11.4)	
Gender	Male	25	34.7
	Female	47	65.3
Residence	Rural	33	45.8
	Urban	39	54.2
Religion	Hindu	57	79.2
	Christian	7	9.7
	Muslim	8	11.1
Education	Illiterate	3	4.2
	Literate	69	95.8
Employment	Unemployed	18	25.0
	Employed	54	75.0
Socioeconomic status	Upper	11	15.3
	Middle	48	66.7
	Lower	13	18.0
Type of family	Nuclear	19	26.4
	Joint	53	73.6
Marital status	Unmarried	23	31.9
	Married	41	56.9
	Widow|Separated|Divorced	8	11.1
Substance use	Present	21	29.2
	Absent	51	70.8
Relationship of caregivers with schizophrenia patients	Spouse	30	41.7
	Parent	17	23.6
	Sibling	9	12.5
	Children	9	12.5
	Others	7	9.7

SD, Standard deviation

The results showed that the mean (SD) total PANSS score (62.4 ± 7.2 vs 41.2 ± 8.1), positive subscale score (13.2 ± 2.4 vs 5.0 ± 1.9), negative subscale score (21.8 ± 7.1 vs 10.6 ± 7.9) and general psychopathology scores (33.6 ± 5.6 vs 19.4 ± 6.3) among patients with schizophrenia were significantly higher among primary caregivers with burden, in comparison with primary caregivers without burden ($P < 0.05$). Similarly, the patient mean (SD) total IDEAS score (10.3 ± 2.0 vs 3.9 ± 2.8), self-care score (1.0 ± 0.2 vs 0.4 ± 0.2), interpersonal scores (1.2 ± 0.3 vs 0.6 ± 0.2), communication scores (1.9 ± 0.2 vs 0.9 ± 0.3), and work scores (2.2 ± 0.5 vs 0.8 ± 0.3) were significantly higher among primary caregivers with burden, in comparison with primary caregivers without burden ($P < 0.05$) [Table 3].

The results of Pearsons correlation analysis showed that age of the caregiver had positive significant correlation ($r = 0.147$; $P = 0.003$), total PANSS score had positive significant correlation ($r = 0.261$; $P = <0.001$), positive subscale scores had positive significant correlation ($r = 0.172$; $P = 0.002$), negative subscale scores had positive significant correlation ($r = 0.294$; $P = <0.001$), general psychopathology scale scores had positive significant correlation ($r = 0.297$; $P = <0.001$), duration of schizophrenia patient treatment in months had positive significant correlation ($r = 0.351$; $P = <0.001$), total IDEAS scores had positive significant correlation ($r = 0.383$; $P = <0.001$), selfcare scores had positive significant correlation ($r = 0.314$; $P = <0.001$), interpersonal scores had positive significant correlation ($r = 0.371$; $P = <0.001$), communication scores had positive significant correlation ($r = 0.328$; $P = <0.001$), and work

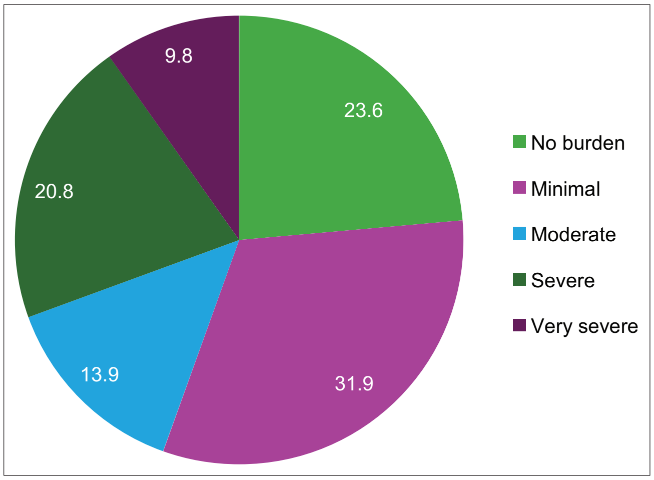

Figure 1: Distribution of primary caregivers by degree of burden

Table 2: Factors associated with burden among primary caregivers of schizophrenia patients

	n **(%)**			***P***
	Burden Present *n*=55	**Burden Absent *n*=17**	**Total *n*=72**	
Age (in years)				
≤40	14 (25.5)	15 (88.2)	29 (40.3)	<0.001*
>40	41 (74.5)	2 (11.8)	43 (59.7)	
Gender				
Male	17 (30.9)	8 (47.1)	25 (34.7)	0.221
Female	38 (69.1)	9 (52.9)	47 (65.3)	
Residence				
Rural	19 (34.5)	14 (82.4)	33 (45.8)	0.001*
Urban	36 (65.5)	3 (17.6)	39 (54.2)	
Religion				
Hindu	44 (80.0)	13 (76.4)	57 (79.2)	0.841
Christian	5 (9.1)	2 (11.8)	7 (9.7)	
Muslim	6 (10.9)	2 (11.8)	8 (11.1)	
Education				
Illiterate	0 (0.0)	3 (17.6)	3 (4.2)	0.012*
Literate	55 (100)	14 (82.3)	69 (95.8)	
Employment				
Unemployed	4 (7.3)	14 (82.3)	18 (25.0)	<0.001*
Employed	51 (92.7)	3 (17.6)	54 (75.0)	
Socioeconomic status				
Upper	2 (3.6)	9 (52.9)	11 (15.3)	<0.001*
Middle	42 (76.4)	6 (35.3)	48 (66.7)	
Lower	11 (20.0)	2 (11.8)	13 (18.0)	
Type of family				
Nuclear	18 (32.7)	1 (5.9)	19 (26.4)	0.028*
Joint	37 (67.3)	16 (94.1)	53 (73.6)	
Marital status				
Unmarried	17 (30.9)	6 (35.3)	23 (31.9)	0.126
Married	34 (61.8)	7 (41.2)	41 (56.9)	
Widow | Separated | Divorced	4 (7.3)	4 (23.5)	8 (11.1)	
Substance use				
Present	16 (29.1)	5 (29.4)	21 (29.2)	0.979
Absent	39 (70.9)	12 (70.6)	51 (70.8)	

*Statistically significant at $P<0.05$

Table 3: Association between patient disability, illness severity, and burden among primary caregivers of schizophrenia patients

	Mean (SD)			***P***
	Burden Present *n*=55	**Burden Absent *n*=17**	**Total *n*=72**	
Total PANSS	62.4 (7.2)	41.2 (8.1)	51.8 (11.4)	<0.001*
Positive subscale	13.2 (2.4)	5.0 (1.9)	9.1 (2.7)	0.002*
Negative subscale	21.8 (7.1)	10.6 (7.9)	16.2 (7.6)	<0.001*
General psychopathology	33.6 (5.6)	19.4 (6.3)	26.5 (5.4)	<0.001*
Total IDEAS	10.3 (2.0)	3.9 (2.8)	7.1 (2.6)	<0.001*
Selfcare	1.0 (0.2)	0.4 (0.2)	0.7 (0.4)	<0.001*
Interpersonal	1.2 (0.3)	0.6 (0.2)	0.9 (0.5)	<0.001*
Communication	1.9 (0.2)	0.9 (0.3)	1.4 (0.7)	<0.001*
Work	2.2 (0.5)	0.8 (0.3)	1.5 (0.8)	<0.001*

scores had positive significant correlation ($r = 0.417$; $P = <0.001$) with burden assessment schedule scores [Table 4].

Discussion

The mean ages of schizophrenia patients and primary caregivers were 39.2 years and 43.1 years, respectively. The proportion of females among patients was 54.2% and that among primary caregivers was 65.3%. The result aligns with prior studies that suggest women frequently assume the primary caregiving role for family members experiencing mental health issues.[13,14] Majority of caregivers have received at least primary school education attributing to adequate literacy among caregivers. Higher burden among literate and employed caregivers may be attributed to caregivers who may be the only breadwinner in the family, thereby, taking care of both work and caregiving responsibilities. In nuclear families, the primary caregivers were both employed and taking care of the patient, due to a lack of people to share caregiving responsibilities, resulting in a higher burden. It was noted that the majority of the caregivers were employed in unskilled work; therefore, they could serve as primary caregivers for patients with schizophrenia. The employed caregivers might still prefer to personally handle caregiving tasks due to concerns about the quality of care, trust issues, or the specific needs of the patient. These findings have important implications for healthcare providers and policymakers involved in supporting individuals with schizophrenia and their caregivers. Firstly, understanding the demographic characteristics of caregivers can inform the development of targeted interventions aimed at addressing their specific needs. For instance, programs providing respite care, psychoeducation, and psychosocial support may be particularly beneficial for female caregivers, who often bear the brunt of caregiving responsibilities.[15] Furthermore, the lack of significant differences in caregiver characteristics suggests that caregiver burden transcends demographic boundaries, emphasizing the need for holistic and inclusive approaches to caregiver support. Regardless of their demographic background, healthcare providers should embrace a person-centered approach that recognizes the distinct experiences and difficulties faced by each caregiver.[16]

Based on the distribution of patients and caregivers across socioeconomic statuses, it is important to note that socioeconomic status can impact access to resources and support services, which may indirectly affect caregiver burden.[17] While joint families may provide a larger support network, they may also introduce additional complexities and interpersonal dynamics that contribute to caregiver stress.[18] Caregivers from nuclear families experienced significantly higher burdens compared to those from joint families. In nuclear families, caregivers may have fewer resources and support networks to share the caregiving responsibilities, leading to increased burden.[19] The proportion of married caregivers was higher in the present study and it's worth noting that married caregivers may have additional responsibilities and stressors associated with managing both the caregiving role and their marital relationship.[20] Substance use was reported by a higher proportion of caregivers. Substance

Table 4: Correlation between continuous independent study variables and caregiver burden

	BAS scores Pearsons's correlation coefficient	*P*
Age of the patient	0.035	0.692
Age of the caregiver	0.147	0.003*
Total PANSS	0.261	<0.001*
Positive subscale	0.172	0.002*
Negative subscale	0.294	<0.001*
General psychopathology scale	0.297	<0.001*
Duration of treatment in months	0.351	<0.001*
Total IDEAS	0.383	<0.001*
Selfcare	0.314	<0.001*
Interpersonal	0.371	<0.001*
Communication	0.328	<0.001*
Work	0.417	<0.001*

*Statistically significant at $P<0.05$

abuse among caregivers can increase caregiver burden by limiting their ability to provide proper care and assistance to the patient.[21] Healthcare providers need to address substance use issues among caregivers as part of comprehensive treatment and support services. These findings underscore the complex and multifaceted nature of caregiver burden in the context of schizophrenia. While socioeconomic factors, family dynamics, marital status, and substance use may influence the caregiving experience to some extent, their impact may vary across individuals and families. Healthcare providers should adopt a holistic approach to caregiver support that considers the unique needs and circumstances of each caregiver.[19] Furthermore, addressing substance use issues among caregivers is crucial for enhancing their capacity to provide effective care and support to patients. Integrated interventions that target both substance use and caregiver burden can improve outcomes for both patients and caregivers.[22]

The burden faced by primary caregivers of people with schizophrenia is a vital aspect of comprehending the broader impact of the illness on individuals and families. In the current study, the Burden Assessment Schedule (BAS) was used to quantify caregivers' burden. The results showed that the mean BAS score among main caregivers was 72.9 (SD 13.2). The BAS is a widely used tool to assess the burden experienced by caregivers of individuals with mental illness, including schizophrenia. In this study, the BAS scores were analysed both on a continuous scale and categorized into different levels of burden. The mean BAS score of 72.9 suggests a moderate to severe level of burden experienced by primary caregivers. The findings suggest that a considerable proportion of caregivers in the study are experiencing significant levels of burden, which can have profound implications for their well-being and the quality of care provided to patients. The burden experienced by caregivers of individuals with schizophrenia is multifaceted and can encompass various domains, including emotional, financial, social, and physical aspects. High levels of caregiver burden have been associated with increased stress, depression, anxiety, and decreased quality of life among caregivers.[20] Furthermore, caregiver burden can impact the ability of caregivers to provide optimal care and support to patients, potentially exacerbating the symptoms and functional impairment associated with schizophrenia.[19] Given the significant burden experienced by caregivers, it's imperative to provide adequate support and interventions to address their needs. Psychoeducation, counselling, respite care, and support groups are among the interventions that effectively reducecounseling caregiver burden and improve caregiver well-being.[22]

The burden of caregiving for schizophrenia patients was significantly higher among caregivers above 40 years of age compared to younger caregivers. Older caregivers may experience increased physical and emotional strain due to caregiving responsibilities, which could contribute to higher levels of perceived burden.[23] Caregivers residing in urban areas reported significantly higher burden compared to those in rural areas. Urban caregivers may face greater challenges such as limited access to support services, higher cost of living, and increased social isolation, which can exacerbate caregiver burden.[24] Literate and employed caregivers experienced significantly higher burdens compared to illiterate and unemployed caregivers, respectively. This finding may reflect the additional stressors and responsibilities faced by educated and employed caregivers, such as balancing work and caregiving duties, which can contribute to increased burden.[20] Caregivers from lower or middle socioeconomic status reported significantly higher burdens compared to those from upper socioeconomic status. Financial constraints, limited access to healthcare resources, and social support networks in lower socioeconomic strata may contribute to heightened caregiver burden.[25]

The results of the study reveal significant associations between caregiver burden and symptom severity as well as disability levels among patients with schizophrenia. Specifically, caregivers experiencing burden were associated with higher scores across various domains of symptomatology and disability in patients. The study found that primary caregivers experiencing burden were associated with significantly higher total "Positive and Negative Syndrome Scale (PANSS)" scores among patients with schizophrenia. This includes higher scores in the positive, negative, and general psychopathology subscales. These findings indicate that caregiver burden might be linked to greater symptom severity in patients, including positive symptoms (such as hallucinations and delusions), negative symptoms (such as social withdrawal and apathy), and general psychopathology (such as disorganized thinking and emotional dysregulation).[26] Similarly, primary caregivers experiencing burden (higher BAS scores) were associated with significantly higher total IDEAS scores and scores across various domains of disability in patients with schizophrenia. This includes higher scores in self-care, interpersonal activities, communication, and work-related disability. These findings imply that caregiver burden may potentially be associated with higher functional impairment and a decreased ability to execute everyday tasks in schizophrenia patients.[27] The significant associations between caregiver burden, symptom severity, and disability levels highlight the complex interplay between caregiver experiences and patient outcomes in schizophrenia. Caregiver burden may have repercussions for the clinical course and functional results of patients, in addition to the well-being of caregivers. Interventions aimed at reducing caregiver burden may thus have the potential to improve patient outcomes by addressing underlying factors contributing to symptom exacerbation and functional impairment.[22]

The results of the study revealed several significant correlations between caregiver burden and various demographic, clinical, and functional variables among patients with schizophrenia. The positive significant correlation between caregiver age and burden assessment schedule scores suggests that older caregivers may experience higher levels of burden. Elderly caregivers may endure increased physical and emotional responsibilities related to caregiving, which can contribute to elevated levels of burden.[28] Several clinical variables, including total PANSS score, positive subscale scores, negative subscale scores, and general psychopathology scale scores, showed positive significant correlations with burden assessment schedule scores. This indicates that higher symptom severity and psychopathology in patients are associated with increased caregiver burden. Caregivers of individuals with more severe symptoms may experience greater stress and strain in managing the caregiving role.[29] The positive significant correlation between the duration of patient treatment and burden assessment schedule scores suggests that longer illness duration may be associated with higher caregiver burden. Prolonged caregiving responsibilities over time may lead to increased burdens due to ongoing challenges in managing the illness and providing support to the patient.[20] Total IDEAS scores and scores across various domains of disability (self-care, interpersonal activities, communication, and work) showed positive significant correlations with burden assessment schedule scores. This indicates that greater functional impairment in patients is associated with a higher caregiver burden. Caregivers may face additional challenges in supporting patients with impaired functioning, leading to increased levels of burden.[30,31]

The present study is not without limitations. It includes cross-sectional study design limiting the chances of establishing causality, use of convenience sampling leading to selection bias, use of self-report measures introducing response bias, and lack of control for all the confounding factors that might influence caregiver burden, like social support, coping strategies, characteristics of the caregivers and cultural peculiarities.

Conclusion

The present study delves into the intricacies of caregiver burden in individuals with schizophrenia and examines its correlation with various demographic, clinical, and functional variables. The results showed a significant correlation between caregiver burden and characteristics such as caregiver age, patient symptom severity, duration of illness, and functional disability. The findings highlight the need for targeted interventions and support services to reduce caregiver burden and improve patient outcomes.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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