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Title of the article: Perceived Stress, Coping Mechanisms, and Associated Factors Among Caregivers of Cognitively Impaired Elderly Attending a Rural Secondary Care Facility in Eastern India: A Mixed-Methods Study

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Abstract

Background

The increasing ageing population and their cognitive decline with age, take a toll in the mental well-being of their informal caregivers. This mixed methods study aimed to assess the prevalence of perceived stress and its associated factors and their coping strategies among the caregivers of cognitively impaired elderly individuals.

Methodology

: A parallel mixed methods design was conducted at the Geriatric Clinic and 81 participants were consecutively recruited to the study after screening them through Rapid Geriatric Assessment. Perceived stress and caregiver self-efficacy were measured using the 10-item Perceived Stress Scale (PSS-10) and the Caregiver Self-Efficacy Scale (CSES-8), alongside functional assessments via the Lawton-Brody IADL scale. Bivariate and multivariable logistic regression analyses examined predictors of high perceived stress. Concurrently, a qualitative phenomenological study involved in-depth interviews with six caregivers, analyzed thematically and triangulated with quantitative findings.

Results

Quantitative findings revealed that 54.3% of caregivers experienced high perceived stress, predominantly by perceived helplessness (median score 10) than lack of self-efficacy (median score 7). Multivariable regression demonstrated that caregiver self-efficacy was sole independent predictor of high perceived stress, with low self-efficacy significantly increasing vulnerability (Adjusted OR: 14.71, 95% CI: 4.06–52.63, $p < 0.001$. Sociodemographic variables or functional dependence showed no statistically significant association with perceived stress levels. Qualitative findings underscored that caregivers relied heavily on informal, family-based coping mechanisms and shared responsibilities.

Conclusion

Caregiver self-efficacy determines perceived stress among rural informal caregivers of cognitively impaired elderly, whereas sociodemographic factors play a minimal role. Interventions must prioritize strengthening caregiver resilience, self-efficacy, and rural support structures.

Clinical Trial registration

Not applicable

Background

The ongoing demographic transition has resulted in a substantial increase in the proportion of older adults, aged 60 years and above worldwide. In India, the 2011 population census reported approximately 104 million older adults, accounting for about 8.6% of the total population, highlighting the growing significance of population ageing in the country. (1) The elderly population is projected to more than double from approximately to 230 million by 2036, such that nearly one in seven Indians will be aged 60 years or above. (2)

Advancing age is a major risk factor for several non-communicable diseases, including cardiovascular disorders, cancers, and neuropsychiatric conditions.(3) The prevalence of neuropsychiatric disorders like dementia, causing cognitive impairment, is increasing more rapidly in low- and middle-income countries (LMICs) than in high-income countries (HICs), driven by rising life expectancy and a greater burden of risk factors. (4) A secondary analysis of Wave 1 data from the Longitudinal Ageing Study in India (LASI) estimated the prevalence of cognitive impairment among older adults in India to be 10.78%. (5)

Caregiving involves providing support with personal care and household activities to another individual, either by unpaid family members or friends or by trained professionals. (6) Caregivers undertake a broad spectrum of responsibilities, ranging from complex tasks such as financial and medication management to assistance with basic personal activities, including bathing and dressing. (7) Caregivers may include family members who provide informal care, trained professionals such as home health aides and nurses. (8) In low- and middle-income countries such as India, the vast majority of individuals with cognitive impairment are unidentified, and the elderly are usually cared for by informal caregivers. (9) Caregiving is associated with significant time-related and emotional stressors, including healthcare visits and behavioural management, and is often accompanied by increased financial strain due to work absenteeism. (9) These stressors are often difficult to manage and, when coupled with competing work and family demands, contribute to significant mental and physical health problems among caregivers, including depression and anxiety. (10) Caregiver burden is determined by patient behavioural and cognitive impairment, caregiving intensity, caregiver stress and social isolation, gender, relationship to the patient, caregiver attributes, and availability of support services. (11)

In India, the rise of nuclear families has increased the complexity of caring for older adults within households. (12) Family caregiving research has evolved since its emergence in the late 1970s, initially focusing on the impact of caregiving on caregivers' health and well-being, and subsequently expanding to include intervention studies aimed at supporting caregivers and improving caregiving outcomes. (13)Incorporating caregiver-focused interventions in clinics may help reduce caregiver burden and improve patient outcomes. (14) In India, caregiver stress among those caring for people with dementia has been documented in only a few studies. (9, 15) Still, there is no study assessing caregiver stress in an undiagnosed cognitively impaired elderly population in a rural health facility. While quantitative studies help estimate the magnitude of caregiver stress and identify associated factors, they provide limited insight into caregivers' abilities to manage caregiving demands and the coping strategies they

adopt in resource-constrained rural contexts. Understanding caregivers' coping mechanisms, resilience, and adaptive capacities is crucial for designing effective, culturally appropriate caregiver-support interventions.

Considering these debilitating conditions in the older population, programs such as National program for healthcare of elderly, have been developed to provide comprehensive care through Geriatric clinics established in all health centres from PHC to medical colleges. However, less consideration is given to the caregivers and their mental as well as physical stress, who spend the majority of their time in the care of these elderly. The rural setting is characterised by limited access to specialised dementia care services, greater reliance on informal family caregiving, and fewer support systems, which may exacerbate caregiver stress and shape coping responses differently from urban settings. The insights developed through subjective caregiving experiences can inform the development of context-specific, caregiver-centred interventions aimed at reducing perceived stress and strengthening caregiving capacity within routine dementia care services.

The present study aimed to identify factors associated with perceived stress among caregivers of cognitively impaired elderly patients attending a rural secondary healthcare facility in Eastern India and to explore caregivers' abilities to manage caregiving demands and the coping mechanisms they adopt in this setting.

Methods

The study was conducted at the Geriatric Clinic of the Rural Health Training Centre (RHTC), Tangi, attached with Community health Center, Tangi, a secondary health care facility in a district of coastal Odisha, which is the field practice area of the All India Institute of Medical Sciences, Bhubaneswar, Odisha. The study employed a parallel mixed-methods design, comprising a quantitative hospital-based cross-sectional study and a qualitative phenomenological study conducted concurrently and independently. The study was carried out from September 2024 to March 2025. The study population comprised caregivers of elderly patients who are cognitively impaired and aged 60 years and above attending the clinic. The Geriatric clinic in the centre runs thrice a week with an average footfall of 200 per month.

For the quantitative component, the sample size was calculated based on a reported prevalence of perceived caregiver stress of 75.86%, with an alpha error of 5% and a 95% confidence level. (9) After accounting for a 10% non-response rate, the required sample size was approximately 81 participants. Cognitive impairment among elderly patients attending the Geriatric Clinic was screened using the Rapid Geriatric Assessment (RGA) developed by Saint Louis University. (16) The RGA is a brief, multidimensional geriatric screening tool that assesses frailty, sarcopenia, nutritional risk, and cognitive function. The Rapid Cognitive Screen (RCS) component of the RGA assessed cognitive function. The RCS consists of four components: immediate learning of five common words, a clock-drawing task, delayed recall of the five words, and recall of a brief story. The total score ranges from 0 to 10. According

to the RGA manual, a score of 8–10 was considered normal cognitive function, 6–7 indicated mild cognitive impairment (MCI), and 0–5 indicated dementia. For the present study, older adults with an RCS score of ≤ 6 were considered to have cognitive impairment for screening purposes and were eligible for inclusion in the caregiver component of the study. A positive screening result was considered indicative of possible cognitive impairment and not a definitive clinical diagnosis of dementia. Eligible caregivers were recruited using consecutive sampling, whereby all eligible caregivers of older adults who screened positive for cognitive impairment were approached and enrolled consecutively during the study period until the required sample size was achieved. Caregivers who did not give consent for participation in the study were excluded from the study.

Data were collected using a pretested and pre-validated semi-structured questionnaire that captured sociodemographic characteristics, functional dependence and caregiver self-efficacy. Perceived stress among caregivers, the primary dependent variable, was assessed using the 10-item Perceived Stress Scale. (17) The scale assesses the frequency with which respondents experienced certain feelings and thoughts during the preceding month. Each item is rated on a five-point Likert scale ranging from 0 (never) to 4 (very often). The four positively worded items (items 4, 5, 7, and 8) are reverse-scored (0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0). The total PSS-10 score is obtained by summing the scores of all 10 items, with a possible range of 0–40. Higher total scores indicate greater perceived stress. The PSS-10 comprises two subscales. The perceived helplessness subscale consists of items 1, 2, 3, 6, 9, and 10 and reflects an individual's perceived lack of control over their circumstances, emotions, or reactions. The lack of self-efficacy subscale consists of items 4, 5, 7, and 8 and reflects an individual's perceived inability to handle or cope with problems. The respective subscale scores were calculated by summing the scores of the constituent items after reverse scoring of the positively worded items. Higher scores on the perceived helplessness subscale indicate greater perceived helplessness, while higher scores on the lack of self-efficacy subscale indicate a greater perceived lack of self-efficacy. (18)

Caregiver self-efficacy was measured using the eight-item Caregiver Self-Efficacy Scale (CSES-8), covering domains such as obtaining respite, controlling negative thoughts, coping with new situations, stress management, self-care, resource identification, and prevention of disruptive behaviours. (19) Functional status of elderly patients was assessed using the Lawton–Brody Instrumental Activities of Daily Living (IADL) scale, which includes eight domains, with scores ranging from 0 to 8 for women and 0 to 5 for men to minimise gender bias. (20) Language validity of the scales was established through translation into the local language followed by back-translation into English, with expert review to ensure semantic and conceptual equivalence.

For the qualitative component, in-depth interviews were conducted using a semi-structured interview guide. The interviewer also used probes to clarify and further explore the responses provided by the study participants. Caregivers were conveniently sampled for participation in the qualitative component. The study participants were interviewed by two researchers (RA or DT), who received formal, supervised training from AM on conducting interviews and communicating with caregivers. In total, six caregivers were interviewed, with recruitment continuing until data saturation was reached. On average, interviews

lasted 25 minutes (range: 18–30 minutes). Interviews were carried out in a quiet, isolated room of the hospital, and no financial remuneration was provided for participation. All interviews were audio-recorded with participant consent and transcribed into English. The transcription was then analysed using thematic analysis where two researchers independently coded the transcript and subthemes were identified using Braun and Clarke method.

Quantitative data were entered in Microsoft Excel and analysed in SPSS Statistics v20. Continuous variables were summarised as mean ± SD or median ± IQR, depending on distribution, while categorical variables were reported as frequencies and percentages. Associations between perceived stress and independent variables were examined using Chi-square tests, with significant factors included in a multivariable logistic regression to identify independent predictors. Statistical significance was set at $p < 0.05$. For perceived stress, the median score of 18, on the PSS-10 was used as the cut-off to categorise participants into low-stress and high-stress groups. The inductive approach was used to analyse the qualitative data thematically using ATLAS.ti to derive codes, sub-themes, and themes, with findings triangulated against the quantitative results.

Ethical consideration

The study was approved by the Institutional Ethics Committee, AIIMS Bhubaneswar (approval no. IEC No. T/IM-NF/CM&FM/24/140. Written informed consent was obtained from all participants after explaining the purpose and procedures of the study in the local language. Confidentiality of all participant information was strictly maintained throughout the study, and no participant was subjected to discrimination at any stage of the study.

Results

A total of 81 participants were included in the study, consistent with the calculated sample size requirement

Characteristics of study participants

Table 1 presents the sociodemographic characteristics of caregivers and patients. Caregivers were predominantly between 41–60 years of age, while patients were a median age of 68 years with an IQR from 63–75. The gender distribution was nearly equal. A substantial proportion of caregivers were illiterate and unemployed, with most belonging to joint families. The majority of participants fell into the lower socioeconomic classes as per the Modified BG Prasad scale (2025). (21)

Table 1
Sociodemographic Characteristics of Caregivers (N = 81)

Sociodemographic characteristics	Categories	N (%)
Age of caregiver	< 40 years	30 (37.0)
	41–60 years	47 (58.0)
	> 60 years	4 (4.9)
Gender	Male	41(50.6)
	Female	40(49.4)
Education	Illiterate	35 (43.2)
	Primary	20 (24.7)
	Upper primary	9 (11.1)
	High school	6 (7.4)
	Higher secondary	4 (4.9)
	Graduate and above	7 (8.6)
Occupation	Unemployed	49 (60.5)
	Farmer	15 (18.5)
	Business	5 (6.2)
	Labourer	6 (7.4)
	Retired	6 (7.4)
Per capita Income (Median, IQR)	1666, 1000–3333	
Type of family	Nuclear	11 (13.6)
	Joint	68 (84.0)
	Three generational	2 (2.5)
Socioeconomic status	Upper	3 (3.7)
	Upper Middle	6 (7.4)
	Middle	19 (23.5)
	Lower Middle	20 (24.7)
	Lower	33 (40.7)

Perceived caregiver stress:

The median perceived stress score among participants was 18 (IQR: 16–22). The median perceived helplessness and lack of self-efficacy score among participants were 10 (IQR: 9–12) and 7 (IQR: 5–9), respectively. Based on median cut-offs, participants were classified into low and high groups for perceived stress, helplessness, and lack of self-efficacy. Figure 1 depicts the distribution of participants classified into high and low categories for perceived stress, perceived helplessness, and lack of self-efficacy. It shows that the perceived stress due to perceived helplessness is higher than that caused due to lack of self-efficacy.

Table 2
Distribution of sociodemographic variables depending on the perceived stress among the study participants (N = 81)

Sociodemographic Characteristics	Low perceived stress (n = 44) n (%)	High perceived Stress (n = 37) n (%)	Total (N = 81) n (%)
Age of Caregiver			
< 40 years	15 (34.1%)	15 (40.5%)	30 (37.0%)
41–60 years	27 (61.4%)	20 (54.1%)	47 (58.0%)
> 60 years	2 (4.5%)	2 (5.4%)	4 (4.9%)
Age of Patient (Years)			
Median (IQR)	69 (63.8–74.3)	67 (63–75)	68 (63–75)
Gender of Patient			
Male	24 (54.5%)	17 (45.9%)	41 (50.6%)
Female	20 (45.5%)	20 (54.1%)	40 (49.4%)
Education Status			
Illiterate	16 (36.4%)	19 (51.4%)	35 (43.2%)
Primary	13 (29.5%)	7 (18.9%)	20 (24.7%)
Upper primary	4 (9.1%)	5 (13.5%)	9 (11.1%)
High school	3 (6.8%)	3 (8.1%)	6 (7.4%)
Higher secondary	3 (6.8%)	1 (2.7%)	4 (4.9%)
Graduate and above	5 (11.4%)	2 (5.4%)	7 (8.6%)
Occupation			
Unemployed / Housewife	25 (56.8%)	24 (64.9%)	49 (60.5%)
Farmer	8 (18.2%)	7 (18.9%)	15 (18.5%)
Business	4 (9.1%)	1 (2.7%)	5 (6.2%)
Labourer	5 (11.4%)	1 (2.7%)	6 (7.4%)
Retired	2 (4.5%)	4 (10.8%)	6 (7.4%)
Per Capita Income (INR) (PCI)			
Median (IQR)	1,600 (1,000–3,437)	1,667 (1,091–3,000)	1,667 (1,000–3,333)

Sociodemographic Characteristics	Low perceived stress (n = 44) n (%)	High perceived Stress (n = 37) n (%)	Total (N = 81) n (%)
Type of Family			
Nuclear	4 (9.1%)	7 (18.9%)	11 (13.6%)
Joint	39 (88.6%)	29 (78.4%)	68 (84.0%)
Three generational	1 (2.3%)	1 (2.7%)	2 (2.5%)
Socioeconomic Status			
Upper	2 (4.5%)	1 (2.7%)	3 (3.7%)
Upper Middle	3 (6.8%)	3 (8.1%)	6 (7.4%)
Middle	12 (27.3%)	7 (18.9%)	19 (23.5%)
Lower Middle	9 (20.5%)	11 (29.7%)	20 (24.7%)
Lower	18 (40.9%)	15 (40.5%)	33 (40.7%)

Table 2 shows distribution of study participants according to their perceived stress status. For regression analysis, categorical variables were dichotomised (e.g., age ≤ 45 vs. >45 years, gender male vs. female, literacy status literate vs. illiterate, occupation gainful vs. not gainful, family type nuclear vs. joint, SES upper/middle vs. lower, CSES low vs. high, and IADL status dependent vs. independent). Table 3 presents the association between sociodemographic and clinical characteristics and perceived stress levels. It shows unadjusted and adjusted odds ratios (OR) with 95% confidence intervals (CI). No significant associations were observed for age, gender, patient age, family type, or socioeconomic status. Educational status, occupation and IADL of the patient showed non-significant trends. Caregiver socioeconomic stress (CSES) demonstrated a strong and statistically significant association with high perceived stress (Adjusted OR: 14.71, 95% CI: 4.06–52.63, $p < 0.001$). Model fit was acceptable (Hosmer–Lemeshow $p = 0.782$), with R^2 ranging from 0.299 to 0.400.

Table 3
Bivariate and Multivariable Logistic Regression Analysis of Factors Associated with High Perceived Stress among Study Participants (n = 81)

Characteristics		Low PSS [N (%)]	High PSS [N (%)]	OR (95% C.I)	p value	Adjusted OR (95% C.I)	p value
Age category	≤ 45 years	18 (42.9)	24 (57.1)	1.27 (0.53–3.04)	0.597	-	-
	> 45 years	19 (48.7)	20 (51.3)	Reference		-	
Gender	Male	19 (46.3)	22 (53.7)	0.95 (0.39–2.27)	0.904	-	-
	Female	18 (45.0)	22 (55.0)	Reference		-	
Age of patient	Less than or equal to 65	16 (48.5)	17 (51.5)	Reference	0.674	-	-
	More than 65	21 (43.8)	27 (56.3)	1.21 (0.50–2.95)		-	
Educational status	Illiterate	13 (37.1)	22 (62.9)	1.85 (0.75–4.53)	0.179	1.35 (0.45–4.04)	-
	Literate	24 (52.2)	22 (47.8)	Reference		1 (Ref)	
Occupation	Gainful employment	14 (53.8)	12 (46.2)	Reference	0.310	1 (Ref)	0.357
	Not in gainful employment	23 (41.8)	32 (58.2)	1.62 (0.64–4.15)		1.76 (0.53–5.87)	
Type of family	Nuclear	4 (36.4)	7 (63.6)	1.56 (0.42–5.81)	0.505	-	-
	Joint	33 (47.1)	37 (52.9)	Reference		-	
Socio-economic status	Upper & middle class	15 (53.6)	13 (46.4)	Reference	0.302	-	0.321
	Lower class	22 (41.5)	31 (58.5)	1.62 (0.65–4.09)		1.81 (0.56–5.78)	
CSES	Low CSES	6 (17.1)	29 (82.9)	10.00 (3.4129.41)	< 0.001	14.71 (4.06–52.63)	< 0.001
	High CSES	31 (67.4)	15 (32.6)	Reference		Reference	

Characteristics		Low PSS [N (%)]	High PSS [N (%)]	OR (95% C.I)	p value	Adjusted OR (95% C.I)	p value
IADL status	Dependent	10 (33.3)	20 (66.7)	2.25 (0.88–5.75)	0.087	2.64 (0.85–8.20)	0.094
	Independent	27 (52.9)	24 (47.1)	Reference			
Hosmer-Lemeshow goodness-of-fit – p-value = 0.782 R^2 = 0.299–0.400							

Table 3 presents the socio-demographic profile of caregiver–patient pairs included in the qualitative component. Caregivers ranged from 18 to 62 years, included both male and female caregivers, and had varied educational backgrounds from primary to high school.

Table 4
Socio-Demographic Characteristics of Study Participants in Qualitative Component (N = 6)

ID	Age/Gender of caregiver	Relation of caregiver with patient	Education of caregiver	Occupation of caregiver	Age of patient	Sex of patient
IDI 1	18/M	Grandson	Diploma	Student	81	M
IDI 2	48/F	Daughter in law	4	Homemaker	70	F
IDI 3	40/M	Son	8	Farmer	65	M
IDI 4	52/M	Son	10	Business	66	F
IDI 5	62/M	Husband	8	retired	62	F
IDI 6	30/F	Daughter	8	Homemaker	74	F

Table 5
Thematic Framework of Caregiver Experiences and coping strategies in Elderly Care: Themes, Subthemes, Codes, and Quotes (n = 6)

Themes	Subthemes	Codes	Quotable Quotes
Awareness about patient's illness	Knowledge on daily care practices	Administering medicines, massaging, feeding, information from social media, regular medicines, timely food	"Timely food should be given, care should be done timely medicine also should be given." (IDI 2,6) "She can do her work without help but she needs some help with insulin." (IDI 2)
	Knowledge on risk factors	Knowledge healthy practices such as exercise & nutritious food, inadequate knowledge about the disease, adequate knowledge on risk factors, adequate knowledge on lifestyle factors,	"If diet is not taken care of, exercise is not done and stress management is not good, diabetes can happen or it will aggravate." (IDI 4)
	Maladaptive coping	Self-medication, avoidance of seeking care in mild conditions, blaming other family members, interfamily conflict, prejudice & fixed beliefs	"After taking cough syrup many times the condition worsens." (IDI 2) "She also is taking medication and following home remedy." (IDI 2,6) "They don't understand how important it is for elderly to go to hospital and eat healthy foods." (IDI 4,6)
Autonomy and dependence of elderly	Functionality and independence	Limited mobility, dependent for daily activities, restricted functionality, feeding issues, intermittent anhedonia, decreased appetite, timely care	"She doesn't eat well, always need someone to feed her" (IDI 6) "She usually does her work, but some days she stays in bed without interest in anything" (IDI 2)
	Cognitive & functional status	Limited mobility, memory loss, feeding issues, decreased appetite	"Sometimes she is not able to identify the people around" (IDI 6) "She can manage herself" (IDI 2,4)
	Support and assistance	Compromised daily activities, help with insulin administration, poor vision	"She does her own daily activities, but requires help for insulin administration." (IDI 2)

Themes	Subthemes	Codes	Quotable Quotes
Societal support	Social participation	Visits temple, limited social engagements	“She walks to temple with my daughter and meet people there” (IDI 2)
	Community support	Support from neighbours, staying alone	“Villagers help people by providing medicine and help get it.” (IDI 3,5) “No one is living nearby our house, if someone is there then it will be good.” (IDI 1, 4)
	Role of Government	No expectations, assistance	“I don’t know, what government can do to support the old people” (IDI 1,6)
Maladaptive coping	Family conflict	Interfamily conflict, blaming other family members,	“Some relatives say that I am not taking proper care of her, but they do not come forward to share the responsibility.” (IDI 6)
	Perceptions & Belief	Prejudice & mixed beliefs,	“They feel that medicines alone cannot help, so they continue with home remedies.” (IDI 3) “Some people believe that memory problems are just part of old age, so they do not think treatment is necessary.” (IDI 1)
	Lack of support	Lack of perceived community support, Staying alone	“If someone nearby could help with medicines or take her to the hospital, it would reduce our difficulties.” (IDI 1,4)
Burden of Caregiving	Caregiver health	Selfcare, worry about long term caregiving, geriatric caregiver	“Money is always a problem for healthcare. Once she got admitted in hospital and all my savings were spent there” (IDI 5)
	Emotional support	Helplessness, reassurance from family, emotional connectivity with patient, empathy	“It gets hectic sometimes to manage all work but I have to take care of family, so we manage somehow.” (IDI 2,6)
	Family structure & support	Migrated out for jobs, play with children, nuclear family, family conflict, poor support from family, loneliness	“All my family members are living outside the village. My son lives in a

Themes	Subthemes	Codes	Quotable Quotes
			distant town and is not able to come" (IDI 5)
	Caregiving responsibility & ownership	Delegated tasks, shared caregiving, sense of ownership, accountability of caregiving, timely food, daily caregiving task, dignity in caregiving, self-driven care, traditional support system,	"One person should be there for taking care of her. We ensure she is not left alone" (IDI 4)
	Social expectations	Community expectations for caregiving, Traditional caregiving role, lack of perceived community support, perceived support for caregiving	"The health awareness has improved after social media took over, but no help can be expected from the neighbours" (IDI 1)
	Occupation & employment	Absenteeism, wage loss, loss of daily wages, nature of work	"I work as daily wage labourer in the town. I lost todays wage as no one else was there to bring her for checkup" (IDI 3)
	Social security	Eligibility for scheme, limited awareness, survives on pension,	"We had a BSKY card, but the Ayushman card has not arrived yet." (IDI 3)
Financial burden and security	Financial security	Health insurance, Pension, financial autonomy	"I retired in 2022. I get 15k as pension. Medicines we get for free from here. We bear the travel charges." (IDI 5)
	Financial constraints	Daily wagers, Out of pocket expenditure, expenses on hospital admissions, expenses on travel to hospital, expenses for treatment	"It's difficult for me to stop work and travel for treatment. I lose wages" (IDI 3) "It will take around 200 rupees for travel. But medicines are free here" (IDI 4,5)
	Income insecurity	Loss of daily wages, absenteeism, financial burden	"I work as daily wage labourer in the town. I lost todays wage as no one else was there to bring her for checkup" (IDI 3)

Themes	Subthemes	Codes	Quotable Quotes
Health seeking behaviour and healthcare system	Accessibility to care	Difficulty in travelling, accessibility to routine medicines, lack of local health services	“There are no government facilities nearby, only private clinics.” (IDI 3) “Nearby our village no medical centre is there. So we have to come here for free medicines” (IDI 3)
	Quality of care	Good counselling, lack of empathy, poor responsibility of staff, irregular checkups	“They just give medicines and do not explain anything.” (IDI 2,6) “Consultation is done well and doctors explain well how to take medications.” (IDI 5)
	Healthcare navigation	Utilisation of health services nearby, resource utilisation	“We come here regularly every 15 days and take medicines regularly.” (IDI 5)

Integration of Qualitative and Quantitative findings

Thematic analysis identified seven overarching themes (Table 4). The joint display presented above (Fig. 2) further illustrates this integration, pairing representative caregiver quotes with the corresponding quantitative indicators of perceived stress, helplessness, and self-efficacy.

Discussion

This study found that perceived stress was high in 54.3% of the study participants, with 38.3% experiencing perceived helplessness and 42.0% lacking self-efficacy among the caregivers of cognitively impaired elderly patients. In a study done in a memory clinic of a tertiary care hospital, caregiver stress was reported in 76% of patients, where almost half of the patients had major neurocognitive disorder. (22) A case-control study similarly found that, compared with caregivers of patients with other chronic diseases, cognitive impairment significantly increased caregiver stress and placed greater demands on their emotional well-being. (23) An analysis of LASI-DAD informants found that, compared to informants of dementia-free respondents, those of respondents with questionable, mild, or moderate dementia experienced higher levels of stress. Also, compared to non-caretakers, primary caregivers experienced a much more severe impact from the respondent's cognitive impairment. (24)

Stress is considered the subjective component of caregiver burden, which depends on an individual's ability to respond to environmental challenges. (25, 26) Rural caregivers were found to have better coping mechanisms in the process of elderly caregiving.(27) Perceived helplessness, where caregivers feel overwhelmed and reduced efficacy in their caregiving process, was higher in only 38.3% of the caregivers in the current study.

Self-efficacy in the elderly with cognitive impairment is a caregiver's confidence in their ability to: manage behaviours and other caregiving stresses, control upsetting thoughts, acquire medical information, manage medical issues, obtain self-care, access community supports, assist with activities of daily living and other care, and maintain a good relationship with a relative, friend, or neighbour of an older adult with cognitive impairment. (28) In the current study, 42% lacked self-efficacy in the caregiving process, which might have contributed to the development of caregiver stress. Primary caregivers were found to have worse mental health and lower positive affect because of their full responsibility for caregiving.(24)

In the current study, the majority of participants had good caregiver self-efficacy, and those with low self-efficacy had higher odds of experiencing high stress in caregiving. In India, it is considered a familial obligation, and no infrastructure is available to provide formal training to those involved in the caregiving process.(24) The stress that is caused by the decline in memory, recognition failures and communication deficits adds to the physical and psychological stress that the caregivers of cognitively impaired elderly carry.(29) There is evidence to suggest that higher self-efficacy per se does not necessarily decrease the mental stress experienced by caregivers, but that the resources available to them can be used to mitigate the deleterious effects of stressors and stress outcomes. (29, 30)

Dependence of cognitively impaired individuals on caregivers for their daily activities was found to cause caregiver stress in this study. Physically demanding tasks such as lifting, bathing, and assistance with toileting cause more stress and strain in caregivers. (30) Although no studies have specifically explored caregiver stress in the context of functional dependence among cognitively impaired elderly, existing evidence has not established a direct association between cognitive impairment and functional dependence.(31)

The qualitative findings reinforced the central role of self-efficacy and perceived support of the quantitative associations. Caregivers who described confidence in managing medications, navigating services, and securing financial resources also reported less emotional strain, despite comparable care demands. In contrast, narratives of income insecurity, family conflict, and lack of community or government support mirrored low self-efficacy scores and higher perceived stress. These accounts suggest that self-efficacy is shaped not only by individual coping skills but also by structural constraints and support networks in rural settings. The data analysis of the nationwide survey done in India found that the disruptions in family dynamics, Conflicts in the family, increased household responsibilities, stigma related to mental health and emotional strain due to cognitive decline. (32)

Rather than drawing on formal support services, caregivers in this rural setting relied predominantly on informal, family-based coping strategies. Shared caregiving responsibilities, emotional reassurance from family members, and occasional support from neighbours were found to help in coping the caregiver stress. (33, 34) This pattern is consistent with caregiving being viewed as a familial obligation in the absence of formal caregiving infrastructure.(16) These qualitative findings explain why caregiver self-efficacy, rather than sociodemographic factors, best predicted perceived stress in quantitative analysis.

Caregivers confident in family-centred coping managed stress more effectively, whereas those with low self-efficacy and sparse support networks faced heightened stress vulnerability. (35)

The strength of this study is that this is among the first in India to assess perceived stress among caregivers of community-screened, previously undiagnosed cognitively impaired elderly in a rural secondary healthcare setting. The mixed-methods design combined quantitative estimation of caregiver stress with qualitative exploration of lived experiences and coping mechanisms. Caregiver stress and associated factors were assessed using validated instruments, ensuring comparability with other studies.

Duration and severity of cognitive impairment of the elderly patients were not considered in this study is its limitation. The study was conducted at a single rural health facility, which may limit the generalisability of the findings to caregivers in urban or tertiary-care settings. Cognitive impairment was identified using RGA screening alone, without confirmatory dementia diagnosis or adjustment for education, which may have led to misclassification. Perceived stress and self-efficacy were self-reported, making them susceptible to recall and social desirability bias.

Conclusions

Sociodemographic factors were not significantly associated with caregiver stress, whereas self-efficacy showed a significant impact. Caregivers relied mainly on informal family and community support, while awareness and use of formal government schemes remained low. Interventions should focus on enhancing caregiver self-efficacy and resilience. Increasing awareness and access to social security schemes can further reduce caregiver stress in rural settings.

Declarations

Ethics approval and consent to participate:

• Provided in methods

Consent for publication:

• Not applicable

Competing interests:

• None

Funding:

• None

Author Contribution

concept and designing the study and intellectual content- Authors 1, 2, 5Literature search for gap identification - All authorsData acquisition - Author 2, 3Statistical analysis of data- Authors 2,3,Manuscript preparation - Authors 1, 2, 3Manuscript review - All authors

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Availability of data and materials:

• All data generated or analysed during this study are included in this published article and its supplementary information files

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Figures

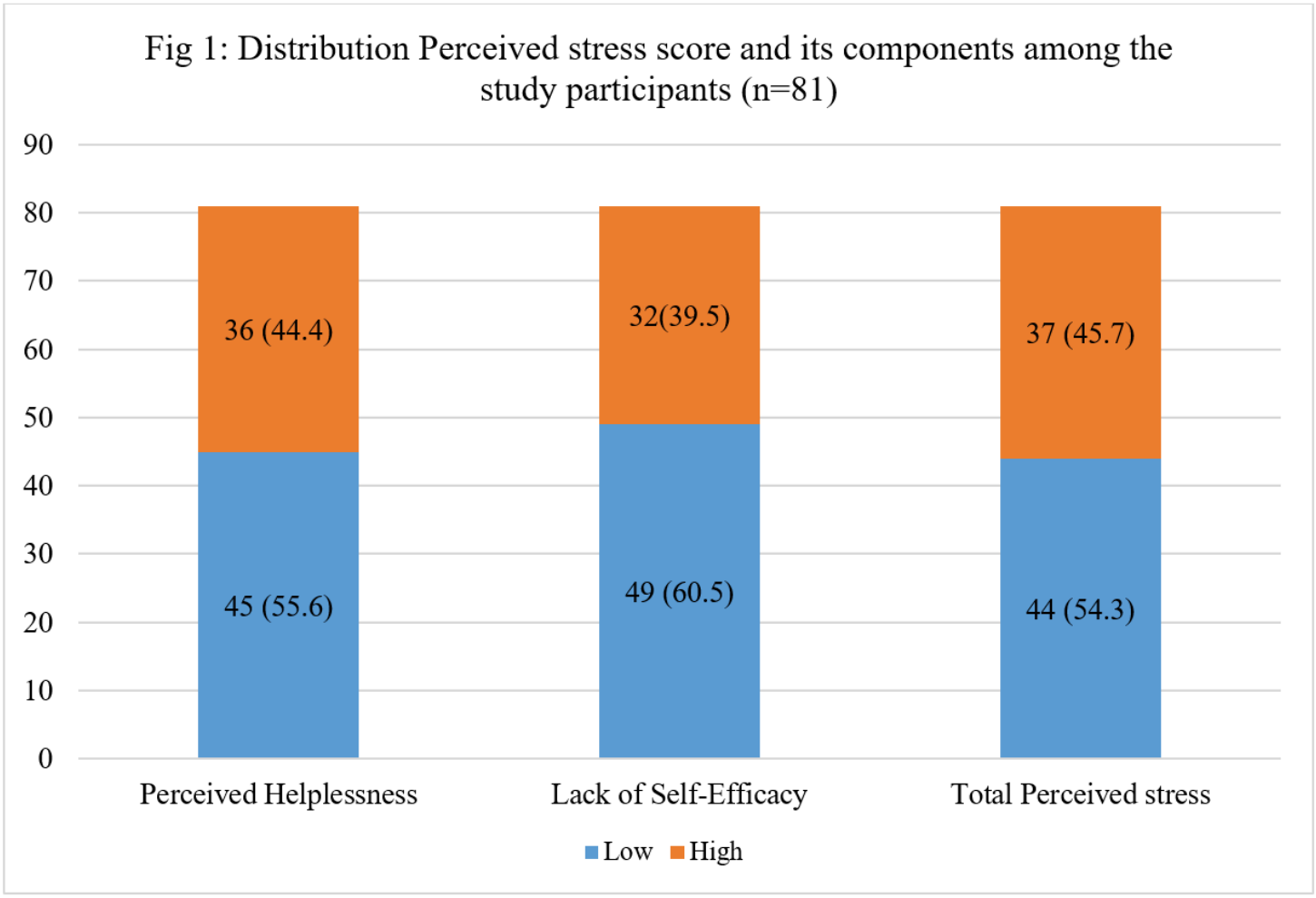


Figure 1

Distribution of Perceived Stress, Perceived Helplessness, and Lack of Self-Efficacy among Participants (N=81)

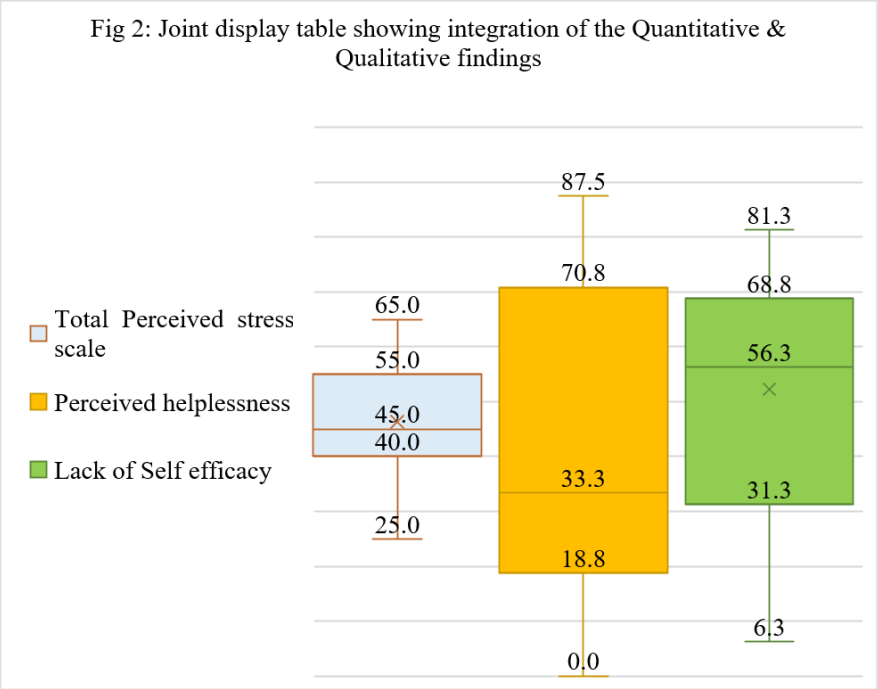


Figure 2

See image above for figure legend.

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- supplementarytable5.docx