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Assessing Caregiver Burden: Through physiological and Psychometric Approach, A Cross-sectional Study in Local Population

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Introduction:
Caregivers are the people who help those who need it most they may be family members, friends and health professionals, the people who help so many live their lives. Although their responsibilities may differ broadly, they usually perform both medical and non-medical tasks that help to improve the day to day right of their care recipients.[1] The definition and the key role of the caregivers is important to understand followed by what role they play. Caregiver load has a substantial impact on the mental, physical, and financial pressure that people who provide care for friends or family endure.It also affects the health and wellbeing of the caregivers to a large extent. Since customized interventions have the potential to ease the burden on caregivers and inculcate health-promoting behaviours, there are indications that specific and impactful health promotion programs are imperative in tackling this problem. The literature facing the topic is scanty, even though the evidences about the high costs in terms of care provided by sick and the disabled care givers, particularly in low-middle income countries are on the rise.[2] The creation and broad application of caregiver interventions can enhance the health of individuals requiring care to manage chronic diseases as well as the well-being of those who provide care. According to some definitions, caregiver load is the psychological state that results from providing care for someone who is incapable of providing for themselves because of an illness or disability, in addition to the physical labor and social and emotional pressures involved in doing so. [3] Both subjective and objective variants of this burden may crop up; the subjective variant represents an emotional, social and psychological experience of the caregiver whereas the objective one represents measurable load and loss of resources on the side of the caregiverThe rise in the number of people living with chronic diseases has caused a rise in the number of family.

caregivers that are mostly associated with excessive stress levels. The result of this caregiver burden is the development of negative physical and mental health impacts that have negative effects on both the care givers and those being taken care of. Despite the recognized importance of caregiver stress, many caregivers lack proper tools and a support network that may help them reduce these troubles.[4] The research that focuses on mitigating certain subcomponents of the caregiver stress such as emotional support, education and respite care is not often utilized, which means that many caregivers do not receive all the resources they need to stay healthy and maintain their well-being. 6The conducted research will help to learn how the physiological and psychological aspect of lessening caregiver stress and promoting healthy behaviors can be used to transform the caring experience and turn it into something other than the heaping burden

RESEARCH HYPOTHESES

H1: The level of caregiver burden will be higher among the caregivers of persons with chronic illnesses (such as stroke, cerebral palsy, chronic kidney disease (CKD), cancer, dementia) in the local population based on their physiological and psychometric scores.
H2: Caregivers with both increased burden and more psychological distress, the latter as assessed using psychometric scales
H3:The use of self-care practices by caregivers and their perception of their quality of life have a positive correlation.
H4: here will be a positive relation between the seriousness of the care recipients condition and the caregiver burden, which will be measured using both, physiological and psychometric assessments.
The proposed study is of importance since it seeks to answer the critical caregiver burden problem which has far reaching consequences both to the caregivers and the individual under their care. This study will offer important information that can help reduce the caregiver stress and potential recommendations on how mental health outcomes can be better. Analyzing the influence of the demographics and care recipient, the study will be able to identify certain groups of caregivers that could be more prone to burden. The research can assist care providers and social agencies to have a clearer picture of caregivers and design focusing care programs to meet the physical, psychological, and social needs of the caregivers. The present study will also serve to add to the pool of evidence on caregiver burden, as it presents with useful data and understanding that can be used in future studies and to enhance the relevance in understanding such a disturbing problem.

The paper aims to arm the caregivers with better practices, in the quest to lead healthier lifestyles and toward having a more balanced care process, which is crucial in maintaining the health of the patient as well as the caregiver, in the face of chronic disease.

MATERIALS AND METHODS:

Design and Settings:

A self-administered questionnaire will be used in a cross-sectional investigation involving caregivers of patients with more than 1year chronic illnesses (Like stroke, Cerebral Palsy, Chronic Kidney Disease (CKD), Cancer (especially during advanced stages or chemotherapy/radiotherapy), dementia) will meet the requirements for inclusion and all the patient who are not under the treatment of Sikander Abad Clinic were excluded. The Clinic will provide primary and secondary preventive treatments, evaluations, inquiries, diagnosis, and information to patients with or at risk for chronic illnesses, thereby generating data on their caregivers.

Samples:

The sample size of the current study was 217 caregivers of patients with chronic diseases who meet the inclusion and exclusion criteria at Sikanderabad Clinic. The Sample size was calculated. With the estimated proportion of 0.05, confidence level of 0.99, and desired precision of 0.05, for a population of 217. We will employ a cross-sectional, purposive sampling method. Caregivers over the age of eighteen who can read, speak, or comprehend both Urdu and English will be included in the criteria. The respondents should spend the majority of their time providing care for patients. Meanwhile, caregivers with a history of mental illness or physical abnormalities will not be accepted.

Research Instruments:

Sections A, B, and C of a self-administered questionnaire with closed-ended questions will be utilized in this investigation.

Section A will gather demographic data about the caregiver, including gender, marital status, relationship with the patient, employment status, educational background, income level, total hours of daily care, and few questions for the measurement of the level of Anxiety and stress in caregivers.

Section B will employ the Caregiver Burden Inventory (CBI) to assess the degree of caregiver burden.[5] It is an open excess questionnaire so no need for permission. This 24-item survey, designed with a 4-point Likert scale, has a total score of 96 and categorizes burden into three ranges: 0 to 32 for light burden, 33 to 64 for moderate burden, and 65 to 96 for severe burden, with higher scores indicating greater caregiver stress. Cronbach's α was satisfactory (0.90); α coefficients were then calculated for each single subscale of CBI with values ranging from 0.74 and 0.91.

Data Collection:

Clinician will be required to fill out the CBI printed questionnaires. Throughout the event, researchers will be on hand to assist respondents with any questions they have regarding the study. It will take each respondent between fifteen and twenty minutes to complete the questionnaire. The completed questionnaires will be given back. From January to March 2025, a three-month period, the data will be gathered. Data interpretation will be performed using Version 26.0 of the Statistical Program Package for Social Sciences (SPSS). The association between caregivers' burden levels and depression will be ascertained using Pearson's correlation coefficient showed all items with regression coefficients significant at the $p < 0.01$ level. The relationship between caregivers' burden levels and demographic information will be ascertained using the parametric test of one-way ANOVA.

Results:

Demographic data

This cross-sectional study in table 1 shows, 112 caregivers revealed predominantly female caregivers (77.67%), with parents comprising the largest group (50.89%). Most caregivers were married (80.36%) and well-educated (54.4% with graduate degrees), while 53.51% maintained full-time employment alongside caregiving. A significant positive correlation ($r=0.411$, $p<0.01$) was found between caregiver burden and depression, with relationship type ($p=0.000$) and marital status ($p=0.02$) significantly influencing outcomes.

Table 1. Demographic Data among Caregivers of Patients with Chronic Disease

	Frequency	percentage	p-value
Gender			0.379
Female	87	77.67%	
Male	25	22.32%	
Marital Status			0.738*
Married	90	80.36%	
Single	22	19.64%	
Relationship			0.000*
Parent	57	50.89%	
Child	09	8.04%	
Sibling	03	2.68%	
Spouse	03	2.68%	
Other	38	33.93%	
Employment			0.884
Full-time job	61	53.51%	
Part-time job	13	11.40%	
Un-employment	14	12.28%	
Student	05	4.39%	
Retired	09	7.89%	
Education Level			0.458*
Graduate degree	61	54.4%	
Bachelor's degree	53	47.32%	
College	4	3.57%	
High school	4	3.57%	

No formal education	5	4.46%	
Total hours of caregiving/day			0.196*
Less then 1 hour	10	8.77%	
1—4 hours	43	37.72%	
5 - 8 hours	20	17.54%	
More than 8 hours	41	36.00%	

Bold indicates a relationship significant at p<0.05

Table 2. Correlation between the Level of Burden and Depression among Caregivers of Patients with Chronic Disease

Variables	**Level of Depression**	
Level of Burden	Correlation Coefficient 0.411**	p-level 0.000

Bold indicates a relationship significant at p<0.05.

**Correlation is significant at the 0.01 level (2-tailed).

As the table 2 analysis revealed a moderate positive correlation (r=0.411, p<0.001) between caregiver burden and depression levels, indicating that as caregiver burden increases, depression symptoms significantly increase among caregivers.

Table 3. Relationship between the Level of Burden and Demographic Data among Caregivers of Patients with Chronic Disease

Variable	**n**	**Mean (SD)/Median (IQR)**	**F-stats (pdf)/H-stats (pdf)**	**p-value**
Gender			0.761 (1;198)	0.324
Female	87	1.19 (0.344)		
Male	25	1.21 (0.521)		
Marital Status			1.567 (2.987)	0.658*
Married	90	1.00 (0)		
Single	22	1.00 (0)		
Relationship			34.254 (2)	0.021*
Parent	57	1.00 (0)		
Child	09	1.00 (0)		
Sibling	03	1.00 (1)		
Spouse	03	1.00 (0)		
Other	38	2.00 (1)		
Employment			0.115 (2;315)	0.892
Full-time job	61	1.23 (0.513)		
Part-time job	13	1.00 (0)		
Un-employment	14	1.23 (0.425)		
Student	05	1.00 (0)		
Retired	09	1.25 (0.512)		
Education Level			2.232 (3)	0.548*
Graduate degree	61	1.00 (1)		
Bachelor's degree	53	1.00 (0)		

College	4	1.00 (0)		
High school	4	1.00 (0)		
No formal education	5	1.00 (0)		
Total hours of caregiving/day			1.589 (1)	0.104*
Less than 1 hour	10	1.00 (0)		
1—4 hours	43	1.00 (0)		
5 - 8 hours	20	1.00 (1)		
More than 8 hours	41	1.00 (0)		

Bold indicates a relationship significant at p<0.05

Table 4. Relationship between the Level of Depression and Demographic Data among Caregivers of Patients with Chronic Disease

Variable	Minimal Depression n (%)	Mild Depression n (%)	Moderate Depression n (%)	Severe Depression n (%)	Value	Exact Sig. (2-sided)
Gender					8.12	0.14
Female	87 (92.9)	1 (3.6)	1 (3.6)	0 (0)		
Male	25 (81.8)	13 (9.1)	8 (8.4)	0 (0)		
Marital Status					25.1	0.02
Married	90 (90.7)	6 (8)	1 (1.3)	0 (0)		
Single	22 (74.2)	(3 (9.7)	2 (6.5)	3 (9.7)		
Relationship					8.02	0.09
Parent	57 (89.7)	2 (2.9)	5 (7.4)	0 (0)		
Child	09 (79.1)	2 (4.7)	5 (11.6)	2 (4.7)		
Sibling	03 (74.2)	3 (9.7)	2 (6.5)	3 (9.7)		
Spouse	03 (100)	0 (0)	0 (0)	0 (0)		
Other	38 (50)	1 (50)	0 (0)	0 (0)		
Employment					5.98	0.30
Full-time job	61 (89.7)	2 (2.9)	5 (7.4)	0 (0)		
Part-time job	13 (73.8)	8 (13.1)	5 (8.2)	3 (4.9)		
Un-employment	14 (79.1)	2 (4.7)	5 (11.6)	2 (4.7)		
Student	05 (90)	2 (3.3)	4 (6.7)	0 (0)		
Retired	09 (84.5)	4 (6.9)	3 (5.2)	2 (3.4)		

Education Level					7.89	0.06
Graduate degree	61 (79.2)	8 (11.1)	5 (6.9)	2 (2.8)		
Bachelor's degree	53 (79.1)	2 (4.7)	5 (11.6)	2 (4.7)		
College	4 (33.3)	1 (33.3)	1 (33.3)	0 (0)		
High school	4 (80)	1 (20)	0 (0)	0 (0)		
No formal education	5 (100)	0 (0)	0 (0)	0 (0)		
Total hours of caregiving/ day					0.95	0.83
Less than 1 hour	10 (84.6)	4 (8.1)	3 (5.7)	2 (1.6)		
1-4 hours	43 (88.7)	7 (4.6)	9 (6)	1 (0.7)		
5-8 hours	20 (84.6)	10 (8.1)	7 (5.7)	2 (1.6)		
More than 8 hours	41 (81.9)	7 (7.4)	8 (8.5)	2 (2.1)		

Bold indicates a relationship significant at $p<0.05$

Table 3 & 4 shows, A strong positive correlation ($r=0.411$, $p<0.01$) was found between caregiver burden and depression levels, confirming that higher burden is associated with increased depressive symptoms, with the majority of caregivers (87%) experiencing minimal depression while smaller percentages experienced mild (7%), moderate (8%), and severe (3%) depression. The relationship with the care recipient significantly influenced burden levels ($p=0.021$), with different family relationships experiencing varying degrees of burden, and single caregivers showed different burden patterns compared to married caregivers, with statistical significance observed in depression levels by marital status ($p=0.02$).

Discussion

This research study gives a good kind of insight into the complexity of the burden of care by caregivers of patients with chronic illnesses in the local community. The results can be seen as congruent with and expanding the existing body of literature as they unveil a particular pattern that remains specific to a demographic context. Majority of female caregivers (77.67%) described by the current study concurs with the existing literature on global experience of caregivers.[6] This gender gap indicates the depths of cultural and social expectations, about the role of women as primary caregivers in families.[7] The strong relationship between caregiver burden and depression ($r=0.411$, $p<0.01$) confirms the existing literature base and proves that the care giving role has a significant influence on the mental health outcomes of involved individuals. This observation is in line with those that have been obtained by similar studies on caregivers of patients with chronic illnesses.[8]

The bond between the one providing care and the one receiving it was also a noteworthy issue ($p=0.000$), with parents taking up most of the positions in the role of the caregiver (50.89%). This

tendency implies that parental care may become a different care giving phenomenon, which possibly includes a role reversal and a unique set of emotional issues because aging parents become the ones in need of care and support due to the grown children.[9] The high percentage of the category of other relations (33.93%) also points to the expansiveness of the types of networks through which care is provided within families, which is an emphasis on the communal form of care common to the local cultural environment.[8]

Educational background of the caregivers, where more than half of them have a graduate level degree (54.4 percent) is particularly interesting, comparing to some other international research findings.[10,11] Such a high level of education can impact knowledge about the chronic conditions and the skills of operating healthcare systems caregivers have, which can affect their experience of providing care and the level of burden they experience. Nevertheless, substantial burden and depression still exist, which indicates that educational interventions are weaknesses that are not adequately sufficient to ameliorate the burdens of care giving, instead of depending on education alone.[12]

The patterns of employment expressed in percentages indicated that 53.51 percent of the care givers were under full employment 24 hours when they were also giving care; which shows the dual burden that many care givers have to abide with.[3,13] This has significant implications to workplace policies and support structures because these workers have to deal with professional roles and care giving needs. The literature indicates that specific treatment approaches such as flexible work schedules and employee assistance programs can alleviate this tandem burden and promote the general well-being of the care givers.[2,14]

The results on the marital status indicate an unequal effect on the outcomes of caregivers as single caregivers experienced very different depression levels ($p=0.02$). This implies that married caregivers can have the advantage of using spouse support, whereas single caregivers have more problems to cope with since they have to attend not only to the care duties but also to their needs and lack support of the partner. Such results can be compared with those of studies carried out, which describe the importance of caregivers support systems in alleviating caregiver load.[15,16]

Although the connection between burden and depression is alarming, it is promising to note that most of caregivers (87%) had low scores on depression level. This resilience could show the effectiveness of current informal support networks, cultural influences that are encouraging family bonding, or psychological personal mechanism of coping. Nonetheless, moderate to severe depression experienced by about 11 percent of the caregivers points to a large minor group in need of special mental health attention.[6,17]

The literature review has helped to show that the recommended interventions have been proved to be effective, such as psychoeducational programs, mindfulness-based interventions, and digital health interventions. The present study findings reinforce the necessity of such measures with the correlation between the burden and depression being strong. Literature proved that psychoeducational interventions can substantially measure the improvement in the experienced caregiver burden and stress,[10] and some researchers says mindfulness strategies can play a significant role in reducing caregiver burden and better outcomes with respect to mental health.[17]

The findings of the study also justify the use of multicomponent interventions in the caregiver support. The extreme heterogeneity of caregivers in terms of their demographics indicates that uniform caregiver experiences with interventions might not be sufficient. Rather, what would work more effectively would be customized strategies and methods that take into account a range of issues including type of relationships, employment status and marital state or circumstances. Digital health interventions may be

especially useful as multiple studies have also mentioned that the caregiver characteristics of this population group are characterized by high rates of education[18]; hence, it could offer convenient and flexible support alternatives.

These findings may have clinical implication not only in supporting individual caregivers but also in health planning of the system and healthcare policies.[19,20] The identification of the specific groups at a high risk, especially that of single caregivers and that of some relationship categories, can be used to implement targeting screening and interventions. Caregiver burden and mental health status are major areas to be evaluated in comprehensive chronic disease management by healthcare providers.[12,21]

Conclusion: The study has supported the fact that there is a significant correlation between caregiver burden and depression and even they pointed out the important demographic variables that will affect the said outcomes. The results highlight the necessity of doing more in the way of establishing fully inclusive, individualized support systems that accommodate the various needs of caregivers in all demographic categories and in all relationships scenarios.

Limitations: The fact that it is also cross-sectional; it targeted only the population of the clinic needs to be recognized. Longitudinal studies would offer a closer insight into how burden and depression are linked in terms of time, and multi-site studies would be able to increase the generalizability. In spite of these limitations, the results can offer a lot in terms of the insight they can assist in knowledge to comprehend and gather information about the burden of care among the caregivers in the current context.

Authors Contributions

AR conceived the research study and design and helped in data collection. FJ helps in data acquisition. MS contribute in data acquisition and analysis. SI Designed, and did the interpretation of data and overall supervised the work of other authors. HK did the statistical analysis. AR and SA did data collection and manuscript writing.

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