

Depression and Anxiety Among Family Caregivers in Hospitalized Diabetic Foot Ulcer Patients

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Abstract

Objective: To determine the frequency of depression and anxiety in family caregivers of hospitalized diabetic foot ulcer patients

Material and Methods: A cross-sectional study was conducted from Dec 2022- May 2023. About 239 family caregivers were recruited using non probability convenient sampling technique. Hospital anxiety and depression scale was used for the assessment of anxiety and depression among study participants. Bi variate and multivariate linear regression analysis were done for the association between dependent and independent variables.

Results: Overall depression (80.8%) was way more prevalent than anxiety. In linear regression analysis female ($p < 0.014$), divorced ($p < 0.001$), illiterate ($p < 0.001$), living in joint family ($p < 0.001$), un employed ($p < 0.004$) were some of the predictors identified for depression. Anxiety predictors were being female ($p < 0.001$), divorced ($p < 0.001$), illiterate ($p < 0.001$), living in joint family unit ($p < 0.001$), un employed ($p < 0.001$) and relationship to patient ($p < 0.001$)

Conclusion: Women who are divorced, illiterate, unemployed, living in a joint family were identified as predictors of depression and anxiety in caregivers Hence, these finding suggested psychological screening of care givers based on clinical need, particularly those who are females, divorced or married, un employed, belonging to joint family caregivers.

Keywords: Depression, Anxiety, Family Caregivers, Hospitalized Diabetic, Foot ulcer

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Introduction

Family caregivers (FCG) provide informal caregiving to incapacitated relatives without any financial benefits making a large contribution not only to the lives of these patients but also to saving the scarce resources of the healthcare system.^{1,2}

Hospitalization due to disease with a longer stay like

diabetic foot ulcer (DFU) is a stressful event, for both patients and relatives with high financial burden and social psychological stress³ i.e. anxiety (45%) and depression (26%)^{4,5}. Diabetic Foot Ulcer (DFU) is the principal cause of severe complications a long-lasting diabetes syndrome, associated with neurological and vascular pathologies; and needed hospitalization among patients with a high glycemic index.^{6,7} Being one of the most serious and dreaded complications requiring high cost and care; Ultimately affects the quality of life and health of patients and families^{8,9,10}. Globally, it is estimated that 11% of total health expenditure is dedicated to meeting the needs of hospitalized diabetic patients¹¹. A study in Lahore estimated DFU as about 7.02%¹². In The European Social Survey report of 20 European countries where an average of 34.3 and 7.6% of the population were informal and intensive caregivers respec-

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tively, were found to suffer from low mental well-being¹³. It is reported that the reason for emotional and psychological stress in two-thirds of FCG was due to a conflict in roles like gender labeled or bread earning activities with Instantaneous involvement in caregiving.¹⁴⁻¹⁶ This study aims to describe the extent of depression and anxiety symptoms and associated modifiable factors among caregivers of DFU in our context and culture to stimulate risk modification tools to diminish these outcomes.

Material and Methods

Across-sectional study was carried out from Dec 2022-May 2023 in three public sector tertiary care hospitals in district Peshawar. After the taking approval from Ethical Committee Ref No. Dir/KMU-ED/DA/000828 dated 16-12-2021. A sample of 239 family caregivers were enrolled in the study using non probability convenient sampling technique. sample size was calculated by using a reported 64% prevalence of depression amongst family caregivers of diabetic patients, 95% confidence interval, and 5% margin of error, taking the power of 80%.

The inclusion criteria for the respondents were; Spouse of the patient with diabetic foot ulcer, blood relatives living in the same house with a patient, (responsible for helping with treatment).living in the same house with a patient, (responsible for helping with treatment). All those who refuses to participate or suffering at present or past from some known psychological problems were excluded. Verbal consent was obtained from all those who willingly participated in the study. Participants were interviewed keeping their names confidential. Data about socio-demographic characteristics were collected on the close-ended questionnaire and HAD scale was used to collect data for assessment of depression and anxiety. For statistical analysis, SPSS software version 22 was used. For categorical data Bivariate analysis was done by Chi-square test and independent t test and multi variate analysis regression analysis, keeping the statistical significance at $p < 0.05$.

Results

Overall, 239 participants were identified for this study. Males were (138) 57.7% of the study participants while (101) 42.3% were females. The majority 68.2% (72) of the participants were married, (163) 30.1% were single while (4) 1.7% were divorced. Sociodemographic profile of care givers is shown in table 1. Most of the participants

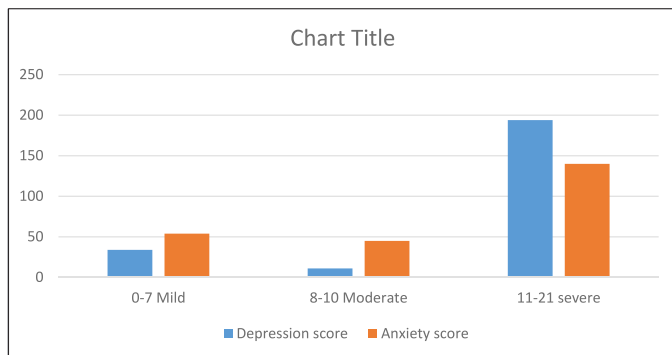
59.4% (142) were literate while 40.6% (97) were illiterate. In addition, (145) 60.7% of the participants were living in a joint family while (94) 39.3% were living in single families. Additionally, (155) 64.9% of the participants were employed while (84) 35.1% were unemployed. Furthermore, 8.8% (21) of the caregivers were husbands, 9.6% (23) were wives, 12.1% (29) were mothers, 20.9% (50) were fathers, 20.9% (50) were sons, 10.9% (26) were daughters, 7.1% (17) were brothers and 9.6% (23) were sisters to the patients with diabetic foot ulcers. Mean depression and anxiety score was 11.4, ± 2.390 SD and 10.35, ± 3.346 SD respectively. The mean age was 35.78 ± 7.977 SD (min 22, max 55 years). The prevalence of different levels of depression and anxiety care givers of diabetic foot ulcers are described in figure 1. Overall severe depression was observed in 81.2% of participants while severe Anxiety was observed in 58.6% of care givers of DFU. In bivariate analysis, applied to estimate the relationship between depression level and socio-demographic profile. There was a significant relationship between depression and being female, illiterate, having a joint family, and being unemployed Table 2. Association among the level of Anxiety and socio-demographic profile was estimated using chi-square test. There was a significant association between anxiety levels and gender being female, married, illiterate, living in joint family, and unemployed in Table 3. Table 4 shows esti-

Table 1: *The Socio-demographic Characteristic Of The Family Caregivers Of Diabetic Foot Ulcer Patients (n=239)*

Variables total n= 239		Frequencies	Percentages
Gender	Male	138	57.7%
	Female	101	42.3%
Marital status	Single	72	30.1%
	Married	163	68.2%
	Divorced	4	1.7%
Educational status	Literate	142	59.4%
	Illiterate	97	40.6%
Family status	single family	94	39.3%
	joint family	145	60.7%
Job-status	Employee	155	64.9%
	Unemployed	84	35.1%
Relation to patient	Husband	21	8.8%
	Wife	23	9.6%
	Mother	29	12.1%
	Father	50	20.9%
	Son	50	20.9%
	Daughter	26	10.9%
	Brother	17	7.1%
	Sister	23	9.6%

mated regression coefficient for HAD score by applying multiple linear regression analysis. The depression predictors in care giver were being female ($p < 0.014$), divorced ($p < 0.001$), illiterate ($p < 0.001$), living in joint family ($p < 0.001$), un employed ($p < 0.004$) and relationship to patient ($p < 0.001$).

Anxiety predictors were being female ($p < 0.001$), divorced ($p < 0.001$), illiterate ($p < 0.001$), living in



joint family unit ($p < 0.001$), un employed ($p < 0.001$) and relationship to patient ($p < 0.001$).

Fig-1: Frequency of Depression & Anxiety in Caregivers of Diabetic Foot Ulcers

Discussions

In the current study, depression and anxiety levels of family caregivers of hospitalized diabetic patients were investigated in an attempt to identify its potential predictors. In our study, there were more males as compared to females and the majority of caregiving was provided by parents, married, literate these aforementioned findings were somehow similar to a study done in our country i.e. Pakistan, showing patten of care giving specific to the context of our country.¹⁷ Patients with DFUs often experience mental health issues, with anxiety and depression being the most common complications observed by caregivers.^{18,19} In our study, severe depression was more prevalent than mild and moderate depression i.e. (81.2%) of participants. Same was true for severe Anxiety where 58% of the study participants reported severe anxiety. The study's findings are reinforced by the research conducted by Inan and Ibrahim. It was revealed that 64% of caregivers

Table 2: BI Variate Association Among The Level Of Depression And Socio-demographic Profile, N=239

Socio-demographic variables		Depression scale levels						X ² (df) p-value
		0-7 normal		8-10 borderline		11-21 Abnormal		
		N	%	N	%	N	%	
Age	35 years and less	20	16.0%	4	3.2%	101	80.5%	1.717(2) 0.438
	More than 35 years	14	12.3%	7	6.1%	93	81.6%	
Gender	Male	33	24.6%	4	2.9%	101	73.2%	31.55 (2) <0.001**
	Female	1	1.0%	7	6.9%	93	92.1%	
Marital status	Single	31	43.1%	4	5.6%	37	51.4%	93.899 (4) <0.001**
	Married	3	1.8%	3	1.8%	157	96.3%	
	Divorced	0	0.0%	4	100.0%	0	0.0%	
Educational status	Literate	32	22.5%	4	2.8%	106	74.6%	24.547 (2) <0.001**
	Illiterate	2	2.1%	7	7.2%	88	90.7%	
Family status	single family	30	31.9%	4	4.3%	60	63.8%	40.440 (2) <0.001**
	joint family	4	2.8%	7	4.8%	134	92.4%	
job-status	Employee	32	20.6%	9	5.8%	114	73.5%	19.704 (2) <0.001**
	Unemployed	2	2.4%	2	2.4%	80	95.2%	
Relation to patient	Husband	0	0.0%	1	4.8%	20	95.2%	154.515 (14) <0.001**
	Wife	0	0.0%	1	4.3%	22	95.7%	
	Mother	1	3.4%	0	0.0%	28	96.6%	
	Father	33	66.0%	2	4.0%	15	30.0%	
	Son	0	0.0%	1	2.0%	49	98.0%	
	Daughter	0	0.0%	3	11.5%	23	88.5%	
	Brother	0	0.0%	0	0.0%	17	100.0%	
	Sister	0	0.0%	3	13.0%	20	87.0%	

X² RESULTS ARE SIGNIFICANT AT 0.05 = *, FISHER'S EXACT RESULTS = **

were affected by severe depression, while 71% experienced severe anxiety.²⁰

According to a study by Huifen Chen and Jun Xie, depression and anxiety are common among caregivers of patients with DFUs. These psychological issues are linked to the additional care and the reliance of patients on their family caregivers.²¹ It is important to effectively manage the involvement of family, the healthcare system, and socio-economic factors. A supportive family can help reduce the anxiety levels of caregivers of patients with DFUs. Additionally, a good healthcare system can help family members achieve good physical health through proper counseling and education. It is clear that family members of patients with DFUs face substantial psychological challenges that have far-reaching impacts on them mentally, socially, economically, and physically.²² Gender did play a part when it comes to anxiety. Our study participant females were found more abnormally anxious than their counterparts, a finding

inconsistent with previous studies²³. Depression significantly impacts women, who are 1.7 times more likely to experience it compared to men. Female caregivers of patients with chronic diseases, such as diabetic foot ulcers, are particularly prone to high levels of depression and anxiety (52.2%). Additionally, male caregivers may also experience depression due to social and economic burdens, resulting in reduced enthusiasm for caregiving. In our study, we found that divorced and married caregivers experience more anxiety and depression than unmarried caregivers. They also face greater challenges in managing the long-term care needed by patients with diabetic foot ulceration, leading to psychological and physiological complications. Caregivers with lower levels of education showed significantly higher levels of anxiety and depression. This is consistent with other studies linking education level to psychological issues such as depression and anxiety among caregivers.²⁴ Previous research has shown that caregivers with a low

Table 3: Bivariate Association Among The Level Of Anxiety And Socio-demographic Profile, N=239

Socio-demographic variables		Anxiety scale levels						X ² (df) p-value
		0-7 normal		8-10 borderline		11-21 abnormal		
		N	%	N	%	N	%	
Age	35 years or less	28	22.4%	17	13.6%	80	64%	5.125(2)
	More than 35 years	26	22.8%	28	24.6%	60	52.6%	0.077
Gender	Male	50	36.2%	23	16.7%	65	47.1%	35.033 (2)
	Female	4	4.0%	22	21.8%	75	74.3%	<0.001**
Marital status	Single	33	45.8%	20	27.8%	19	26.4%	48.544 (4)
	Married	21	12.9%	25	15.3%	117	71.8%	<0.001*
	Divorced	0	0.0%	0	0.0%	4	100.0%	
Educational status	Literate	37	26.1%	43	30.3%	62	43.7%	39.520 (2)
	Illiterate	17	17.5%	2	2.1%	78	80.4%	<0.001**
Family status	single family	35	37.2%	21	22.3%	38	40.4%	24.427(2)
	joint family	19	13.1%	24	16.6%	102	70.3%	<0.001**
Job-status	Employee	36	23.2%	44	28.4%	75	48.4%	24.427 (2)
	Unemployed	18	21.4%	1	1.2%	65	77.4%	<0.001**
Relation to patient	Husband	1	4.8%	20	95.2%	0	0.0%	317.841(14) <0.001*
	Wife	1	4.3%	1	4.3%	21	91.3%	
	Mother	1	3.4%	1	3.4%	27	93.1%	
	Father	34	68.0%	3	6.0%	13	26.0%	
	Son	0	0.0%	0	0.0%	50	100.0%	
	Daughter	0	0.0%	1	3.8%	25	96.2%	
	Brother	15	88.2%	0	0.0%	2	11.8%	
	Sister	2	8.7%	19	82.6%	2	8.7%	

FISHER'S EXACT RESULTS = *, X² RESULTS ARE SIG = **

level of education are more likely to experience abnormal anxiety, possibly due to a lack of understanding of the underlying disease, leading to adverse emotional reactions. Family members of patients with DFUs may also experience high levels of anxiety and depression due to unemployment. Studies have highlighted the association between employment and anxiety and depression. This

guides health care workers to focus on women, unemployed and illiterate family caregivers to provide psychological counseling, training, and health education to reduce the development of anxiety and depression in hospitalized caregivers.²⁵⁻²⁷

Conclusion

Table 4: BI Variate And Multiple Linear Regression Analysis Of Depression Score And Anxiety Score In Care Givers

Socio-demographic variables		Estimated regression coefficient Depression & Anxiety score for care givers								
		T test / Anova for depression in care givers		Linear regression for Depression score		T test / Anova for anxiety in care givers		Linear regression for Anxiety score		
		P-value & C.I		Reg. coeff	P-value & C.I		P-value & C.I		Reg. coeff	P-value & C.I
Constant			2.513	0.004*			2.375	0.026*		
				0.793—4.234					0.286—4.467	
Age	35 years or less	0.596	0.178	0.723	0.547	-0.097	0.746			
	More than 35 years	-0.773-- 0.448		0.470— -0.307	-0.593— 1.116		-0.686— 0.492			
Gender	Male	<0.014*	1.936	<0.001*	<0.001*	5.067	<0.001*			
	Female	-1.256-- -0.145		1.268—2.604	-2.923--- -1.361		4.255—5.878			
Marital status	Single	<0.001*	1.410	<0.001*	<0.001*	2.570	<0.001*			
	Married	F 47.671		0.000--- 0.810	F 31.041		1.840— 3.299			
	Divorced									
Educational status	Literate	<0.001*	0.901	0.045	0.121	4.724	<0.001*			
	Illiterate	-2.024--- -0.858		0.019--- 1.784	-1.548 -- +0.181		3.651— 5.797			
Family status	single family	<0.001*	1.714	<0.001*	<0.007*	-1.628	<0.001*			
	joint family	-2.268-- 0.297		0.810--- 2.010	-1.256— 0.456		-2.515— -0.740			
Job-status	Employee	0.004*	-0.388	0.210	0.047*	-2.285	<0.001*			
	Unemployed	-1.461 -- -0.287		-0.998--- 0.221	-1.963-- -0.013		-3.026— -1.545			
Relation to patient	Husband	<0.001*	-0.011	0.898	<0.001*	-0.998	<0.001*			
	Wife	F 24.323		-0.176--- 0.154	F 82.752		-1.199— -0.798			
	Mother									
	Father									
	Son									
	Daughter									
	Brother									
Sister										
Number of included variable	7					7				
R²				0.400			0.548			
R² Adjusted for confounders				0.381			0.534			

Statistically significant p-value= *

As hospitalization due to diabetic foot ulcers needs a “longer stay”. A source identified as economic, psychological, and physiological stress for the family caregivers; already overburden with family and social responsibilities.

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Authors Contribution

SN: Conceptualization of Project

IU: Data Collection

KR: Literature Search

KURK: Statistical Analysis

IU: Drafting, Revision