

DEPRESSION, ANXIETY, STRESS, AND SATISFACTION WITH DAILY OCCUPATION AMONG CAREGIVER OF ELDERLY DIABETIC PATIENT

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ABSTRACT

A caregiver is a person who is taking care of a sick or dependent individual. The caregiving process would involve numerous tasks like helping the patients with daily activities, supervising medications, and arranging medical appointments. The demand and multiple roles as caregivers might lead them to experience depression, anxiety, and stress. The study aimed to evaluate the prevalence and relationship of depression, anxiety, stress, and satisfaction with daily occupation among the caregivers of elderly diabetic patients. This study adopted a cross-sectional design. A total of 139 participants who were the caregivers of elderly diabetic patients consented to participate in this study. The results indicated a low percentage of caregivers with a high level of depression, anxiety, and stress, and low level of satisfaction with daily occupation. There was a significant strong negative relationship between satisfaction with daily occupation with depression ($r = -0.806$), anxiety ($r = -0.764$), and stress ($r = -0.770$). The more complications of the patients have a significant fair, positive correlation with depression ($r = 0.366$), anxiety ($r = 0.183$), and stress ($r = 0.384$), with a fair negative correlation with satisfaction with daily occupation ($r = -0.381$) among the caregivers. The findings in this study might open the doors for supporting those caregivers. The positive correlation between depression, anxiety, and stress with complications of the patients that they are taking care of indicates that these caregivers need to be educated on self-care and techniques in coping stress.

Keywords: Caregiver; DASS21; satisfaction with daily occupation; elderly diabetic patient

1. Introduction

The caregiver is the person who cares for the task of taking care of a sick or dependent individual, including their daily tasks such as feeding, personal hygiene, taking medicines, visiting doctors for a regular check-up, and many more as their daily routine (Moustafa & Moustafa, 2018). Caregivers may be spouses, children, family members, friends, and others who commit their time to help their loved ones (Al-Zahrani et al., 2015). However, caregivers' quality of life decreases due to the impact on their physical, psychological, and social lives. They might be suffering from financial issues and difficulties in handling other responsibilities such as marriage and work (Irfan et al., 2017). Furthermore, caregivers tend to neglect their own physical and emotional needs especially those looking after older adults. According to the International Council on Management of & Population Programmes (2017), Malaysia will be an ageing nation by around 2030, when 14% of the population will be over 60 years old. Sinclair (2011) stated that informal caregivers also perform other care responsibilities such as skin and

wound care, medication management, dietary provision, financial care, and even in-home dialysis apart from direct diabetes care that sometimes impose burdens including loss of a job, no source income and increased risk of mental illness. Depression, anxiety, and stress are the most common problems that caregivers experience and often need medical interventions for (Mahadevan et al., 2010; Taati et al., 2016).

Kim et al. (2012) state that increase of life span and high prevalence of diabetes in elderly causes the number of the elderly with diabetes is rapidly increasing globally. In 2017, an estimated 425 million people globally were living with diabetes. The highest prevalence was recorded in the Western Pacific region representing 159 million people clustered in 23 countries, including Malaysia (International Diabetes Federation, 2017).

The World Health Organization (2015) defines depression as a common mental disorder characterized by sadness, loss of interest, low self-esteem, disturbed sleep or appetite, tiredness, and trouble with concentration. It can affect a person's ability to function well at work or school or cope with daily life. Depression could also lead to suicide. Depression is often associated with anxiety, a feeling of worry, nervousness, and uneasiness about something that can be overwhelming or disabling. The level of distress from anxiety that is very high can disrupt a person's everyday life. Stress is a feeling of tension that can be very bad for health if it is too much. It can cause cognitive, emotional, physical, and behavioural problems. The demand for caregiving is sometimes overwhelming, leading to increased depression, anxiety, and stress.

Information about depression, anxiety, stress, and satisfaction with daily occupations amongst caregivers of elderly patients with diabetes was limited and insufficient. Therefore, this study was conducted to identify the prevalence and relationship of depression, anxiety, and stress with the satisfaction of daily occupation perceived by the caregiver of the elderly diabetic patients.

2. Materials and Methods

2.1 Study design and setting

A cross-sectional study design was adopted in this study. The approval was obtained for data collection from six diabetic centres and clinics: D' Centers Diabetes Resources Centre, Diabetic Wound Care Clinic, Diabetes Malaysia, Diabetic Wound Care Clinic, Diabetic Education Clinic KPJ Selangor, and Diabetes Treatment Natural & Holistic.

2.2. Participants

The participants of this study included family members, spouses, or any individuals taking care of elderly patients with diabetes mellitus. The inclusion criteria were:

- The caregivers were between 20 to 65 years old
- The caregivers spent time with the patient for at least 5 hours a day
- The patients were 60 years old or above
- The patients were confirmed diabetic on treatment by the physician based on ADA 2020 guideline: plasma glucose criteria, either the fasting plasma glucose (FPG) value or the two-hour plasma glucose (2-h PG) value obtained after a 75-g oral glucose tolerance test (OGTT), or A1C criteria.

The exclusion criteria were:

- Caregivers with serious health issues that were diagnosed with psychiatric, cardiac, or other orthopaedic neurological disorders that affect the role of caregiving.
- Caregivers who spent less than 5 hours a day looking after the patient.

- Caregivers who had language barriers as the questionnaire was in English.

After screening, 139 caregivers were eligible to participate in the study.

2.3. Data collection and Instruments

2.3.1. Ethical approval

The ethical approval for this research was obtained from the Ethical Committee, Faculty of Health Sciences, Universiti Teknologi Mara (UiTM) (REC/531/19).

2.3.2. Screening and consent

Both caregivers and patients were screened based on the inclusion and exclusion criteria. Potential participants that met the inclusion criteria were approached. Then, the consent forms were obtained from agreeing participants.

2.3.3. Research instruments

Caregivers were asked to fill in an online questionnaire via Google Form. The questionnaire included demographic information, the 21-item Depression, Anxiety, and Stress Scale (DASS-21), and the Satisfaction with Daily Occupation Scale (SDO). The 21-item Depression, Anxiety and Stress Scale (DASS-21) is an instrument to measure emotional state. It is a set of three self-reported scales designed to measure depression, anxiety, and stress (Lovibond & Lovibond, 1995). Satisfaction with Daily Occupations Scale (SDO) was used to target relevant aspects of everyday occupations and specifically address the client's satisfaction with currently performing, or not performing, an occupation (Watsberg et al., 2016). Therefore, DASS-21 and SDO were used in this study to measure the level of depression, anxiety, stress, and satisfaction with daily occupation in caregivers of elderly diabetic patients. The details about the standardized questionnaires are as follows:

(1) 21-item Depression, Anxiety, and Stress Scale (DASS-21)

DASS is a standardised assessment to measure depression, anxiety, and stress. It is a self-reported instrument that is used on participants 18 to 65 years old. There are 21 items divided into three domains with seven items per domain. A four-point severity scale ranging from 0 ("does not apply to me") to 3 ("applies to me most or all of the time") measures how each state was experienced over the past week. Depression (0-9, 10-20, and >20), anxiety (0-7, 8-14, and >14), and stress (0-14, 15-25, and >25) scores were categorized into normal, mild-moderate, and severe.

(2) Satisfaction with Daily Occupation Scale (SDO)

SDO is a standardised assessment to measure activity level and perception of satisfaction with daily occupations developed in 2001. It consists of nine items under four domains: work and work-related, leisure, domestic, and self-care. Each item consists of a 2-part question. The first part is the activity level scored with either "yes" or "no". 1 point is given for a "yes" and 0 for a "no". The maximum point for this part is 9 points. Higher score indicates a higher activity level. The second part is the satisfaction score regarding the condition, answered using a 7-point Likert scale from 1 (worst possible) to 7 (best possible). The total sum of satisfaction score ranges from a minimum 9 points to a maximum 63 points. Higher score indicates a higher satisfaction level.

2.4. Data Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 24. The descriptive analysis of the demographic information and the total scores were reported as frequency and percentage for categorical data and mean (SD) or median (IQR 25% – 75%) for continuous data depending on the data distribution. For inferential statistics, the correlation analysis was calculated to test the relationship between depression, anxiety, and stress with the satisfaction of daily occupation. The significant level (α) was set at 0.05.

3. Results and Discussion

3.1. Demographic data

The demographic characteristics of the participants are summarised in Table 1. Among 139 participants, the majority of them, 74.1% ($n = 103$), were in the 20 – 29 age group. The majority were female 71.9% ($n = 100$). In Japan, a study also found that most caregivers were female, either they were spouses, daughters, or daughters-in-law (Honda et al., 2013) Women feel more accountable and obligated to care, while males will be more receptive to leaving care jobs (Hong & Coogle, 2016).

Among the patients, 56.8% ($n = 76$) were male while 43.2% ($n = 60$) were female, with mostly 91.4% ($n = 127$) in the age group of 60 – 69 years old, 7.9% ($n = 11$) in age group of 70 – 79 years old and 0.7% ($n = 1$) were in the age group of 80 – 89 years old.

Most of the caregivers, 76.3% ($n = 106$) were children of the patients.

Most of the caregivers, 87.8% ($n = 122$), had tertiary education. Regarding working status, 46.9% ($n = 69$) of the caregivers were unemployed, 20.1% ($n = 28$) were working at the government sector, 21.6% ($n = 30$) were working at the private sector, 6.5% ($n = 9$) were self-employed and 2.2% ($n = 3$) were retired.

In terms of the caregivers' income level, about half of them, 46.9% ($n = 69$) had no fix monthly income, while 9.4% ($n = 13$) had less than RM 1000 monthly income, 12.9% ($n = 18$) had RM1000 – 1999 monthly income, 12.2% ($n = 17$) had RM2000 – 2999, and 15.8% ($n = 22$) had monthly income more than RM3000.

Around half of the patients, 52.5% ($n = 73$) had no complications, 11.5% ($n = 16$) of the patients had nephropathy, 20.1% ($n = 28$) had ophthalmological complications, 16.5% ($n = 23$) had foot pathogenesis, 33.1% ($n = 46$) had cardiovascular complications, one patient (0.7%) had Alzheimer's disease, 5.8% ($n = 8$) had depression, and lastly 33.1% ($n = 46$) had skin related problems.

Caregivers were required to list down if the patients had one or more complications. The results indicated that 48.9% ($n = 68$) of the patients had one complication, 30.2% ($n = 24$) of the patients had two complications, 18% ($n = 25$) had three complications, and 2.9% ($n = 3$) had four complications while there was no patient with more than four complications.

Table 1: Demographic characteristics of the participants

Characteristics	Frequency (N)	%
Age of respondent		
18 – 19	1	0.7
20 – 29	103	74.1
30 – 39	11	7.9
40 – 49	10	7.2
50 – 59	8	5.8

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60 – 69	6	4.3
Gender of caregiver		
Male	39	28.1
Female	100	71.9
Age of patient		
60 – 69	127	91.4
70 – 79	11	7.9
80-89	1	0.7
Gender of patient		
Male	79	56.8
Female	60	43.2
Relationship with patient		
Spouse	6	4.3
Children	106	76.3
Sibling	3	2.2
Relative	18	12.9
Education level of caregiver		
No education	0	0.0
Primary school	0	0.0
Secondary school	17	12.2
University	122	87.8
Employment status of the caregiver		
Unemployed	69	49.6
Government sector	28	20.1
Private sector	30	21.6
Self-employment	9	6.5
Retired	3	2.2
Income level of caregiver		
No income	69	49.6
< RM1000	13	9.4
RM1000 – 1999	18	12.9
RM2000 – 2999	17	12.2
> RM3000	22	15.8
Complications in patient		
Nerve damage	73	52.5
Kidney damage	16	11.5
Eye damage	28	20.1
Foot damage	23	16.5
Cardiovascular damage	46	33.1
Alzheimer's disease	1	0.7

Depression	8	5.8
Skin condition	46	33.1
Number of complications in the patient		
1	68	48.9
2	42	30.2
3	25	18.0
4	4	2.9
5 and more	0	0.0

3.2. Prevalence of depression, anxiety, and stress with the level of satisfaction with daily occupation (SDO) of caregivers

Based on Table 2, most of the caregivers had normal scores for depression, anxiety, and stress levels. These three scales' mean scores were 2.17 for depression, 2.27 for anxiety, and 1.78 for stress.

For depression, 45.3% (n = 63) of the caregivers had normal score, 14.4% (n = 20) were in mild depression, 24.5% (n = 34) in moderate depression, 7.2% (n = 10) in severe depression, and 8.6% (n = 12) in extremely severe depression.

For anxiety, 50.4% (n = 70) had normal score, 10.1% (n = 14) were in mild anxiety, 17.3% (n = 24) in moderate anxiety, 6.5% (n = 9) in severe anxiety, and 15.8% (n = 22) in extremely severe anxiety.

For stress, 63 % (n = 88) had a normal score, 10.1% (n = 14) were in mild stress, 15.8% (n = 22) in moderate stress, 10.1% (n = 14) in severe stress, and 2.2% (n = 3) in extremely severe stress.

A previous study stated that those who cared for the elderly patient are more likely to suffer from depression and anxiety with physical and psychological burdens (Honda et al, 2013). The greater the severity of the disability, the more stressful it is to provide care. A person with a severe impairment is more reliant on the caretaker; the caregiver has less time and is more stressed (Kim, 2017). The restriction of their activities is a factor that contributes to the mental health of the caregivers (Forsberg-Warleby et al, 2004).

Table 2: Level of depression, anxiety, and stress of the caregivers of elderly diabetic patients (N = 139)

Level	Depression n (%)	Anxiety n (%)	Stress n (%)
Test	Mean (SD) =2.19 (1.318)	Mean (SD) =2.27(1.517)	Mean (SD) =1.78(1.155)
Normal	63 (45.3%)	70 (50.4%)	88 (63.3%)
Mild	20 (14.4%)	14 (10.1 %)	14 (10.1%)
Moderate	34 (24.5%)	24 (17.3%)	22 (15.8%)
Severe	10 (7.2%)	9 (6.5%)	14 (10.1%)
Extremely severe	12 (8.6%)	22 (15.8%)	3 (2.2%)

For satisfaction with daily occupation (SDO), the score was categorized into low, moderate, and high satisfaction levels. 18.0% (n = 25) caregivers had low satisfaction with daily occupation, 59.7% (n = 83) caregivers had moderate satisfaction, while 22.3% (n = 31) caregivers had high satisfaction.

An elderly patient who is highly dependent with low functional ability requires more physical assistance, causing less time for caregivers to spend on leisure and health. Subsequently, caregivers would complain of fatigue and psychological distress (Mahadevan et al., 2013). Also, it has been reported that 61.3% of caregivers neglected their health while taking care of the other people (Irfan et al., 2017).

Table 3: Level of satisfaction with daily occupation (SDO) of the caregivers of elderly diabetic patients (N = 139)

Level of satisfaction with daily occupation (SDO)	Frequency n (%)
Low	25 (18.0 %)
Moderate	83 (59.7 %)
High	31 (22.3 %)
Total score	139 (100%)

3.3. Association of depression, anxiety, and stress with the satisfaction with daily occupation (SDO) of caregivers

The association was calculated using the Pearson correlation. Table 4 shows depression, anxiety, and stress had a strong negative relationship with the satisfaction with daily occupation (SDO); the r-values for depression, anxiety and stress were ranged between $r = -.764$ to $r = -.806$. Figures 1 – 3 shows the r-value is near to -1 to produce a downward slope.

The interpretation for DASS-21 was classified into cut-off points of normal, mild, moderate, severe, and highly severe; higher score indicates worse mental state condition. There was no stated cut-off point for the interpretation of the SDO. Higher score indicates a higher satisfaction level. The correlation coefficient was nearing -1 for depression, anxiety, and stress with SDO indicating a strong relationship. The correlation coefficient for depression, anxiety, and stress with SDO was all negative, indicating that the higher the level of depression, anxiety, and stress in caregivers, the lower the SDO.

Honda et al. (2013)'s study found that each participant with a high level of depression, anxiety and stress also had low satisfaction with doing occupation in their daily life when taking care of the patient. Moustafa and Moustafa (2018) noted that caregivers sometimes had a higher risk of psychological health distress than the elderly diabetic patients because they tend to neglect their obligation and health when they commit to taking care of others. The stress might also be contributed by the lonely feeling to complete their caregiving duties, which meant they had to give up hobbies and leisure activities and be less active in social situations (Motaharinezhad et al., 2020).

Table 4: The correlation between depression, anxiety, and stress with satisfaction with daily occupation (SDO) in caregivers

		Depression scale of the caregivers	Anxiety scale of the caregivers	Stress scale of the caregivers
Total satisfaction with daily occupation score	Pearson Correlation (r)	-.806**	-.764**	-.770**
	P-value	<.001	.000	.000
	N	139	139	139

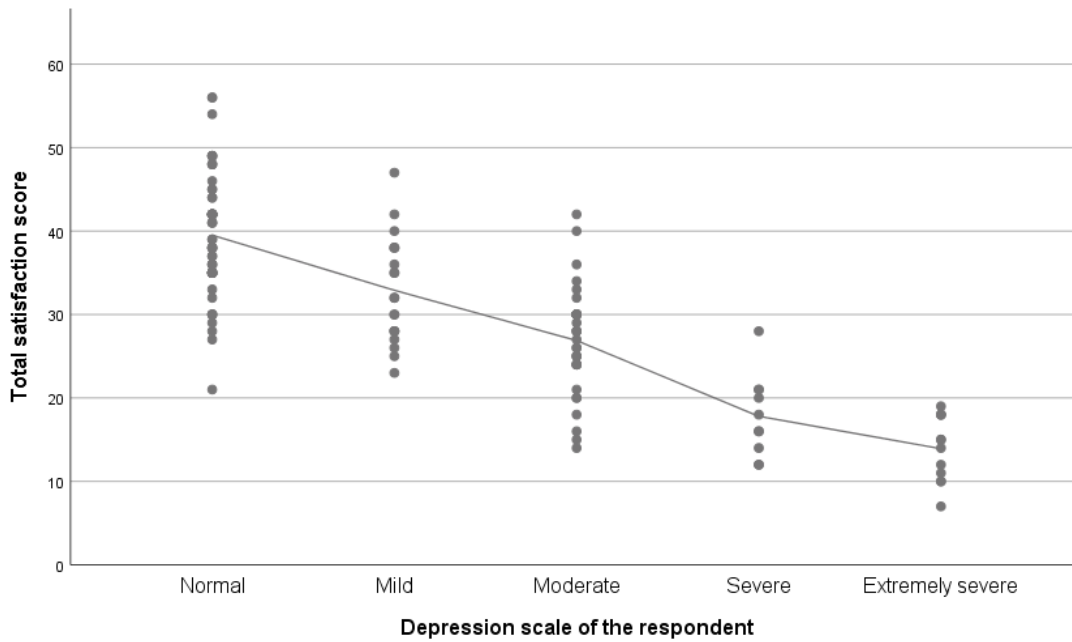


Figure 1: Linear relationship with a negative correlation of depression scale in DASS-21 and total satisfaction score in SDO

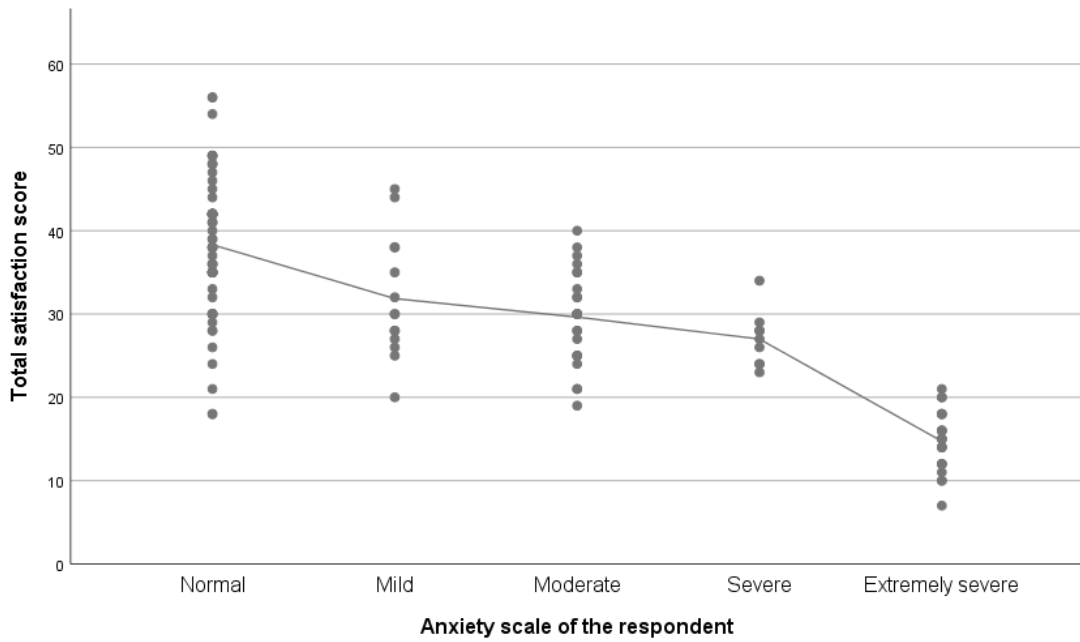


Figure 2: Linear relationship with a negative correlation of anxiety scale in DASS-21 and total satisfaction score in SDO

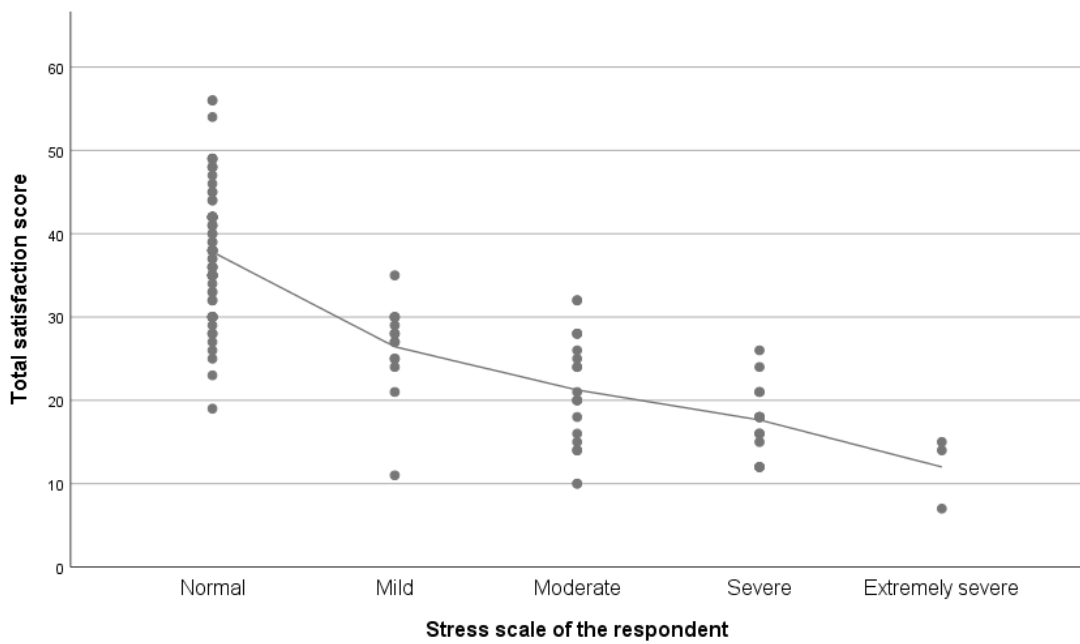


Figure 3: Linear relationship with a negative correlation of stress scale in DASS-21 and total satisfaction score in SDO

3.4. Education level, employment status and income level

There was no significant difference between depression, anxiety, stress and SDO with the education level of the caregivers as all the values were more than $p = .001$. Moreover, the r -value also showed a very low to almost none negative relationship with depression scale, stress scale and SDO score and positive low to almost none correlation with anxiety scale.

Table 5: The correlations and significant difference value between depression, anxiety, stress and SDO scores with the educational level in caregivers

		Depression scale of the caregivers	Anxiety scale of the caregivers	Stress scale of the caregivers	SDO score
Education level of the caregivers	Pearson Correlation (r)	-.112	.038	-.072	-.023
	Sig.	.189	.653	.397	.789
	N	139	139	139	139

Participants were grouped into secondary school and university groups. The secondary school group had higher depression, stress, and daily occupation score satisfaction than the university group. The university group had a higher mean than the secondary school group, 2.30 and 2.06 respectively. This indicates that the secondary school group had a slightly higher mean for depression and stress but lower anxiety than the university group. Thus, there was no significant difference between depression, anxiety, stress, and SDO with caregivers' level of education. Thus, there was no significant difference between depression, anxiety, stress, and SDO with caregivers' level of education. It indicates that regardless of the education levels, they are equally experienced burden during caregiving. In contrast, Bayoumi (2014) and Belasco (2002) studies reported that lower levels of educational attainment contributed to higher levels of burden towards caregivers of End-Stage Kidney Disease patients.

Table 6: Comparison of mean of each scale according to different group of education level

Scale	Secondary school (Mean)	University (Mean)
Depression	2.56 (1.153)	2.14 (1.338)
Anxiety	2.06 (1.436)	2.30 (1.536)
Stress	1.94 (1.237)	1.75 (1.147)
Satisfaction with daily occupation (SDO)	32.81 (10.864)	31.61 (10.787)

t-test ($p < 0.05$)

Next was the result of the significant difference between depression, anxiety, stress, and SDO with the employment status of caregiver. Table 7 showed that there was no significant difference and relationship between the employment status of caregivers with their depression, anxiety, stress and SDO. Employment status had a low positive relationship with depression scale, stress scale, and SDO score satisfaction while having low to almost no relationship with anxiety scale.

Table 7: The correlations and significant difference value between depression, anxiety, stress and SDO with the employment status in caregivers

		Depression scale of the caregivers	Anxiety scale of the caregivers	Stress scale of the caregivers	SDO score
Employment status of the caregiver	Pearson Correlation (r)	.113	-.159	.004	.061
	Sig.	.186	.061	.967	.477
	N	139	139	139	139

Table 8 listed the mean for depression, anxiety, stress, and SDO scores in each group. This result shows that the self-employed group had the highest score of depression, while the retired group had the lowest score of depression. For anxiety, the unemployed group had the highest anxiety score, while the self-employed group had the lowest. The highest stress was scored by the private-sector group followed by the unemployed group, self-employed group, government sector group and the lowest was the retired group. Meanwhile, the highest mean SDO was for the retired group, next was the government sector group, then self-employment group, private sector group and the lowest was the unemployed group. The study had found that the retired group of caregivers had the lowest score of depression and stress.

A study conducted in Japan proved that caregivers taking care of sick family members while working had a higher risk of mental health distress. Honda et al. (2103) also studied that factors such as young age, poor health, and low sleep quality, low social activity, low satisfaction with daily life, severe job overload, and low job satisfaction while caregiving for family members had the highest toll for the risk of depression in caregivers. A study by Moustafa and Moustafa (2018) also found that the caregiving burden in young working caregivers in Egypt was also causing a higher economic burden.

Table 8: Comparison of mean of each scale according to different groups of the employment status of caregivers

Scale	Unemployed (Mean)	Government sector (Mean)	Private sector (Mean)	Self- employed (Mean)	Retired (Mean)
Depression	2.04 (1.311)	2.25 (1.295)	2.43 (1.406)	2.56 (1.333)	1.67 (0.577)
Anxiety	2.54 (1.623)	1.96 (1.427)	2.17 (1.392)	1.67 (1.118)	2 (1.732)
Stress	1.8 (1.132)	1.57 (1.2)	2 (1.174)	1.78 (1.302)	1 (0)
SDO	30.84 (10.729)	33.14 (9.759)	31.73 (12.273)	32.89 (10.694)	34 (6.928)

t-test (p<0.05)

Caregivers were grouped according to their income status into no income group, less than RM1000 income group, RM1000 – 1999 income group, RM2000 – 2999 income group and more than RM3000 income group. This was to find out the effect of the income level on the

DASS-21 and SDO score. Table 9 shows the significant difference between depression, anxiety, stress, and SDO with the caregivers' income. The values for depression ($p = .140$), anxiety ($p = .018$), stress ($p = .981$) and satisfaction with the daily occupation ($p = .512$) were listed. Surprisingly, there was no significant difference between the income of caregivers and their depression, anxiety, stress, and SDO, where there was low to almost no relationship. This contrasts with a previous study that showed significant correlation between income status and job satisfaction (Kesyabyan & Day, 2020).

Table 9: The correlations and significant difference value between depression, anxiety, stress, and SDO with the income level of caregivers

		Depression scale of the caregivers	Anxiety scale of the caregivers	Stress scale of the caregivers	SDO score
Income level of the respondent	Pearson	.126	-.201*	-.002	.056
	Correlation (r)				
	Sig.	.140	.018	.981	.512
	N	139	139	139	139

Table 10 shows that the group with the highest score of depression was the group with more than RM3000 income, while the lowest was the no income group. The highest score of anxiety was the group of no income, while the lowest was income more than RM3000. Moreover, the group with the highest score of stress was less than RM1000 income, while the lowest was the group of income between RM 2000 – 2999. Lastly, the group with the highest score of satisfaction of daily occupation was the group of less than RM1000; the lowest was the no income group.

Table 10: Comparison of mean of each scale according to different groups of income levels of caregivers

Scale	No income (Mean)	<RM1000 (Mean)	RM1000-1999 (Mean)	RM2000-2999 (Mean)	>RM3000 (Mean)
Depression	2.04 (1.292)	2.27 (1.191)	2.28 (1.487)	2.29 (1.105)	2.5 (1.504)
Anxiety	2.54 (1.62)	2.18 (1.401)	2.33 (1.572)	1.82 (1.237)	1.77 (1.27)
Stress	1.77 (1.375)	1.91 (1.124)	1.78 (1.263)	1.59 (1.064)	1.86 (1.207)
SDO	30.79 (10.591)	34.91 (14.244)	31.44 (9.513)	33.53 (10.519)	31.82 (10.901)

t-test ($p < 0.05$)

3.5. Total of complications

Table 11 shows the p-value for depression ($p < 0.001$), anxiety ($p = .031$), stress ($p = .000$) and SDO ($p < 0.00$). There was a significant difference between the total number of complications in patients with caregivers' depression, anxiety, stress, and SDO. Also, there was a fair, positive relationship between the total number of complications and depression and stress of the

caregivers, while there was a weak positive relationship with anxiety. Thus, the more complications in the patients, the higher the level of depression, anxiety, and stress in the caregivers. The correlation between total complications in the patient with SDO was a fair negative relationship. Therefore, the more complications, the lower the level of SDO in caregivers.

Table 11: The correlations and significant difference value between depression, anxiety, stress and SDO with the total numbers of complications in the patients

		Depression scale of the caregivers	Anxiety scale of the caregivers	Stress scale of the caregivers	SDO score
Total number of complications in patient	Pearson Correlation (r)	.366**	.183*	.384**	-.371**
	Sig.	.000	.031	.000	.000
	N	139	139	139	139

Table 12 elaborated that the group with only one complication had the lowest mean of depression, anxiety, and stress, with the highest SDO. The group with two complications had the second-lowest of all items of DASS-21 and had the second-highest SDO score. The group with three complications had the third-lowest in depression and stress but had the highest mean anxiety score. The SDO score for three complications recorded the third-highest score. Except for anxiety, the group of four complications had the highest score of depression and stress. Other than that, this group also recorded the lowest SDO. This might be because a person with a severe complication will have to rely more on the caretaker, which means the caregiver will have less time to spend on themselves and encounter more significant challenges and stress (Kim, 2017). As a result, it affects their job satisfaction. The finding aligned with the caregivers of individuals with Alzheimer's disease or dementia study who are more likely to have depression because they require continuous care (Pinquart & Sorensen, 2003).

Table 12: Comparison of mean of depression, anxiety, stress, and SDO experienced by caregivers according to the total numbers of complications of patients

Total of complications		Depression scale of the caregivers	Anxiety scale of the caregivers	Stress scale of the caregivers	SDO score
1	Mean	1.84	2.04	1.47	34.96
	N	68	68	68	68
2	Mean	2.10	2.26	1.62	31.40
	N	42	42	42	42
3	Mean	3.16	2.88	2.72	24.84
	N	25	25	25	25
4	Mean	3.25	2.50	2.75	22.25
	N	4	4	4	4
Total	Mean	2.19	2.27	1.78	31.70
	N	139	139	139	139

In older adults, symptoms and complications of diabetes were often mistaken for ageing-related diseases as the symptoms were not specific. The presence of the non-specific symptoms of diabetes are often misdiagnosed and frequently mistreated. Complications were listed as nerve damage, kidney damage, eye damage, foot damage, cardiovascular damage, Alzheimer's disease, depression, and skin condition without extending the severity of the damage or disease (Hornick & Aron, 2008). Macrovascular and microvascular complications as well as disability were significant in diabetes patients (Strain et al., 2018).

This study highlighted that caregivers were under pressure as diabetic elderly who suffered from more complications would need more time and attention from caregivers. A previous study suggested that elderly patients with complications were more likely to get impairment in activity of daily living (ADL) than elderly patients without complications (Wu et al., 2003). Additionally, physical, cognitive, and mental function impairment, polypharmacy, fear of falling, comorbidities, and diabetes-related complications lead to declining balance function. As balance function declines with ageing, it became the leading cause of injuries and disability in the elderly, causing limitation in ADL that could lead to dependency on others (Hong et al., 2017). Patients who had ADL impairment had significant effects on caregivers as it might cause burnout to the caregivers and lead to the institutionalization of the patients themselves (Feng & Mlinac, 2016). Wu et al (2003) stated that diabetes complications progression is one of the significant factors causing the caregivers' low quality of life, leading to financial and social issues.

4. Conclusion

The findings of this study suggest that although there was a low number of caregivers who had moderate levels of stress, anxiety, and depression, most of them reported a low satisfaction with their daily occupation. This can result in poor work performance. Hence caregivers need to be taught self-care while taking care of patients. In addition, future studies should include a face-to-face data collection to explain the questionnaire.

References

- Al-Zahrani, R., Bashihab R., Ahmed, A. E., Alkhodair, R., & Al-Khateeb, S. (2015). The prevalence of psychological impact on caregivers of hospitalised patients: The forgotten part of the equation. *Qatar Medical Journal*, (3). DOI:10.5339/qmj.2015.3.
- American Diabetes Association (2019). 2. Classification and diagnosis of diabetes: Standards of medical care in diabetes 2019. *Diabetes Care*, 42(1), S13–S28. <https://doi.org/10.2337/dc19-S002>.
- American Diabetes Association. (2018). 11. Older adults: Standards of medical care in diabetes. *Diabetes Care*, 41(1), S119–S125.
- Bayoumi, M.M. (2004). Subjective burden on family carers of hemodialysis patients. *Open J. Nephrol.* 4, 79.
- Belasco, A.G.; Sesso, R. (2002) Burden and quality of life of caregivers for hemodialysis patients. *Am. J. Kidney Dis* 39, 805–812.
- Bloom, D. E, Canning, D., & Lubet, A. (2015). Global population aging: Facts, challenges, solutions & perspectives. *Daedalus*, 144, 80-92. 10.1162/DAED_a_00332.
- Dionysiotis, Y. (2019). Sarcopenia in the elderly. *European Endocrinology*, 15(1), 13–14 doi:10.17925/EE.2019.15.1.13.
- Bigelow, A. & Freeland, B. (2017). Type 2 diabetes care in the elderly. Continuing education. *The Journal for Nurse Practitioners*, 13(3), 181-186.
- Fareed, M., Nasir, S., Khoja, A. T., Mahmoud, M.A., Ahamed, M. (2017). Lifestyle related risk factors of type 2 diabetes mellitus and its increased prevalence in Saudi Arabia: A brief review. *International Journal of Medical Research & Health Sciences*, 6, 125-132.
- Forsberg-Wärleby, G., Möller, A., & Blomstrand, C. (2004). Life satisfaction in spouses of patients with stroke during the first year after stroke. *Journal of Rehabilitation Medicine*, 36, 4–11

- Ghazali, S., & Abdullah, K. L., Aziz, A. A., Amin, R. M., Jusoh, A. S., Mansor, M., Wan Abdul Rahman, W. N. A., Shaffie, Z. M. (2015). Burden of caregivers of the elderly with chronic illnesses and their associated factors in an urban setting in Malaysia. *Malaysian Journal of Public Health Medicine*, 15, 1-9.
- Goldberg, S. E., Whittamore, K. H., Harwood, R. H., Bradshaw, L. E., Gladman, J. R., & Jones, R. G. (2011). The prevalence of mental health problems among older adults admitted as an emergency to a general hospital. *Age and Ageing*, 41(1), 80-86. doi:10.1093/ageing/afr106.
- Hackett, E. & Jacques, N. (2009). Type 2 diabetes pathophysiology and clinical features. Clinical focus. *Clinical Pharmacist*, 1, 475-478.
- Honda, A., Date, Y., Abe, Y., Aoyagi, K., & Honda, S. (2013). Work-related stress, caregiver role, and depressive symptoms among Japanese workers. *Safety and Health at Work*, 5, 7-12
- Hong, X. F., Chen, X. J., Chu, J. J., Shen, S. S., Chai, Q. C., Lou, G. B. & Chen, L. Y. (2017). Multiple diabetic complications, as well as impaired physical and mental function, are associated with declining balance function in older persons with diabetes mellitus. *Dove Press Journal: Clinical Interventions in Aging*, 12, 189-195.
- Hong, S. C., Coogole, C. L. (2016). Spousal caregiving for partners with dementia: A deductive literature review testing calasanti's gendered view of care work. *Journal of Applied Gerontology: The Official Journal of the Southern Gerontological Society*, 35, 75-787. doi:10.1177/0733464814542246
- Hornick, T. & Aron, D. C. (2008). Managing diabetes in the elderly: Go easy, individualise. *Diabetes in the elderly. Cleveland Clinic Journal of Medicine*, 75(1), 70-78.
- International Council of Management & Population Programmes (ICOMP) (2017). Ageing. Thailand, Malaysia, Indonesia and Cambodia. Demographic transition, policy and programmatic responses. Retrieved from https://umexpert.um.edu.my/file/publication/00001678_150577.pdf.
- International Diabetes Federation, Eight Edition (2017).
- Irfan, B., Irfan, O., Ansari, A., Qidwai, W. & Nanji, K. (2017). Impact of caregiving on various aspects of the lives of caregivers. *Cureus*, 9(5), 1-7. DOI 10.7759/cureus.1213.
- Jaul, E. & Barron, J. (2017) Age-related diseases and clinical and public health implications for the 85 years old and over population. *Frontiers in Public Health*, 5, 335. DOI: 10.3389/fpubh.2017.00335.
- Kaku, K. (2010). Pathophysiology of type 2 diabetes and its treatment policy. Research and reviews. *Journal of the Japan Medical Association*, 53(1), 41-46.
- Kalyani, R. R., Golden, S. H., & Cefalu, W. T. (2017). Diabetes and aging: Unique considerations and goals of care. *Diabetes Care*, 40(4), 440-443. <https://doi.org/10.2337/dci17-0005>.
- Kazmierska, J. (2012). Health Status Screening in Elderly Patients. Touch Briefing 2012: Geriatric Oncology. *European Oncology & Haematology*, 8(1):63-68.
- Keshabayan A. & Day, M.V (2020). Concerned whether you'll make it in life? Status anxiety uniquely explains job satisfaction. *Frontiers in Psychology*, 11, 1523.
- Kim, K. S., Kim, S. K., Sung, K. M., Cho, Y. W., & Park, S. W. (2012). Management of type 2 diabetes mellitus in older adults. Management of elderly diabetes. *Diabetes & Metabolism Journal*, 36, 336-344.
- Kim, D. (2017). Relationships between Caregiving Stress, Depression, and Self-Esteem in Family Caregivers of Adults with a Disability. *Occupational Therapy International* <https://doi.org/10.1155/2017/1686143>
- Kilvert, E. & Fox, A. (2017). Diagnosis and management of diabetes in older people. Review. *John Wiley and Sons Practical Diabetes*, 34(6), 195-199.
- Krishna, P. (2018). Depression, anxiety, and stress levels in patients with type 2 diabetes mellitus. *National Journal of Physiology, Pharmacy and Pharmacology*, 8(11), 1570-1572. DOI:10.5455/njppp.2018.8.0929117092018.
- Langa, K. M., Vijan, S., Hayward, R. A., Chernew, M. E., Blaum, C. S., Kabeto, M. U, Weir, D. R., Katz, S. J., Willis, R. J., Fendrick, A.M. (2002). Informal caregiving for diabetes and diabetic complications among elderly americans. *The Journals of Gerontology*, 57(3), S177-186. <https://doi.org/10.1093/geronb/57.3.S177>.
- Longo, M., Bellastella, G., Maiorino, M. I., Meier, J. J., Esposito, K. & Giugliano, D. (2019). Diabetes and aging: From treatment goals to pharmacologic therapy. *Frontier Endocrinology*, 10, 45. DOI: 10.3389/fendo.2019.00045.
- Lovibond, S. H. & Lovibond, P. F. (1995). *Manual for the depression, anxiety & stress scales. Second edition.* Sydney: Psychology Foundation.
- Mafauzy, M. (2000). The problems and challenges of the aging population of Malaysia. *The Malaysian Journal of Medical Sciences*, 7(1), 1-3.
- Mahadevan, R., Jaafar, N. R. N., Din, S. H. S., Ahmad, S. N. A., Baharuddin, A. & Razali, R. (2013). The stress of caregiving: A study of family caregivers of breast cancer patients receiving oncologic treatment at a Malaysian general hospital. *Sains Malaysiana*, 42(7), 1019-1026.

- Motaharinezhad, F., Lajevardi, L., Hassani Mehraban, A. & Ghahari S. Occupational Challenges in the Caregivers of People with Multiple Sclerosis: A Qualitative Study, *Middle East Journal of Rehabilitation and Health Studies (MEJRH)*. Online ahead of Print ; 7(4):e105815. doi: 10.5812/mejrh.105815.
- Mlinac, M. E. & Feng, M. C. (2016). Assessment of activities of daily living, self-care, and independence. *Archives of Clinical Neuropsychology*, 31, 506-516.
- Moulton, C. P. (2008). Enough is enough: when to stop careening in elderly. *Aging Health. Future Medicine Ltd*, 4(6), 571-574.
- Moustafa, N. S. A. & Moustafa, M. S. A. (2018). Depression, anxiety, and stress among some elderly caregivers in Alexandria city, Egypt. *International Journal of Medical Science and Public Health*, 7(7), 570-579.
- Ministry of Health Malaysia. (2013). *National diabetes registry report*. In Non-Communicable Disease Section, Disease Control Division, Ministry of Health Malaysia. <https://doi.org/10.2337/dc14-S014>.
- Pinquart, M., & Sorensen, S. (2003). Differences between caregivers and non-caregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging*, 18(2), 250-267.
- Rosli, H., Shahar, S., Badrasawi, M., Singh, D. K., & Mohamed Sakian, N. I. (2017). Identification of older adults with sarcopenia: Comparison of two methods. *Jurnal Sains Kesihatan Malaysia*, 15(02), 103-108. doi:10.17576/jskm-2017-1502-04
- Sazlina, S. G. (2015). Health screening for older people – What are the recommendations? *Malaysian Family Physician*, 10(1), 2-10.
- Satcher, D. (2000). Mental health: A report of the Surgeon General--Executive summary. *Professional Psychology: Research and Practice*, 31(1), 5-13. <https://doi.org/10.1037/0735-7028.31.1.5>.
- Sidik, S. M., Rampal, L., & Afifi, M. (2004). Physical and mental health problems of the elderly in a rural community of Sepang, Selangor. *The Malaysian Journal of Medical Sciences*, 11(1), 52-59.
- Sinclair, A. (2011). Diabetes care for older people: A practical view on management. Continuing professional development module 13. *Diabetes & Primary Care*, 13(1), 29-38.
- Strain, W. D., Hope, S. V., Green, A., Kar, P., Valabhji, J., & Sinclair, J. (2018). Type 2 diabetes mellitus in older people: A brief statement of key principles of modern-day management including the assessment of frailty. A national collaborative stakeholder initiative. Review article. *Diabetic Medicine*, 35, 838-845.
- Taati, F., Bahramezhad, F., Seyedfatimi, N., Syarifi F., & Navab, E. (2016). The Effect of participation in support groups on depression, anxiety, and stress in family caregivers of people with Alzheimer's: Randomised clinical trial. *International Journal of Medical Research & Health Sciences*, 5(7), 256-262.
- Tkatch, R., Musich, S., MacLeod, S., Alsgaard, K., Hawkins, K., & Yeh, C. S. (2016). Population health management for older adults: Review of interventions for promoting successful aging across the health. Literature review. *Continuum Gerontology & Geriatric Medicine*, 2, 1-13.
- Wästberg, B., Persson, E., & Eklund, M. (2016). The Satisfaction with daily occupations (SDO-13) scale: Psychometric properties among clients in primary care in Sweden. *Occupational Therapy in Health Care*, 30(1), 29-41.
- World Health Organization. *WHO: Non-communicable diseases*. <http://www.euro.who.int/en/health-topics/noncommunicable-diseases/pages/news/news/2012/10/depression-in-europe/> depression-definition/
- Wu, J. H., Haan, M. N., Liang, J., Ghosh, D., Gonzalez, H. M. & Herman, W. H. (2003). Diabetes as predictor of change in functional status among older Mexican Americans. *Diabetes Care*, 26, 314-319.
- Yakaryılmaz, F. D., & Öztürk, Z. A. (2017). Treatment of type 2 diabetes mellitus in the elderly. Mini reviews. *World Journal of Diabetes*, 8(6), 278-285.
- Yeong, U. Y., Tan, S. Y., Yap, J. F., & Choo, W. Y. (2016). Prevalence of falls among community dwelling elderly and its associated factors: A cross-sectional study in Perak, Malaysia. *Malaysian Family Physician: the official journal of the Academy of Family Physicians of Malaysia*, 11(1), 7-14.