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Psychosocial Aspects of Living With Diabetes Mellitus: An Enhancement of Diabetic Program of Primary Health Care in Doha, Qatar

Khalid Ali Shams, MD, ABFM (Principal Investigator)
Health Center Manager, Al Sheehaniya Health Center, Doha, Qatar

Joyce J. Espinosa, MAN, MN, RN (Principal Investigator)
Staff Nurse, Al Sheehaniya Health Center, Doha, Qatar

Perry Paul J. Espinosa, PhD, RN*
Assistant Professor, Department of Nursing, Woosong College,
Daejeon, Republic of Korea
Email: paulespinosa721@gmail.com

Luz L. Rovira, RN
Charge Nurse, Al Sheehaniya Health Center, Doha, Qatar

Ali Bader Albader, MD, ABFM
Senior Consultant Family Medicine, Mughualinah Center, Doha, Qatar

Abdulla Alnaama, MD, ABFM
Health Center Manager, Rawdat Al Khil Health Center, Doha, Qatar

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Abstract
Diabetes mellitus has a detrimental impact on one's well-being. Psychological and social aspects play a significant role in diabetes care and it is believed that these issues are important in the overall health of Qatari patients with diabetes mellitus. This descriptive cross-sectional research was conducted to determine the psychological and social aspects of living with diabetes mellitus. Two hundred eighty patients with diabetes mellitus were included as respondents of the study. It has shown that the respondents were, in general, psychologically and socially well. They were satisfied with their own selves and lived in a purposeful manner, however, they were anxious about the complications of the disease. Family members were concerned about their condition wherein they could talk freely about diabetes mellitus. Educational attainment and living arrangement were significantly correlated with psychological well-being. Presence of illnesses not related to diabetes was significantly correlated with both psychological and social well-being. To conclude, despite having diabetes mellitus, the patients still feel good about themselves, maintain healthy relationships and exhibit good psychological health and social well-being. To achieve the goals of diabetes care and to meet the challenges of diabetes, psychosocial interventions should be included as part of ongoing diabetes management.
Keywords: diabetes mellitus; psychosocial aspect of diabetes mellitus; diabetic program; primary health care

1. Introduction

Diabetes Mellitus (DM) is one of the major health and development challenges of the 21st century (International Diabetes Association, 2017). Globally, an estimated 422 million adults were living with diabetes mellitus in 2014, compared to 108 million in 1980 (World Health Organization, 2016). It is expected to reach 438 million by the year 2030, with two-thirds of all diabetes cases occurring in low-to-middle income countries (International Diabetes Federation, 2017). Fueled by rapid urbanization, nutrition transition, and increasingly sedentary lifestyles, the epidemic has grown in parallel with the worldwide rise in obesity (Hu, 2011).

The Middle East and North Africa (MENA) region is particularly affected by the disease with the highest prevalence of Type I and II diabetes mellitus among adults aged 20-79 years in the world (11%), and with 48 percent of diabetes cases being undiagnosed (International Diabetes Federation, 2013 cited by Christos, Chemaitelly, Abu-Raddad, Zirie, Deleu, & Mushlin, 2014). Furthermore, out of the ten countries listed as having the highest DM prevalence worldwide (2013), several were MENA countries including Saudi Arabia (24%), Kuwait (23%) and Qatar (23%) (Christos et al., 2014).This situation has prompted the Ministry of Public Health (2017) in the State of Qatar to strengthen their strategies to ensure proper lifestyle advice, education, and

counseling be made available to diabetic patients and those at risk of developing type 2 diabetes, which in the long term would lead to a modification of risk factors, improving rates of diabetes prevalence and morbidity. Further, the Qatar Diabetes Association is also responsible for promoting awareness of diabetes and its prevention throughout the population (Accessed December 25, 2016 from http://www.idf.org).

In this study, the psychological aspect refers to the psychological functioning of the respondents where it has been defined by Preedy and Watson (2010) as the ability to achieve goals within self and the external environment. While, the social aspect refers to the respondents' social functioning in which they interact and fulfill their role within the environment as work, social activities, and relationships with partners and family (Bosc, 2000).

Over the years, a substantial part of healthcare and a number of studies have documented the morbidity and impaired quality of life in patients with various forms of endocrine disease (Sonino, Guidi, & Fava, 2015). Earlier studies have found that those with diabetes mellitus are at high risk of having decreased psychological well-being (Gask, Macdonald, & Bower, 2011; Stuckey et al, 2014 cited by Chew, Shariff-Ghazali, & Fernandez, 2014) and that diabetes mellitus has a detrimental impact on one's well-being (Brands et al., 2007, cited by Stuckey et al., 2014), and in the sense, sufferers from this disease are more likely to experience depression (Almeida, 2015). In one recent survey, almost one-third of Arab diabetic patients attending primary health care attendees in Qatar have psychological morbidity (Al-Madhaki & Al-Kuwari, 2017).

Moreover, psychological and social problems appear to be common among diabetic patients worldwide (Peyrot, Rubin, Lauritzen, Snoek, Matthews, & Skovlund, 2005), which resulted to non-adherence to medications, poor quality of life, and lack of interest in managing disease resulting in poor glycemic control and long-term complications (Gupta, Bhadada, Shah, & Mattoo, 2016). A second international study about the Diabetes Attitudes, Wishes, and Needs (DAWN2) was conducted to assess psychosocial outcomes in people with diabetes across countries for benchmarking (Nicolucci et al., 2013). It has been found that diabetes-related distress was reported by 44.6 percent of participants (17.2-67.6%), wherein the overall quality of life was rated "poor" or "very poor" by 12.2 percent of the participants. Diabetes had a negative impact in all aspects investigated, ranging from 20.5 percent on relationship with family and friends to 62.2 percent on physical health. Furthermore, despite the widespread prevalence of psychological problems and their negative consequences, the availability of person-centered chronic illness care and psychological support was also low among patients with diabetes mellitus. Only 48.8 percent had received psychological treatment or educational activities to help manage diabetes (Chew, Shariff-Ghazali, & Fernandez, 2014).

Diabetes mellitus posed debilitating and life-threatening complications which can cause negative impacts on the patient's well-being, psychological functioning, and social life (Stuckey et al., 2014; Chew, Shariff-Ghazali, & Fernandez, 2014; & Nicolucci et al., 2013). Thus, they need to be provided with information, reassurance, and support in relation to all aspects of their condition. It is essential to assess the individual's ability to cope with and manage their diabetes effectively. This assessment involves careful observation, probing questions and attention to their feelings, thoughts, and expectations (Clarke & Forde, 2006). Successful management of diabetes depends upon successful adjustment to the psychological and social challenges of the condition (Retrieved June 1, 2017 from https://www.diapedia.org).

Psychological and social issues are important concerns in the overall health of patients with diabetes mellitus, however, in Qatar, this area is understudied. As noted, no studies have yet been conducted on the psychosocial issues in a diabetic population. Moreover, doctors, nurses, and other health care professionals should need to emphasize the psychological and social health aspects of patients with diabetes mellitus. It is important therefore, to look into the psychological and social issues of patients with diabetes mellitus. Furthermore, as a member of the health team, it is imperative to enhance the programs and policies of the Ministry of Public Health in Qatar in order for the diabetic patients to achieve a good psychological well-being and better social functioning and quality of life as well.

This study examined the psychological and social aspects of patients living with diabetes mellitus in Doha, Qatar.

2. Methods

2.1 Design, Respondents, and Sampling

This is a descriptive research, cross-sectional design. The respondents of the study were the 280 patients with type 2 diabetes mellitus from the three health centers in Doha, Qatar. They were taken from the three health centers, specifically, the Al Sheehaniya Health Center (Western Region), the Mugalina Health Center (Central Region) and the Gharaffa Health (Center Northern Region). These health centers where chosen because they have the most number of patients with diabetes mellitus in the month of November, 2015. The sample size was drawn using stratified random sampling and systematic sampling, with random start, respectively.

Table 1. Distribution of Respondents

Health Centers	Total Number of Patients with Diabetes	Total Number of Respondents
Al Sheehaniya Health Center	400	120
Mugalina Health Center	262	79
Gharaffa Health Center	269	81
Total	**931**	**280**

2.2 Instrument

This study has used a researcher-made questionnaire-checklist, composed of three parts. Part 1 includes the profile of the respondents in terms of age, sex, civil status, educational attainment, work status, family monthly income, living arrangements, duration of diabetes, medications in use, presence of illnesses other than diabetes, and number of hospitalization related to diabetes. Part 2, assessed the psychological functioning of diabetic patients, which was composed of 10-item statement. The scale was rated from one to four, wherein 1= Never, 2=Sometimes, 3=Oftentimes, and 4=Always and was categorized into "Good Psychological Functioning" for a mean score of 3.70-4.00, "Fair Psychological Functioning" for a mean score of 2.40-3.69, and "Poor Psychological Functioning" for a score of 1.00-2.39. Part 3, which examined the social functioning of diabetic patients, was also composed of a 10-item statement. The responses were: Always=4, Oftentimes=3, Sometimes=2, and Never=1. This was categorized into "Good Social Functioning" for a mean score of 3.70-4.00, "Fair Psychological Functioning" for a mean score of 2.40-3.69, and "Poor Psychological Functioning" for a score of 1.00-2.39. For both aspects, negatively worded statements were reversed coded.

The questionnaire was validated by a jury composed of experts in the field for face and content validation. Each member of the jury was given a copy and was asked whether the questions could yield useful information, which would aid in achieving the objectives of the study. The comments and suggestions provided by the jury were incorporated in the final revision of the questionnaire. The questionnaire was also translated into Arabic, carefully taking into consideration the cultural background and sensitivity to the questions posed. After the questionnaire had been validated, a pretest was conducted for reliability testing to determine internal consistency of items indicated.

The questionnaire was administered to five percent of the total number of respondents and the reliability coefficient was calculated using SPSS Software Version 17.0. These patients with diabetes mellitus were not included in the selection of the final respondents. Calculated Cronbach's alpha value revealed .873 and .815 for psychological and social functioning, indicating the instrument was reliable.

2.3 Data-Gathering Procedure

Upon obtaining an approval, the researchers visited the three health centers and arranged a convenient date and time to conduct the study. The administration of questionnaires was done with the help of nurses on duty and was oriented properly on how to conduct the study. All instructions were given to respondents and they were assured that all information would be kept confidential. Upon retrieval, the questionnaires were checked for completeness and accuracy of responses.

2.4 Ethics

This research study was subjected to a rigorous review and was approved by the Ethical Board and Research Section of the Department of Clinical Affairs, Primary Health Care Corporation, Doha, Qatar. Permission to conduct the study was also obtained from the Medical Directors of the three health centers.

2.5 Data Analysis

The data were processed using the Statistical Package for Social Sciences (SPSS) software and were subjected to descriptive and inferential statistics set at 5% significance level. For descriptive data analysis, the frequency, percentage, mean, and standard deviation were used. For inferential analysis, Gamma and Cramer's V were utilized to determine the association between the profile of the respondents and their psychological and social functioning.

3. Results and Discussions

3.1 The Demographic Profile of the Older People

The respondents of this study were predominantly male and the age ranged from 51 to 60 years old. The mean age was 53.63 years old. Most of the respondents were married (92.9%) and more than half (55.4%) were living with spouse and children. Majority were high school educated, not working, and with a family monthly income of below 10,000 Qatari Rials. However, the mean family monthly income was 23, 328.93 Qatari Rials. Most of the respondents have shorter diabetes duration of below 5 years, were on oral medications, no illnesses other than diabetes, and have not been hospitalized. The demographic profile is presented in Table 1.

3.2 Psychological Functioning of the Respondents

Table 4 reveals the psychological well-being of patients with diabetes mellitus. Among the specific components in the area, specific item stating, "I am satisfied with myself" obtained the highest rating with a mean of 3.19 (SD=0.973). The data further reveal that specific items about living in a purposeful manner, feeling nervous, and restless about complications of diabetes, and sense of helplessness about future condition obtained high mean scores and were rated fair psychological functioning (M=2.98, M=2.95, and M=2.92, respectively). Furthermore, there were some items which scored fair in this aspect, wherein the respondents were worried (M=2.83, SD= 0.804), felt worthless, lack of self-confidence (M=2.81, SD=1.029 and M=2.76, SD=1.029), and facing-up problems with a mean score of 2.73 (SD=1.067). The respondents also think that they were burdened of their condition (M=2.73, SD=0.913). Of the ten specific items, it was found that only one item scored poor in psychological functioning. The item was about the respondents' feeling of being relaxed and free of tension, with a mean score of 2.37 (SD=0.858).

The respondents generated an overall mean score of 2.82 (SD=0.983) which indicates a fair psychological functioning. Respondents were found to be satisfied with self and they are living purposefully, however, sometimes they were tensed and have negative feelings toward the effects and complications of diabetes mellitus. The fair psychological functioning could possibly lead to better diabetes management and adherence to treatment and perhaps improve quality of life of the patients. The result is supported by the results of Porojan, Poanta, and Dumitrascu (2012) in which diabetes mellitus was found to have a substantial burden on affected individuals by influencing the psychosocial aspects of quality of life. Certain psychosocial factors, such as health beliefs, social support, style of coping with stress, and personality traits, can have a direct or indirect impact on quality of life (Lewko & Misiak, 2015). Moreover, Odili, Ugboka, and Oparah (2008) have found that diabetic patients had statistically lower mean score in psychological well-being. This lower mean score could be attributed to the burden the disease places on them as a result of its demanding nature in management.

Table 2. Respondents' Demographic Profile

Variables	**f**	**%**
Age (In Years)		
40 and below	34	12.1
41-50	67	23.9
51-60	99	35.4
61 and above	80	28.6
Total	**280**	**100.0**
Mean= 53.63 years old		
Sex		
Male	160	57.1
Female	120	42.9
Total	**280**	**100.0**
Civil Status		
Single	20	7.1
Married	260	92.9
Total	**280**	**100.0**

Educational Attainment		
None	59	21.1
Elementary	56	20.0
High School	95	33.9
College	70	25.0
Total	**280**	**100.0**
Occupational Status		
None	140	50.0
Employed in Private Firm	70	25.0
Employed in Government	11	3.9
Self Employed	59	21.1
Total	**280**	**100.0**
Family Monthly Income		
10,000 and below	106	37.9
10,001- 20,000	60	21.4
20,001- 30,000	37	13.2
30,001- 40,000	30	10.7
40,001 and above	47	16.8
Total	**280**	**100.0**
Mean= 23, 328.93		

Table 3. Respondents' Demographic Profile

Living Arrangement		
Living Alone	52	18.6
Living with Children	21	7.5
Living with Spouse	15	5.4
Living with Relatives	8	2.9
Living with Children and Spouse	155	55.4
Living with Friends	29	10.4
Total	**280**	**100.0**
Duration of Diabetes (in years)		
5 years and below	103	36.8
6-10	94	33.6
11-15	38	13.6
16 and above	45	16.1
Total	**280**	**100.0**
Mean= 9.36		
Medications in Use		
Oral Medications Only	157	56.1
Insulin Only	36	12.9
Both	87	31.1
Total	**280**	**100.0**

Illnesses other than Diabetes		
None	121	43.2
Hypertension	100	35.7
Hyperlipidemia	21	7.5
Both Hypertension and Hyperlipidemia	24	8.6
Others	14	5.0
Total	**280**	**100.0**
Number of Hospitalization Related to Diabetes		
None	247	88.2
Once	11	3.9
Twice	22	7.9
Total	**280**	**100.0**

Table 4. Respondents' Psychological Functioning

Items	**Mean**	**SD**	**Interpretation**
1. I am satisfied with myself.	3.19	0.973	Fair
2. I am living in a purposeful manner.	2.98	0.989	Fair
3. I feel nervous and restless about the complications of diabetes.	2.95	1.089	Fair
4. I feel sense of helplessness about my future condition.	2.92	1.091	Fair
5. I worry about my health.	2.83	0.804	Fair
6. I feel worthless about my condition.	2.81	1.022	Fair
7. I feel lacking of self-confidence.	2.76	1.029	Fair
8. I have been able to face up my problems.	2.73	1.067	Fair
9. It burdens me that I always have to think about my condition.	2.73	0.913	Fair
10. I feel relaxed and free of tension.	2.37	0,858	Fair
Over-all	2.82	0.983	Fair

Scale Interpretation

3.70-4.00 - Good
2.40-3.69 - Fair
1.00-2.39 - Poor

3.2 Social Functioning of the Respondents

As shown in Table 5, the specific item, "I feel that my family is concerned towards me", had obtained the highest mean score (M=3.36, SD=0.873). The second highest mean scores which indicated fair social functioning where the respondents could open up freely about their condition to family members (M=3.10, SD=0.945) and finding it easy in getting up with other people (M=3.10, SD=0.886). The respondents were also capable of making decisions about treatment (M=3.08, SD=0.886), enjoy day-to-day activities (M=3.08, SD=0.925), supported by friends (M=3.05, SD 0.098) and talking to other patients with diabetes (M=2.81, SD=0.961). These items were interpreted as fair in their social functioning. The data also reveal that specific items about feeling alone and unable to participate in civic activities obtained a mean scores of 3.05 (SD=1.178) and 2.76 (SD=1.000) and were interpreted as fair. The lowest mean score obtained was 2.63 (SD=2.63) wherein the respondents were keeping themselves busy and occupied. The over-all mean score for social aspect was 2.98 (SD=0.964) and interpreted as fair. Although the respondents' social activities have been affected by diabetes mellitus, the support of the family members was found to be the strongest factor in this area. This means that

family members are the most important support system as they are living with and managing diabetes mellitus. The result is supported by earlier findings of other researchers that social functioning of Iranian diabetic patients were relatively desirable (Khaledi, Moridi, & Gharibi, 2009) and social activities of Turkish and Spanish diabetic patients (Saraç, Tütüncüoglu, Parildar, Saygili, Yilmaz, & Tüzün, 2007; Morales, Navas, Jimenez, & Ramos, 2015; Spasić, Radovanović, Đorđević, Stefanović, & Cvetković, 2014) have been decreased. Contrary to the current findings, some other researchers argued that not of all social and family support are useful (Haynes, 2001 cited by Garrusi, Baneshi, & Moradi, 2013). Odili, Ugboka, and Oparah (2008) have found lowest health-related quality of life in the social domain and the support was unfavorable among the Nigerian diabetic patients (Ghasemipoor, Ghasemi, & Zamani, 2010). Pakistani diabetic patients reported higher social stress and poorer health related quality of life (Husain, 2012). Furthermore, Alcubierre et al. (2014) have found diabetes-related quality of life were significantly lower in patients' leisure, work, freedom to travel, physical ability, family and social life, emotional and sexual relationships, self-confidence, motivation, and dependence among diabetic patients.

Table 5. Respondents' Social Functioning

Items	**Mean**	**SD**	**Interpretation**
1. I feel that my family is concerned towards me.	3.36	0.873	Fair
2. I can open up freely about my condition to my family.	3.10	0.945	Fair
3. I have been finding easy to get on with other people.	3.10	0.886	Fair
4. I am capable of making decision about my treatment.	3.08	0.886	Fair
5. I have been able to enjoy my day-to-day activities.	3.08	0.925	Fair
6. I am feeling alone.	3.05	0.098	Fair
7. I have friends that support in managing diabetes.	2.83	0.961	Fair
8. I talk to other diabetes patients.	2.81	1.178	Fair
9. I feel unable to participate in civic activities.	2.76	1.000	Fair
10. I am keeping myself busy and occupied.	2.63	1.031	Fair
Over-all	2.98	0.964	Fair

Scale *Interpretation*

3.70-4.00 - *Good*
2.40-3.69 - *Fair*
1.00-2.39 - *Poor*

3.3 The Relationship Between Respondent's Profile and their Psychological Aspect in terms of Age, Educational Attainment, Income, Duration of Diabetes, and Number of Hospitalization related to Diabetes

Table 6 shows the relationship between respondent's profile and psychological functioning. The results reveal that respondent's profile grouped according to age (Gamma=0.138, *P*=0.211), family monthly income (Gamma=-0.131, *P*=0.169), duration of diabetes (Gamma=0.017, *P*=0.875), number of hospitalization related to diabetes (Gamma=-0.205, *P*=0.323), were not statistically significant at 0.05 level, thus accepting the null hypothesis. Irrespective of the respondent's age, income, duration of diabetes, and number of hospitalization, their psychological functioning is the same.

It was also observed that majority of college, high school, and elementary educated respondents as well as those with no formal education had fair psychological functioning. The result further shows that educational attainment is negatively significantly correlated with psychological functioning (Gamma=-0.383, *P*=0.000), allowing the rejection of the null hypothesis. The results have found that education was a strong predictor to psychological functioning. This means that those respondents with higher education, have lesser tendency to develop poor psychological health because they were able to understand better the psychological effects of diabetes mellitus to their health. In fact, those with higher education are more likely to be satisfied and living in a purposeful manner. On the other hand, however, those respondents with no formal schooling are more likely to experience poor psychological functioning. The results are variable in relation to previous studies of Qiu et al. (2017), Gavrić and Grujić-Vujmilović (2014), and Saatci et al. (2010) that education is associated with higher prevalence of psychological distress. It was found that those who attained primary education and were illiterate had higher prevalence of distress. The finding is also in accordance with the results of Ozder (2015) wherein it

was revealed that education is negatively associated with level of depression. University graduates were experiencing less level of depression than those who graduated from primary and secondary schools.

Education can impart a variety of benefits that improve the health trajectory of the recipient. The association between education and health is that education itself produces benefits that later predispose the recipient to better health outcomes (Zimmermann, Woolf, & Haley, 2015). It is an important mechanism for enhancing the health and well-being of individuals because it reduces the need for health care, the associated costs of dependence, lost earnings, and human suffering. Thus, promoting and sustaining healthy lifestyles and positive choices, supporting and nurturing human development, human relationships and personal, family and community well-being as well (Feinstein, Sabates, Anderson, Sorhaindo, & Hammond, 2006).

Furthermore, the results of this study are in alignment with the reported results by Palizgir, Bakhtiari and Esteghamati (2013) that age and duration of diabetes, were not correlated with psychological disorders, while higher mental well-being was found among unemployed patients than the employed ones.

The findings also corroborates with the previous research studies by Hamdan-Mansour, Aboshaiqah, Thultheen, and Salim (2015) that no significant difference can be found in psychological distress and mental health in relation to age of patients diagnosed with chronic illnesses and diabetes. Contrary, earlier results of Gavrić and Grujić-Vujmilović (2014) and Paddison (2010) have found that higher age was associated with psychological health in which older diabetics patients tend not to worry about diabetes and have better psychological functioning.

Income is perhaps the most important social determinant of health which shapes overall living conditions, aspects of psychological functioning, and influences health-related behaviors (Mikkonen & Raphael, 2010). The finding differs from that of Qiu et. al. (2017) which reveals that diabetics with low family average monthly income had a great likelihood of developing psychological distress. To some extent, income and wealth directly support better health because wealthier people can afford the resources that protect and improve health (Woolf, Simon, Aron, Zimmerman, Dubay, & Luk, 2015).

In terms of duration of diabetes, the finding of the study is not aligned with the result of Ozder (2015) that patients with longer duration of diabetes were generally more depressed and lacking in energy, having lower positive and general well-being, and as the duration of the disease advances, the impact of chronic complications begins to affect the well-being of the diabetic patients through physical and psychological disorders. Hamdan-Mansour, Aboshaiqah, Thultheen, and Salim (2015) have also found that patients with longer period of diagnosis are more likely to have lower level of psychological distress and higher level of life satisfaction as well. According to Spasić, Radovanović, Đorđević, Stefanović, and Cvetković (2014), the best quality of life in all areas was observed in patients diagnosed with diabetes less than 10 years than with 11-15 years and more than 16 years. The duration of diabetes was also associated with significant declines in general health scores and had inverse relationship between mental health–related quality of life items (Thommasen & Zhang, 2006). Contradictory to the current findings, Khalid, Raluy-Callado, Curtis, Boye, Maguire, & Reaney (2013) have found that patients with type 2 diabetes were hospitalized at a considerably high rate for causes directly related to diabetes complications and stay longer in hospital. The most common primary reasons for a diabetes-related admission were renal failure, cardiovascular disease, and development of cataract. They concluded that re-admissions to hospital related to diabetes mellitus could indicate higher disease burden and could have a significant impact on a patient's quality of life. Furthermore, prior findings of Bolge, Flores, and Phan (2016) have found that diabetic patients with poor and very poor mental well-being reported a greater number of health care practitioner visits, emergency room visits, and hospitalizations than patients with good mental well-being.

Table 6. Relationship Between Respondent's Profile and their Psychological Aspect in terms of Age, Educational Attainment, Income, Duration of Diabetes, and Number of Hospitalization related to Diabetes

Profile	**Gamma Value**	***P*-value**	**Interpretation**	**Conclusion**
Age	0.138	0.211	Not Significant	Accept Ho
Educational Attainment	-0.383	*0.000	Significant	Reject Ho
Family Monthly Income	0.131	0.169	Not Significant	Accept Ho
Duration of Diabetes	0.017	0.875	Not Significant	Accept Ho
Number of Hospitalization Related to Diabetes	-0.205	0.323	Not Significant	Accept Ho

Table 7. Post-Hoc Result Between Psychological Aspect and Educational Attainment

Educational Attainment	**Psychological Aspect**							
	Good		**Fair**		**Poor**		**Total**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
No Formal Schooling	2	3.39	36	61.02	21	35.59	59	100.0
Elementary	4	7.20	49	87.50	3	5.30	56	100.0
High School	4	4.21	78	82.10	13	13.69	95	100.0
College	6	8.57	62	88.57	2	2.86	70	100.0
Total	**16**	**5.71**	**225**	**80.36**	**39**	**13.93**	**280**	**100.0**
Gamma= -0.383		***P*=0.000**						

3.4 The Relationship Between Respondent's Profile and their Psychological Aspect in terms of Sex, Civil Status, Work Status, Living Arrangements, Medications in Use, and Illnesses Other than Diabetes

It was also shown that the respondent's profile in terms of sex (Cramers V=0.103, *P*=0.230), civil status (Cramers V=0.070, *P*=0.501), occupation (Cramers V=0.108, *P*=0.364), medications in use (Cramers V=0.054, *P*=0.805) were not correlated to psychological functioning. This means that the respondents' sex, civil status, occupation, and medications in use have no bearing on their psychological functioning. On the other hand, however, the findings reveal that living arrangement (Cramers V=0.214, *P*=0.005) and presence of illnesses other than diabetes (Cramers V=0.190, *P*=0.010) were found to be significantly correlated with psychological functioning.

Living arrangements were strongly connected to various dimensions of ill health (Joutsenniemi, 2007). In the current study, those respondents who were living with friends, children and spouse, were more likely to have good psychological functioning. In an Arab world, extended family structures have long played a key role in the care and well-being especially of the elderly and frail family members. To varying degrees, older persons in most Arab societies have traditionally lived in multi-generational households where adult children, spouses, and other family members can be relied on for material support and care (Kronfol, Rizk, & Sibai, 2015). Those who are sick are expected to be cared for by the family members (McGoldrick, Giordano, & Garcia-Preto, 2006). This context is very important because families and the social support networks are the most important providers of economic, instrumental, and emotional support for elderly and frail family members (Montes de Oca Zavala, 2009). The result is supported by the findings of Roupa and colleagues (2014) where women with diabetes mellitus in Greece who are living alone are presented with higher percentages of anxiety and depression and are more vulnerable and face greater risk than persons who live with significant others.

The psychological well-being of the respondents with other illnesses like hypertension and hyperlipidemia were found to be significantly poorer than that of those without other illnesses. In line with the results of the study, respondents who co-morbid more than or equal to two kinds of other diseases were associated with a higher prevalence of psychological distress among Chinese diabetic patients (Qiu et al., 2017). Similarly, a study from Australia found a positive association between psychological distress and risk for developing cardiovascular diseases (Brumby, Chandrasekara, McCoombe, Kremer, & Lewandowski, 2012) especially hypertension (Sepúlveda, Points, Constante, Pais-Ribeiro, Freitas, & Carvalho, 2015).

Contradictory result showed significant sex difference in the patient's psychological distress, with female patients having higher mean score of psychological distress than male patients (Qiu et al., 2017; Hamdan-Mansour, Aboshaiqah, Thultheen, & Salim, 2015; Roupa et al., 2014; Palizgir, Bakhtiari & Esteghamati, 2013). Siddiqui, Khan, & Carline (2013) have found that male diabetics were observed to be living more effectively with diabetes, lesser depression, and anxiety but more energy and better positive well-being. They were more satisfied with their management of the disease and experience lesser social worry.

Moreover, earlier findings about psychological distress and marital status did not support the results of the current study. Many researchers believed that marriage has a protective effect on mental health (Fu & Noguchi, 2016; Hughes & Waite, 2009), while Qiu, et. al., (2017) have found that being divorced or separated from one's spouse and multiple co-morbidities were associated with psychological distress among Chinese diabetic patients. Ramkisson, Pillay, and Sartorius (2016) found that being married was linked to low levels of

distress, probably due to having spousal support. However, the results of this study are in alignment with the reported results by Palizgir et al. (2013) that marital status was not correlated with psychological disorders.

In terms of work status, the result is supported by Sepúlveda et al. (2015) that there is no significant difference in psychological distress and mental health in relation to work status of patients diagnosed with chronic illnesses and diabetes. Interestingly, participants who were homemakers/retired had considerably lower levels of distress, possibly indicating they had fewer stressors to deal with and had more time to adhere to the strict medication and self-care regimes, which is not consistent with the findings of the study (Ramkisson, Pillay, & Sartorius, 2016).

In terms of the medications used, the result is supported by the findings of Palizgir et al. (2013) which revealed that taking a pill and injecting insulin is not associated with depression and anxiety, however, the findings is not in line with the findings of Thommasen and Zhang (2006) wherein insulin use was associated with a significantly greater number of unhealthy mental days.

Table 8. Relationship Between Respondent's Profile and their Psychological Aspect in terms of Sex, Civil Status,Work Status, Living Arrangements, Medications in Use, and Illnesses Other than Diabetes

Profile	**Cramer's V Value**	***P*-value**	**Interpretation**	**Conclusion**
Sex	0.103	0.230	Not Significant	Accept Ho
Civil Status	0.070	0.501	Not Significant	Accept Ho
Work Status	0.108	0.364	Not Significant	Accept Ho
Living Arrangement	-0.214	*0.005	Significant	Reject Ho
Medications in Use	0.054	0.805	Not Significant	Accept Ho
Illnesses Other than Diabetes	-0.190	*0.010	Significant	Reject Ho

Table 9. Post-Hoc Result Between Psychological Aspect and Living Arrangement

Living Arrangement	**Psychological Aspect**							
	Good		**Fair**		**Poor**		**Total**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
Alone	1	1.93	47	90.38	4	7.69	52	100.0
With Children	2	9.52	16	76.19	3	14.29	21	100.0
With Spouse	0	0.0	8	53.30	7	46.7	15	100.0
With Relatives	0	0.0	4	50.00	4	50.0	8	100.0
With Children and Spouse	9	5.81	128	82.58	18	11.61	155	100.0
With Friends	4	13.79	22	75.87	3	10.34	29	100.0
Total	**16**	**5.71**	**225**	**80.35**	**39**	**13.94**	**280**	**100.0**
Cramer's V= -0.214		***P*=0.005**						

Table 10. Post-Hoc Result Between Psychological Aspect and Illnesses Other than Diabetes

Illnesses Other than Diabetes	**Psychological Aspect**							
	Good		**Fair**		**Poor**		**Total**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
None	4	3.31	103	85.12	14	11.57	121	100.0
Hypertension	7	7.00	77	77.00	16	16.00	100	100.0
Hyperlipidemia	2	9.52	15	71.43	4	19.05	21	100.0
Both	3	12.50	17	70.83	4	16.67	24	100.0
Others	0	0.0	13	92.90	1	7.10	14	100.0
Total	**16**	**5.71**	**225**	**80.35**	**39**	**13.94**	**280**	**100.0**
Cramer's V= -0.190		***P*=0.010**						

3.5 The Relationship Between Respondent's Profile and their Social Aspect

Tables 11, 12, and 13 depict the relationship between respondent's profile and their social functioning. It was found that age, educational attainment, family monthly income, duration of illness, and number of hospitalization related to diabetes are not statistically significantly related to social functioning (Gamma Value=-0.097, *P*=0.332; Gamma Value=-0.034, *P*=0.679; Gamma Value=0.146, *P*=0.138; Gamma Value=-0.046, *P*=0.642, and Gamma Value=0.132, *P*=0.461, respectively). The null hypothesis, therefore, stating that there is no significant relationship between respondent's profile grouped according to age, educational attainment, family monthly income, duration of illness, and number of hospitalization related to diabetes were accepted.

Further, the respondent' sex (Cramers V=0.088, *P*=0.339), civil status (Cramers V=0.072, *P*=0.479), occupation (Cramers V=0.137, *P*=0.103), living arrangement (Cramers V=0.172, *P*=0.083), and medications in use (Cramers V=0.082, *P*=0.438) show no significant correlation. This implies that the respondents' sex, civil status, occupation, living arrangement, and medications in use do not influence social functions. With regards to the presence of illnesses other than diabetes, the data reveal significant correlation (Cramers V=-0.214, *P*=0.005) with social functioning. Those respondents with hypertension and hyperlipidemia were more likely to develop poor social functioning, while those respondents with no other illnesses were more likely to develop higher social functioning.

The result is concordant with the findings of Kakhki and Saeedi (2013) and Porojan, Poanta, and Dumitrascu (2012) that diabetic patients' age was insignificantly associated with social functioning. Higher social functioning score was associated with individuals who were younger and employed (Bohlke, Nunes, Marini, Kitamura, Andrade, & Von-Gysel, 2008), while Ghasemipoor, Ghasemi, and Zamani (2010) have found age has inverse relationship with support in which older diabetic patients' emotional and instrumental support decreases as they age which could lead to decrease quality of life.

Earlier studies have found that high levels of social support and income also contributed significantly to successful social functioning of diabetes patients, which is not in line with the findings of the current study (Altinok, Marakoğlu, & Kargın, 2016; Mertens, Bosma, Groffen, & van Eijk, 2012). The patients' families and friends can provide support to assist in overcoming social barriers and executing complex self-management behavior, especially since self-management tasks such as glucose testing, insulin injection, diabetes meal planning, checking feet, and exercise often take place in social settings, and can alter family and social routines (Kadirvelu, Sadasivan, & Ng, 2012).

Moreover, the current finding is not consistent with the results of Ghasemipoor, Ghasemi, and Zamani (2010) and Altinok, Marakoğlu, and Kargın (2016) that job (work status) and education are significantly correlated with social functioning. Ghasemipoor, Ghasemi, and Zamani (2010) have found a meaningful relation between job and education and factors of social support, emotional, instrumental, and informational support in employed and educated diabetic patients. Those respondents who are working and with higher level of education have more opportunity for meeting new people in many settings and this kind of access to different support sources can increase the amount of support. While, Altinok, Marakoğlu, and Kargın (2016) have found that lack of any occupation, restricted life within the home and low level of education may also have influenced this situation.

Contradictory to the findings, the quality of life of diabetic patients in terms of social function was decreased by increasing disease duration (Özdemir, Hocaoğlu, Koçak, & Önder Ersöz, 2011; Thommasen & Zhang, 2006). While diabetes disease duration has no association with social aspect quality of life among Romanian diabetic patients (Porojan, Poanta, & Dumitrascu, 2012) which support the findings of the current study.

The result is in line with the earlier findings of Costa, Campos, and Costa (2014) and Porojan, Poanta, and Dumitrascu (2012) in which respondent's sex has no association in the social functioning among Romanian and Portuguese diabetic patients. Contrary to the findings, social functioning is negatively correlated to men, as these patients perceive difficulties in carrying social activities and relationships (Morales, Navas, Jimenez, & Ramos, 2015). While women with diabetes reported a lower quality of life in social functioning than the Dutch healthy controlled subjects (Bakker, Pouwer, Tushuizen, Hoogma, Mulder, & Simsek, 2013) and Turkish patients (Altinok, Marakoğlu, & Kargın, 2016).

In terms of marital status, the current finding is supported by the result of Ghasemipoor, Ghasemi, and Zamani (2010) which state that marital status does not have a meaningful relation with the quality of life especially in social functioning of diabetic patients. However, Altinok, Marakoğlu, & Kargın (2016) have found that married respondents have better support than those who were widowed and divorced.

Furthermore, the current finding is not in line with the results of the earlier study, wherein patients with diabetes who have used insulin (Altinok, Marakoğlu, & Kargın, 2016; Thommasen & Zhang, 2006) and with longer duration of diabetes (Altinok, Marakoğlu, & Kargın, 2016; Sepúlveda et al., 2015; Spasić et al., 2014; Ghasemipoor, Ghasemi, & Zamani, 2010; & Ovayolu, Akarsu, Madenci, Torun, Ucan, & Yilmaz, 2008) have poor social functioning scores, leading to decreased quality of life. On the other hand, examining the effects of insulin use, quality of life, and social functioning, there are no significant differences between patients following insulin therapy and patients with other therapeutic protocols (Porojan, Poanta, & Dumitrascu, 2012).

The presence of cardiovascular diseases among Portuguese (Sepúlveda et al., 2015) and Indian (Kazemi-Galougahi, Ghaziani, Eftekhar, & Mahmoud, 2012) diabetic patients, and those with two or more complications (Altinok, Marakoğlu, & Kargın, 2016) are significantly associated with lower health-related quality of life in terms of social functioning. Other authors also pointed out that hospitalization significantly alters the lives of patients, and that the degree of involvement, length of hospitalization, and the loss of autonomy bear direct impact on this process (Fernandes, 2014; Frota, Machado, Martins, Vasconcelos, & Landin, 2010; Macena & Lange, 2008; & Borges & Martins, 2001 cited by Oliveira, Schmidt, Amatneeks, Santos, Cavallet, & Michel, 2016), which did not support the result of the current study.

Table 11. Relationship Between Respondent's Profile and their Social Aspect

Profile	**Gamma Value**	***P*-value**	**Interpretation**	**Conclusion**
Age	-0.097	0.332	Not Significant	Accept Ho
Educational Attainment	-0.034	0.679	Not Significant	Accept Ho
Family Monthly Income	0.146	0.138	Not Significant	Accept Ho
Duration of Diabetes	-0.046	0.642	Not Significant	Accept Ho
Number of Hospitalization Related to Diabetes	0.132	0.461	Not Significant	Accept Ho

Table 12. Relationship Between Respondent's Profile and their Social Aspect

Profile	**Cramer's V Value**	***P*-value**	**Interpretation**	**Conclusion**
Sex	0.088	0.339	Not Significant	Accept Ho
Civil Status	0.072	0.479	Not Significant	Accept Ho
Work Status	0.137	0.103	Not Significant	Accept Ho
Living Arrangement	0.172	0.083	Not Significant	Accept Ho
Medications in Use	0.082	0.438	Not Significant	Accept Ho
Illnesses Other than Diabetes	-0.214	*0.005	Significant	Reject Ho

Table 13. Post-Hoc Result Between Social Aspect and Illnesses Other than Diabetes

Illnesses Other than Diabetes	**Social Aspect**							
	Good		**Fair**		**Poor**		**Total**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
None	20	16.53	87	71.9	14	11.57	121	100.0
Hypertension	10	10.0	81	81.0	9	9.0	100	100.0
Hyperlipidemia	2	9.52	15	71.42	4	19.06	21	100.0
Both	4	16.67	15	62.5	5	20.83	24	100.0
Others	1	7.14	10	71.43	3	21.43	14	100.0
Total	**37**	**13.2**	**208**	**74.3**	**35**	**12.5**	**280**	**100.0**
Cramer's V= -0.214		***P*=0.005**						

4. Conclusions and Recommendations

This study sheds light on the importance of addressing the psychological and social well-being of patients living with diabetes mellitus in Doha, Qatar. The results suggest that self-satisfaction and living purposefully despite the illness, and the support of family members are the factors that could increase the likelihood of positive psychological state and better social functioning. Higher level of education and living with spouse, children, and friends are associated with lesser tendency of having poor psychological health. Respondents with no illnesses other than diabetes were more likely to develop good psychological and social functioning as well. Overall, patients with diabetes mellitus still have the ability to maintain positive psychological health and social functioning. In order to achieve the goals of diabetes care and to meet the challenges of diabetes, psychosocial interventions should be included as part of ongoing diabetes management.

It is recommended that doctors and nurses should continuously and effectively counsel diabetic patients that would maintain and improve patients' satisfaction and therapeutic outcomes through appropriate psychological and social interventions such as problem-solving and coping skills, relaxation techniques and stress management, motivational interviewing, and empowerment-based programs as part of ongoing diabetes care. To effectively counsel the patients with diabetes, doctors and nurses should receive appropriate training associated with teaching and counseling techniques. To those patients with poor literacy and poor numeracy skills, diabetes education should be strengthened through interactive modules which should be culturally flexible for diabetic patients of different origin and backgrounds. This study has several limitations. This is a cross-sectional study, which is not possible to draw any causal relationships between variables. There were only two factors assessed in this study, however, physical functioning, recreation, life satisfaction, and personal development in general were not included. It is hoped that this study would provide data for comparison in the future and further research would be needed to substantiate the impact of the findings.

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