

Social support and self-care activities among the elderly patients with diabetes in Kelantan

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Abstract

Introduction: Diabetes is common among the elderly and can significantly affect their lives including the issues related with social support and diabetic self-care activities.

Objectives: The objective of this study was to examine the social support and self-care activities among the elderly patients with diabetes.

Methods: A survey involving 200 patients was conducted from March 2013 to May 2013 in three hospitals in Kelantan. Data were obtained through self-administered questionnaires and clinical characteristics were acquired from the patients' records.

Results: The scores for social support (mean = 19.26; SD = 2.63) and self-care activities (mean = 14.83; SD = 4.92) were moderate. Higher social support was associated with high levels of glycated haemoglobin (HbA1c), fasting blood sugar (FBS) level, the duration of diabetes and a decrease in body mass index (BMI) ($p < 0.05$). It was observed that the patients with low educational, Hb1Ac and FBS level, with other chronic diseases and who have had diabetes for some time had low self-care activities ($p < 0.05$). There was a significant negative relationship between an increase in social support and decrease in self-care activity ($p < 0.05$).

Conclusion: Healthcare providers, family and friends have to strengthen their relationship with the elderly patients with diabetes to provide more social support and promote the compliance with diabetic self-care activities to improve clinical outcomes.

Introduction

Globally, the number of patients affected by diabetes has seen sustained increase in terms of incidence and prevalence. Diabetes is widely known as the most complex disease to manage,¹ especially in its final stages. It is defined by the level of hyperglycaemia that escalates the risk of microvascular damage, macrovascular complications and diminishes the quality of life.²

Globally, the total number of people with diabetes is estimated to rise from 171 million in 2000 to 366 million in 2030.³ Recent statistics have found that globally 346 million people suffer from diabetes.⁴ According to the International Diabetes Federation,⁵ a total of 25.8 million people from all age groups have been affected by diabetes, which account for 8.3% of the total population of the United States; out of which, 1.8 million people were

diagnosed with diabetes while 7.0 million were left undiagnosed.

The prevalence of diabetes among elderly population is increasing due to extended human life span.⁶ The elderly population with diabetes are more at risk of developing hypoglycaemia than the adult population. This is due to the high prevalence of comorbidities, polypharmacy, cognitive impairment and the use of agents that interfere with glucose metabolism.⁷

In Malaysia, the elderly is defined as a person who is 60 years old and more and it is estimated that Malaysia has approximately 17 million (1,691,000) people aged more than 65 years.⁸ The increasing number of diabetics in developing countries has been attributed to urbanisation and unhealthy lifestyles.⁹ The prevalence of diabetes in Malaysia has risen by 31.0% in a period of 5 years, from 11.6%

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in 2006 to 15.2% in 2011 and it is projected to increase to 21.6% by 2020.¹⁰

Since diabetes is significantly related with the aged population,¹¹ the increasing number of the elderly people in Malaysia and globally has made it a real challenge for healthcare providers to meet demands. Keeping this in mind, in terms of taking care of the elderly patients with diabetes, it is crucial to focus on the correlation between social support and self-care activities. This is because social support has been identified as the most important influential factor that affects diabetes management among the elderly population.¹²

There is a lack of adequate strategies related documentation to promote social support among the elderly patients with diabetes in Malaysia.¹³ The current management of incurable diabetes includes regular blood glucose monitoring, medications, dietary regulation of carbohydrate intake and regular exercise to control the amount of glucose in the bloodstream. Due to the complexity and demand of managing the illness, daily motivation and self-care activities are required to maintain optimal metabolic (blood glucose level) control.⁵ Diabetics' self-care activities should comprise diet intake, glucose level monitoring, foot care, exercise and medication. Direct or active patient participation for their diabetic self-care activities could be a turning point in the healthcare system to efficiently and effectively manage diabetes.

However, despite symptoms management and control of the disease, still there is a need to examine other factors that may impede patients' self-care activities. This paper discusses these factors in order to improve the health status of the patients.

Methods***Design, setting and sample selection***

A cross-sectional study was conducted from March to May 2013 to collect data from medical and diabetic clinics in three government hospitals in Kelantan, Malaysia (Gua Musang Hospital, Kuala Krai Hospital and Machang Hospital). Respondents were selected through convenience sampling. The

study population consisted of elderly patients with diabetes.

The estimated number of the elderly patients with diabetes registered in the three hospitals was 550 patients per year. A total of 200 elderly diabetics were selected from the sample, which represents 36% of the total population. The selection criteria were: patients having type 2 diabetes within 3 months and more and aged 60 years and more. Poor glycaemic control and glycated haemoglobin (HbA1c) greater than 7.5% during the last 6 months were also considered.

Instrument

A questionnaire was used to collect data, which consisted of four sections: demographic characteristics, clinical data, questions related to social support and questions related to diabetic self-care activities.

The medical outcomes study (MOS) social support survey includes 19 items to assess the kinds of support available to the elderly people. The five subscales measuring social support comprised emotional/informational support, tangible support, affectionate support, positive social interaction and additional items. The questionnaire was used to measure the respondents using a five-point Likert scale, reading 1 for never to 5 for all of the time. Higher scores represented good social support whereas, lower scores represented poor social support. Scores were rescored out of 100 using the following formula: $[100 \times ((\text{Observed score} - \text{minimum possible score}) / (\text{maximum possible score} - \text{minimum possible score}))]$.¹⁴

The diabetic self-care activity scale (SDSCA) questionnaire includes 11 items to assess diabetic self-care 7 days before the survey. It has five subscales measuring the following dimensions: diet, exercise, blood sugar testing, medications and foot care. The questionnaire measured the self-care activities taken just 7 days before the survey using seven-point Likert scale that ranged from 0 for never done to 7 for done 7 days per week. Higher scores represent good compliance with diabetic self-care, whereas lower scores represent poor compliance.¹⁵

Ethical considerations

Ethical approval was obtained from the Research and Ethics Committee, Universiti Teknologi MARA and the Ministry of Health (NMRR-12-1342-14274). Permission from the Director of the hospitals was also obtained.

A written consent was obtained from each of the respondents and all respondents were given the information prior to their participation. This was done by providing a written informed consent form, signed and dated by the respondent, researcher and a witness. A copy of the form was given to the respondents while the original signed copy was retained by the researcher.

Statistical analysis

Data were analysed using the statistical package for social science (SPSS) version 17. Variables were described using frequency distribution for categorical variables and the mean and standard deviation for continuous variables. The Kruskal–Wallis test and Mann–Whitney U test were used to evaluate the association between demographic variables with social support and self-care activities. Regression analysis was performed to evaluate the relationship between demographic and clinical variables with social support and self-care activities. Correlation analysis was used to evaluate the relationship between social support and self-care activities and also for the relationship between clinical

data with social support and self-care activities. A p -value less than 0.05 was considered statistically significant.

Results

Two hundred and fifty (250) elderly patients with diabetes were asked to participate in the study. Out of these, 50 patients did not complete the study for the following reasons: 43 patients did not have an HbA1c value within 6 months and seven did not complete the questionnaire. This means that 80% or 200 respondents' data were analysed from the three hospitals.

The Cronbach's alpha for social support questionnaire was 0.96, which indicated a high level of internal consistency for our scale with this particular sample. For diabetic self-care activities, the Cronbach's alpha was 0.70. The results of Kolmogorov–Smirnov and Shapiro–Wilk for both scales showed that all scales failed to reach the normality value.

Patients' characteristics

Table 1 shows that the mean age of the respondents was 67.9 (SD 5.7) years and the majority of the respondents (74%) were 60–70 years old. Approximately 59.5% of the respondents were men; 41% were illiterate and only 12.5% had received secondary education. The majority of the respondents were Malay (92%).

Table 1. Demographic characteristics ($n = 200$)

Variable	Status	<i>n</i>	%
<i>Age (mean age = 67.9; SD = 5.7)</i>			
	60–70	148	74.0
	71–80	43	21.5
	≥81	9	4.5
<i>Sex</i>			
	Male	119	59.5
	Female	81	40.5
<i>Education level</i>			
	Illiterate	82	41.0
	Primary	93	46.5
	Secondary	25	12.5
<i>Ethnicity</i>			
	Malay	184	92.0
	Chinese	14	7.0
	Indian	2	1.0

As shown in the Table 2, the majority of the respondents in this study were on oral medication (75.5%), 64% of patients had other chronic diseases, 80.5% of respondents did not have any complications related to diabetes and 76.5% had received health education on diabetes. The mean for HbA1c, fasting blood sugar (FBS), body mass index (BMI) and length of diabetes of the respondents were 9.94, 9.08, 26.11 and 8.22 respectively (Table 2).

Table 2. Clinical data ($n = 200$)

Clinical data	<i>n</i>	%
<i>Types of treatment</i>		
Oral medication	151	75.5
Insulin	34	17.0
Oral medication and insulin	15	7.5
<i>Have other chronic diseases</i>		
No	72	36.0
Yes	128	64.0
<i>Have complication</i>		
No	161	80.5
Yes	39	19.5
<i>Receive health education</i>		
No	47	23.5
Yes	153	76.5
<i>HbA1c</i>		
Mean (SD)	9.94	1.64
<i>FBS</i>		
Mean (SD)	9.08	2.06
<i>BMI</i>		
Mean (SD)	26.11	3.05
<i>Duration of diabetes</i>		
Mean (SD)	8.22	4.14

Table 3. Social support among the elderly patients with diabetes

Variable	Score out of 100	Mean (SD)	Median (IQR)	Minimum	Maximum
Social support		19.26 (2.63)	20.00 (4.63)	14.42	24.38
<i>Subscale</i>					
Tangible	73.8	3.95 (0.63)	4.00 (0.50)	1.00	5.00
Affectionate	62.7	3.88 (0.68)	4.00 (1.00)	2.00	5.00
Positive social interaction	60.7	3.82 (0.67)	4.00 (1.00)	2.00	5.00
Emotional/informational	55.5	3.74 (0.52)	4.00 (0.75)	2.63	4.63

Social support among the elderly patients with diabetes

Table 3 shows that the overall mean of social support scale was moderate (mean = 19.26; SD = 2.63). Tangible support scored

highest (mean = 3.95; SD = 0.63), followed by affectionate support (mean = 3.88; SD = 0.68), positive social interaction support (mean = 3.82; SD = 0.67) and the lowest scale was emotional/informational support (mean = 3.74; SD = 0.52).

Self-care activities among the elderly patients with diabetes

The mean total score of the self-care activity scale was moderate (mean = 14.83; SD = 4.92). Medication compliance scored the highest (mean = 5.66; SD = 2.50), followed by diet (mean = 4.43; SD = 0.99), foot care (mean = 1.92; SD = 1.81), exercise (mean = 1.64; SD = 1.83) and blood sugar testing (mean = 1.18; SD = 1.16) (see Table 4).

The relationship between self-care activities and patient characteristics (demographic and clinical data)

The result showed that respondents who attended secondary education had higher self-care activities than those who were illiterate and had received only primary education ($p = 0.007$). Other relations did not result in any significant difference (Table 5).

Table 4. Self-care activities among the elderly patients with diabetes

Variable	Mean (SD)	Median (IQR)	Min	Max
Self-care activities	14.83 (4.92)	15.75 (7.25)	3.75	30.50
Subscale				
Medication	5.66 (2.50)	7.00 (0.0)	0.0	7.00
Diet	4.43 (0.99)	4.50 (1.50)	1.5	6.50
Foot care	1.92 (1.81)	1.50 (3.00)	0.0	7.00
Exercise	1.64 (1.83)	1.00 (3.00)	0.0	5.50
Blood sugar level testing	1.18 (1.16)	1.00 (2.00)	0.0	7.00

Table 5. The relationship between self-care activities and demographic characteristics

Variable	Status	Median	IQR	p value
<i>Age^a</i>	60–70	15.75	7.25	0.149
	71–80	17.75	5.25	
	≥ 81	19.50	8.63	
	<i>Sex^b</i>	Male	15.75	6.75
Female		15.75	7.60	
<i>Education level^c</i>	Illiterate	15.25	7.50	0.007*
	Primary	15.00	7.25	
	Secondary	18.50	3.25	
<i>Ethnicity^d</i>	Malay	15.38	7.25	0.329
	Chinese	18.50	6.38	
	Indian	17.13		

* $p < 0.05$ ^aKruskal–Wallis test^bMann–Whitney U test

The results of our regression analysis (Table 6) showed that there was a negative significant linear relationship between self-care activities and HbA1c ($p = 0.0001$), patients with other chronic diseases ($p = 0.001$) and primary level of education ($p = 0.014$). Those variables explained 28% of the variance in self-care activities ($R^2 = 28$). Other variables did not show significant results such as demographic variables (age, gender and ethnicity), and clinical data (FBS, BMI, type of treatment, length of diabetic, complication of diabetes and health education).

The association between social support and diabetic self-care activities

Table 7 shows there was a significant negative weak relation between both scales ($r_s = -0.21$,

$p = 0.003$). Hence, if social support increases the self-care activity decreases.

The correlation between clinical variables and social support level indicated that there was a positive significant difference between the level of HbA1c, FBS and duration of diabetes with the level of social support with p values of 0.0001, 0.023, and 0.0001 respectively. The significant difference between social support and BMI was negative ($r_s = -0.26$, $p = 0.0001$). On the other hand, the self-care activity scale showed a highly negative significant difference ($p = 0.0001$) with HbA1c, FBS and length of diabetes (Table 8).

Table 6. Multiple linear regression analysis of variables associated with self-care activities ($n = 200$)

Independent Variable	MLR	(95% CI)	t-stat	p value
Adj. b				
<i>Constant</i>				
	21.60	(14.75, 28.42)	6.23	0.0001
<i>Clinical Data</i>				
Hb1Ac	-1.32	(-1.73, -0.90)	-6.28	0.0001
Have other chronic diseases	-2.21	(-3.45, -0.96)	-3.50	0.001
<i>Educational Level</i>				
Never				
Primary	-1.46	(-2.63, -0.30)	-2.47	0.014

R^2 adj. = 0.28

Adj. b = Adjusted regression coefficient

Prediction model = $21.60 - 1.32(\text{Hb1Ac}) - 2.21(\text{Comorbid}) - 1.46(\text{Primary})$

Table 7. Spearman's rho correlation between social support and self-care activities ($n = 200$)

Self-care activities	Correlation	p value
Social support	$r_s = -0.21$	0.003

Table 8. Spearman's rho correlation of social support and self-care activities with clinical data ($n = 200$)

	Social Support		Self-care activities	
	Correlation (rs)	p value	Correlation (rs)	p value
HbA1c	0.41	0.0001	-0.52	0.0001
FBS	0.16	0.023	-0.25	0.0001
BMI	-0.26	0.0001	0.03	0.682
Length of diabetes	0.32	0.0001	-0.35	0.0001

Discussion

Social support among the elderly patients with diabetes

In this study, the overall social support was moderate. However, Amin's research, found that the majority of the elderly patients with diabetes had good social support.¹³ Yet in Akiyama's study, it was found that the social support was less among their sample.¹⁶ This highlights how the social support received by elderly patients with diabetes differed based on population. Further studies may be needed to understand this phenomenon.

Current study revealed that tangible social support was the highest followed by the affectionate, positive social interaction and lastly by emotional/informational support. Similarly, tangible support reported the highest score in Chew's study conducted among diabetic patients in Kuala Lumpur.¹⁷ The emotional because from the data obtained, most patients claimed that they had limited time to talk about their concerns with family or healthcare providers.

Patients with diabetes need to make extensive changes in self-care activities. The adjustments in these activities may be accompanied by the psychological issues including frustration and emotional distress.¹⁸ Social support is a psychological source related to better mental functioning with the ability to reduce depression in patients with diabetes.¹⁹ Social support can influence patients' motivation to self-care and may possibly affect the ways in which diabetes is managed, especially among the elderly patients.²⁰ This is important since social support is crucial in helping the elderly people to cope with diabetes and indirectly comply with the allocated treatment.

The contributions of better quality of life among diabetic patients are obtained through the acceptance and knowledge of diabetes, together with social support by family and friends.²¹ Besides, family members and friends also influence health management to effect greater compliance to recommended behavioural modification.^{22,23}

For that reason, all stakeholders, family and friends are responsible to overcome the lack of motivation to comply with the prescribed treatment.²⁴ Healthcare providers must have

interpersonal skills to ensure patients are motivated to comply with the treatment.²⁵ In order to overcome these problems, a diabetic support group should be formed so that elderly patients with diabetes are able to get personal advice from the healthcare providers and receive positive encouragement from other patients with diabetes. This will make patients feel that they have someone who exhibits love and concern for them thereby making them feel needed and appreciated.

Self-care activities among the elderly patients with diabetes

Overall, the self-care activities among the elderly patients with diabetes are at a moderate level. The findings are relatively parallel with Gallagher's study that reported self-care as being moderate to high among the elderly patients with chronic diseases.²⁶

The subscale in the self-care activities showed that medication scored the highest. Similar to previous studies, the majority of the participants adhered to their medication schedule.^{27,28} Diet had the second highest score, which had been supported by Mahfouz's study.²⁸

This study has also found that patients had poor compliance with foot care activity. The majority of the elderly patients with diabetes had various problems due to aging such as memory problems, impaired cognitive functions and poor awareness regarding administering foot care.²⁹ Furthermore, in Malaysian diabetic foot problems occur mostly among the elderly patients.³⁰

In this study, the respondents were not doing enough exercise. This finding was similar to Ploypathrpinyo's study where physical exercise was insufficient in respect to self-care activities.³¹ Other barriers to exercise were physical, environmental, psychological and time limitations.³² Patients who had many health conditions and complications such as retinopathy, neuropathy, nephropathy, hypertension and cardiovascular disease were also less able to follow regular physical exercise as chronic diseases have a stronger relationship with functional impairment.³³

Most of the respondents in this study did not check their glucose level periodically. This study is similar to Mahfouz and Awadalla study on blood glucose level monitoring which was poor among

patients with diabetes.²⁸ Some respondents stated that blood glucose level testing was expensive. Blood glucose level testing was one of the most expensive aspects of diabetes care.³⁴

The relationship between self-care activities and patients' characteristics (demographic and clinical data)

This study found that patients with low educational level, low Hb1Ac, other chronic diseases, low FBS, and longer length of diabetes showed low levels of self-care activities.

This finding was in line with the other studies that also found that self-care activities were poor among diabetic patients with poor education.^{35,36} It can be expected that the illiterate elderly patients with diabetes might have difficulty to follow instructions regarding self-care activities.

Similarly, self-care activities had a significant relationship with HbA1c in many studies,^{37,38–40} FBS, BMI and the duration of diabetes.⁴¹ O'Shea et al. also supported that comorbid patients with diabetes had been associated with self-care activities.⁴²

Therefore, the elderly patients with diabetes who have low educational levels, a poor HbA1c value, low FBS level and other chronic conditions and long-term diabetes need to improve their self-care. As healthcare providers, serious attention must be awarded to these issues. This vulnerable population needs to be adequately aware and instructed about proper self-care activities.

The association between social support and diabetes self-care activities

According to the results, the patients' self-care activities will decrease with an increase in social support. In the local culture, the parent-child bond is strong where the majority of the elderly people live together and receive support from their children. Elderly patients who live with family have a high level of dependence on their family for social and medical support.⁴³ Nevertheless, the elderly patients with diabetes need to be more responsible for their self-care to improve their abilities in managing the disease.

The association between social support and clinical data

This study found that social support increases with an increase of HbA1c, FBS and duration of diabetes. Social support also increases with decrease in BMI.

However, these results contradict other studies, which found that social support was most frequently associated with reduced HbA1c,⁴⁴ FBS²² and patients with less duration of diabetes have more social support.⁴⁵ The result of this study suggested that patients who had received good social support might have poor glucose management (high level of HbA1c and FBS), whereas patients with longer duration of diabetes might receive good social support. It can be expected that the elderly patients with longer duration of diabetes might have some physical limitations such as not being able to control their own blood glucose level and receiving more attention and social support from their family members.

Likewise, other studies revealed that higher BMIs were associated with significantly lower levels of social support.⁴⁶ Hence, collaboration with healthcare providers and family members is needed to provide good social support whilst at the same time improving the levels of HbA1c and FBS of the elderly patients with diabetes.

Limitations of the Study

The results of this study were limited by the following factors. The study included patients from only government hospitals. Some physical disabilities related to aging might have affected the cooperation of participants, such as hearing problems and the inability to understand the question. The number of patients who visited the hospital was not consistent across the years and the convenience sampling might not represent the whole population. Possible individual biases in answering the questionnaires might also have influenced the results. The cause and effect in this research could not be established by the factors studied using a cross-sectional study design.

Conclusion

Healthcare providers need to promote compliance with the self-care activities among elderly patients with diabetes. Other than that, the expected diabetic treatment and further

complication by promoting health education should be done to create awareness and exposure. The involvement of close family members during health education sessions is important to gain social support and reinforce more information regarding self-care activities for the elderly patients with diabetes.

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Conflict of interest

We declare there is no conflict of interest in the publication of this study.

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