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Patient Education and Counseling 72 (2008) 252–267

Patient Education and Counseling

www.elsevier.com/locate/pateducou

Self-care practices of Malaysian adults with diabetes and sub-optimal glycaemic control

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Received 20 August 2007; received in revised form 24 January 2008; accepted 15 March 2008

Abstract

Objective: To investigate the self-care practices of Malaysian adults with diabetes and sub-optimal glycaemic control.

Methods: Using a one-to-one interviewing approach, data were collected from 126 diabetic adults from four settings. A 75-item questionnaire was used to assess diabetes-related knowledge and self-care practices regarding, diet, medication, physical activity and self-monitoring of blood glucose (SMBG).

Results: Most subjects had received advice on the importance of self-care in the management of their diabetes and recognised its importance. Sixty-seven subjects (53%) scored below 50% in their diabetes-related knowledge. Subjects who consumed more meals per day (80%), or who did not include their regular sweetened food intakes in their daily meal plan (80%), or who were inactive in daily life (54%), had higher mean fasting blood glucose levels ($p = 0.04$). Subjects with medication non-adherence (46%) also tended to have higher fasting blood glucose levels. Only 15% of the subjects practiced SMBG. Predictors of knowledge deficit and poor self-care were low level of education ($p = <0.01$), older subjects ($p = 0.04$) and Type 2 diabetes subjects on oral anti-hyperglycaemic medication ($p = <0.01$).

Conclusion: There were diabetes-related knowledge deficits and inadequate self-care practices among the majority of diabetic patients with sub-optimal glycaemic control.

Practice implications: This study should contribute to the development of effective education strategies to promote health for adults with sub-optimal diabetes control.

Keywords: Diabetes; Sub-optimal glycaemic control; Self-care; Diet and medication intake; Physical activity; Self-monitoring of blood glucose

1. Introduction

The incidence of diabetes mellitus is escalating making it a global public health concern and this is especially the case in Asia [1]. Malaysia, due to its rapid socio-economic growth and changes in nutritional habits resulting in an increased proportion of the population who are overweight and obese, has not been spared from the epidemic [2–4]. This is reflected in the increased prevalence of diabetes in Malaysia over the last few decades, from 0.65% in 1960 to 2.1% in 1982, 8.4% in 1996 and 11% in 2006 [5,6].

In response to this problem, the Malaysian Government has increased resources such as diabetes centres and education facilities. The access to these varies between states, with most being situated in urban hospitals or main rural healthcare centres. Despite these initiatives, there are less than 400 trained diabetes educators or dieticians in the current healthcare system to meet the health needs of the 27 million Malaysian population [7]. Hence nurses and doctors with no specialized diabetes training at the out- and in-patient departments are relied upon to deliver health education during their busy working hours.

Studies in Malaysia indicate a high prevalence of sub-optimal glycaemic control and that diabetes complications are common [8–14]. It has been reported that one of the reasons for this is lack of self-care by people with diabetes [15,16]. Although self-care practices of individuals are influenced by a complex interaction of biological and psychosocial factors, dietary intake, medication use, physical activity and self-monitoring of blood glucose (SMBG) are the four main cornerstones of overall diabetes management. Despite the abundance of studies on self-care practices, there is limited information available on the self-care practices of individuals with diabetes in Malaysia. Hence this study was designed to

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0738-3991/$ – see front matter
doi:10.1016/j.pec.2008.03.017

enhance the understanding of the factors that contribute to the self-care practices of subjects with sub-optimal glycaemic control. The research question was 'What are the self-care practices of diabetic adults with sub-optimal glycaemic control in Malaysia?'

2. Methods

2.1. Participants and settings

A descriptive study was used to explore the self-care practices of 126 non-pregnant adults (>18 years), with either Type 1 or Type 2 diabetes and a medical record indicating sub-optimal glycaemic control over the last year. Subjects of both genders with no hearing or visual impairment were included, regardless of ethnicity. Due to the limited availability of subjects' HbA1c results, in this study sub-optimal glycaemic control was defined as 'a mean of at least three fasting blood glucose (FBG) levels of more than 7 mmol/L in the previous year'. Prior studies have shown that FBG of more than 7 mmol/L is associated with increased micro- and macro-vascular complications [17–20]. Subjects were excluded if physical or mental impairment impacted on their ability to answer questions independently. All subjects were recruited between June and September 2005, from the in- and out-patient departments of an urban general hospital, a district hospital and two rural health care centres in Malaysia. The study was approved by the Research Ethics Committee of the University of Adelaide and the Malaysian Medical Research and Ethics Committee.

2.2. Questionnaire

A 75-item 'Self-care Activity' questionnaire was designed by the investigator based on several previously validated self-care questionnaires. This tool was used to assess the following:

- knowledge of and recognition of the importance of self-care practices in relation to diet, medication, physical activity and SMBG [21–27];
- knowledge of complications [22];
- advice received regarding self-management;
- self-care practiced in the preceding 7 days [26,27] (Appendix A).

For the knowledge questions, one point was allocated for each correct answer with a maximum score possible of 20.

There were nine questions that assessed dietary intake in the past week. For example, the quantity of carbohydrate intake and the number of meals consumed each day were recorded with options from 1 to 7. Subjects were also asked how often they ate during their waking hours. A Likert scale was used to assess whether subjects reduced carbohydrate intake during meals when they had consumed sweetened foods and drinks and whether their eating habits in the last week resembled their usual behaviour.

Medication adherence was assessed by comparing subjects' reported medication dosage, frequency and timing with the physician's prescription. Medical adherence was defined as adherence to 90% or more of the daily prescribed medication and calculated as the number of doses actually taken divided by the number prescribed [28].

Assessment of physical activity included leisure, non-leisure and total daily physical activities using 5-point Likert scales and minutes of activity such as walking or cycling. Activity levels were categorized as 'least active', 'moderately active' and 'most active' according to the sum of the scores.

The subjects were asked if they practiced SMBG and if so the frequency of testing and the number of times they modified their treatment plan in response readings [29]. Perceived importance of self-care was recorded using a Likert scale. In addition, two open questions were used to assess comprehension of previous advice on diet and exercise.

The questionnaire was pilot tested. Three people in each of the following groups reviewed the questionnaire independently for face and content validity; they were diabetologists, diabetes clinical nurse specialists, dieticians and adults with diabetes. The panels considered that the questionnaire had good face validity and the contents of the questionnaire were appropriate. Some minor suggestions were given to improve clarity. For example, 'gardening means digging and mowing the lawn and not watering pots or plants'. The overall Cronbach's alpha reading was 0.71 with individual sections ranging from 0.69 to 0.86 (Table 1).

Table 1
Internal consistency reliability results of the five sections

Number	Category of sections table	Cronbach's alpa
1	Diabetes knowledge	0.86
2	Dietary self-care	0.76
3	Medication intake practices	0.69
4	Physical activity self-care	0.71
5	Self-monitoring of blood glucose practices	0.70
	Total score	0.71

2.3. Procedure

After gaining informed consent, the investigator read the questionnaire to the subjects and recorded their responses. Actual sizes of spoons, bowls, plates and photos of fruits and food servings were used to enhance dietary recall and improve reliability. To ensure consistency, the investigator converted the subjects' reported food intake to appropriate serving sizes and recorded the frequency of consumption after checking this with the subjects. A visual analogue scale and samples of oral diabetic medications and insulin were used to enhance physical activity and medication recall, respectively.

2.4. Statistical analysis

Data were analysed using descriptive statistics. Pearson's or Spearman's rho correlation coefficient was used to examine the relationship between data, such as subjects' knowledge and