# Reality vs Illusion: Knowledge, Attitude and Practice among Diabetic Patients

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# ABSTRACT

**Introduction:** Type II diabetes mellitus (DM) is a chronic metabolic disorder associated with high morbidity and mortality among patients. The data from NHMS III has reported that the present prevalence of DM in Malaysia has exceeded the projected prevalence for the year 2025 as estimated by the International Diabetes Federation.1 Assessment of knowledge, attitudes, and practices (KAP) is a crucial element of DM control.2 However, very few studies have focused on this area and there is paucity of KAP data among Malaysian diabetic patients.

**Objective:** This cross-sectional study aims to assess the Knowledge, Attitude and Practices (KAP) towards DM and the association between the patients' KAP and control of DM among patients with type II DM (T2DM).

**Method:** Diabetic patients were recruited using the convenient sampling method from an urban diabetes care centre managed by a non-government, non-profit organisation. KAP were assessed using a 25 item structured KAP questionnaire and control of DM was evaluated from the HbA1C and fasting blood glucose levels respectively.

**Result:** Seventy five patients with T2DM participated in this study. There was a strong association between knowledge and attitude as well as knowledge and practice (P<0.05). The mean ( $\pm$  standard deviation (SD) knowledge score was 11.85  $\pm$  2.45; attitude 3.36  $\pm$  1.29 and practice 4.39  $\pm$  1.36, with the maximum possible scores for knowledge, attitude and practice being 14, 5 and 6 respectively. The scores suggested the presence of good KAP among our study participants. However, there was no correlation between the KAP and blood glucose control, based on patients' fasting blood glucose and HbA1c results with 85.7% of the participants' having a unsatisfactory HbA1C value of  $\geq$ 6.5% and 69% of participants' had fasting blood glucose of >7mmol/l.

**Conclusion:** Our data suggests that factors beyond knowledge and attitude contribute to disease management. The plausible factors could be poor self-management, lack of motivation, inadequate social support or lack of resources that are necessary for sustained life style modification behaviour. A patient/self-empowerment approach to diabetes care may enhance the efficiency of DM prevention and control programs in countries experiencing DM as a major public health problem.

Keywords: Knowledge, Attitude, Practices, Diabetes Mellitus, Malaysia

# Introduction

Type II diabetes mellitus (DM) is a chronic metabolic disorder associated with high morbidity and mortality among patients <sup>1,2</sup>. Today, with a global prevalence of more than 138 million people, it is projected that the number of diabetic patients would continue to increase, making type II DM a pandemic <sup>3, 4</sup>. As of 2010, about 3.4 million people were affected by DM in Malaysia <sup>5</sup>. Data from the Malaysian National Health and Morbidity Survey (NHMS) III has indicated that the current prevalence of diabetes in Malaysia has far exceeded the projected prevalence for year 2025 as estimated by the IDF <sup>6</sup>.

Plausible reasons for the steady increase in the prevalence of DM in Asian countries may include poor lifestyle, rapid westernization, lack of knowledge and unsatisfactory attitude and practices towards DM among the general population and diabetic patients. Moreover, there also exists an apparent gap between knowledge and the attitude towards diabetes among diabetes patients<sup>1</sup>. A recent study involving 524 diabetic and non-diabetic subjects in Turkey reported an unsatisfactory level of knowledge about the disease<sup>7</sup>. However, as reported by Upadhyay DK et al<sup>1</sup>, the attitude of patients towards diabetes is modifiable. Glycaemic control and quality of life among diabetic patients can be improved with intensive diabetes education and proper implementation of awareness programmes<sup>1, 8</sup>.

Knowledge about diabetes mellitus, appropriate attitude and practices are vital to reduce the incidence and morbidity associated with DM <sup>9, 10</sup>. However, very few studies have focused on this area and there is paucity of the knowledge, attitude and practices (KAP) data among Malaysian diabetic patients. Our study aims to assess the KAP towards DM and the relationship between KAP and the actual disease control among type 2 diabetic patients in an urban health care facility.

# **Material and Method**

#### Participant recruitment

This cross sectional study was conducted as part of a community based program (CBP) for year 2 medical students between May and August 2011 in an urban diabetes care centre after approval by the CBP ethics committee. The diabetes care centre is a leading non-profit organisation in Malaysia that provides comprehensive preventive measures and disease management to diabetic patients. All the T2DM patients visiting the diabetes centre during this period were identified using the convenient sampling method and enrolled in this study. Participants who did not consent to participate in the project or with intellectual impairment were excluded.

#### Questionnaire design

The KAP questionnaire was adapted from P & T Journal, Medimedia USA, Inc, which was developed by Subish et al. The questionnaire has been used in previous KAP studies among diabetics and has proven to be reliable <sup>11</sup>. The self-administered questionnaire had a total of 25 questions (knowledge-14, attitude-5, and practice-6) and each correct answer was given a score of 'one' and the wrong answer was given a score of 'zero'. The questionnaire was prepared in English and later translated to Mandarin and Bahasa Malaysia. A small pilot test was carried out in a sample group of 8 participants to assess the appropriateness and clarity of the questionnaire.

To assess the relationship between KAP towards DM and the actual disease control, most recent  $(4 \pm 2 \text{ weeks})$  levels of HbA1c and fasting blood glucose were obtained from the patient records. HbA1C > 6.5% and fasting blood glucose levels > 7.0 mmol/L were considered to have poor control of DM.

#### Statistical analysis

Data was analysed using the Statistical Package for Social Studies, version 18. The overall scores for knowledge, attitude and practice questions (maximum marks of 14, 5 and 6 respectively) and subscale scores were converted into percentages. The chi-square test was used to determine the relationship between KAP and t-test was used to assess the association between KAP and diabetes control. The level of statistical significance was set at p < 0.05.

## Results

#### **Demographics**

A total of 75 patients were enrolled in the study of which 47 (62.7%) were male participants and 28 (37.3%) were female participants. The greatest number of patients were in the age group of 60-69 years (32.0%) followed by 50-59 years (24.0%), 70-79 years (21.3%), 40-49 years (17.3%) and 30-39 years (5.3%). The mean  $\pm$  SD age of the patients was 59.2  $\pm$  11.6 years. Almost 75% of the participants had completed at least secondary education.

#### Response to Knowledge, Attitude and Practice Questions

The participants' knowledge was assessed based on their understanding towards DM, which included the causes, risk factors, symptoms, complications and treatment options. Participants

were specifically asked to identify the important elements of the lifestyle modifications necessary for diabetes management based on options given (Table 1). Participants were considered to have answered the questions correctly if they adhered to the recommended guidelines. Most of the questions were answered correctly by the participants, indicating a relatively good overall knowledge towards the disease. However, more than half of the participants were not aware of the major causes of diabetes, the effects of diabetes to their blood pressure and the purpose/importance of doing urine tests. Furthermore, 72% of the participants had uncertainties with regards to components of a well-balanced diet (Figure 1).

Less than 45% of the patients admitted to regular exercise and only about 50% adhered to the recommended dietary guidelines. Our study participants seemed to underestimate the importance of checking their blood sugar regularly though 86% of the diabetics regarded regular physician visits are important in the management of DM (Figure 1). A significant relationship was observed between Knowledge and Attitude (P=0.003) and between Knowledge and Practices (P=0.015) suggesting that most participants had good knowledge associated with good attitude and practices accordingly (Table 2).

#### Relation between KAP and control of diabetes

Though the KAP scores were satisfactory among our participants interestingly HbA1c and fasting blood glucose levels were far from the satisfactory range. The HbA1c levels were higher than the recommended level of 6.5% ( $7.9\% \pm 1.1\%$ ) and the fasting blood glucose levels were > 7.0 ( $12.1 \pm 4.7$ ) mmol/L as shown in Table 3. There was a significant negative correlation between the KAP scores and HbA1C levels (r=-0.79; P<0.001). The control of DM was also significantly poor (P<0.001) in 86% of our study population irrespective of satisfactory KAP scores.

## Discussion

Our study has two important findings: (a) diabetic patients possess adequate knowledge and have positive attitude towards their condition and (b) there is no relation between the KAP and actual control of DM.

Studies have been conducted in the past exploring the KAP towards DM. A recent study conducted among the diabetic patients of Western Nepal reported poor KAP scores <sup>1</sup> and the plausible factors could be lack of awareness, unavailability of information and literacy level of the study population. Another recent study involving young (31-40 years) diabetic Saudi women also reported poor KAP scores <sup>8</sup>. The authors of the previous reports concluded that implementation of adequate awareness programs may enhance the KAP which in turn would improve the control of DM.

In Malaysia, Ranjini et al reported that diabetic patients in a primary care center had good knowledge and better attitude towards the care of their own disease <sup>12</sup>. It was not reported whether the knowledge and attitude translated into practices as recommended by the management guidelines. They also did not measure the actual control of DM in their study

population. Another study by Wong et al reported significant suboptimal care of diabetes in Malaysian primary care center where 38% of diabetics achieved good glycaemic control <sup>13</sup>. However, the authors of the study did not comment on the KAP towards DM in their study participants.

Our study explored the relation between knowledge and attitude and knowledge and practices as reported by the study participants and compared it with actual glycaemic control of the diabetics. It is a popular assumption that good KAP would equate to adequate control of DM. However, it is clear from our report that though a positive relationship exists between the 3 parameters (KAP), it may not be related to reality. It is possible that these patients had the desire to control DM but lacked the will to do so. In our study 56% of the subjects were between 50-69 years of age and being closer to retirement or already retired, they may have different priorities or lack of self-interest. There may also be lack of motivation, social support or possibly poor compliance to medications due to financial difficulties. Older patients may need frequent follow-ups and closer monitoring along with motivation and counselling stressing the importance of life-style modifications and self-management.

Most patients in our study reported to have checked their blood glucose levels only during their scheduled consultation with the doctor every three months. The lack of frequent self-monitoring of glucose levels maybe one of the factors responsible for poor glycaemic control among the study participants. Self- monitoring of blood glucose aims to collect information of blood glucose level on a daily or regular basis to allow for timely and prompt high glucose level identification, thus allowing measures to be taken to ensure adequate blood glucose control. The U.K. Prospective Diabetes Study <sup>14</sup> showed that each 1% reduction in HbA1c was associated with a 37% decrease in risk for microvascular complications and a 21% decrease in risk for any end point or death related to diabetes. Besides that, non-randomized controlled trials <sup>15</sup> also found an improvement in HbA1c levels as a result of monitoring at least daily compared with less frequent monitoring. A significant decrease in HbA1c levels in the patients with a poor glycemic control was observed in patients who practise self- monitoring of blood glucose <sup>16</sup>. Apart from that, a systematic review by Welschen et al <sup>17</sup> concluded that diabetes patients might perceive better self-efficacy in disease management with self-monitoring of blood glucose, and would have a better understanding about the possible factors that affect diabetes management. Moreover, self-monitoring of blood glucose might also improve medication adherence and motivate patients to make necessary lifestyle changes.

Diabetes management requires more than good KAP and medication adherence. Patients must be engaged in their care and committed to making necessary lifestyle modifications. However, lack of social support, particularly from friends and family, could be a barrier to self-management. Better long-term disease management, health outcomes, and glucose control has been reported with high levels of social support <sup>18,19</sup>. Physical activity is another vital factor that has been linked to numerous metabolic improvements and lower overall mortality <sup>20</sup>. Despite that, people with diabetes often find it difficult to initiate and sustain physical activities in their daily lives. In our study, less than 50% of the study participants reported to exercise regularly. Adaptation skills are vital to combat this life-changing chronic disease. Initiation and sustaining motivation towards lifestyle modification could be addressed by physicians <sup>21</sup> while family members and

peers can provide assistance by monitoring patients' progress in behaviour change and accommodate patients' dietary needs and lifestyle changes <sup>22</sup>.

In conclusion, there may not be a direct relation between KAP and the actual glycaemic control of DM. Collaborative efforts between patients and health care professionals along with good social support are vital for patient empowerment which would enable them to have a better understanding and self-management of their illness.

This study is limited by the small sample size and the KAP data is based on a self-reported questionnaire.

## Conclusion

Factors beyond knowledge and attitude contribute to disease management. Plausible factors could be poor self-management, lack of motivation, inadequate social support or lack of resources that are necessary for sustained life style modification or behaviour change. A patient/self-empowerment approach to diabetes care may enhance the efficiency of DM prevention and control programs in countries that experience DM as a major public health problem.

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Conflict of Interest: None declared.

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Table 1: 25 item KAP questionnaire

	Knowledge questions						
1.	Diabetes is a condition in which the body contains						
2.	The major causes of diabetes are hereditary and obesity						
3.	The symptoms of diabetes are frequent urination, increased thirst and hunger						
4.	Diabetes, if not treated, will cause heart disease.						
5.	The most accurate method of monitoring diabetes is						
6.	In a diabetic patient, high blood pressure can worsen the disease.						
7.	A diabetic patient should measure his or her blood pressure						
8.	The lifestyle modification required for diabetic patients is						
9.	A diabetic patient should have his or her eyes checked every year.						
10.	Regular urine tests will help in knowing the amount of proteins in your urine.						
11.	The important factor that helps in controlling blood sugar is						
12.	A regular exercise regimen will help in glucose control						
13.	A well-balanced diet include						
14.	Treatment of diabetes comprises of						
	Attitude questions						
1.	Do you exercise regularly?						
2.	Are you following a controlled and planned diet?						
3.	Do you think missing doses of your diabetic medication will have a negative effect on your disease control?						
4.	Are you aware of your blood sugar levels fall below normal when you are taking drugs?						
5.	Do you think you should keep in touch with your physician?						
	Practice questions						
1.	When your blood pressure was last checked?						
2.	When was your last eye examination?						
3.	When was your last urine examination?						
4.	When was your last visit to your physician?						
5.	When was your blood sugars last checked?						
6.	When was your lipids last checked?						

		Attitude range scores		Total	Practice range scores		Total
		0-2 (%)	3-5 (%)	Total	0-3 (%)	4-6 (%)	Total
Knowledge	0-7 (%)	5.3	4.0	9.3	5.3	4.0	9.3
range scores	8-14 (%)	12.0	78.7	90.7	16.0	74.7	90.7
Total number of patients		13	62	75	7	68	75
P value		0.003		0.015			

Table 2: Relationship between knowledge and attitude and knowledge and practice

Table 3: HbA1c and Fasting blood glucose results of study participants

	HbA1c Results (%)		Fasting Blood Glucose (mmol/L)		
	Poor (>6.5)	Good (≤6.5)	Poor (>7.0)	Good (≤7.0)	
Percentage %	85.7	14.3	69.2	30.8	
P-value	0.007		0.469		



Figure 1: Percentage of participants answering correctly (Knowledge–14; Attitude–5; Practice – 6)