

## **Knowledge and Attitude on Diabetes Among Public In Kota Bharu Kelantan, Malaysia**

### **Author's Names and Affiliations:**

Mohd Nadzri Mohd Najib  
Ahmad Fauzi Dali  
Azwandi Ahmad  
Dr. Suraya Sulaiman  
Siti Normiyah Hussin  
Nur 'Ainun Mokhtar

Faculty of Pharmacy  
Universiti Teknologi MARA(UiTM)Pulau Pinang  
Kampus Bertam  
Persiaran Pendidikan Bertam Perdana  
13200 Kepala Batas, Pulau Pinang, Malaysia

### **Corresponding Author:**

Mohd Nadzri Mohd Najib  
Tel. Number: +60104309768  
Office: +6045623581  
Email: mohdna2857@ppinang.uitm.edu.my  
Address: Faculty of Pharmacy  
Universiti Teknologi MARA(UiTM)Pulau Pinang,  
Kampus Bertam,  
Persiaran Pendidikan Bertam Perdana,  
13200 Kepala Batas, Pulau Pinang, Malaysia.

### **Sponsoring Information:**

None.

## KNOWLEDGE AND ATTITUDE ON DIABETES AMONG PUBLIC IN KOTA BHARU KELANTAN, MALAYSIA

*Mohd Nadzri Mohd Najib  
Ahmad Fauzi Dali  
Azwandi Ahmad  
Suraya Sulaiman  
Siti Normiyah Hussin  
Nur 'Ainun Mokhtar  
Faculty of Pharmacy  
Universiti Teknologi MARA(UiTM), Malaysia*

### ABSTRACT

#### **Background:**

Diabetes is a common health problem among Malaysians as the statistics showed that the country has been listed among those with high number of diabetic patients in the population. While the Ministry of Health Malaysia is actively playing their roles in preventing the disease, there is still a continuous increase in the number of new diabetics each year. Diabcare Malaysia 2008 study showed deteriorating glycaemic control of the diabetic patient and poor adherence to diet, exercise, and self monitoring of blood glucose (Mafauzy; 2011). As diabetes may causes a lot of health complications, preventing the disease seem very crucial and practical in the long run (Mustaffa, 2004).

**Objective:** To evaluate the level of diabetes awareness in central region of Kota Bharu, Kelantan, and to identify factors that influence this awareness.

**Methods:** A total of 150 respondents were interviewed through a predesigned questionnaire. Verbal consent was taken before administering the questionnaire. The following questions were asked in the questionnaire: name, age, gender, address, educational status and attitude towards diabetes awareness. Chi-square test was employed for association analysis using SPSS version 16.

**Results:** Out of 150 subjects, 49.33% were male and the educational level of the study population was high, with 54.67% of the having diploma and degree level. The knowledge on diabetes was high (79.33%) and majority of the knowledgeable respondents (24.00%) were aged between 21 - 30 years. There was a significant association between high knowledge on diabetes with level of educational background ( $p < 0.01$ ). Most of respondents (66.0%) showed good attitude toward diabetes awareness. About 33.30% stated that they never check for blood glucose level due to busy with work. Significant associations were found between good attitude toward diabetes with education level. ( $p < 0.01$ ). and with employment status ( $p < 0.01$ ).

**Conclusions:** Study findings indicate that individuals with high educational level, currently employed status and aged between 21 - 30 years were more likely to have high level of knowledge about the disease and good attitude toward diabetes awareness.

**Keywords:** diabetes, Kelantan, factors, knowledge, attitude

## Introduction

WHO defines diabetes as a chronic disorder that transpires when there is not enough insulin being made, or when the body cannot efficiently utilize the insulin it make. The word "diabetes mellitus" describes a metabolic disorder of multiple causes, signified by chronic hyperglycaemia due to flaws in insulin secretion, insulin action, or both, thus causing problems in the metabolism of carbohydrate, fat and protein. The effects of diabetes mellitus include long-term damage, dysfunction and organ failures (WHO 1999).

It has been widely accepted for quite some time that sugar does not play a detrimental role in diabetes incidence (Howard, 2002; Fesken, 1990; Marshall, 1994) and the relationship between sugar consumption and diabetes (especially type II diabetes) was solely in relation to weight gain (Janket, 2003), but new research showed that sugar intake may also be directly linked to diabetes.

Excessive sugar intake may be a principal and independent cause of rising diabetes rates (Lustig *et al.*, 2012) and Kelantan, a state known for the fondness of its people towards all things sweet, has consequently, in 2011, recorded the highest number of diabetic patients as compared to other states throughout Malaysia. It is estimated that 20 out of 100 the state residence age 19 and above is likely to be diagnosed with diabetes.

The statistics indicated is in line with Basu *et al.* (2013) who has found that for every increase of 150 kcal/ person/ day in sugar availability, contributes to the increased diabetes prevalence by 1.1%. The research concluded that diabetes rates increased when a population is exposed to surplus of sugar longer, and it decreased when sugar availability diminished. In addition to the fact that Malaysia is a sugar-producing country, basically highlights that Malaysians would always be in constant excess of sugar availability. It has been reported that there has been an alarming increment of diabetic cases from 11% in 2006 to 15.2% in 2011 (Utusan, 2012). Therefore, it is far more important to educate the people of this country of proper sugar intake or consumption.

Diabetes develops and affects in silence, and victim of the illness may only become aware once life-threatening complication appears. Thus, it is important to have a good attitude towards diabetes awareness especially on the common signs and symptoms of diabetes, which are; constant tiredness, excessive thirst, frequent urination, especially at night, unexplained weight loss, blurred vision, skin infections and itching in the genital areas, slow healing of cuts and wounds, and numbness or burning sensations in the limbs (NADI, 2009) and frequent blood glucose monitoring.

Hence, the assessment of public knowledge level pertaining diabetes in general is crucial in order to improve the current circumstances that plaguing the people of Kelantan. This paper discusses the result of a cross-sectional survey conducted to evaluate the knowledge and attitude diabetes issues

among the general public of a district in Kelantan, Kota Bharu. It will act as a pilot study to give a brief representation on the status of knowledge among the general public of Kelantan.

## Methods

This descriptive cross-sectional study was carried out in Kota Bharu area which is a capital city of Kelantan. A total of 150 respondents were interviewed through a predesigned questionnaire. Verbal consent was taken before administering the questionnaire. Confidentiality of the respondents was ensured. All respondents were interviewed, irrespective of their health status. If the respondents could not understand the questions due to language problems, interview was carried out in the language of the patient. The following questions were asked in the questionnaire: name, age, gender, address, educational status and attitude towards diabetes awareness. If he could tell five out of six questions from the following list of knowledge, it was considered a positive answer. For attitude towards diabetes awareness again seven out of eight of the following lists were considered a positive response (glucose level).

Data was analyzed using Statistical Package for Social Sciences 16 (SPSS, Inc., Chicago, IL, USA). Chi-square test was employed to look for association of two key aspects of knowledge with education and age. For attitude, Chi-square test was employed to look for association of two key aspects of employment and education level. Results were recorded as frequencies.

## Results

A total of 150 subjects were interviewed at random from the general population. Of the 150 subject, 49.33% were male and 50.67% were female. The age ranged from 18 – 65 years. The educational level of the study population was high with 54.67% of the having diploma and degree level and 2.67% have higher degree level. The demographic characteristics of the respondents are listed in Table 1.

Table 1: Demographic of respondents

Characteristics	Percentage (%)
Gender	
Male	49.33
Female	50.67
Age (Years)	
<20 years	20.67
21 - 30 years	29.33
31 - 40 years	14.67
41 - 50 years	17.33
>50 years	18.00

Educational level	
None	3.33
Primary	16.00
Secondary	23.33
Tertiary	54.67
Others	2.67
Employment status	
Employed	59.33
Unemployed	40.67

Primary result of the survey indicates that about 79.33% of the total respondent is knowledgeable of the topic in question while 20.67% is not. The manner of which the result is obtained is explained in detail in the methodology section. Figure 1 shows the percentage of knowledgeable and not knowledgeable respondents on diabetes according to age respectively. It indicates that the highest number or percentage of knowledgeable respondent is from the group ageing from 21 - 30 years which is about 24.00%.

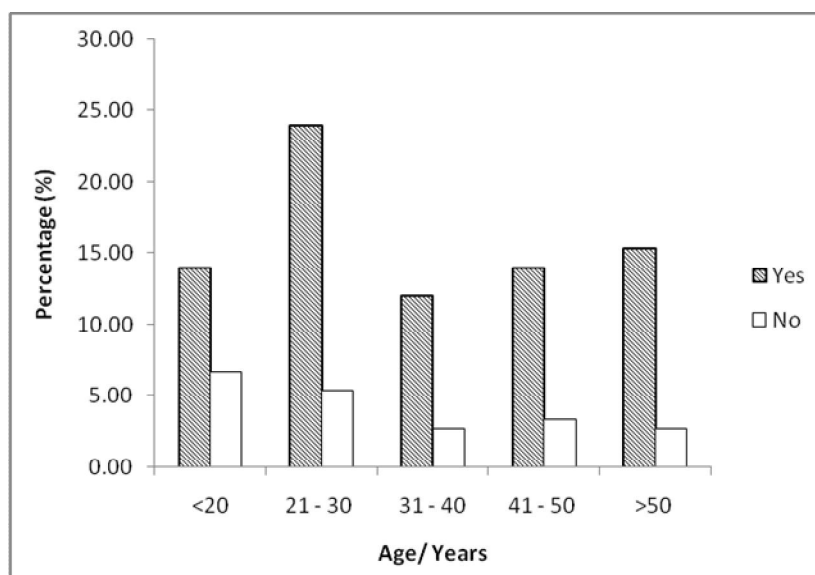


Figure 1: Percentage of knowledgeable and not knowledgeable respondents on diabetes according to age.

Figure 2 indicates that the highest percentage of knowledgeable respondent is from the group having Tertiary level education with 47.33%. The Chi-square test was statistically significant,  $\chi^2 (4, N = 119) = 131.714, p < 0.01$ , indicating that educational background were significantly greater function than others. As index of effect size, Cohen's was 1.03, which can be considered large.

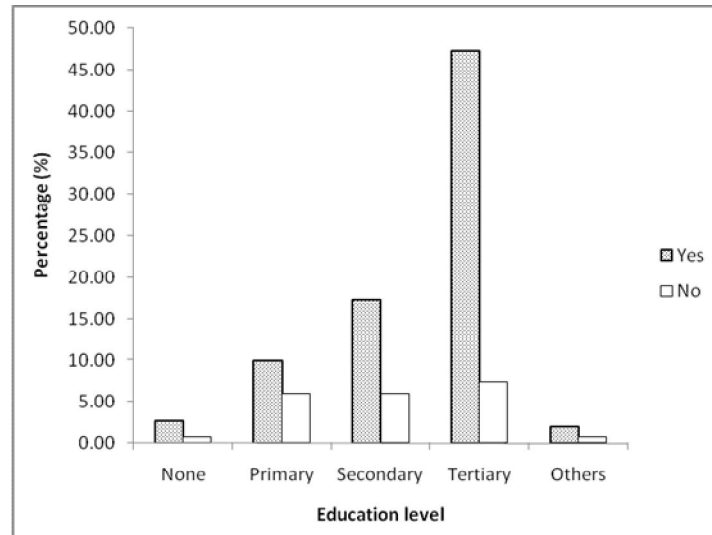


Figure 2: Percentage of knowledgeable and not knowledgeable respondents on diabetes according to education level.

In our study, about 66.0% of respondents showed good attitude toward diabetes awareness while 34.0% does not. An essential question from our survey that reflects good attitude toward diabetes awareness was blood glucose monitoring. Of those who never check blood glucose (thus having poor attitude toward diabetes awareness) indicates that most (33.30%) are busy with work, while others are either has transportation problem (21.00%), trust issues (13.7%), or just plain ignorant (25.5%). Of the respondents that show good attitude towards diabetes awareness (Figure 3), those having Tertiary level education show the highest percentage with 40.00%. Chi-square test was statistically significant,  $\chi^2 (4, N = 99) = 113.3, p < 0.01$ , indicating that education level were significantly greater function than others. As index of effect size, Cohen's was 1.07, which can be considered large.

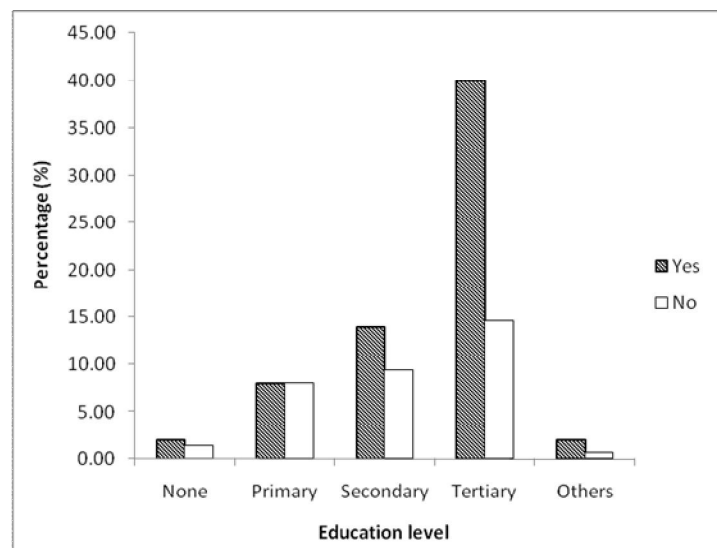


Figure 3: Percentage of respondents showing good attitude toward diabetes awareness according to education level.

Figure 4 shows the percentage of respondents showing good attitude toward diabetes awareness according to employment status. Chi-square test done was statistically significant,  $\chi^2 (2, N = 150) = 28.120, p < 0.01$ , indicating that employment status were significantly greater function than others. As index of effect size, Cohen's was 0.43, which can be considered medium.

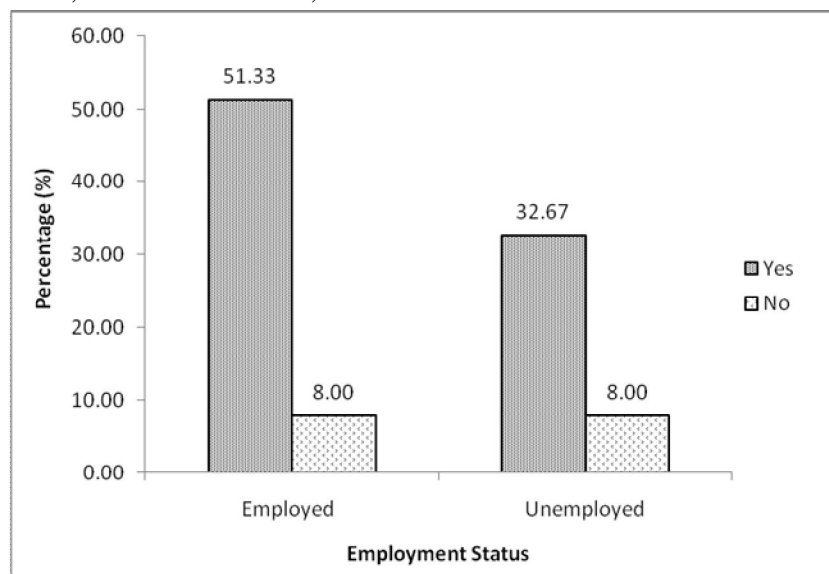


Figure 4: Percentage of respondents showing good attitude toward diabetes awareness according to employment status.

## Discussion

This is the first survey on the knowledge and attitude on diabetes awareness among public in Kota Bharu, Kelantan. Similarly, studies in other countries also focus on the depth of knowledge and attitude the public have about diabetes but some of the surveys also measured how they practice. However, this survey did not examine public's practice in preventing the disease.

Our most important finding from this investigation is that among the 150 randomly sampled general public in Kota Bharu, Kelantan, most of them (79.33%) were knowledgeable which indicates that this population was aware of the basic information of the disease. In this group of people, the knowledge of the disease were significantly associated with two key factors ; educational level and age This is similar to other countries, particularly those studies done in India, Saudi Arabia, and Kenya where the sample population had optimal knowledge on diabetes (Mohan et al., 2005; Maina et al., 2011; Mohieldein et al., 2011) The main reasons for the similarities are not clear but this could probably due to the increment in opportunities to receive higher standard of formal education in the respective countries. On top of that, young adult ; those aged between 21-30 years old are more exposed to health information via electronic medias as the internet can now be assessed in anywhere around the world. However, in a study done by Yun et al. (2007), showed that diabetic patients had higher level of knowledge on diabetes when compared between healthy adult in a population.

Although majority of the public (66%) had good attitudes toward diabetes, 33.30% of the respondents reported that they never check their blood glucose for diabetes screening due to busy with work. Even though, in Malaysia, diabetes screening is not a routine, it is possible for the healthcare authorities to look into feasibility of implementing continuous routine screening of high-risk individuals as a preventive step. In fact, this is very alarming to the country as the government has undertaken various campaigns on healthy lifestyle and on diabetes awareness over the years (Mustaffa, 2004). Other reasons that contribute to the failure for diabetes screening includes ignorance about the disease (25.5%), transportation problem (2.0%) and low level of trust (13.7%). In those with good attitude on diabetes, influencing factors such as educational level and current employment status were found to be significantly associated with their attribute. This is obvious from the fact that the good education and employment status would likely to improve your overall quality of life.

### **Limitation of the study**

There are potential limitations to this study. Due to the nature of cross-sectional design, the researchers are unable to directly determine cause-effect relationships such as “does lack of health facilities leads to low rates of checking the blood sugar?”. Apart from that, the findings of this survey cannot be generalized to all population of the country as the data were derived from only one state. Lastly, the survey is unable to explore the causes of problems and beliefs. Therefore, a qualitative study is recommended to further explore the public’s knowledge and attitude toward diabetes.

### **Conclusion**

The results of this study demonstrate that public in Kelantan are knowledgeable about the disease and have good attitude toward diabetes awareness. Individuals with high educational level, currently employed status and aged between 21 - 30 years were more likely to have these attributes. In conclusion, the study strongly implicates that educational level, employment status and age as the significant factors that influencing the knowledge and attitude toward the disease.

### **Acknowledgements**

The authors would like to thank the individuals who participated in this study, and Diploma in Pharmacy students at Universiti Teknologi MARA who interviewed the respondents and assisted the study to take place.



## References

- Al Shafae, M. A. , Al-Shukaili, S. (2008). Knowledge and perceptions of diabetes in a semi-urban Omani population. *BMC Public Health*. 8(249), 1-8.
- Barbara V. Howard and Judith Wylie-Rosett,(2002) A Statement for Healthcare Professionals From the Committee on Nutrition of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association. *Circulation*; 106: 523-527doi: 10.1161/01.CIR.0000019552.77778.04
- Basu S, Yoffe P, Hills N, Lustig RH (2013) The Relationship of Sugar to Population-Level Diabetes Prevalence: An Econometric Analysis of Repeated Cross-Sectional Data. *PLoS ONE* 8(2): e57873. doi:10.1371/journal.pone.0057873
- Chaudhary, F.M.D & Chaudhary, S.M.D. (2010). Awareness about diabetes risk factors & complications in diabetic patients : A cross-sectional study. *Nishtar Medical Journal*. Vol 2(3) July-September 2010 (pp. 84-88).
- Edith JM Feskens, Daan Kromhout (1990) Habitual Dietary Intake and Glucose Tolerance in Euglycaemic Men: The Zutphen Study. *Int. J. Epidemiol*. 19 (4):953-959.doi: 10.1093/ije/19.4.953
- Julie A Marshall, Sharon Hoag, MS, Susan Shetterly, MS and Richard F Hamman (1994) Dietary fat predicts conversion from impaired glucose tolerance to NIDDM: the San Luis Valley Diabetes Study. *Diabetes Care* 17: 50–56
- Mafauzy, M., Hussein, Z. & Chan, S.P. (2011). The status of diabetes control in Malaysia : Results of Diabcare 2008. *Medical Journal of Malaysia*. Vol.66(3) August 2011 (pp. 175-181).
- Maina, W.K., Ndegwa, Z.M (2011). Knowledge, attitude, and practices related to diabetes among community members in four provices in Kenya : a cross-sectional study. *African Journal of Diabetes Medicine*. Vol. 19 (1).
- Mohan, D., Raj, D. (2005). Awareness and knowledge of diabetes in Chennai – The Chennai Urban Rural Epidemiology Study [CURES – 9]. *Journal of the Association of Physician of India*. Vol. 3 (pp. 283-287).
- Mohieldien, A.H, Alzohairy, M.A & Hasan, M. (2011). Awareness of diabetes mellitus among Saudi non-diabetic population in Al Qassim region, Saudi Arabia. *Journal of Diabetes and Endocrinology*. Vol. 2(2) (pp. 14-19).
- Mustaffa, B.E. (2004). Diabetes Epidemic in Malaysia. *Medical Journal of Malaysia*. Vol.59(3) August 2004 (pp. 295-296).

NADI (2009). What is Diabetes?. <http://www.diabetesmalaysia.com.my/article.php?aid=4>

Robert H. Lustig, Laura A. Schmidt, Claire D. Brindis (2012) Public health: The toxic truth about sugar. *Nature* 482 (27–29) doi:10.1038/482027a

Sok-Ja Janket, DMD, MPH, JoAnn E. Manson, MD, DRPH, Howard Sesso, SCD, Julie E. Buring, SCD and Simin Liu, MD, SCD (April 2003) A Prospective Study of Sugar Intake and Risk of Type 2 Diabetes in Women. *Diabetes Care* vol. 26 no. 4 1008-1015 doi:10.2337/diacare.26.4.1008

Utusan (2012) Penghidap diabetes di Kelantan semakin meningkat [http://www.utusan.com.my/utusan/Dalam\\_Negeri/20121104/dn\\_22/Penghidap-diabetes-di-Kelantan-semakin-meningkat](http://www.utusan.com.my/utusan/Dalam_Negeri/20121104/dn_22/Penghidap-diabetes-di-Kelantan-semakin-meningkat)

Wee, H.L, Ho, H.K & Li, S.C. (2002). Public Awareness of Diabetes Mellitus in Singapore. *Singapore Medical Journal*. Vol. 43(3) (pp. 128 – 134).

WHO (1999). Diabetes Mellitus. <http://www.who.int/mediacentre/factsheets/fs138/en/>

Yun, L.S et. al (2007). A comparison of knowledge of diabetes mellitus between patients with diabetes and healthy adults: a survey from north Malaysia. *Patient Education Counseling*. December; 69(1-3) (pp. 47-54).