SOCIO-DEMOGRAPHIC PREDICTORS OF ADEQUATE HEALTH LITERACY AMONG TYPE 2 DIABETES MELLITUS PATIENTS ATTENDING TWO GOVERNMENT HEALTH CLINICS IN THE DISTRICT OF KUALA SELANGOR

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ABSTRACT

Background: This study aims to determine the socio-demographic predictors of adequate health literacy among Type 2 Diabetes Mellitus (T2DM) patients attending two government health clinics in the district of Kuala Selangor.

Methodology: A cross-sectional study using a validated self-administered questionnaire was performed with a total of 200 respondents with T2DM. The respondents were selected using systematic random sampling from a list of T2DM patients attending the two health clinics. The questionnaire consists of 2 sections on socio-demography characteristics and MY-TOFHLA. Significance level was set at p < 0.05. The predictors were then analysed using multiple logistic regression.

Results: The response rate was 86.9% and 85% of respondents had adequate health literacy. The odds of having adequate health literacy among those with secondary/tertiary education were 6 times higher compared to those with primary education [AOR = 5.990, 95% CI (1.301, 27.577), p = 0.022]. The odds of having adequate health literacy also increased by 5 times with 1 unit increase of household income [AOR = 4.836, 95% CI (1.152, 20.306), p = 0.031].

Conclusion: The prevalence of adequate health literacy was high among the T2DM patients in this study population. The predictors of adequate health literacy are level of education and household income.

Keywords: Health literacy, predictors, type 2 diabetes mellitus, sociodemographic
1.0 INTRODUCTION

1.1 Background

In 2000, the worldwide estimated number of adults aged 20 years and older with diabetes was 171 million and is estimated to reach 366 million by 2030 (1). Ten years later, the estimate rose to 285 million worldwide in 2010, and the same year's projections (2030) was increased to almost 440 million people (2). Based on the Diabetes Atlas, the European region currently has the highest number of people with diabetes at an estimated 48 million, followed by the Western Pacific region with an estimated 43 million sufferers. By 2025, however, the region with the largest number of people with diabetes is expected to shift to South-East Asia, with an estimated prevalence of 13.5% and around 145 million people involved (3). Singapore has a prevalence of 12.3% for diabetes mellitus and it is predicted to increase up to 15% in the year 2025 (4). Thailand on other hand, has a lower diabetes mellitus prevalence, which was estimated to be at 9.6% (5).

Malaysia seems to have the highest incidence of diabetes in the Western Pacific region. There are currently 2.6 million adults 18 years of age and older in Malaysia who have diabetes mellitus. In forecasting the prevalence of diabetes in Malaysia in 2030, the International Diabetes Federation quoted 13.3% (3), however, the prevalence of diabetes in Malaysia has risen faster than the forecast, being 11.6% in 2006 (6) and 15.2% in 2011 (7). Malays have the highest prevalence of type 2 diabetes mellitus (T2DM) (58.9 %), followed by the Chinese (21.4 %), Indians (15.3 %), other Malaysians (4.2 %) and non-Malaysians (0.2 %), based on the 2011 NHMS survey (7).

Adequate management of T2DM involves teamwork between health care providers and patients to foster effective self-care in many areas including adherence and handling of complicated medication schedules, execution of particularized dietary recommendations, promotion of physical activity and partaking in preventive care strategies (8). Health literacy can described as the exchange of complex health information between patients, providers, health organizations, and the public or the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions” (9). There are several socioeconomic factors through which health literacy impacts health status, such as income level, occupation, education, housing, and access to medical care (10).

A low level of health literacy is often associated with significant health consequences. For many patients, lack of literacy skills is a major obstacle to effective health care communication, resulting in low literacy being independently linked to poor health (10). Health literacy in diabetes is linked to knowledge on diabetes, self-efficacy, behavior of self-care, and glycaemic control (11). A study directly testing the link between general literacy and health discovered that low literacy (the ability to read, write and comprehend information at level of between fifth and eighth grades) was significantly related to poorer physical and psychosocial health status (12). Patients with low literacy skills were found to need more medical care than those with marginal literacy skills, were more likely to report poor health and were more likely to be hospitalized in the previous year than those with higher levels of literacy (13).
Consequently, a particular issue for a T2DM patient is inadequate health literacy. Many health education techniques have been engaged in Malaysia by the Ministry of Health (MOH). One of the MOH's strategies is to update and upgrade health educators’ (doctors, paramedics, nurses, and allied health workers) knowledge through ongoing training programs (14). Despite the existence of health education programs, materials and methods established by the MOH for diabetic patients, including the continued presence of diabetic educators in health clinics, due to the different level of health literacy, the efficacy of the efforts could be limited. Thus, despite these advancements and scientific breakthroughs to advance understanding of the pathology of diabetes mellitus and to develop new therapeutic approaches, the liability of diabetes continues to worsen and treatment results often remain inferior. (15).

Thus, this study was conducted to determine the socio-demographic predictors of adequate health literacy among T2DM patients in two government health clinics in the district of Kuala Selangor. The short version of TOFHLA (Test of Functional Health Literacy in Adults) was chosen as the instrument to use in this study. It is one of the frequently used valid and reliable tools in measuring health literacy on variety of populations (16).

2.0 MATERIALS AND METHODS

A cross-sectional study was conducted among T2DM patients aged 18 and older, attending two government health clinics in Kuala Selangor District (a district in Selangor State, Malaysia). For the sampling technique, systematic random sampling was used to search for potential participants from a list of eligible participants provided by both health clinics. Inclusion criteria was a diabetic patient age 18 and above and could understand the national language (Bahasa Melayu). Sample size was calculated using the formula of two proportions (17). The estimated sample size was 223. The data collection was carried out from September to November 2017 using self-administered questionnaire. The questionnaire consisted of two sections: socio-demographic questions and Malay version of the Short Test of Functional Health Literacy in Adults (S-TOFHLA, MY-TOFHLA). The questionnaire was adapted from a validated questionnaire from previous study, however for this study, it was pre-tested and revalidated. The Cronbach’s alpha value was α0.942.

Version 23.0 of the IBM Social Science Statistical Package (SPSS) was used to analyze the data collected and the level of significance was set at p<0.05. Chi-square test was used for categorical data to analyze associations and simple logistic regression was used for variables. Ethnicity, education level, occupation household income, diabetes knowledge and the level of physical activity were dichotomized into two groups for further analysis of predictors. Predictors was analyzed using multiple logistic regression where variables with p-value less than 0.25 in bivariate analysis were chosen (18).

Ethics approval was obtained from the Medical Research Ethics Committee (MREC) Ministry of Health Malaysia (MOH) (NMRR-17-146-33859 IIR) and Universiti Putra Malaysia (FPSK (MREC17) P025) Ethics Committee for Research Involving Human Subjects. The Selangor State Health Department and the Kuala Selangor District Health Office granted permission to use the facilities and identify potential subjects from both government health clinics.
3.0 RESULTS

A total of 200 respondents participated in this study, with the response rate of 86.9%. Table 1 illustrates the socio-demographic characteristics of the respondents. The respondents were predominantly Malay (88.0%). The majority of them were 61 years old and above (82.5%), female (59.0%), married (94.5%), had secondary education (53.0%), housewives (33.0%), and had household income of less than RM1000 per month (33.5%). Most of the respondents have adequate health literacy (85.0%). Table 2 shows that education level ($p = 0.015$) and household income ($p < 0.001$) were found to have significant associations with the level of health literacy. Table 3 shows that secondary/tertiary education and household income of RM1000 and above, are significant predictors of adequate health literacy.

4.0 DISCUSSION

This study revealed 85% of the respondents have adequate health literacy. However this result is based on using S-TOFHLA, MY-TOFHLA to measure the level of health literacy thus it is not comparable to other studies using different study instruments to measure health literacy such as Newest Vital Sign (NVS) tool (19, 20, 21 and 22) and Rapid Estimate of Adult Literacy in Medicine (REALM) (23). The S-TOFHLA, MY-TOFHLA was selected for this study since it is easier to understand and therefore, more appropriate to be used among rural populations as compared to tools such as the NVS. Furthermore, the NVS was known to be inappropriate and overestimates people with low health literacy specifically among rural Malaysian population due to its specificity (22). Thus the level of literacy in this study is also not comparable to the result reported in NHMS 2015 which stated the overall prevalence of adequate health literacy was only 6.6% with a figure of 2.3% for the rural population (19). This result is also inconsistent with the result obtained from another study using NVS to measure health literacy conducted among T2DM patients in Kajang, Malaysia, which showed only 14.2% of the respondents had adequate level of health literacy (20).

However, the result of this study is closer to a study done in Wichita, United States, which used S- TOFHLA, giving 100% respondents with adequate health literacy (24). On the other hand, the prevalence of adequate health literacy from this study is higher compared to the findings from a study conducted among diabetic patients in two primary care centres in California, United States of America, also using S-TOFHLA to measure health literacy, which was shown to be 37.7%, or 47.3% less compared to the finding of this study (10). This could be due to the fact that the S-TOFHLA, MY-TOFHLA used has 36 items measuring only the reading comprehension, while the study in United States using S-TOFHLA included the four numerical items along with 36 reading comprehension items (25,26). Apart from that, the majority of the respondents in this study had received proper education and the exclusion criteria used eliminates sampling illiterate respondents.

The findings reveal a significant association between the level of education and household income and the level of health literacy. This study's significant association between the level of education and the level of health literacy is consistent with a previous study in a health clinic in Kajang, Malaysia, among T2DM patients (20). The associative result was also consistent with many other U.S. studies (10,27). This study also shows that the level of education in this
study population is a crucial predictor of adequate health literacy among T2DM patients. Based on the outcome of this study, the odds of having adequate health literacy among those with Secondary / Tertiary education were 6 times higher than those with primary education. Secondary / Tertiary education therefore predicts a sufficient level of health literacy. This finding is consistent with other studies which reported that lower education is associated with the inability to understand medication labels and is higher among people with low education (28) (29).

In this study, the second important association was between household income and health literacy level. This is also consistent with other study results. Two systematic reviews have reported that adults above the poverty line have a higher level of health literacy compared to those living below the threshold (30,12). Another study using a French version health literacy tool also supported a significant association between household income and health literacy level (29). Household income among this study population was also found to be an important predictor of adequate health literacy. Respondents with household income of RM 1000 and above were four times more likely to have adequate health literacy than those with income lower than RM 1000. This is also supported by a specific national study on predictive models of health literacy that has been conducted in the United States of America, which reported that income is one of the health literacy proxies (31). This might be because people with higher incomes can afford better education and information quality.

5.0 CONCLUSION AND RECOMENDATION

Based on this study, it can be concluded that there is adequate health literacy in most T2DM patients attending two government health clinics in Kuala Selangor district. It was found that education level and household income were significantly linked to the degree of health literacy and are significant predictors of adequate health literacy among the study population. It is recommended that health clinics enhance their focus on patients with lower education and those with lower income in advocating the best way to manage their T2DM for better glycemic control and lower the risk of complications of diabetes.

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