A Survey of Knowledge on Diabetes in the Central Region of Thailand

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ABSTRACT

Objectives: The objectives of this study were to evaluate the level of knowledge of diabetes among the Thai general population, identify areas of deficiency for targeted health education effort, and identify respondent characteristics that may be associated with knowledge of diabetes.

Methods: A survey involving 1000 respondents (age ≥ 15 years) was conducted in the central region of Thailand. A 42-item pre-tested questionnaire to assess general and specific knowledge of diabetes (e.g., risk factors, symptoms, treatment, etc.) was administered. Scores of <50%, ≥50% to <80%, and ≥80% were classified as “poor,” “fair,” and “good,” respectively, according to expert consensus.

Results: Mean age of respondents was 33.8 years (SD 13.4), with 57.5% being female. Mean diabetes knowledge score was fair: 25.02 of 42 (59.6%), SD 8.35 (19.9%). Respondents performed best in the risk factor section: mean (%) score was 2.88 of 4 (72%), SD 1.11 (27.8%); and worst in the section on diabetes in women: mean (%) score was 0.82 of 3 (27.3%), SD 0.96 (32.0%). In multiple linear regression analyses, education level, older age, own self having diabetes, and having a family member/relative/friend with diabetes were significantly associated with knowledge of diabetes.

Conclusions: Knowledge of diabetes among the Thai respondents was fair. Areas of deficiency and factors associated with knowledge of diabetes were identified. Our findings would be useful in informing targeted health education programs.

Keywords: awareness, diabetes, knowledge, survey.

Introduction

With its dramatically increasing global prevalence and the high clinical and social costs associated with it, diabetes mellitus is one of the major public health concerns worldwide [1]. Diabetes is also one of the most prevalent chronic diseases in Thailand, with approximately 1.5 million and 2.7 million sufferers estimated in 2000 and 2030, respectively [2]. Diabetes was the fourth leading cause of death, accounting for 5% of all causes of death in Thailand in 2002 [3]. Undeniably, public health education is a key factor for the early diagnosis of diabetes [4]. Increasing the level of public knowledge of diabetes could contribute to an improved overall health behavior of the society and reduce the risk of developing diabetes [5].

Therefore, information on the level of public knowledge of diabetes will be useful for planning an effective educational program. To the best of our knowledge, there is no published study of the level of knowledge of diabetes in the Thai public. Thus, the objectives of this study were to 1) evaluate the level of knowledge of diabetes among the population in the central region of Thailand; 2) identify areas of knowledge deficiency requiring additional education effort; and 3) evaluate whether factors such as sex, older age, education level, own self having diabetes, and having family member/relative/friend with diabetes are associated with knowledge of diabetes.

Methods

Study Design

This was a cross-sectional survey conducted in the central region of Thailand during mid-June to July 2007. The study areas were Bangkok (the capital) and four other provinces. Every effort was made to ensure that the sample would be as representative of the population of the central region as possible. For details on the selection of the study sites, see A Survey of Knowledge on Diabetes in the Central Region of Thailand Value in Health Supporting Information, part 1 at: http://www.ispor.org/Publications/value/ViHsupplementary/ViH12s3_Lin.asp. Respondents may complete the survey by self-administration or interview, thus allowing the inclusion of respondents who were elderly, with visual problems, and/or illiterate, groups that were more likely to have poorer knowledge of diabetes. The interviewers are comprised of one of the investigators (TP), four senior pharmacy students from Silpakorn University, five pharmacists, and five temporary staffs. To minimize interviewer biases, interviewers were well trained in interview techniques.

Survey Instrument

The questionnaire comprised seven sections: sociodemographics (9 items), general knowledge of diabetes (8 items), risk factors (4 items), symptoms and complications (11 items), treatment and management (11 items), monitoring (5 items), and diabetes in women (3 items). The response options were “Yes,” “No,” and “Don’t know.” The “Don’t know” option was included to reduce the amount of guess work from respondents. The respondents were awarded one point for each correct response, and zero for each wrong or “Don’t know” response. As the first section was not scored, the maximum possible score was 42. Percentage scores were converted from raw scores using the following formula: (raw score x 100)/42.

The questionnaire used in the survey was translated from a published English questionnaire previously used in Singapore, cross-culturally adapted, and pilot tested [6]. The interpretation of scores was performed by a Delphi panel of experts and defined as poor (<50%), fair (≥50–<80%), and good (≥80%). For details, see A Survey of Knowledge on Diabetes in the Central Region of
Thailand Value in Health Supporting Information, part II at: http://www.ispor.org/Publications/value/ViHsupplementary/ViH12s3_Lin.asp.

The hypotheses tested in the current study were the following:

1. Respondents with diabetes would have better knowledge of diabetes than respondents without diabetes [7,8], given that respondents with diabetes would have been exposed to the actual management of diabetes and that they are likely to have received further patient education as part of their disease management.

2. Education level would be associated with knowledge of diabetes [4,5,7–10], based on existing literature suggesting that low literacy is associated with poor disease outcome [11].

3. Respondents who have a family member/relative/friend with diabetes would have higher level of knowledge of diabetes [5,8,9], for reasons similar to hypothesis no. 1.

4. Older age would be negatively correlated with knowledge of diabetes [4,9,10], based on existing literature suggesting that older individuals are disadvantaged in several ways [12].

5. Sex would be associated with knowledge of diabetes [4,8,10], with females having poorer knowledge, based on existing literature suggesting sex disparity in several areas in health care [13].

Statistical Analyses

All data were analyzed using Microsoft Excel (Microsoft Corporation, Redmond, WA) and SPSS version 15.0 (SPSS Inc., Chicago, IL). Random checks were performed to detect errors in data entry. Student’s t test, one-way analysis of variance, and multiple linear regression analyses were applied as appropriate. The significance level was set at 5%, unless otherwise stated.

Results

Characteristics of Study Respondents

A total of 1000 respondents were recruited. The participation rate was about one in every five people approached in Bangkok, and one in every three people approached in other provinces. Most respondents completed the survey by self-administration (81%). Mean age of respondents who preferred self-administration (29.88 years, SD 10.17) was significantly lower than those who preferred interview mode (30.57 years, SD 12.77, P < 0.0001). Likewise, mean number of years of education between the two groups was significantly different, with higher number of years in the self-administration group (13.46 years, SD 3.06 vs. 7.06 years, SD 3.69, P < 0.0001). Interview effect was investigated using multiple linear regression analysis and was found to be insignificant. There were statistically significant differences in overall scores between respondents who completed the survey by self-administration (25.34 [60.3%], SD 8.05 [19.2%]) and by interview (23.68 [56.4%], SD 9.43 [22.3%], P = 0.026). As excluding those subjects who completed the survey by interview made little difference to the findings, data were combined for all respondents.

In the pooled sample, mean age of respondents was 33.8 years (SD 13.4) (ranged from 15 years to 85 years). Among the respondents, 3.6% had diabetes, with a mean disease duration of 7.8 years (SD 8), and more than half (57%) had a family member/relative/friend with diabetes. For details, see A Survey of Knowledge on Diabetes in the Central Region of Thailand Value in Health Supporting Information, part II at: http://www.ispor.org/Publications/value/ViHsupplementary/ViH12s3_Lin.asp.

Knowledge of Various Aspects of Diabetes

With a score range of 0 to 42, the mean (%) score of the respondents was 25.02 (59.6%) (SD 8.35 [19.9%]). According to the grading criteria established, 26.9%, 58.8%, and 14.3% of the respondents were considered to have “poor,” “fair,” and “good” knowledge of diabetes, respectively.

In the general knowledge of diabetes section, the mean score was less than 50% (3.8 out of 8 [47.5%], SD 2.03 [25.4%]). Although most respondents knew what diabetes is and that it is noncontagious, less than 50% of respondents (n = 494 of the 1000) realized that diabetes is curable. The respondents performed best in the risk factor section with a mean score of 2.88 out of 4 (72.0%) (SD 1.11 [27.8%]), and worst in the section on diabetes in women with a mean score of 0.82 out of 3 (27.3%) (SD 0.96 [32.0%]) (see A Survey of Knowledge on Diabetes in the Central Region of Thailand Value in Health Supporting Information, part IV at: http://www.ispor.org/Publications/value/ViHsupplementary/ViH12s3_Lin.asp). A good understanding of diabetes symptoms would allow the general public to detect the disease early. Slow healing of cuts and wounds, constant tiredness/taxi-time, and frequent urination were generally well recognized as symptoms of diabetes. Majority of the respondents however did not know that unexplained weight loss is also a symptom of diabetes. With regard to diabetes complications, although most of the respondents (74.8%) were aware that chronic ulcers could be a result of diabetes, fewer than half (44.2%) knew that nephropathy is also a complication of diabetes (see A Survey of Knowledge on Diabetes in the Central Region of Thailand Value in Health Supporting Information, part V at: http://www.ispor.org/Publications/value/ViHsupplementary/ViH12s3_Lin.asp).

Knowledge of treatment and management of diabetes was fair, with a mean score of 70% (7.69 out of 11, SD 2.61). Knowledge of diabetes monitoring was also fair, with a mean score of 3.46 out of 5 (69.2%) (SD 1.43 [28.6%]). Approximately 40% of the respondents did not know the need for renal function tests and regular eye checkup in diabetes monitoring. These need to be further emphasized as friends and family members of people with diabetes can help improve compliance with these regular tests that are useful in early identification and management of diabetes complications.

Factors Associated with Knowledge of Diabetes

As hypothesized, factors that were associated with knowledge of diabetes in univariate analyses were age, education level, working status, salary, having a family member/relative/friend with diabetes, own self having diabetes, and mode of survey administration (see A Survey of Knowledge on Diabetes in the Central Region of Thailand Value in Health Supporting Information, part VI at: http://www.ispor.org/Publications/value/ViHsupplementary/ViH12s3_Lin.asp). In multiple linear regression analyses, only age, education level, having a family member/relative/friend with diabetes, and own self having diabetes remained statistically significant in the final model (see A Survey of Knowledge on Diabetes in the Central Region of Thailand Value in Health Supporting Information, part VII at: http://www.ispor.org/Publications/value/ViHsupplementary/ViH12s3_Lin.asp).
Discussion

Knowledge of Various Aspects of Diabetes

In this study of 1000 Thai respondents, we sought to evaluate the level of knowledge of diabetes among the population in the central region of Thailand and found this to be fair (according to Delphi panel’s criteria). This suggests a need to further strengthen knowledge of diabetes among the general public.

We also sought to identify areas of knowledge deficiency to inform future educational effort. It was encouraging that respondents performed best in the risk factor section, as an understanding of the risk factors is likely to heighten awareness about the importance of prevention of diabetes. This was also consistent with the fact that public diabetes education programs in Thailand have traditionally focused on risk factors. Given that respondents performed poorly in other areas of the survey, it is timely to reevaluate the current focus and strategies of public diabetes education programs in Thailand. Our study suggests a need to increase awareness of the kidney-related complications of diabetes. Awareness of the complications of diabetes is important in at least two ways: 1) heighten the need for disease prevention and early diagnosis among the general public; and 2) heighten the need for disease control among individuals with diabetes. The issue of gestational diabetes is often neglected in public education effort, and this is reflected in the very low score obtained by respondents in the section on diabetes in women. As gestational diabetes is strongly associated with the risk of diabetes in future offspring [14], knowledge in this area needs to be strengthened.

Factors Associated with Knowledge of Diabetes

The current literature evaluating the relationship between sex and knowledge of diabetes yielded mixed findings, with a few reporting that sex was a determinant of knowledge of diabetes [4,8,10] whereas others did not [5,7]. In our study, sex was not associated with knowledge of diabetes.

The current literature evaluating the relationship between age and knowledge of diabetes similarly yielded mixed findings. In our study, respondents who were aged 45 years or older scored significantly higher than younger respondents. This was in agreement with several studies that found a positive relation between age and knowledge of diabetes [6,15]. Nevertheless, some studies found lower level of knowledge of diabetes in older people [4,9,10], and a number of studies revealed no association between age and knowledge of diabetes [5,7,8].

Study Strengths and Limitations

An important strength of this study lies in the use of expert consensus on the appropriate grading criteria of diabetes knowledge scores assessed with our questionnaire. In most published studies, researchers often concluded that the scores achieved were “acceptable/satisfactory” or “poor” without providing any criteria for their interpretations, with a score of 50% found to be the most commonly utilized (either explicitly or implicitly) cutoff [15–18]. In the few studies that do specify the criteria, the details of how those criteria were developed were not available [16,19]. For example, Kamel et al. [18] described the percentage of scores <50%, 50% to 75%, and >75% as “poor,” “satisfactory,” and “very good” knowledge level, respectively, without an explanation for the cutoff. To the best of our knowledge, only the study of He and Wharrad [9] described that a score of <60% was considered “inadequate knowledge,” and a score of >80% was considered “good knowledge” based on the Chinese education system. Hence, by defining a priori the grading criteria of knowledge of diabetes, our study findings are less subject to bias in the interpretation of scores. This study is also important in that we included both urban and rural regions of Thailand. Although this presented a logistical nightmare, we felt that this was important as it more accurately reflected the educational needs of the people in Thailand.

We are aware that there are limitations to this study. We have found that knowledge of diabetes in the central region of Thailand is generally fair. Nevertheless, this finding could have been biased by the relatively high proportion of respondents with bachelor or higher degrees. This sampling bias has occurred in spite of our best effort to recruit respondents from various places and at different times. Hence, a truly random sampling strategy should be considered for similar projects in the future to confirm our findings.

Another limitation of our study is that it was conducted only in the central region, thus limiting generalizability to other regions of the country. Nevertheless, the central region is the most populated region in Thailand and would represent the majority of Thais.

Conclusion

Knowledge of diabetes among the study population was fair (defined as 50–80%). Specific aspects of knowledge of diabetes that needed further strengthening and specific groups that are suitable for future targeted public education campaigns were identified. Such targeted public education programs would conceivably be more cost-effective than campaigns aimed at the masses.

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References