A comparison of knowledge of diabetes mellitus between patients with diabetes and healthy adults: A survey from north Malaysia

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Source

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Abstract

The purpose of this study was to assess and compare the knowledge of diabetes mellitus possessed by patients with diabetes and healthy adult volunteers in Penang, Malaysia. A cross-sectional study was conducted in. A 240 sample randomly selected (120 patients with diabetes mellitus and 120 healthy adults at a shopping complex participated in the survey. Data collection was done through face-to-face interviews. A30 items questionnaire facilitated data collection about diabetes mellitus. The results showed that patients with diabetes mellitus were significantly more knowledgeable than the healthy group on the following aspects: risk factors, symptoms, chronic complications, treatment and self-management, and monitoring parameters. Educational level was the best predictive factor for diabetes mellitus and public awareness. In conclusion, knowledge about diabetes mellitus should be improved among the general population. The study has key practice implications as it served as a baseline for the design of educational programmes for diabetics and a health promotion programme for the healthy population in general, and especially for those at high risk.

Introduction

Tang et al (2008), Mohieldein et al (2011) and Foma et al (2013) agree that diabetes mellitus is one of the diseases most commonly encountered by healthcare professionals. The disease remains to be an expanding global health crisis. The worldwide incidence of type 2 diabetes is projected to increase sharply from the 71 million in 2000 to 366 million by 2030. The greatest burden of this condition is felt in low and middle-income countries, and these nations account for about 80% of all cases of diabetes. It has been proven right that obtaining information about the level of awareness about diabetes in a population is the first step in formulating a prevention program for diabetes. An understanding of the level of public awareness of disease conditions is helpful for health educators to plan for future programmes. Some research findings indicate that patients may have better knowledge about the disease, which plays a great role in prevention of both complications and high prevalence rates (Foma et al, 2013), while others argue against (Farrel et al, 2006 quoted by Mashige et al, 2008). Malaysia, is part of the affected region, hence its researchers undertook the study under review to compare knowledge of diabetes mellitus between patients with diabetes and healthy adults.

Body

The authors aimed at comparing the knowledge of diabetes mellitus possessed by patients with the disease and healthy adult volunteers in Penang, Malaysia. This article is significant, considering that diabetes mellitus is a growing public health concern and its prevalence has intensified exponentially to pandemic levels. This was echoed by the International Diabetes Federation (IDF) 2010, which reported that the disease then affected over 300 million people worldwide and was expected to cost the global economy at least US $ 376 billion in 2010, or 11.6% of the total world healthcare expenditure. A further 344 million people are at risk of developing type 2 diabetes, which is the most

common form of the disease. If nothing is done to reverse the epidemic, the IDF predicts that by 2030, 438 million people will live with diabetes at a cost projected to exceed US $ 490 billion. The World Health Organisation (WHO) projected that diabetes' deaths will double between 2005 and 2030. With evidence supporting the benefits of adequate knowledge in the prevention of type 2 diabetes, knowledge about the disease, symptoms, risk factors, symptoms, complications, treatment, self-management and preventive measures, may be an important determinant of intention to modify health behaviours of diagnosed and healthy people (Morrison, Lowe &Collinst 2010).

After a detailed introduction highlighting the burden of type 2 diabetes pandemic, its socio-economic effects, the authors turned their attention to the methodology. To establish the probable difference between diabetics and healthy respondents, researchers used a cross-sectional design. A cross-sectional study gives general description of the scope of a problem; provides prevalence estimates; often based on population (or community) sample, not just those who sought care. The indication is useful in health service evaluation and planning. In cross-section studies, data are obtained at once, less expense and quicker than cohort because no follow-up. However, it was not clearly stated whether the research is quantitative or qualitative. Nevertheless, the large sample selected (120 patients and 120 healthy respondents) suggests the study was quantitative survey, which is appropriate. Quantitative research gathers data which can be processed statistically and represent a wide target population, which can be generalised (Cohen, Manion & Morrison, 2007). A quantitative study also ascertains that certain factors correlate with each other (correlation and covariance). Though non-probability samples tend to be avoided in quantitative surveys, the researchers used a purposive sampling method, which is a qualitative technique.

Ethical considerations

The inclusion criteria avoided under-age respondents, while using the age range between 21 and 64 years. The study excluded those whose mental ability was challenged. The mention of confidentiality, anonymity, none maleficence, avoidance of coercion, avoidance of over-intrusive questions could have enhanced the credibility and adherence to the research process.

Data collection

The data was taken from 240 participants that made the sample, half of which were patients with diabetes mellitus from a diabetic clinic at a general hospital, and the other half were healthy adults from the shopping complex both in Penang. The sample was randomly selected from a population which was not specified in number. Each participant was interviewed face-to-face, using a 30 items research tool. Interview methods of data collection are useful in that the presence of the interviewer can clarify queries from the respondents and can stimulate the respondents to give full answers to an on-the-spot supervisor (Cohen, Manion, & Morrison 2007). However, interviews are time consuming and are mainly used when people have problems of reading and writing. Since one of the inclusion criteria was ability to understand the questionnaire, one may assume that respondents' literacy could allow them to fill-in the research tool themselves. The tool had five sections, which are: general knowledge; risk factors; symptoms and complications; treatment and management; and monitoring, which enhanced the validity.

Statistical data analysis

Data were analysed using the SPSS 14.0 software and Microsoft Excel. The following statistical tests were performed to test for significance: x^2 to assess the difference between diabetic and healthy groups, student's t-test to test mean age, the Mann-Whitney U-test was used for gender and marital status and Kruskal-Wallis test was used to assess the effect of age, race, educational level, employment status, income level, source of information, years with disease on the total knowledge score, with a 0.05% level of significance. The statistical tests were appropriate, in line with what each tested for significance. However, in many studies of such level, analysis of variance is mostly used to assess difference between groups. In public health studies, most researchers used relative risks to estimate the relative risk of acquiring disease for those who are exposed compared with those who are unexposed or less exposed. This ratio of incidence proportions is called the risk ratio (or relative risk),

and a ratio incidence rate is called the rate ratio. The relative risk ratio better expresses the risk run by lack of knowledge and developing the type 2 diabetes.

Results

Using a variety of statistical methods, the researchers demonstrated a number of interesting findings. Data were arranged in a frequency distribution table, which showed that there was no significant difference between the diabetic and healthy groups for age, gender, race, marital status, education level, employment status or income.

Diabetic group performed better in the knowledge of risk factors, symptoms, chronic complications, treatment, self-management, and monitoring. There was a significant difference between the diabetic and healthy groups for mean total knowledge: diabetics had a mean of 24.4 $\pm$ 3.83 versus the one of the healthy 20.2 $\pm$ 5.97. Results showed that 85% of respondents with diabetes had from good to very good knowledge of the disease confirming Khan et al (2008) who found that family history of diabetes mellitus was statistically associated with awareness about diabetes mellitus. The majority of people who are aware of diabetes are only so because a family member is affected. These were the same findings in the study of Al-Maskari et al (2013) that patients' general awareness of diabetes symptoms and complications was relatively high, perhaps because they had experienced these symptoms themselves or observed them in fellow-patients. The study also shows that a history of diabetes in first degree relatives has a positive impact on diabetes knowledge. Having a close relative with chronic disease may be a good source of health information, but such informal sources cannot be relied upon. In the research under review, of the total respondents, among the diabetics, there were significant differences of knowledge associated with educational level, employment status and income level. However, there was no significant difference associated with age, race, gender or marital status. These results somehow contradict Upadhyay, Palaian, and Shankau (2007) whose findings revealed a low level of knowledge, attitude and practice among the diabetes patients.

Among the healthy group, there was a significant difference of knowledge associated with educational level and employment status, but no significant difference associated with age, race, gender, marital status or income level. This means that respondents who had a high education, with better jobs had better good knowledge of diabetes mellitus than their less educated with low status jobs. The data is consistent with previous studies from other parts of the world, which showed the association between level of education and the increase in diabetes mellitus knowledge (Kamelet al., 1999; Caliskan et al., 2006; Powell et al., 2007; AlShafaee et al., 2008) quoted by Mohieldein, Alzohairy, and Hasan (2011) whose findings showed the knowledge of risk factors and symptoms of diabetes mellitus at 63.4% and 80.8% respectively. Their study revealed serious levels of unawareness about the complications of type 2 diabetes (47.7%) among Saudi non-diabetic population in Al-Qassim region. Only 41.2% of participants showed to have knowledge that one of the complications of diabetes is high blood pressure. In fact, hypertension is a common comorbid condition, occurring at least twice as frequently in patients with diabetes mellitus as in the non-diabetic population (Feldstein et al., 2002). This lack of knowledge regarding hypertension as a complication of diabetes mellitus, may lead to expect the limited knowledge about the fact that diabetic patients may develop a silent form of my cardinal infarction. To raise the awareness of diabetes, a formal, structured approach should be designed to deliver the necessary educational information to the less developed areas. This has been proven that even a small reduction in the average blood pressure or serum cholesterol of a population would produce a large reduction in the incidence of cardiovascular disease for example. This mass (population) approach should be directed towards socio-economic, behaviour and lifestyle changes. To have an impact on the population, primordial, population strategy and high-risk strategy should be implemented together as they are complementary.

Logistic regression modelling was used to determine significant predictors of overall knowledge of diabetes mellitus. In the final model, educational level and number of years with the disease were the most important predictors of knowledge of diabetes, and could predict it 93.3% of the time. This was an appropriate statistical test, and the model agree with findings of Khan et al (2009) who found education and age to be the most important predictors of knowledge. In the healthy group, logistic

regression modelling with a maximum likelihood ratio of 86% confirmed that educational level was the most significant predictor variable correlated with increase in the knowledge of the disease. It is noteworthy that in the healthy group, 55.8% of respondents showed from good to very good knowledge of the disease. A few healthy adults obtained their knowledge from health professionals, a situation which calls the later for more involvement in disease prevention interventions. Interventions could be health promotion, early diagnosis and treatment, disability limitation and rehabilitation.

Conclusion

The main points of the article have been to show the burden of non communicable, particularly diabetes mellitus; specifically, authors wanted to compare knowledge between patients of the disease and a healthy group in Malaysia. The disease is a public health concern of the 21st century by among others, the World Health Organisation (WHO). The regions with the greatest potential increase in the future are Africa and Asia, where diabetes is estimated to become two to three times more common (WHO 2005, 2011, & Hjelm & Mufunda 2010). Research (Foma et al 2013) has established that awareness of various aspects of diabetes mellitus is essential for the prevention, management and control of the disease.

The results showed that patients with diabetes mellitus were significantly more knowledgeable than the healthy volunteers about risk factors, symptoms, chronic complications, treatment and self-management, and monitoring parameters. The results concurred with Foma et al (2013) who reported that several studies have consistently shown that awareness of diabetes mellitus in the general population is low. Authors theorise diabetics' good knowledge to be a reflection of adequate health education received by diabetic patients. The lack of significant difference between diabetic and healthy adults in the mean score of general knowledge of pathology highlights the need for more concerted effort towards educating the patients with diabetes about the basics and path physiology of the disease. Education programmes for healthy population may include: healthy lifestyle, risk factors, diet, exercise, and screening. This model, can be used in community-based and/ or institution-based (hospital) interventions. Furthermore, the data indicated that, there is need of more efforts for educating general population about diabetes and its associated secondary complications. Concerted efforts are needed to educate the general public about preventable and modifiable risk factors especially in high-risk groups. Those efforts should be coupled with screening for diabetes as part of routine medical care. These conclusions are in line with the 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of non communicable Diseases (NCDs), whose objectives to curb the burden of NCDs include to promote interventions to reduce the main shared modifiable risk factors: tobacco use, unhealthy diets, physical activity and harmful use of alcohol.

The article has advanced knowledge in the field, as it has proven wrong the popular belief that healthy populations are more knowledgeable about diabetes than those diagnosed with the disease. Diabetics come from the general population, there is no way that they can be less knowledgeable about the disease, when in addition to the knowledge that every citizen has, they (diabetics) will have added life experience from the ill-health. This realisation will assist policy makers, health educators, and public health officials to come up with interventions which will target the right group – population, at risk groups with a focus on primordial and primary prevention. Such have been established as cost-effective and life-saving programmes applicable even in low and middle-income nations. The practice implications of the study are that it served as a baseline for design of diabetes' education programmes. On the basis of these results, continuing professional development can be offered for health professionals, to keep them abreast with emerging re-emerging diseases. The article was written in a clear, thorough and useful explanation of the topic was given.

The initial weakness of the research was the claim that diabetic patients had better knowledge about the disease. The other was the use of non-parametric statistical tests, whose deficiencies include: usually do not state hypotheses in terms of a specific parameter; make few (if any) assumptions about the population distribution, thus called distribution-free tests, thus not generalisable; generally not as sensitive as parametric tests; are more likely to fail in detecting a real difference between two treatments (Gravetter & Wallnau, 1995 p. 373). There were no hypotheses or research questions given at the beginning of the study to lead the whole process.

The strengths of the study include the proof of the socio-economic burden of the disease, need for an urgent response, and the presentation of a clear summation of the issue. It is also important to mention the use of a clear language, thorough presentation of data and provision of explanation of the subject matter. Tables and figures were clearly labelled and succinct. There was a systematic presentation of the article, including a separation between results and discussion, which shows adherence to research process. It also allowed researchers to integrate their findings in the context of a broader scholarly debate about knowledge of diabetics and their healthy counterparts about the disease.

Acknowledgements

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