



RESEARCH ARTICLE

ASSESSMENT OF KNOWLEDGE AND AWARENESS TOWARDS DIABETES MELLITUS IN MAJULI,
ASSAM OF INDIA: A CASE STUDY

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ABSTRACT

Background: Inadequate awareness about real dimension of diabetes mellitus among the general public of India is a key problem for increase incidence of diabetes. The status of awareness varies from place to place which necessitates case studies in small areas having geographical and cultural importance.

Objectives: This study is aimed to assess the level of knowledge and awareness of diabetes mellitus among the people of river island Majuli, Assam of India which, will be of a great help to identify areas of knowledge that might require additional efforts to increase.

Methodology: A cross-sectional survey is conducted to meet the objectives. There are 260 subjects scientifically selected for the study. The respondents are required to answer 32 questions focusing on different aspects of diabetes. A simple scoring method is used to convert qualitative response to quantitative ones and hence the total scores are calculated for each individual. Further, to test whether there is significant differences in awareness status of the people w.r.t. various socio-economic and demographic factors, non parametric tests such as Mann-Whitney U test and Kruskal Wallis test have been used as p-p plot shows data do not follow normal distribution.

Results: The study reveals that level of awareness towards diabetes mellitus varies with respect to different socio-economic and demographic factors, viz., sex, age, marital status, caste, family structure, family history of having diabetes mellitus, occupation and income among respondents are significantly different. Only an exceptional finding observed from this study is that although, level of awareness increases towards diabetes with level of education.

Conclusion: It can be concluded that inspite of the government and other organizations have been taking different steps to enhance the awareness level of the people towards various diseases having more prevalence, its impact on the society of the study area is not up to the mark.

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INTRODUCTION

Diabetes mellitus is commonly known as diabetes, a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. It is like a silent disease – many sufferers became aware that they have diabetes only when they develop one of its life-threatening complications. Besides significant mortality, diabetes-related morbidities such as diabetic retinopathy, neuropathy and cardiovascular disease have also placed a heavy financial burden on society (Al-Hussaini and Mustafa, 2016). Also, hyperglycemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads

to serious damage to many of the body's systems, especially the nerves and blood vessels. India has a large population and population density with low literacy levels. In India, diabetes has gained the status of a potential epidemic with more than 62 million diabetic individuals currently diagnosed with the disease (Kaveerhwar and Cornwall, 2014). According to Joshi and Parikh (2007), India (31.7 million) topped the world with the highest number of people with diabetes mellitus followed by China (20.8 million) with the United States (17.7 million) in second and third place respectively in 2007. Unfortunately, there is still inadequate awareness about the real dimension of diabetes among the general public in India. There is also a lack of awareness about the existing interventions for preventing diabetes and the management of complications. Inadequacies in primary health care systems, which are not designed to cope with the additional challenges posed by diabetes, result in poor detection of cases, suboptimal treatment and insufficient

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follow up leading to unnecessary disabilities and severe complications, often resulting in early death. There are many factors may be responsible for this situation, including unhealthy adopted Western life style with reduced physical activity, sedentary lifestyle, excessive intake calories etc. Further, diabetes has been linked to a number of social factors such as occupation, marital status, religion, economic status, education, urbanization and changes in life style. Awareness about the disease is very must essential for preventing or fighting with this menace. In the same way, awareness and knowledge towards diabetes mellitus can assist in early detection of the disease and reduce the incidence of complications. So, in order to reduce the burden of the disease in the community, increase of awareness among the people towards the disease is very much essential. Knowledge is a critical component of behavior change and diabetes is also related to behavior of an individual (Al-Sarayra and Khalidi, 2012). Aware people are more likely to participate in prevention and control activity (Wee *et al.*, 2002). Thus, it is important to know the awareness level about the disease in population, to reduce its burden. There are many literatures available for assessing awareness of diabetes. For example, Public awareness of diabetes mellitus in Singapore is studied by Wee *et al.* (2002). Similarly, Al-Hussaini and Mustafa (2016) studied adolescent's awareness and the knowledge of diabetes in Kuwait. Also, Al-Dahan *et al.* (2013) evaluated the knowledge and perception of diabetes among attendees of a primary care centre in Riyadh capital of Saudi Arabia. Further, Sagar and Srinivasan (2014) evaluated public awareness of diabetes mellitus in Kalong district, Selangor. In India, some similar studies have been carried out but these are not sufficient to entangle all the parts of India. For example, Rani *et al.* (2007) studied knowledge of diabetes and diabetic retinopathy among rural populations in India In Southern India, Murugesan *et al.* (2007) conducted a survey to assess the awareness and complication of diabetes in general and diabetic population. Poornima *et al.* (2012) studied the awareness of diabetes mellitus among college students in Mandya city, Karnataka. However, literature search retrieved very few works on awareness of diabetes mellitus in the state of Assam, India and its different parts. In the present, a research study has been initiated to assess the awareness level of diabetes mellitus among the rural people of Majuli, Jorhat district of Assam, India. Majuli is geographically important in World scenario, globally renowned cultural hub and famous for its natural virginity. It is located in the north of Jorhat district of Assam, India (93°30'-94°35' E and 26°50'- 27°10' N) elevation of the area varies from 60 to 85 meters from the mean sea level and it is bounded by three major rivers Kherkutia Suti, Subansiri and Brahmaputra (Bhaskar *et al.*, 2010). The severity of erosion might be understood from the fact that the island including some sand chars and chaparis has reduced in recent years from 12,45 sq.km to 421.65 sq.km. (as of 2001). Obviously, the life style of the people of this area is different from other parts of Assam in particular and India in general.

MATERIALS AND METHODS

A cross-sectional household level study is conducted to meet the objectives. Based on results of previous study and using proper sample size calculation formula, the required number of

individuals to be studied is found to be 260. A two stage cluster sampling procedure is used to do the sampling. At the first stage, 20 villages are selected by using probability proportional sampling from Census 2011 data. At the second stage, 13 households are selected by using circular systematic sampling from the each selected villages. From the selected household only one individual who is the eldest among the members present at the time of survey is included for data collection.

A questionnaire is constructed to collect the data of awareness about diabetes with consultation of the questionnaire adopted by earlier researchers Wee *et al.* (2002), Al-Hussaini and Mustafa (2016). In this questionnaire, information about different demographic factors of the respondents is also included. The questionnaire is divided into eight main sections, with each section focusing on different aspects of diabetes mellitus, namely general knowledge about diabetes (four questions), knowledge of risk factors of diabetes (six questions), knowledge of symptoms (seven questions), knowledge on complications (four questions), knowledge about treatment and non medical measure (five questions), things diabetics should not do (three questions), and monitoring of diabetes (three questions). The purpose of the study is explained to each respondent and due consent for the survey are taken. For assessing the awareness level, a score of 1 is given for correct response and 0 for incorrect or unsure response. Total score for each individual is calculated by adding the scores for all 32 questions. Individual scores for each 7 sections are also calculated: general knowledge, risk factors, symptoms, complications, treatment and non medical measures, things diabetics should not do and monitoring. Also, to check the normality of the total scores of 260 individuals, a normal probability plot is drawn which is given in Fig.3.1. Further, to check the significant difference of total scores with different socio demographic factors, Mann-Whitney U test and Kruskal Wallis test are performed. Statistical analyses have done using the Statistical Package for Social Sciences, version 17.0 (SPSS Inc., Chicago, USA).

RESULTS

In this study, a total of 260 individuals are included of which majority of them are females (59.62%). The mean age of the male individuals is 42.42 (s.d. 15.00). Also, mean age of the female individual is 38.02 (s.d. 13.12). The detail demographic profile of the study subjects are given in Table 1.

Assessing Awareness level of respondents towards diabetes mellitus

Considering different aspects of diabetes, the questions are divided in 8 different sections viz. general knowledge about diabetes, knowledge of risk factors of diabetes, knowledge of symptoms, knowledge on complications, knowledge about treatment and non medical measure, things diabetics should not do, and monitoring of diabetes. The awareness with respect to these sections is presented in Table 2. In Table 2 it is observed that in general knowledge section, 59.5% respondents think that diabetes is not contiguous.

Table 1. Demographic Characteristics of respondents (n =260)

Characteristics	%	Characteristics	%
<i>Sex</i>		<i>Occupation</i>	
Male	40.5	Unemployed	8
Female	59.5	Business	16
<i>Age</i>		Cultivator	15
Less than 40	61.5	Housewife	53.5
40-50	13.5	Service	4
50-60	18	Daily Wage Labour	3.5
60 and above	7	<i>Income</i>	
<i>Marital Status</i>		0-5000	43
Married	76.5	5000-10000	46
Unmarried	23.5	10000-20000	9.5
<i>Family Structure</i>		20000 and above	1.5
Joint	50.5	<i>Education</i>	
Nuclear	49.5	Illiterate	26
<i>Family History</i>		Primary	33.5
Diabetes	30	HSLC	22
Non Diabetes	70	Above HSLC	18.5
<i>Caste</i>			
General	29		
OBC	35		
SC	17		
ST	19		

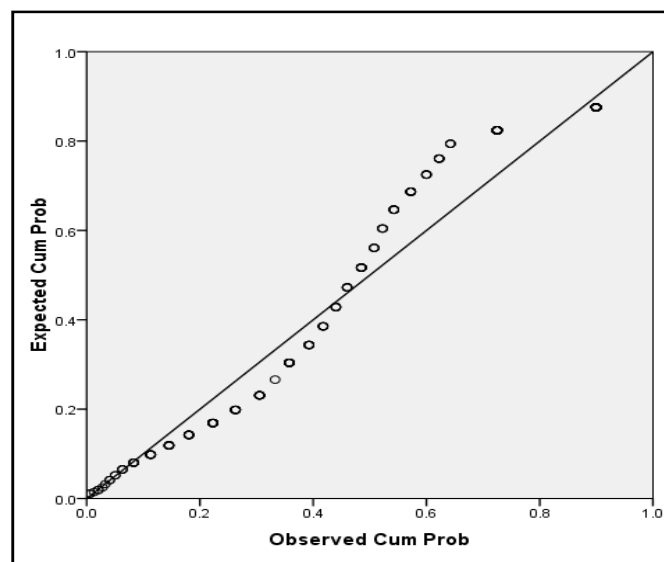
Table 2. Response of the Participants for different Questions (n =260)

Questions	Correct (%)	Wrong (%)
<i>General Knowledge of Disease</i>		
Diabetes is not contagious	59.5	40.5
Diabetes is curable	9.5	90.5
Diabetes is a condition of high blood sugar	67	33
Diabetes can occur in children, adolescent and adults	68	32
<i>Knowledge of Risk Factors</i>		
Diabetes is genetic disease	46	54
Obesity	74.5	25.5
Pregnancy	63	37
Age above 40 years	73	27
Lack of Physical Activity	65.5	34.5
Alcohol and Smoking	68	32
<i>Knowledge of Symptoms</i>		
Frequent Urination	80	20
Constant Feeling of thirst	74.5	25.5
Blurred Vision	64	36
Weight Loss	72	28
Slow Healing of Cut and Wound	60	40
Tiredness and Weakness	88.5	41.5
Extreme Hunger	57	43
<i>Knowledge of Complications</i>		
At extreme position amputation can be done	52.5	47.5
Eye Problem (Diabetic Retinopathy)	59.5	40.5
Kidney problems	69.5	30.5
High Blood Pressure	88.5	11.5
<i>Knowledge of Medication</i>		
Tablets and Capsules are available for control of diabetes	81.5	18.5
Insulin injections are available for the control of diabetes	63.5	36.5
<i>Lifestyle and non-medical measure</i>		
Diabetics should exercise regularly	57	37
Diabetics should care for their toes and feet	72.5	27.5
Diabetics should have good weight control	68.5	31.5
<i>Things Diabetics should not do</i>		
Diabetics should not donate blood	72.5	27.5
Diabetics should not smoke	57.5	42.5
Diabetics should not wear tight shoes	67	33
<i>Monitoring of Diabetic Condition</i>		
Diabetics should test their blood sugar regularly	77	23
Diabetics should go for regular eye check-up	65.5	34.5

Also, 90.5% people have misconception that diabetes is curable. Similarly, in knowledge of risk factor section, only 46% respondents have knowledge that diabetes is a genetic disease. It is noticed that 63% respondents is of the view that diabetes can grow up during pregnancy of woman which is a good indication. Further, respondents have good knowledge in knowledge about symptoms of diabetes section. It is observed that 80% respondents know that frequent urination is a symptoms of diabetes, 74.5% respondents know that constant feeling of thirst is one of the cause of diabetes etc. Further, in knowledge of complication section, 52.5% respondents know that sometimes amputation of organ of diabetes patients is necessary at extreme condition. Also, 88.5% individuals have fair knowledge that diabetes tends to hypertension. In case of knowledge of medication section, 63.5% respondents know about insulin injection. Also, it is noticed that 57% respondents aware about regular exercise that maintain diabetes.

Awareness with respect to different characteristics

As mentioned above, score of '1' is given for correct answer and '0' for the wrong answer. The total scores of all the respondents are calculated. Normality of the total score is tested by Kolmogorov-Smirnov (K-S) one sample test. The value of K-S statistic is found to be significant. So, from K-S test, it is clear that total score of individuals does not follow normal distribution and also Fig.1 depicts the same fact. So, as an alternative to parametric tests, we have applied proper non parametric tests viz. Mann-Whitney U and Kruskal Wallis test to check the significance difference in the total scores with respect to different socio-economic and demographic factors. The results are given in Table 3.

**Fig.1. Normal Probability Plot of Scores**

In Table 3, it is observed that mean score obtained by female (22.97) is significantly more than male (19.63). So, we can say that females are more aware or knowledgeable than male regarding the disease diabetes. It is also noticed that in Table 3.2.1, mean score obtained by respondents of different age groups do not show any systematic pattern.

Table 3. Awareness with respect to different Characteristics

Characteristics	Mean of Score	Standard deviation of Score	Test statistic	p-value
<i>Sex</i>				
Male	19.63	8.90	2.652	.0080
Female	22.97	8.85		
<i>Age</i>				
Less than 40	22.72	8.66	19.71	.0001
40-50	16.70	9.02		
50-60	23.81	8.84		
60 and above	15.86	7.19		
<i>Marital Status</i>				
Married	22.88	8.61	3.732	.0001
Unmarried	17.53	9.09		
<i>Caste</i>				
General	25.40	7.14	1.043	.7910
OBC	22.06	9.10		
SC	17.71	9.31		
ST	18.55	8.04		
<i>Family Structure</i>				
Joint	19.53	8.80	3.541	.0001
Nuclear	23.74	8.39		
<i>Family History</i>				
Diabetes	18.58	8.33	3.665	.0001
Non Diabetes	22.92	8.99		
<i>Education</i>				
Illiterate	21.73	8.17	1.043	.7910
Primary	20.75	9.87		
HSLC	21.80	9.25		
Above HSLC	22.84	8.31		
<i>Occupation</i>				
Unemployed	16.44	10.31	9.97	.030
Business	19.34	8.53		
Cultivator	20.43	9.06		
Housewife	22.93	8.83		
Service	25.38	5.80		
Daily Wage Labour	24.71	7.99		
<i>Income</i>				
0-5000	20.91	9.06	6.91	.043
5000-10000	21.38	8.98		
10000-20000	24.50	8.60		
20000 and above	30.67	1.15		

Respondents belonging to 50-60 age groups are more aware and knowledgeable than other age groups. Also, Kruskal Wallis test tells that there is significant difference among age groups towards knowledge of different components of diabetes (p -value=.0001). Further, it is observed that mean score of married respondents (22.88) is more than unmarried. The reason may be increasing health consciousness after marriage due to family responsibility. Also, p -value=.0001 reveals the significant difference among married and unmarried respondents. In Table 3, we also see that people residing in nuclear family is more aware than the joint family towards diabetes due to the high value of mean score (23.74) obtained by respondents of nuclear family than joint Family. Also, from p -value =.0001, we get the significant difference of total scores among the respondents of two groups. In Table 3, it is also noticed that total mean score obtained by respondents having family history of diabetes (18.58) is less than the respondents do not have family history of diabetes which is notable for us. Also, p -value =.0001, tells the significant difference among the two groups. Moreover, in Table 3, we also see that mean score of the respondents increases when education level increases i.e. awareness level towards diabetes increases with level of education. But, from the p -value =.7910, no statistically significant difference

between the respondents have been noticed w.r.t. education. So far as occupation is concerned, it is observed that in Table 3, highest mean score obtained by respondents belonging to service groups (25.38) followed by housewife (22.93). Also, lowest mean score (16.44) is observed in unemployed group. Also, from the p -value=.040, we get significant difference among respondents of different occupation levels towards awareness of diabetes. Further, in Table 3 it is observed that mean score of the respondents increases with income level. Highest mean score is observed in respondents belonging to high income group i.e. above Rs.20000 per month followed by the group belonging Rs.10000-Rs.20000 per month. Further, from the Kruskal Wallis test, we conclude that there is significant difference among respondents belonging to different income level towards awareness of diabetes mellitus (p -value=.030).

Some Additional Information

Information is also collected about the treatment seeking behavior and source of information about the disease under study. From results, it can be observed that about 38% of the individual is of the opinion that medication is not necessary for diabetes mellitus. Among the respondents who advocate medication for diabetes mellitus, 53% prefers herbal treatment,

only 31.5% prefers allopathic treatment and 12.5% prefers to go traditional healer. From these results it can be observed that traditional treatment has some impact on health issues in Majuli which may be because of its remoteness and lack of health facility. Questions also ask about the source of information about diabetes mellitus. The main source of information is found to be relatives and friends as about 57% of respondents know about the disease from their relatives and friends. About 29% and 15% respondents know about the disease diabetes from health workers and mass-media. Also, no awareness programs about the disease diabetes have been conducted by government authorities and NGO's in the study area in the last 10 years.

DISCUSSION

A study is conducted to assess the awareness level of diabetes mellitus in the largest river island of the world i.e. Majuli. The general awareness of the disease is found to be less in comparison to other population as reported by different similar kind of studies Al-Hussaini and Mustafa (2016) and Wee *et al.* (2002). Only about 9% of the respondents have proper knowledge about curability of the disease. About 67% of the respondents aware that diabetes is a condition of high blood sugar which is very less in comparison to studies conducted elsewhere Al-Hussaini and Mustafa (2016) and Wee *et al.* (2002). In risk factors the respondents score equally well in comparison to other similar study Al-Hussaini and Mustafa (2016) and Wee *et al.* (2002). Further, 65% of female respondents know that pregnancy is a risk factor. In light of this result, it is interesting to know that similar studies conducted in Singapore and Kuwait, Al-Hussaini and Mustafa (2016) and Wee *et al.* (2002), where the respondents had low score of ignorance regarding the possibility of getting diabetes through pregnancy. About 80% of the respondents know that thirst is a symptom of diabetes. Similarly, 74.5%, 88.5%, 72%, 64% and 57% of the respondents have proper knowledge on symptoms frequent urination, tiredness and weakness, slow healing of cut and wound, blurred vision respectively. Moreover, respondent's knowledge on complications associated with diabetes is also low in some aspects. About 52.5% respondents know that diabetes can progress to affect different organs in the body leading to deterioration in their function and at extreme position amputation can be done which is low in comparison to other similar studies Al-Hussaini and Mustafa (2016) and Wee *et al.* (2002). Also, about 59.5% respondents have knowledge on eyes related complication. Thus, it is very important to educate people about diabetes complications and it will help them to encourage their relatives and friends having diabetes to comply with treatment in order to avoid some of the complications associated with diabetes such as amputation, eye problem etc. The respondents have fairly good knowledge about the types of treatment available. Also, it can be observe that traditional treatment and healer have some impact on health issues in Majuli which may be because of its remoteness and lack of health facility. This result is also revealing that respondent's knowledge regarding the lifestyle of person with diabetes is fairly good as compared to Al-Hussaini and Mustafa (2016) and Wee *et al.* (2002). But opinion about regular exercise to avoid diabetes is comparatively low. Around 72.5%

respondents think that diabetics should not donate blood which is very important. According to the Canadian Diabetes Association, a person with diabetes that is treated by diet or oral medications may be eligible to donate blood unless treated with insulin. Moreover, about 57.5% know that diabetics should not smoke. Here, respondents show good knowledge about monitoring blood sugar and the regular check-up. It is also observed that level awareness is significantly different with respect to sex, age, family history, marital status, family structure, occupation and income. Moreover, level of awareness increases towards diabetes with level of education. Our study tries to highlight the area of shortage of awareness and knowledge towards different aspects of diabetes mellitus in Majuli, Assam. In the study, most of the respondents belong low educational level. Some respondents may not continue higher education due to their economic condition or insufficient educational infrastructure of Majuli. So it is highly recommended that Ministry of Human Resource Development of India improves the health education in Majuli and include the curriculum related to awareness of the disease in primary level because level of education is the most significant predictor of knowledge regarding general knowledge of the disease, risk factors, complications and the prevention of disease. More health education awareness programmes by all available sources such as TV, lectures, workshops are needed to address this poor knowledge in order to equip them with the right information to positively affect on the society in order to trim down the burden imposed by the disease.

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