Prevalence of Self Reported Diabetes, Knowledge, Attitude and Practice on Diabetes and Diabetes Care in a Rural Community in Malaysia

Sandheep Sugathan[a], Davinder Singh[b], Umabalan Tirupathy[b]

a. Department of Public Health and Specialist in Epidemiology and Biostatistics, University Kuala Lumpur - Royal College of Medicine Perak (UniKL RCMP), Perak State, Malaysia; b. Universiti Kuala Lumpur, Royal College of Medicine Perak, Malaysia*

ABSTRACT

Published on 24th December 2018

Background / Objective: Diabetes is a global public health challenge with high economic burden. Diabetes is increasing not only in the urban but also in the rural settings. This study was conducted to study the prevalence of self reported diabetes, risk factors, complications, knowledge, attitude and practice on diabetes among adults above 40 years in a village in Kinta district, Malaysia

Methodology: Cross-sectional study conducted on 194 villagers of Kampung Seri Jaya, who were aged 40 years and above, conducted during May-July, 2013

Results: The prevalence of reported diabetes with documented evidence was 20.1% (95% CI 15.07 to 26.3) among the participants. Prevalence among males was 18.7% (95% CI 11.46 to 28.93) and among females was 21% (95% CI 14.65 to 29.18). Prevalence of diabetes was significantly higher in higher age groups. A positive family history was a significant risk factor among diabetics ($p < 0.05$). Knowledge and attitude regarding importance of exercise, weight reduction and checking of glycosylated hemoglobin was less

Conclusion: More intensive interventions on lifestyle changes in the rural population is needed to control this alarmingly high occurrence.

Keywords: Prevalence, Self Reported Diabetes, Knowledge, Attitude, Practice, Diabetes Care

*See End Note for complete author details

BACKGROUND

Diabetes is a global public health challenge with high economic burden. Diabetes is increasing not only in the urban but also in the rural settings. According to World Health organization (WHO) statistics, 347 million people worldwide have diabetes.[1] In 2004, an estimated 3.4 million people with high blood sugar level died from consequences of fasting.[2] A similar number of deaths have been estimated for 2010. More than 80% of diabetes deaths occur in low and middle-income countries.[3] WHO projects that diabetes will be the 7th leading cause of death in 2030.[4] Healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use can prevent or delay the onset of type 2 diabetes.[5]

In Malaysia, diabetes steadily gained momentum over the decades. The prevalence of diabetes among adults of age ≥ 30 years stood at 6.2% in the 1986 National Health Morbidity Survey (NHMS).[6] It went up to 8.2% in NHMS II (1996).[7] NHMS III (2006) however, saw an incredible hike in the prevalence which stood at a staggering 14.9%.[8] NHMS IV which was published in 2011 showed a prevalence of 15.2%.[9] The objective of this cross sectional survey was carried out to study the prevalence of self reported diabetes, its risk factors and complications, knowledge, attitude and practice on diabetes and diabetes care among adults above 40 years of age in a village in Kinta district, Perak, Malaysia.

MATERIALS AND METHODS

This was a cross-sectional study conducted among 194 villagers of Kampung Seri Jaya, in Kinta district in Malaysia, who were aged 40 years and above. Kampung Seri Jaya is a village in Batu Gajah subdistrict of Kinta district in Perak state in Malaysia. This village was chosen based on the secondary data from District health office and from the Community Health centres

Cite this article as: Sugathan S, Singh D, Tirupathy U. Prevalence of Self Reported Diabetes, Knowledge, Attitude and Practice on Diabetes and Diabetes Care in a Rural Community in Malaysia. IMA Kerala Medical Journal. 2018 Dec 24;11(4):99–104.

Corresponding Author:
Dr Sandheep Sugathan, Senior Lecturer in Public Health and Specialist in Epidemiology and Biostatistics, University Kuala Lumpur - Royal College of Medicine Perak (UniKL RCMP), Perak State, Malaysia. E-mail: drsandheep@gmail.com

Table 1. Distribution of study subjects based on socio demographic and lifestyle factors

Age	No. (%)
40 – 59 y	134 (69.1%)
60.79 y	57 (29.4%)
80 – 99 y	3 (1.5%)
Gender	
Male	75 (38.7%)
Female	119 (61.3%)
Ethnicity	
Malay	171 (88.1%)
Chinese	1 (0.5%)
Indians	22 (11.3%)
Marital Status	
Married	169 (87.1%)
Single	2 (1%)
Widowed	23 (11.9%)
Education status	
Illiterate	11 (5.7%)
Primary school	64 (33%)
Secondary school or above	119 (61.3%)
Income	
Less than RM 1000	131 (67.5%)
RM 1000 – 1999	37 (19.1%)
> RM 2000	26 (13.4%)
Diet	
High risk diet	99 (51%)
Low risk diet	95 (49%)
Exercise per week	
> 3 times	138 (71.1%)
<3 times	56 (28.9%)
Family History of Diabetes	
Positive	110 (57%)
Negative	83 (43%)
Smoking status	
Smoker	35 (18%)
Non smoker	159 (82%)
Alcohol use	
Alcohol user	6 (3%)
Non user	188 (97%)
Obesity	
Underweight	5 (2.6%)
Normal	33 (17%)
Pre obese	86 (44.3%)
Obese	70 (36.1%)

which cater to the population of this village. Secondary data showed a high prevalence of non communicable diseases from these villages. According to the district health office, health education campaigns on non communicable and lifestyle disorders were not conducted in this village in recent past. So the researchers decided to select this village. This study was conducted during May-July, 2013.

All the occupied households in the village were tagged by universal sampling and all the residents who were aged 40 and above in the 274 occupied households who were willing to participate were included in this study.

Known Diabetics those who self-professed to be diabetics with a documented evidence of diagnosis of diabetes mellitus (laboratory reports, doctor's notes, prescription mentioning that the person is diabetic or a combination of more than one of these) were included in the study.

An informed consent was obtained from the participants. Those who were not willing to participate were excluded from the study. One health education campaign and a health exhibition on diabetes mellitus were conducted at the end of data collection on a common meeting place in the village. Health education was given based on the identified knowledge gaps. This was done as an ethical commitment from the part of researchers.

Data were collected by interviewing the participants, using a pre tested structured questionnaire developed in the local language. An initial survey and tagging of the village was carried out to identify occupied and unoccupied households. Subsequently, mapping of Kampong Seri Jaya was done to facilitate the planned survey. The data was analyzed using SPSS version 17. Descriptive statistics was done using proportions and Chi-square test was employed to determine the association between categorical variables in this study. The level of statistical significance was fixed at 0.05.

RESULTS

Majority of study subjects (69.1%) were between 40 to 59 years of age, were females (61.3%) and were from malay ethnic group. Majority of the study subjects

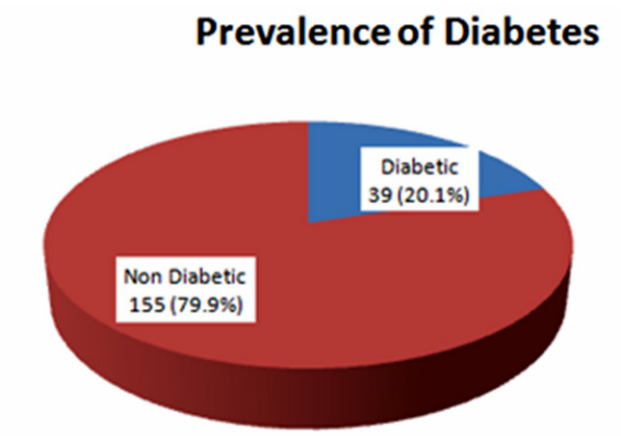

Figure 1. **Prevalence of Diabetes with Documented Evidence**

Table 2. Association between various sociodemographic and lifestyle risk factors with diabetes

Socio demographic and Lifestyle factors	Diabetic N = 39	Non Diabetic N = 155	Total N = 194	P value for Chi square test
Age				
40 – 59 y	20 (14.9%)	114 (85.5%)	134 (100%)	<0.05
60.79 y	18 (31.6%)	39 (68.4%)	57 (100%)	
80 – 99 y	1 (33.3%)	2 (66.7%)	3 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Gender				
Male	14 (18.7%)	61 (81.3%)	75 (100%)	>0.05
Female	25 (21%)	94 (79%)	119 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Ethnicity				
Malay	33 (19.3%)	138 (80.7%)	171 (100%)	>0.05
Chinese	0 (0%)	1 (100%)	1 (100%)	
Indians	6 (27.3%)	16 (72.7%)	22 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Marital Status				
Married	32 (18.9%)	137 (81.1%)	169 (100%)	>0.05
Single	0 (0%)	2 (100%)	2 (100%)	
Widowed	7 (30.4%)	16 (69.6%)	23 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Education status				
Illiterate	1 (9.1%)	10 (90.9%)	11 (100%)	>0.05
Primary school	17 (26.6%)	47 (73.4%)	64 (100%)	
Secondary school or above	21 (17.6%)	98 (82.4%)	119 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Income				
Less than RM 1000	27 (20.6%)	104 (79.4%)	131 (100%)	>0.05
RM 1000 – 1999	8 (21.6%)	29 (78.4%)	37 (100%)	
> RM 2000	4 (15.4%)	22 (84.6%)	26 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Family History of Diabetes				
Positive	29 (34.9%)	54 (65.1%)	83 (100%)	<0.001
Negative	10 (9%)	101 (91%)	111 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Smoking status				
Smoker	4 (11.4%)	31 (88.6%)	35 (100%)	>0.05
Non smoker	35 (22%)	124 (78%)	159 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Alcohol use				
Alcohol user	3 (50%)	3 (50%)	6 (100%)	>0.05
Non alcohol user	36 (19.1%)	152 (80.9%)	188 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	
Obesity				
Underweight	2 (40%)	3 (60%)	5 (100%)	>0.05
Normal	7 (21.2%)	26 (78.8%)	33 (100%)	
Pre obese	15 (17.4%)	71 (82.6%)	86 (100%)	
Obese	15 (21.4%)	55 (78.6%)	70 (100%)	
Total	39 (20.1%)	155 (79.9%)	194 (100%)	

were married (87.1%), educated upto secondary school or above (61.3%) and were having a monthly family income of less than 1000 Malaysian ringgits (67.5%). They were categorized as consuming high risk diet or not, based on frequency of consumption of sweetened drinks, plain water, fast food, fried foods, fruits, vegetables, red meat, dairy products and fish for the previous week. A slightly higher proportion of participants were taking high risk diet (51%). Majority of study subjects were doing exercise for 30 minutes or above , 3 times a week or above (71.1%). Majority of participants were having a positive family history of diabetes (57%) and most of the study subjects were pre obese (44.3%) according to the Malaysian Clinical practice guideline on management of obesity **(Table 1)**.

The prevalence of diabetes with documented evidence among population above 40 years of age in Kampung

Table 3. Attitude of the study participants on diabetes

Attitude Questions		Diabetics (n = 39)	Non diabetics (n = 155)	Total (n = 194)	Chi square test p-value
Checking blood sugar regularly is very important in controlling diabetes	agree	38 (97.4%)	135 (87.1%)	173 (89.2%)	> 0.05
	disagree	1 (2.6%)	20 (12.9%)	21 (10.8%)	
Diabetic patients should always follow doctor's advice.	agree	37 (94.9%)	141 (91%)	178 (91.8%)	> 0.05
	disagree	2 (5.1%)	14 (9%)	16 (8.2%)	
People should do regular exercise to prevent / control diabetes	agree	31 (79.5%)	113 (72.9%)	144 (74.2)	> 0.05
	disagree	8 (20.5%)	42 (27.1%)	50 (25.8)	
People should reduce weight and avoid being obese to prevent or control diabetes	agree	28 (71.8%)	103 (66.5%)	131 (67.5%)	> 0.05
	disagree	11 (28.2%)	52 (33.5%)	63 (32.5%)	
People should take more vegetables in diet to prevent or control diabetes	agree	32 (82.1%)	121 (78.1%)	153 (78.9%)	> 0.05
	disagree	7 (17.9%)	34 (21.9%)	41 (21.1%)	
People should take diet low in carbohydrates and fat to prevent or control diabetes	agree	36 (92.3%)	134 (86.5%)	170 (87.6%)	> 0.05
	disagree	3 (7.7%)	21 (13.5%)	24 (12.4%)	
Total attitude level	good	37 (94.9%)	129 (83.2%)	166 (85.6%)	> 0.05
	poor	2 (5.1%)	26 (16.8%)	28 (14.4%)	

Seri Jaya was 20.1% (95% CI15.07 to 26.3) **Figure 1**. Prevalence among males was 18.7% (95% CI 11.46 to 28.93) and among females was 21% (95% CI 14.65 to 29.18). Diabetes prevalence was significantly higher in higher age categories ($p < 0.05$). Those with positive family history showed a significantly higher prevalence as compared to those without family history ($p < 0.001$).

Other factors did not show a significant association **(Table 2).** A significantly higher proportion of diabetic patients (64.1%) were on a low risk diet as compared to non diabetics (45.2%). The practice of doing exercise for a duration of 30 minutes or more for at least 3 times a week was less among both diabetics and non diabetics among the population of Kampung Seri Jaya, who were above 40 years of age. A total of 10 questions were asked to assess the knowledge of the study participants. Analysis of the results showed that there was no significant difference in knowledge between diabetics and non diabetics. Majority of questions were answered correctly by more than 75% of participants.

Less than 75% of participants knew about the importance of regular exercise and the periodic checking of glycosylated haemoglobin. Less than 75% of subjects knew that diabetic patients are at high risk of developing heart disease. A total of 6 questions were asked to assess the attitude of the study participants. There was no significant difference in knowledge between diabetics and non diabetics. Correct attitude was shown by more than 75% of participants for most of the questions. Correct attitude was shown by less than 75% of participants for questions related to regular exercise and weight reduction **(Table 3).** Those participants who scored median score or above is categorized as having good knowledge level and those who scored below median score was categorized as having poor knowledge.

Those participants who scored median score or above is categorized as having correct attitude and those who scored below median score was categorized as having incorrect attitude towards the disease. A majority of diabetic patients were practicing good diabetic care.

The most common self reported complication among the diabetic subjects was retinopathy, which was followed by neuropathy **(Table 4).** The most common source of information for the knowledge about diabetes was media followed by health personnel **(Table 5).**

DISCUSSION

The proportion of known diabetics among Kampung Sri Jaya residents was found to be high at 20.1%. According to the National Health and Morbidity Surveys of Malaysia, the prevalence of diabetes mellitus increased from 6.3% in 1986 (Public Health Institute, 1986) to 8.2% in 1996 (Public Health Institute, 1996) and to more than 10% in 2006 (Public

Table 4. Presence of self reported complications with documented evidence, among the diabetics

Self reported Complication	No. (% of total)
Retinopathy	13 (33.3%)
Ischemic heart disease	3 (7.7%)
Diabetic foot ulcer	5 (12.8%)
Neuropathy	14 (35.9%)
Nephropathy	6 (15.4%)

Table 5. Source of information for the knowledge

Source	Percentage of total
Media (television, radio and newspaper)	78%
Doctors / Nurses / Health personnel / Health workers	72%
Friends and Relatives	66%
Internet and Social media	48%

Health Institute, 2006). Based on that prevalence rate, the estimated number of diabetic patients in Malaysia is 2.6 million, indicating that Malaysian individuals have a tendency to develop diabetes with prevalence variations among Malaysian ethnic groups.[10]

Based on data and information gathered by the National Health Morbidity Survey (NHMS) for the Malaysian population aged ≥30 years, which is conducted every 10 years (1986, 1996 and 2006), the prevalence of diabetes increased drastically in the last 10 year period, almost doubling in 2006 compared with 1996 (from 8.3% to 14.9%). The prevalence of undiagnosed diabetes (or newly diagnosed) also increased, from 1.8% in 1996 to 5.4% in 2006.[11] NHMS focussed on adult population 30 years and above. The difference in age distribution between the studies could also explain the discrepancies in our result. The high proportion of diabetes mellitus in rural population rationalizes the immediate need to address this silent epidemic. The most prevalent self-perceived diabetes associated complication in our study is diabetic retinopathy, hence eye screening must be conducted more frequently irrespective of whether it is caused by diabetes or not.

In this present study, a significantly higher proportion of diabetic patients (64.1%) were on low risk diet as compared to non diabetics (45.2%). This shows a healthy behaviour among those who were already diagnosed as diabetics to follow low risk dietary pattern. This might be due to increased awareness and self care among the diabetics. Majority of the non diabetics (54.8%) were consuming high risk diet. This shows that till they develop diabetes, they continue taking high risk food items. Health education campaigns should focus on dietary behaviour among general population.

The practice of doing exercise for recommended duration of 30 minutes for at least 3 times a week was low among both diabetics and non diabetics in our study. Health education interventions should focus on the importance of physical exercise.

According to the present study, diabetes prevalence was significantly higher in higher age categories. Secondary prevention (such as early diagnosis and correct treatment) and tertiary prevention programs (such as control of blood sugar and prevention of complications) should focus on elderly individuals. In the present study, there is a statistically significant association between family history and diabetes. This emphasises the need for screening programmes among those with family history of diabetes especially in rural areas. There was no significant difference in knowledge or attitude between diabetics and non diabetics. This reveals that knowledge and attitude is good in both the groups for most of the components. Knowledge and attitude was poor regarding importance of regular exercise and weight reduction. Knowledge regarding the importance of periodic checking of glycosylated haemoglobin was less among the study participants. These reveal the need for emphasising these areas during health promotion programmes.

CONCLUSION

The proportion of diabetes among those above 40 years of age was 20.1%. More serious and widespread health education interventions along with better case detection programs with sustained availability of treatment are a must in tackling this silent epidemic.

END NOTE

Author Information

1. Dr Sandheep Sugathan, Senior Lecturer in Public Health and Specialist in Epidemiology and Biostatistics, University Kuala Lumpur - Royal College of Medicine Perak (UniKL RCMP), Perak State, Malaysia
2. Dr Davinder Singh, Universiti Kuala Lumpur, Royal College of Medicine Perak, Malaysia
3. Dr Umabalan Tirupathy, Universiti Kuala Lumpur, Royal College of Medicine Perak, Malaysia

Conflict of Interest: None declared

Acknowledgement: The researchers express sincere gratitude to Prof. Dr Osmanali, Dean, UniKL RCMP,

and Staff members of District Health office and the villagers of Kampung Seri Jaya, Kinta District for their support. We thank the students of year 3 who were involved in data collection and health campaign.

REFERENCES

1. Danaei G, Finucane MM, Lu Y, Singh GM, Cowan MJ, Paciorek CJ et al. National, regional, and global trends in fasting plasma glucose and diabetes prevalence since 1980: systematic analysis of health examination surveys and epidemiological studies with 370 country-years and 2.7 million participants. Lancet, 2011, 378(9785):31–40.
2. Global health risks. Mortality and burden of disease attributable to selected major risks. Geneva, World Health Organization, 2009.
3. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med, 2006, 3(11):e442.
4. Global status report on non-communicable diseases 2010. Geneva, World Health Organization, 2011.
5. World Health organization—Fact Sheet on Diabetes. Fact sheet N°312. Reviewed on October 2013
6. Institute for Public Health, Ministry of Health, Malaysia. Vol.4. National Health Morbidity Survey 1986-1987. Diabetes Mellitus
7. Institute for Public Health, Ministry of Health, Malaysia. Vol.9. National Health Morbidity Survey 1996, Diabetes
8. Institute for Public Health, Ministry of Health, Malaysia. The Third National Health Morbidity Survey (NHMS III), Diabetes Mellitus, 2006.
9. Institute for Public Health, Ministry of Health, Malaysia. The Fourth NationalHealth Morbidity Survey (NHMS IV), Diabetes Mellitus, 2011.
10. Khaled Abdul-Aziz Ahmed, Sekaran Muniandy, Ikram Shah Ismail, Reyadh Saif Ali and Zaid Hizam Alhamodi; Evaluation of Nε - (carboxymethyl) lysine and lipid peroxidation in multiethnic Malaysian subjects with type 2 diabetes mellitus; Scientific Research and Essays Vol. 6(9), pp. 1957-1962, 4 May, 2011. Available online at http://www.academicjournals.org/SRE; ISSN 1992-2248 ©2011 Academic Journals
11. Malaysia country profile 2011, Country health Information profiles – WHO Western pacific Regional Office http://www.wpro.who.int/countries/mys/15MAApro2011_finaldraft.pdf