



Original Article

Lifestyle and diabetes among Muslim population of Manipur

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ABSTRACT

Objectives: This study aims to find out the association of lifestyle with adiposity markers among the patients with diabetes.

Materials and methods: 200 diabetic participants of both sexes were enrolled in the present study. Age group of the participants ranged from 20 years to 45 years. A cross sectional study was conducted for the present study. Data was collected from Imphal East district and Thoubal district of Manipur.

Observations: The study reported maximum percentage of overweight BMI among diabetic females as compared to diabetic males. Spending long hours at work place was positively associated with body mass index among diabetic participants.

Conclusions: This study informs the need of physical activity for those individuals who were physically inactive and had diabetes, as increasing BMI may lead to other non-communicable diseases.

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1. Introduction

Patients who suffered from diabetes with psychiatric disorders, mostly depression and foreign born patients were at higher risk of poorer Health Related Quality of Life (HRQoL). Thus the permanence of care was associated with improved HRQoL. Thus diabetes affected the HRQoL through macro-vascular complications and associated non-vascular co-morbidity, and also by adding to the total burden of disease. Diabetes is a complex disorder with multiple cases, including rare and frequent genetic variants and is one of the biggest global health challenges of the 21st century. Large number of people in India (around 41 million) are diabetic and it is expected to rise to 70 million in 2025 [1]. India being the second most populous country in the world, has a wide diversity in terms of caste, religion, habitat, food habits, lifestyle, and socio-economic status [1]. Variation in size and shape of body with advancing age can be seen among individuals in different sexes. Metabolic disease like diabetes is often related with obesity. Obesity stands the sixth most important risk factor which contributes to the overall burden of disease worldwide [2]. Diabetes mellitus and obesity have a complex relationship in which T2DM is highly associated with obesity [3]. Most of the researchers suggested that the relationship between this parameter is different [4]. The association of diabetes with central adiposity is found to be stronger than the association

with general fatness which is suggested by clinical evidence. Some epidemiologic studies have demonstrated the three obesity indicators, i.e., body mass index (BMI), waist circumference (WC) and waist-hip ratio (WHR) as strong and consistent predictors of type 2 diabetes mellitus [5].

BMI is known to be an independent predictor of type 2 diabetes in both sexes [6]. Waist circumference as well as WHR and WHtR (waist-height ratio) are used to measure central obesity and also provide information on risk for type 2 diabetes [7,8]. But it is not known which of the three indices is the most suitable for assessing the risk of type 2 diabetes in women [9]. Type 2 diabetes is more closely associated with visceral obesity than peripheral obesity [10].

In the recent context, the prevalence of obesity is not attributed to genetic factors, because of high calorie intake of food and less physical activity which results in accumulation of excess fat in the body [11]. Health problems may be influenced by social, economic, biological and political ones [12]. The nutritional status markers, physiological measurements and light grade physical activity are associated with glucose intolerance [13]. A study in the state of Manipur showed the prevalence of diabetes to be more among meat eaters. The Muslims showed the highest percentage of diabetic and overweight i.e. 36%. Only 42.1 % of diabetic individuals had basic knowledge regarding risk factors, treatment and complications of the disease [14].

Adults, who are generally employed, spend most of the time at work place where the pressure and demand of their work affect their usual dietary pattern and physical activity that may result into overweight and obesity [15] -. Sitting for a long time at workplace

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may contribute to an increase in body weight. Further, most of the working people usually spend much time watching television after returning from the workplace and during holidays for relaxation. If not compensated by regular physical exercise, this habit adversely affects the health condition which may result into long term complications.

Objective: The present study was conducted to find the association of lifestyle factors with adiposity markers among the patients with diabetes.

2. Methodology

The Muslim community is a minority group in Manipur, inhabiting the valley areas of Manipur. They are also known as Meitei Pangal. They are fond of non-vegetarian foods and their staple diet is rice. They speak Manipuri language. Their main sources of income are business, government and private services, and agriculture.

The study was conducted from July–September 2015 among the Muslim community of Manipur who were in the age group of 20–45 years. It was a cross-sectional study in which 200 participants were selected. All the participants were explained about the purpose of the study and the techniques that were to be employed during the study. The study was initiated by taking written consent and further steps were carried in an organized manner. Standardized proforma was used to collect the required information of the study. Ethical approval was taken from the institutional ethical committee.

Anthropometric parameters such as height, body weight, waist circumference and hip circumference were measured on the study participants, which were then used to calculate various obesity indices. Body mass index (kg/m^2) classified according to the criteria of World Health Organization [16], for Asian population (BMI <18.5 as underweight, 18.5–22.9 as normal and ≥ 23.0 as overweight) was used in the study. Lifestyle parameters were also recorded in the proforma. Diabetic status of the participants was confirmed from the clinical reports given by the physicians. Statistical analysis was carried out using SPSS 17.0 version. Chi-square test and Spearman's correlation were calculated for the study.

3. Results

Distribution of diabetic participants according to body mass index (BMI) categories is given in Table 1. Overweight was found to be highest among female participants (70%) as compared to the male participants (45%). The association was statistically significant at $p < 0.001$. Maximum number of males was under the normal category of BMI. Duration of time spent at work place by both sexes has been represented in Table 2. It was found that majority of male participants spent about 8 h at work place whereas less number of females spent more time at work place. For the same attribute, significant gender differences ($\chi^2 = 150.659, p < 0.001$) were reported. Distribution of diabetic participants according to number of hours spent in watching television is given in Table 3. It was found that male participants spent less time on watching television, and

Table 1
Distribution of diabetic participants according to body mass index (BMI) categories.

BMI categories	Male (%)	Female (%)	χ^2
Underweight (<18.5)	2	–	13.8***
Normal weight (18.5–22.9)	53	30	
Overweight (≥ 23.0)	45	70	
Total	100	100	

*** $p < 0.001$.

Table 2
Distribution of diabetic participants according to number of hours spent at work place.

No. of hours spent at workplace	Male (%)	Female (%)	χ^2
Not applicable	1	85	150.659***
≤ 7 h	33	9	
8 h	44	6	
≥ 9 h	22	–	
Total	100	100	

*** $p < 0.001$.

majority of them watched TV for only 1 h. However, 42% of female participants spent more than or equal to 2 h on watching TV. The difference between males and females for the duration of time spent on viewing TV, was statistically significant ($p < 0.001$).

Correlation between body mass index and number of hours spent at work place as well as number of hours spent in watching television of the participants is displayed in Table 4. This study observed that number of hours spent at work place was positively correlated with body mass index in both males and females. For the number of hours spent in watching TV, body mass index was found to be negatively correlated among males. In case of females, positive correlation was found with body mass index.

4. Discussion

Sedentary lifestyle is becoming one of the major factors of chronic disease. The people of the community studied were mostly non-vegetarian and their physical activity level was also very less. They had the habit of sleeping during daytime also. Replacement of most of the physical works by modern appliances and machines led to physical inactiveness among Manipuri Muslims. Sedentary life style has been found to be an important risk factor of diabetes. Overweight, obesity and obesity-related deaths are becoming a serious problem with its rapid increase [17]. BMI was used as a common benchmark for assessment; however, the risks of disease in all populations could increase progressively from lower BMI levels onwards [18].

The present study found more overweight diabetic females as compared to males. This is because women had more sedentary living habits. Most of the women who participated in this study were homemakers. A study at Gujarat in India found that majority (68%) of the subjects with T2DM were obese [19] which was consistent with the findings of the study done by Musaiger et al. [20]. It is not enough to be only physically active but it is also required to avoid spending too much time in sedentary behaviours [21](González, 2017). It might explain a smaller relative risk in studies with a higher incidence of diabetes or higher baseline glucose levels by studying different mechanism of biological action between obesity and diabetes in those populations where diabetes were more prevalent. Vazquez et al. [5] found few differences in the relative risk of the three obesity indicators for each population group in their study. It was found that body mass index and waist circumference have a stronger association with incidence of

Table 3
Distribution of diabetic participants according to number of hours spent in watching TV.

No. of hours spent in watching TV	Male (%)	Female (%)	χ^2
Not applicable	20	35	37.063***
1 h	58	23	
≥ 2 h	22	42	
Total	100	100	

*** $p < 0.001$.

Table 4
Correlation of lifestyle parameters with body mass index.

Parameters	Body mass index	
	Male	Female
No. of hours spent at work place	0.07	0.03
No. of hours spent in watching TV	-0.12	0.15

diabetes than waist/hip ratio. They hypothesized that these associations might be heterogeneous due to different underlying causes of overweight, genetic predisposition, and obesity distribution [5].

This study reflected a strong relation between diabetes with occupation. Different occupations were associated with multiple responsibilities and physical activity which in turn might enhance tension. The study by Pranita et al. [22] among 300 women volunteers in the age group of 45–49 years at private dispensaries and the Bharati Vidyapeeth University, Medical College, also showed effects of occupational status on diabetes. Various studies such as that of Marsella et al. [23] among Filipino men from different age groups and social classes on the effects of goal-striving discrepancy stressed in housing; and Galobardes et al. [24] reported significant association between occupational statuses with different metabolic disorders such as type 2 DM, hypertension and dyslipidaemia among both genders.

Positive association between duration of hours spent at work place and body mass index among diabetic participants was revealed in the present study among Muslim community of Manipur. Stressful work, having fast foods while working due to more working hours with less physical activity might be the cause for this condition. Less physical work decreases the metabolic rate of the body, hence extra calories ingested are stored by the body adding to adiposity. Thorp et al. [25] also supported the study that spending more time on sitting at work place might increase the risk of chronic disease. Wardle et al. [26] also reported the positive association of high demand work environment with body mass index. Brisk walking and light activities such as standing might lower risk of obesity and diabetes [27]. Another study explained strong and consistent association between sedentary life pattern and diabetes in large epidemiological studies which resulted from the evidence that sitting for a long time has a rapid deleterious impact on insulin resistance and glycaemia [28].

The present study found a positive correlation of body mass index with number of hours spent in watching TV among diabetic females. Intervention of advanced machine like washing machine, pumping water by electric motors etc. reduced the physical activity of the females in household work. The household work in itself has reduced, thereby leading to decrease in time for work at home and rendering more leisure time. So, they spend free time by watching TV. This might be the reason for positive association between BMI and time spent in watching TV among females. It was consistent with the study of Fitzgerald et al. [27], as they also found positive association between BMI and time duration spent in watching TV among Pima Indians. One of the main contributing factors to ill health was a decrease in physical activity. Sedentary lifestyle including less physical work, spending more hours in leisure time by watching TV and use of more vehicles for commuting was prevalent in high percentage in lower and middle income countries [29].

5. Conclusion

This study draws out the negative impact of sedentary lifestyle on the health of the diabetic patients and participants who were not physically active. They were facing most of the major health

issues such as cardiovascular disease, diabetes, hypertension etc. mainly due to modernity in their habits of eating as well as living standards or lifestyle changes.

6. Recommendation

This study will provide useful information to the diabetic population as well as to the common people for improving their future health conditions especially among conservative population.

Conflicts of interest

The authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.dsx.2018.07.006>.

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