

Original Research Article

Screening the risk factors of type 2 diabetes mellitus in minor ethnic Bishnupriya Manipuri community in Bangladesh

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Received: 03 December 2023

Revised: 21 February 2024

Accepted: 01 March 2024

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ABSTRACT

Background: Type 2 diabetes mellitus (T2DM) development involves various interrelated risk factors, including age, gender, obesity, and inactivity. However, research lacks insights into the risk factors within the minor ethnic Bishnupriya Manipuri community in Bangladesh. This study aimed to identify T2DM risk factors within this community.

Methods: This survey-based prospective observational study was conducted in different villages of Kamalgonj Upazila under the Moulvibazar district in Bangladesh from March 2023 to June 2023 enrolled 280 individuals using purposive sampling. Data collection involved a questionnaire, verbal agreement, and diagnostic documentation. Analysis utilized Microsoft Office and the student's t-test.

Results: Participants exhibited a 1:1.2 male-female ratio, with 64% aged 36-65. 43% were housewives, 55% engaged in moderate work, 15% smoked, and 41% had a family history of diabetes. Diabetic cases accounted for 39%, with an average age of 57.39 ± 11.99 years, significantly higher than non-diabetic cases (46.79 ± 17.93 years). Diabetic cases also showed significantly higher waist circumference (94.11 ± 6.63 cm versus 84.71 ± 14.76 cm) and body mass index (BMI) (26.12 ± 7.61 kg/m² versus 21.44 ± 6.97 kg/m²).

Conclusions: T2DM predominantly affects older individuals in the Bishnupriya Manipuri community. Increased waist circumference, overweight, and obesity emerged as significant risk factors for T2DM within this population.

Keywords: Risk factors, Type 2 diabetes mellitus, Bishnupriya Manipuri, Physical inactivity, Obesity

INTRODUCTION

In Bangladesh, the majority of Manipuri are living in the Sylhet division and the majority of them are living in different villages of Kamalgonj Upazila under the Moulvibazar district.¹ Three groups of Manipuri exist based on ethnic origin: Bishnupriya, Meitei, and Pangans.² Linguistically speaking, the Manipuris are classified into

two groups: the Meitei and the Bishnupriyas. The Manipuris moved from the Indian state of Manipur in the seventeenth century; the Bishnupriyas are mostly Indo-Aryan, the Meitei are mongoloid, and the Pangans are a blend of both Indo-Aryan and Mongoloid ethnic groups.³ Through their traditional customs, they have preserved their essential identity since the exodus. Their clothing, language, rituals, cultural traditions, and architecture all strikingly represent their unique features while adjusting

to the local environment. Vernacular architecture, according to Rapoport (1969), is a direct representation of society and culture.⁴ Consequently, the Manipuri community's traditional building serves as a visual art that captures their cultural identity as an agrarian civilization. It is believed that a combination of lifestyle, genetic, medical, psychosocial, and demographic risk factors such as elevated serum uric acid levels, poor sleep, smoking, heart disease, depression, dyslipidemia, age, hypertension, physical inactivity, and obesity leads to the development of type 2 diabetes in an individual.⁵ Both young and elderly are affected by type 2 diabetes, which is strongly linked to death, morbidity, and significant medical expenses for the patients, their families, and nations.⁶ In industrialized nations, the majority of people with type 2 diabetes are over 65, with only 8% of those affected by the disease being younger than 44. In contrast, in developing nations, three-quarters of diabetic patients are over 45, and one-fourth of adults with the disease are younger than 44.⁷ Type 2 diabetes mellitus is most prevalent in low-income Sub-Saharan African nations, such as Uganda, where the number of patients with the disease has sharply grown from an estimated 98,000 in 2000 to over 1.5 million in 2010 out of a total population of 30 million.⁸ This study's goal was to evaluate type 2 diabetes mellitus risk variables in Bangladesh's minority ethnic Bishnupriya Manipuri group.

METHODS

This was a prospective observational study that was conducted in different villages of Kamalgonj Upazila under the Moulvibazar district in Bangladesh from March 2023 to June 2023. In total 280 individuals from minor ethnic Bishnupriya Manipuri community were enrolled in this study as the study subjects. The whole intervention was conducted following the principles of human research specified in the Helsinki declaration and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR).^{9,10} A convenient purposive sampling technique was used in sample selection. Data were recorded in a pre-designed questionnaire. Verbal agreement and proper diagnostic documents were considered for detecting diabetic cases among the total study population. Obeying the inclusion criteria of this current study individuals from the Bishnupriya Manipuri community aged by ≥ 18 years from either gender were included. On the other hand, according to the exclusion criteria of this study, individuals who currently live in the same community but are historically not Manipuri were excluded. Properly written consent was taken from all the participants before data collection. All data were processed, analyzed and disseminated by using the Microsoft office program. For assessing the significance, the student's t-test was done.

RESULTS

In this study, among the total participants, 47% were male whereas the rest 53% were female. So, the male-female

ratio of the participants was 1:1.2 (Figure 1). In this current study, we found that the highest number of patients (64%) were from the 36-65 years age group (Table 1). In analyzing the occupational status, we observed that 43% of the total participants were housewives (Table 2). In this study, the majority of the participants (55%) were moderate workers, 32% were sedentary and the rest 14% were heavy workers (Table 3). We found that 41% of patients had a family history of diabetes (Figure 2). Only 1% of our participants had polycystic ovarian syndrome (Figure 3). Among our total participants, 15% had a smoking habit (Figure 4). In this study, we found that more than one-third of the participants (39%) were with diabetes mellitus (Figure 5). In analyzing the age between diabetic and non-diabetic cases, we observed that the mean \pm SD age of diabetic cases was 57.39 \pm 11.99 years which was 46.79 \pm 17.93 years in non-diabetic cases where we found a significant correlation between the groups ($p < 0.001$). According to the waist circumference status, we observed that the mean \pm SD measure of circumference was 94.11 \pm 6.63 cm in diabetic cases which was significantly higher than that (84.71 \pm 14.76 cm) in non-diabetic cases ($p < 0.001$). Moreover, the mean \pm SD BMI (kg/m²) of diabetic cases was 26.12 \pm 7.61 kg/m² which was significantly higher than that (21.44 \pm 6.97 kg/m²) in non-diabetic cases ($p < 0.001$) (Table 4).

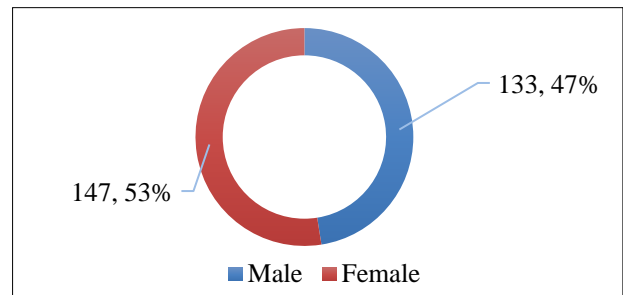


Figure 1: Distribution of participants as per gender (n=280).

Table 1: Distribution of participants as per age (n=280).

Age (year)	N	%
18-35	50	18
36-65	178	64
>65	52	19

Table 2: Distribution of participants as per occupational status (n=280).

Occupation	N	%
Housewives	120	43
Farmer	44	16
Service holder	32	11
Student	30	11
Unemployed	31	11
Businessman	14	5
Driver	9	3

Table 3: Distribution of participants as per physical activity (n=280).

Activity type	N	%
Sedentary worker	89	32
Moderate worker	153	55
Heavy worker	38	14

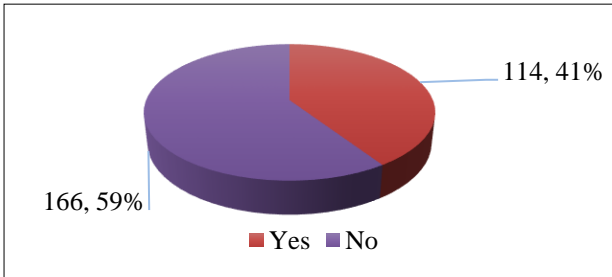


Figure 2: Distribution of participants as per family history (n=280).

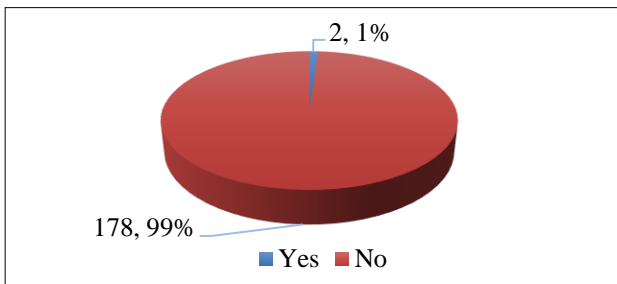


Figure 3: Distribution of participants as per polycystic ovarian syndrome (n=280).

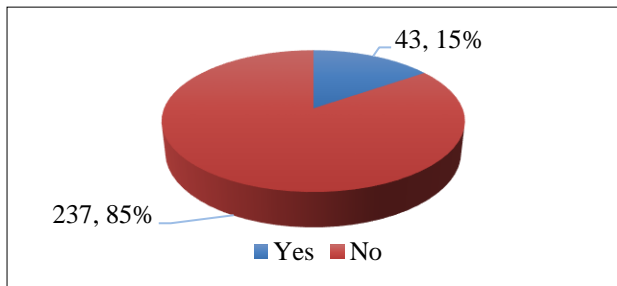


Figure 4: Distribution of participants as per smoking habit (n=280).

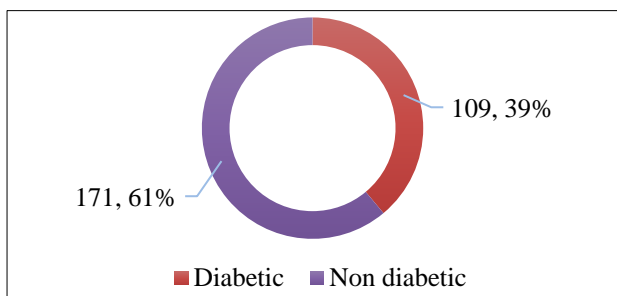


Figure 5: Distribution of participants as per the frequency of diabetes (n=280).



Table 4: Risk factor analysis between diabetic and non-diabetic cases (n=280).

Characteristics	Diabetic (n=109)		Non-diabetic (n=171)		P value
	N	%	N	%	
Age distribution (mean±SD)					
Year	57.39±11.99		46.79±17.93		<0.001
Gender distribution					
Male	44	40	89	52	0.184
Female	65	60	82	48	
Physical activities					
Sedentary worker	30	28	59	35	0.184
Moderate worker	62	57	91	53	
Heavy worker	17	16	21	12	
Waist circumference status (cm)					
Mean±SD	94.11±6.63		84.71±14.76		<0.001
BMI (kg/m²)					
Mean±SD	26.12±7.61		21.44±6.97		<0.001

DISCUSSION

This study aimed to assess the risk factors of type 2 diabetes in the minor ethnic Bishnupriya Manipuri community in Bangladesh. In this study, among the total participants, 47% were male whereas the rest 53% were female. So, the male-female ratio of the participants was 1:1.2. These results were similar to the study conducted by Machado-Alba et al who found that females were highly affected by type 2 diabetes.¹¹ In this current study, we found that the highest number of patients (64%) were from the 36-65 years age group. This was to some extent in agreement with the findings by Cho et al where adults aged 45-64 were the most diagnosed age group for type 2 diabetes mellitus.¹² In this study, the majority of the participants (55%) were moderate workers 32% were sedentary and the rest 14% were heavy workers. Bommer et al found that the female cases in Uganda were physically inactive by performing less exercise to burn excess body fat and yet they took an unhealthy diet containing many fats and starches leading to type 2 diabetes.¹³ In this study, 15% of our participants had a smoking habit. Helmut et al reported that exposure to smoke as well as second-hand smoke strongly affects the risk of T2DM and the probability of its complications.¹⁴ In this current study, we found that 41% of patients had a family history of diabetes. Tsenkova et al reported that a family history of diabetes is strongly associated with the incidence of diabetes.¹⁵ Another study also reported that parental history of diabetes mellitus is an independent risk factor for diabetes.¹⁶ In analyzing the age between diabetic and non-diabetic cases, we observed that the mean±SD age of diabetic cases was 57.39±11.99 years which was 46.79±17.93 years in non-diabetic cases where we found a significant correlation between the groups (p<0.001). These findings were to some extent in agreement with

findings by Cho et al.¹⁷ On the other hand, research by ADA reported that management of diabetes mellitus is directly affected by gender and a person's age.¹⁸ According to the waist circumference status, we observed that the mean±SD measure of circumference was 94.11±6.63 cm in diabetic cases which was significantly higher than that (84.71±14.76 cm) in non-diabetic cases ($p<0.001$). These findings were similar to that of another study.¹⁹ Moreover, in our study, the mean±SD BMI (kg/m^2) of diabetic cases was 26.12±7.61 kg/m^2 which was significantly higher than that (21.44±6.97 kg/m^2) in non-diabetic cases ($p<0.001$). A study conducted by Zunt et al reported BMI as one of the potential factors that increased the incidence of diabetes in almost all countries.²⁰ High BMI has been reported in another study to be one of the strongest determinants of T2DM.²¹

Limitations

This was conducted with small-sized samples. Moreover, the study was conducted over a very short period. So, the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION

As per the findings of this current study, we can conclude that aged individuals of the Bishnupriya Manipuri community are mainly prone to type 2 diabetes mellitus. Besides, larger circumference, overweight and obesity are the risk factors for type 2 diabetes mellitus among the Bishnupriya Manipuri population. On the other hand, female gender and family history may be also risk factors. But for some limitations of our study, we could not analyze those two factors. For getting more specific results, we would like to recommend conducting similar studies in several places with larger-sized samples.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Singha SK, Emran MS, Sinha SK, Sinha S, Ahmed KU, Tahite D. Screening the risk factors of type 2 diabetes mellitus in minor ethnic Bishnupriya Manipuri community in Bangladesh. *Int J Res Med Sci* 2024;12:1051-5.