Original Article

RISKS OF TYPE 2 DIABETES AMONG NONDIABETIC PATIENTS

*Krishna Kumari Paudel (Subedi), Prakriti Shrestha, Sushila Pokharel, Gita Thapaliya and Elisha Shrestha

Nepal.

*Corresponding Author: Krishna Kumari Paudel (Subedi)

Nepal.

ABSTRACT

Introduction: The prevalence of type 2 diabetes has been rising worldwide, including in low- and middle-income countries such as Nepal. Early detection of individuals at risk is of the utmost importance to prevent the escalating condition. This study used the Indian Diabetes Risk Score (IDRS) in order to assess the risks of developing diabetes among undiagnosed diabetes patients attending OPD and Emergency units due to other problems in Manmohan Medical College and Teaching Hospital of Nepal. **Objective:** The objective of this study was to assess the risk of developing diabetes among undiagnosed patients in Manmohan Medical College and Teaching Hospital Sowyambhu, 15 Kathmandu Nepal. **Methods:** A hospital-based cross-sectional descriptive study was conducted among 385 adult undiagnosed diabetic patients attending OPD and Emergency due to other health problems in Manmohan Medical College and Teaching Hospital sowyambhu Kathmandu Nepal. Simple random sampling was utilized to select participants. The data collection tool consisted of two parts; first, socio-demographic information was collected and second, the Indian Diabetes Risk Score was used to measure the risks. Pearson's Chi-square was used to see the associations. **Result:** The majority (61.3%) of participants were female, and only 38.7% were female. In regard to marital status the majority of participants (74.8%) were married, followed by 25.2% were unmarried. In terms of employment status, both employed and unemployed nearly had similar eminence (48.1% and 51.9% respectively). Likewise, 61% were non-alcoholic, 36.9% were occasional alcohol users, and 1.6% used alcohol on a regular basis. About half of the participants (50%)) had a moderate risk of developing type 2 diabetes. Similarly, 31% had severe risk and 19% had a low risk of developing diabetes. Diabetes risk is significantly associated with marital status, employment status, and alcohol consumption (p= 0.000, 0.040, and 0.41respectively). Conversely, diabetes risk was not associated with gender (p=1.111). **Conclusion:** According to this study, there were about 50% of participants had a moderate level of risk, and about one-third had a high level of risk of developing diabetes. This denotes that many undiagnosed people are likely to develop diabetes in the future. It is important to understand that this study has alerted us that such threats can only be dealt with by focusing on preventive measures.

KEYWORDS: level of risk factors, IDRS, Type 2 Diabetes.

INTRODUCTION

At the moment, diabetes is known as a "global health emergency" it is estimated that 9% adult population is affected. However, it is predicted that half of them remain undiagnosed. Actually, type 2 diabetes is a chronic metabolic disease characterized by elevated blood sugar levels. It is the most common form of adult diabetes. The prevalence of type 2 diabetes has been rising globally, and it's affecting a greater number of people in developing countries like Nepal.[1] The world health organization states that there were 422 million people living with diabetes, and estimates that there will be 642 million by 2035.[2]

Type 2 Diabetes Mellitus patients may often remain asymptomatic for an extended period of time. According to the study conducted Type 2 Diabetes Mellitus has established itself as a silent epidemic with disturbing multiorgan involvement in the latter stage.[3]

The only to prevent it is by forwarding is to nip it in its bud with proactive screening tools in every available circumstance. There are various types of cost-effective screening tools. Among them, the Indian Diabetic Risk Score (IDRS) is one of the simple and cost-effective tools and is very useful for low economic countries like Nepal. Originally developed by Madras Diabetes

Research Foundation. The Indian Diabetes Risk Score (IDRS), is a simple screening tool for predicting undiagnosed diabetes.[4]

A cross-sectional study conducted among 400 population of south India shows unexpected kind of findings. The findings show that 31% were at high risk of developing type 2, 47% had intermediate risk and 22% had low-risk diabetes.[5] In the study total of 290 medical students were included. The IDRS categorization revealed 77%, 22%, and 1% of students in low-, moderate- and high-risk categories, respectively. It has been statistically proven that a person is at a greater risk for developing diabetes if they are male, and have a family history of diabetes. The benefits of this tool include it being non-expensive non-invasive, simple, and easily applicable to the target population during mass screening programs. Nonetheless, it is more useful to estimate the worthiness of the IDRS tool in identifying undiagnosed diabetes.[6]

It is well proven that diabetes leads to severe symptoms over time damaging the eyes, heart, blood vessels, kidneys, and nerves. A systematic review of 10 articles from 2000 to 2014 is carried out by Gyawali, Sharma, Neupane, and Mishra Teijlingen & Kallestrup in Nepal Prevalence of type 2 diabetes ranged from a minimum of 1.4% to a maximum of 19.0% and pooled prevalence of type 2 diabetes was 8.4%.[7] According to WHO, diabetes affects more than 500,000 people in Nepal, and this number will rise to 1,500,000 by 2030.[2] It suggests that the extents of the risks of developing diabetes need to be detected in the time immediately. In this terrible condition, early recognition of the risks of diabetes is only the key to preventing the development of type 2 diabetes to a significant extent.

OBJECTIVE

The objective of this study was to assess the risk of developing diabetes among undiagnosed patients in Manmohan Medical College and Teaching Hospital Sowyambhu, 15 Kathmandu Nepal.

MATERIALS AND METHODS

Research Design: A quantitative cross-sectional descriptive study design was adopted for the study.

Research Site, Population, and Sampling and sample size of the Study
The locations of this research study were all units of Manmohan Medical College and Teaching Hospital. It is a tertiary-level hospital. For this study, a purposive sampling technique was adopted. All non-diabetic patients of the total sample size of the study were 385 at a 95% confidence level and 0.05% allowable error. The sample size was calculated using the following formula.
At a 95% confidence level, $z =$
1.96 and allowable error, $(e) = 0.05$
Prevalence (p) = 0.5

Non- Prevalence (q)
$= 1 - p = 1 - 0.5 = 0.5$

We have, n_0 (in infinite population) $= \dfrac{z^2 pq}{e^2}$

$= \dfrac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$

$= 384.16$

$= 384$

Tools and Instrumentation
Taking into consideration that the development of tools is a significant matter in order to assemble the required data, we have given special attention to selecting the proper tool and instrument. In this study, researchers used a validated tool, the Indian Diabetes Risk Score (IDRS). Madras Diabetes Research Foundation (MDRF) has developed the Indian Diabetes Risk Score (IDRS) to detect the risk of developing Type 2 diabetes. The MDRF-IDRS screening tool was found to be sensitive and specific in identifying diabetes among people. The MDRF-IDRS score of 60 or greater had the highest accuracy in detecting this illness.[7]

Data Collection Procedure
In order to collect data researchers went to each selected respondents OPD and emergency department patients introduce themselves as researchers, and then stated the purpose of the study. Then the researchers interviewed the respondents. Respondents who desired to participate in this study were asked to give written consent before starting the interview with them. It took nearly 15-20 minutes to complete the interview.

Data Analysis Procedure
The purpose of analyzing the data is to change it from an unprocessed form to an understandable presentation. For this purpose, we used descriptive statistics i.e. frequencies, and percentages so that we can explore the result of data on demographic variables. Risks will be classified into three categories: mild(less than 30 points), moderate (30-50 and severe (60 and above) Inferential statistics were used to determine the association of risk factors and the probability of developing diabetes 2. Similarly risk of developing diabetes with their demographic variables. Ultimately, the findings of the study were interconnected with the purpose and research questions. Similarly, each finding was also related to reviewed literature and findings of other similar kinds of a study conducted internationally.

Validity and Reliability
In order to maintain validity extensive literature review and consultation with nurse experts, health professionals, and peers were done extensively. Additionally, for analysis, and questionnaire validity, three experts (senior Nurses, a research expert, and an endocrinologist) were asked for their opinion. They were asked to complete the questionnaire as if they were actual respondents. Their

suggestions and feedback were incorporated while developing the questionnaire.

Reliability is the confidence we can place in the measuring instrument to give us the same numeric value when the measurement is repeated on the same object. Taking this theoretical consideration in mind, we gave specific emphasis on reliability. Pretesting of the instrument will be done among 10% of participants and for internal consistency of the items Cronbach alpha was calculated. The necessary modification was done after the pretest result and the participant's suggestion or opinion.

Ethical Consideration

The ethical aspects of the study were consciously followed. Written proposal was submitted and approval had taken from the institutional research committee of Manmohan Memorial Medical College and Teaching Hospital. Written consent was also taken from respondents who met the eligibility criteria and were willing to participate in the study. The respondents were guaranteed anonymity; confidentiality and privacy of the information given by them. Respondents were allowed to withdraw their participation from the study at any time if they like to withdraw their participation. Researchers followed a coding system to maintain the subject's anonymity or privacy.

RESULT

Table 1: Demographic Distribution of Participants.

Variables N= 385	Categories	Frequencies	Percentages
Gender	Female	236	61.3
	Male	149	38.7
Marital status	Unmarried	97	25.2
	Married	288	74.8
Employment status	Unemployed	185	48.1
	Employed	200	51.9
Alcohol consumption	Non	237	61.6
	Occasional	142	36.9
	Regular	6	1.6

The above table shows that the majority (61.3%) of participants were female, and only 38.7% were female. In regard to marital status the majority of participants (74.8%) were married, followed by 25.2% were unmarried. In terms of employment status, both employed and unemployed nearly had similar eminence (48.1% and 51.9% respectively). Likewise, 61% were non-alcoholic, 36.9% were occasional alcohol users, and 1.6% used alcohol on a regular basis.

Table 2: Participants had a risk of developing diabetes.

Extent of Risks	Frequencies	Percentages
Low	73	19
Moderate	173	50.1
Severe	119	30.9
Total	385	100

Table 2 displays that among 385 participants, about half of the participants (50%)) had a moderate risk of developing type 2 diabetes. Similarly, 31% had severe risk and 19% had a mild risk of developing diabetes. It denotes that the majority of participants had a significant level of risk of developing diabetes.

Table 3: Association between risks of diabetes with demographic variables.

Variables N= 385	Categories	Frequencies	Percentages	Chi-square	
				Statistic Value	P Value
Gender	Female	236	61.3	2.551	0.111
	Male	149	38.7		
Marital status	Unmarried	97	25.2	46.982	0.000
	Married	288	74.8		
Employment status	Unemployed	185	48.1	8.466	0.040
	Employed	200	51.9		
Alcohol consumption	Non	237	61.6	4.402	0.041
	Occasional	142	36.9		

	Regular	6	1.6		

Table 3 demonstrates that diabetes risk is significantly associated with marital status, employment status, and alcohol consumption (p= 0.000, p=0.04, and p=0.41respectively. Conversely, diabetes risk was not associated with gender (p=1.111).

DISCUSSION

The present study was a cross-sectional descriptive study that was conducted among 385 non-diabetic patients attending the medical OPD and emergency department of Manmohan Medical College and Teaching Hospital. Indian Diabetic Risk Score (IRDS) was used as a screening tool. This study reveals among 385 participants, about half of the participants (50%)) had a moderate risk of developing type 2 diabetes. Similarly, 31% had severe risk and 19% had a mild risk of developing diabetes. The extent of high risk for diabetes was 30 % this study was similar to a study conducted by Thapa, Kayastha, & Mishra.[1] In which one-third of the population had high risk. The study conducted by Singh M.M. found that 43% of participants had a higher level of risk as compared to the findings of this study participants had slightly higher.[8] Only a few studies are there in the context of Nepal so this study may serve as a foundation for a further larger-scale study. The researcher would like to recommend conducting a large sample size study in a community setting.

This study shows that diabetes risks were significantly associated with gender Findings of this study support this study, reported that diabetes risks were significantly associated with gender. Although Nepal is an agricultural country, due to increasing mechanization in agriculture, physical activity is decreasing than before. Due to less physical activity, the weight will be increased. In other words, the risk of diabetes is increasing due to the increase in urbanization.

Earlier diabetes was said to be a disease of the rich, but today it is seen in both the rich and the poor, as well as in low and middle-income countries like Nepal. Early detection of risk is key to intervening in preventive strategies so that the impediment and burden of diabetes can be minimized.

CONCLUSION

This study was conducted among 385 non-diabetic patients using the IDRS tool. It shows moderate level risk in 50% of the percentage and high-level risk in almost one-third of the participants. This indicates that many undiagnosed people are likely to develop diabetes in the future. It is important to understand that this study has alerted us that such threats can only be dealt with by focusing on preventive measures.

REFERENCES

1. Thapa, S, Kayastha, P and Mishra D.K. Assessment of Risk of Type 2 Diabetes Among Adults of Banepa Municipality, Nepal: Community Based Cross-Sectional Study. Int J Travel Med Glob Health, 2020; 8(1): 31-36.
2. World Health Organization (WHO). Global Report on Diabetes. Geneva: WHO, 2016.
3. Barjatya, P, Mishra, BN, Panwar, NKS. Study of Effectiveness of IDRS as a Screening tool in OPD attending Adults at a Medical College Hospital in Central India. *Journal of Advanced Research in Medical Science & Technology, 2019;* 3 (4): 1. Available from https://medicaljournalshouse.com/index.php/Journal-MedicalSci-MedTechnology/article/view/326.
4. Jain, M, Kumar V, Jain M, Garg, K, Shekhawat, R, Gupta, P K. Indian Diabetes Risk Score (IDRS) as a strong predictor of diabetes mellitus: A cross-sectional study among urban population of Jhalawar, Rajasthan, 2022.
5. Tamilarasan M, Selvaraju M, Kulothungan K and Srirangathan T. A cross-sectional study to assess diabetic risk using Indian diabetic risk score among the urban population of Perambalur, South India, 2021.
6. Lt Col, P. D., Maj, G.S. Maj, T. G**,** and Air Cmde, S.M. Performance of Indian Diabetes Risk Score (IDRS) as **a** screening tool for diabetes in an urban slum. Med J Armed Forces India, 2022; 73(2): 123–128.
7. Gyawali B, Sharma R, Neupane D, Mishra, S.R. Teijlingen, E.V. and Kallestrup, P. Prevalence of type 2 diabetes in Nepal: a systematic review and meta-analysis from 2000 to 2014 Glob Health Action, 2015.
8. Singh, MM, Mangla V, Pangtey R, and Garg, S. Risk Assessment of Diabetes Using the Indian Diabetes Risk Score: A Study on Young Medical Students from Northern India. Indian J Endocrinol Metab, 2019; 23(1): 86–90.