International Journal of Clinical and Biomedical Research

Original Article

DIABETES RISK SCORE OF STAFF OF AN URBAN MISSION HOSPITAL IN NIGERIA

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ABSTRACT

Background: Diabetes mellitus is a major global health problem which in hospital staff poses a major stress and can lead to migration away from health related posts. Certain features of health work e.g. long hours, shifts and uncertain break times increase the risk for hospital staff. It is critical to predict chronic conditions like diabetes mellitus that have a definable onset in adults so that morbidity and mortality can be mitigated through early recognition and treatment. **Aims**: To determine the diabetes risk score of health workers in an urban hospital and the associated risk factors. **Methods and Materials**: A correlational cross sectional survey of staff was conducted and diabetes risk was determined using a modified form of the Finnish Diabetes Risk Score questionnaire. **Results and Conclusions**: A total of 220 staff representing a response rate of 69.8% completed the study. The mean age was 41.6±9.88, Median duration of employment was 7.2years with a range of (0-37). Majority (66.4%) were in the 25-44 years age group, and most were female (66.4%) and married (70.5%). Mean BMI was 26.62±4.85. The mean Diabetes Risk score for the entire study group was 7.43±4.46 with a median score of 7 and a range of 0-19. About 40.5% had slightly elevated risk, 14.5% had moderate risk, and 5% had high risk. Female gender (AOR 0.17, 95% CI 0.09-0.33), and duration of employment (AOR 2.27, 95% CI 1.18-4.37) were significant predictors of higher diabetic risk score category.

KEYWORDS: Type 2 Diabetes mellitus, Diabetes risk, risk score, health workforce.

INTRODUCTION

Diabetes is becoming a major health problem for developed and emerging economies.[1] With cure still far from available, primary and secondary prevention are critical to good control and prevention of complications that reduce quality of life. Significant numbers of individuals are at risk of developing diabetes. Consequently, diabetes is regarded as a population health issue requiring a population health approach. Broad strategies need to be considered in reducing the incidence of type 2 diabetes. Simply isolating the health status of an individual is insufficient to prevent diabetes. It is well known that multiple factors affect an individual's health and overall wellbeing.[2]

A population health approach acknowledges the influence of these factors, typically referred to as determinants of health. These factors, which are interrelated are: income and social status; social support networks; education; employment and working conditions; social environments; physical environments; personal health practices and coping skills; healthy child development; biology and genetic endowment; health services; gender; culture.[2] With regards to type 2 diabetes in the population, three groups are important: those who do not have diabetes, those who have diabetes but are unaware and those who are diagnosed with diabetes.

Those who do not have diabetes are the majority of the population and keeping these individuals healthy and preventing the disease is a priority. Preventing diabetes demands increased attention to those risk factors believed to be major contributors to diabetes.[2] Prevention initiatives are targeted at healthy living and address the barriers to healthy eating and physical activity. Prediction of chronic conditions that have a definable onset in adults can help to guide interventions and health policy

development. Prediction is an important issue, given that diabetes leads to considerable morbidity and mortality, which can be mitigated through early recognition and treatment.[3]

There has been a recent major concern about the global health workforce. It is obvious that chronic illnesses like diabetes in hospital staff pose a major stress and can even lead to migration away from health related posts because of the added stress of these jobs.[4] It's also observed that certain features of health work e.g. long hours, shifts and uncertain break times make many hospital staff at risk of diabetes from poor diet and exercise habits.[5] This study was aimed at determining the diabetic risk score of health workers in an urban hospital and the associated risk factors.

MATERIALS AND METHODS

Ethics: Approval to conduct the study was obtained from the Hospital research and Ethics committee.

Study place: The study was conducted in an urban mission hospital between July and September 2013.

Sample size: At the time of the study, the hospital had 350 full time staff.

Study design: A cross sectional hospital based study.

Inclusion criteria: All consenting staff that were over the age of 18 years.

Exclusion criteria: Staff who had been previously diagnosed with diabetes mellitus or those who did not give consent for the study were excluded.

Methodology: The target population were given a participant's information sheet and a consent form. All consenting staff who met the inclusion criteria for the study were given a two part questionnaire by the investigators.

The first part contained socio-demographic data, and the second part was a diabetes risk score questionnaire. All subjects who indicated an interest in knowing their diabetes risk score.[6]

A validated version of the diabetes risk assessment form of the Finnish Medical Association, slightly modified and adapted to the local setting was used.[6] It consists of eight questions that have points allotted for each response to a maximum total score of 23. The parameters will be graded and scored. The total risk score for each study participant was summed up. The risk of

developing type 2 diabetes within 10 years will be stratified into: low (<7); slightly elevated (7–11); moderately elevated (12–14); high (15–20); and very high (>20).

STATISTICAL ANALYSIS

Data collected was analyzed using SPSS (Statistical Package for Social Sciences) software 20.0. Chi-square test was used to test for associations and comparisons of proportions. The student t-test was used to test for differences between quantitative variables, and multivariate analysis was performed using multinomial logistic regression.

RESULTS

A total of 350 full time staff were presented with the opening statement and 20 declined to participate in the study. An additional 15 staff were excluded because they were previously diagnosed diabetics. A total of 220 staff fully completed the study representing a 69.8% response rate. The mean age was 41.6 ± 9.88, Median duration of employment was 7.2years with a range of (0-37). Majority (66.4%) were in the 25-44 years age group, and most were female (66.4%) and married (70.5%). Other details are provided in Table 1.

Table 1. Socio-demographic characteristics of study participants

Variable	Number	Percentage
Sex		
Male	74	33.6
Female	146	66.4
Age group		
<24	3	1.4
25-44	136	61.8
45-64	79	35.9
>64	2	0.9
Marital status		
Married	155	70.5
Single	65	29.5

Educational status		
None	3	1.4
Primary	36	16.4
Secondary	45	20.5
Tertiary	136	61.8
Duration of employment (years)	132	60
<10	37	16.8
10-19	38	17.3
20-29	13	5.9
30-39		
Occupation		
Health Service Providers (HSP)	9	4.1
Physicians	62	28.2
Nurse/Midwives	52	23.6
Others		
Health Management & Support Staff (HMS) Professionals	35	15.9
Others	62	28.2

The anthropometric measurements of the study group indicated a mean weight 70.36±12.65Kg, mean height of 1.63±0.08m, and mean BMI of 26.62±4.85.

The mean Diabetic Risk score for the entire study group was 7.43±4.46 with a median score of 7 and a range of 0-19. Details are in Table 2.

Table 2. Diabetes Risk Score distribution of study participants

Risk score	Number	Percentage
Low (<7)	88	40
Slightly elevated (7-11)	89	40.5
Moderate (12-14)	32	14.5
High (16-20)	11	5
Very High (>20)	0	0
Total	220	100

Multivariate analysis for factors predicting high diabetes risk indicated that female gender (Adjusted Odds Ratio 0.17, 95% CI 0.09-0.33), and duration of employment (Adjusted Odds Ratio 2.27, 95% CI 1.18-4.37) were significant predictors. Other details are in Table 3.

Table 3. Multinomial Logistic Regression Table of Factors Associated With High DM Risk Score in Study Population

Variables	Wald statistic	Adjusted Odds ratio (95%CI)
Occupation (HSP)	2.83	0.53 (0.25-1.11)
Gender (female)	27.73	**0.17 (0.09-0.33)**
Marital status (married)	2.57	0.57 (0.29-1.14)
Duration of employment (<10years)	5.98	**2.27 (1.18-4.37)**
Education (tertiary)	0.44	1.25 (0.65-2.38)

*= Multinomial Logistic Regression

DISCUSSION

The study aimed at determining the pattern of diabetes risk scores in healthcare workers, as well as the predictive factors for high diabetes risk in the workers. The study response rate was almost 70%. The socio-demographic data indicated a relatively young, highly educated, mostly female workforce. These findings are similar to results published by Busari et al,[6] from another urban tertiary health care institution in Nigeria. They however reported 58% male respondents. In our study, there were more females than males tallying with the general staff distribution where most Nursing staff are female.

The mean BMI in the study was 26.62±4.85 which is in the overweight category. Alebiosu et al had reported 28.9% overweight in a community cohort they had screened for diabetes risk.[7] Other studies have pointed out the additional part obesity plays in raising the risk for metabolic syndrome particularly in night shift health workers.[8]

The mean Diabetes Risk score in the study 7.43±4.46 with a median score of 7 and a range of 0-19. The mean score is in the slightly elevated category for risk of developing Type 2 diabetes mellitus in 10 years. However, 40.5% of the workers in this study were in the slightly elevated risk category while an

additional 19.5% were in the moderate and high risk category. Overall, 60% of the staff surveyed had elevated risk of developing diabetes mellitus in the next 10 years. Busari et al had reported 42% of the staff of a tertiary hospital with slightly elevated to high risk diabetic risk scores,[6] while Alebiosu et al working with a community based sample had reported 41.9% with elevated risk scores.[7] Our finding is remarkably high and even more disturbing considering the fact that two thirds of the staff were in the 25-44 years age range and had a mean age of 41.6±9.88. The higher diabetes risk in this cohort may be connected to the urban setting of the hospital. The research setting is also an urban mission hospital which are typically understaffed compared to government facilities, as a result of which staff tend to work longer hours including night shifts. Long hours and shift work have been noted as significant contributors to increased diabetes risk in health care workers.[9,10]

Multivariate analysis indicated that female gender and duration of employment <10 years were significantly associated with higher diabetes risk categories. Some investigators have reported increased diabetes risk for females and especially female healthcare workers who take night shifts.[6-9] An unexpected finding is the fact that shorter duration of employment was associated with increased risk. Since diabetes risk generally increases with age, increased duration of employment would have been expected to be associated with increased risk. However, since 60% of the staff had <10 years duration of employment, this might simply be the contribution of this large proportion to the overall diabetes risk score.

The findings from this study confirm the reality of rising risk for Diabetes mellitus and other Non-communicable diseases in Nigeria particularly among the young, urban employed. It also has implications for maintaining the healthcare workforce, these findings are limited by the fact that this was a single hospital based study and the results may not be in keeping with community based findings.

CONCLUSION

Majority (60%) of the health workers had an elevated risk of developing Type 2 Diabetes mellitus. Female staff with <10 years duration of employment were more likely to have elevated

risk of developing Type 2 Diabetes mellitus. It would therefore point to the need for increased vigilance and screening of healthcare workers for Diabetes, and more studies on the contribution of the work environment to the risk of type 2 diabetes mellitus.

ACKNOWLEDGEMENT

REFERENCES

1) Hossain P, Kawar B, Nahas ME. Obesity and Diabetes in the Developing World — A Growing Challenge. N Engl J Med 2007;356:213-21.

2) Alberta Diabetes Prevention Working Group. Alberta Diabetes Prevention Strategy 2003-2013. Available from http://www.health.alberta.ca/documents/Diabetes-Strategy-2003.pdf. Accessed 27th March 2015.

3) Vijan S, Stevens DL, Herman WH, Funnell MM, Standiford CJ. Screening, prevention, counseling, and treatment for the complications of type II diabetes mellitus. J Gen Intern Med. 1997;12(9):567-80.

4) Chandola T, Brunner E, Marmot M. Chronic stress at work and the metabolic syndrome: prospective study. BMJ 2006;332:521–5.

5) Nakanishi N, Nishina K, Yoshida H. Hours of work and the risk of developing impaired fasting glucose or type 2 diabetes mellitus in Japanese male office workers. Occup Environ Med 2001;58:569–74.

6) Busari OA, Opadijo OG, Adeyemi AO. Risk of developing diabetes among healthcare workers in a Nigerian tertiary hospital. Mera: Diabetes International 2008;21.

7) Alebiosu OC, Familoni OB, Ogunsemi OO, Raimi TH, Balogun WO, Odusan O et al. Community based diabetes risk assessment in Ogun state, Nigeria (World Diabetes Foundation project 08-321). Indian J Endocrinol Metab. 2013;17(4):653.

8) Pietroiusti A, Neri A, Somma G, Coppeta L, Lavicoli L, Bergamaschi A et al. Incidence of metabolic syndrome among night-shift healthcare workers. Occup Environ Med 2010;67:54–7.

9) Kroenke CH, Spiegelman D, Manson J, Schernhammer ES, Colditz GA, and Kawachi I. Work Characteristics and Incidence of Type 2 Diabetes in Women. Am J Epidemiol 2007;165:175–183.

10) Wang X-S, Armstrong MEG, Cairns BJ, Key TJ, Travis RC. Shift work and chronic disease: the epidemiological evidence. Occup Med (Lond) 2011;61:78–89.