



Prevalence of Risk Factors for Diabetes Among Construction Workers in Majmaah City, Saudi Arabia

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ABSTRACT

Background: Considering the fact that diabetes is one of the most prevalent non – communicable diseases in the world today, secondary prevention can at best prolong life of those affected by it. But arguably it has been proved time and again that primary prevention will always lead to a better quality of life. Risk factors have been the major factors studied worldwide to prevent diabetes and due to a high rate of migration of people around the world it should be considered as an essential tool to diagnose the risk of diabetes among migrants.

Purpose: The aim of the study was to assess the risk factors that play a significant role in causing diabetes among construction workers.

Methods: The risk factors data was collected from 120 (150) construction workers (response rate=80%) staying in two residential compounds. The workers were asked to fill in a pre – tested, structured and close-ended questionnaire to evaluate the risk factors. In addition, we measured the BP and BMI by using weight scale, measuring tape, and mercury sphygmomanometer.

Results: The results showed that construction workers had an acceptable quality of life but the risk factors were also present that could pose a threat in future to the development of diabetes mellitus. 95.5 % ate all types of food without any consideration. 21.7 % of them were above the normal weight. 62.5 % were sleeping less than 7 hours, which increased the stress level.

Conclusions: Construction workers have good quality of life in Saudi Arabia. However, prevalence of modifiable and non-modifiable risk factors for developing DM is considerable. Primary preventive measures need to be inculcated to reduce it to a level where it ceases to be a public health problem.

Key Words: Expatriates, Asians, Risk factors, Diabetes mellitus, Saudi Arabia

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder, which has affected all part of the world, and its prevalence is still increasing. The people living with diabetes are vulnerable to various complications both long term and short term.

According to WHO more than one in three adults worldwide has diabetes – a condition that causes around half of all deaths from stroke and heart disease. It has also published that that 347 million people worldwide have diabetes out of which more than 80% of people with diabetes live in low- and middle-income countries with a grim projection that diabetes death will double between 2005 and 2030.² It is important to note that diabetes is a multifactorial disorder, which is

common in genetically susceptible individuals who are, exposed to environmental risk factors especially those who are employed in stressful and difficult environment condition.

Saudi Arabia is one of the largest labor markets in the world with 11 million foreign workers from more than 100 countries work in different sectors and fields. Saudi Arabia is committed to achieve the milestone of Vision 2030 and all efforts are being aimed at making labor market more attractive to foreign workers.

With the globalization of oil and gas industry Saudi Arabia has become an important work destination for many expatriate workers from various countries. Among expatriate workers, common health problems include alcoholism and

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respiratory problems caused by sand and dust in the air – a situation exacerbated by continuous construction work in most states.

There is lot of evidence available from Multiple studies in the past that there is a much higher prevalence of cardiovascular diseases risk factors among expatriates living in a foreign country compared to their own country of origin. There has been mention of few studies in the gulf region about workers health problems like urinary tract infections, hepatitis E infections, accidents and injuries etc. but very rarely any studies have covered health problems like diabetes mellitus among the expatriate workers.

Contributing to the above factors it has been determined that working in shift may itself be an independent risk factor for sleeping quality, diabetes and hypertension even in retired workers. Applicable intervention strategies are needed for prevention of sleep loss, diabetes, and hypertension for shift workers.

With this occupational and environmental background we felt there is a need to look into the risk factors for non – communicable diseases especially diabetes mellitus among apparently healthy non – Saudi construction workers and assess their health behavior and habits that can determine their chances of having the disease in the future.

Research Problem and Motivation:

This was a baseline pilot study to find out the association of risk factors for diabetes and hypertension among the immigrants workers and their knowledge and attitude toward its prevention in Majmaah, KSA.

Research Methodology

It was a cross – sectional study of the prevalence of risk factors among the expatriate construction workers for diabetes and hypertension. It consists of two parts:

- a. An interview based pre – tested close-ended questionnaire administered to the participants and the responses entered by the interviewee.
- b. An anthropometric assessment to measure BMI and recording the blood pressure in an ambulatory position.

There were six residential compounds of construction companies in Majmaah where the expatriate workers were residing. Cluster sampling method was used to select two residential compounds for the study. Since this is a baseline study to find out the prevalence of risk factors for diabetes and hypertension among expatriate workers, a complete enumeration method was used to include all the resident workers (150) in the study who were residing in the selected residential compounds.

Total duration of the study was 6 months. The data collection took around 2 months to complete as planned.

Training was given to the data collectors on conducting the survey. A language translator was present during the survey to resolve any issue of communication gap between the investigators and the participants.

The data collected with the aid of:

- a) A pre – tested, structured and close ended questionnaire was administered by the investigators to the study participants.
- b) A human electric weighing scale calibrated to the nearest 0.5 kgs used for taking weight.
- c) A measuring tape – each 1cm 10 line 5line mean 1/2 cm was used for measuring the height of the participants to calculate the BMI
- d) A blood pressure instrument – calibrated to the nearest 0.5 mm of Hg used to take the blood pressure in the sitting position.

Data analysis was done using SPSS version 20.0 for assessing the qualitative data.

• Ethical Considerations

Participation consent from the workers was taken in the beginning of the study. They were briefed about the advantages to them as well as to the community due to their participation. All information kept purely confidential and to be used only for the purpose of statistical analysis.

• Limitations

- Due to difference in the mother tongue of the participants and the interview a slight probability of communication bias cannot be ruled out.

• Inclusion and exclusion criteria

- All the workers who are not citizens of Kingdom of Saudi Arabia were included in the study.
- Any study participants who voluntarily refused to participate in the study were excluded.

RESULTS

A total of 120 expatriates (70.6%) participated out of a study sample of 170 residing in the residential compounds of a construction company in Majmaah, KSA. Most of the participants are native of Philippines, India and Pakistan. (Fig - 1)

The mean age of the participants was 35.25 ± 8.78 years. Most of them are married (76.7%) but have left their family behind in their native countries. Even though majority of them are carpenters, there are 16 different occupations that the workers are involved in. Most of the workers come from a poor background (46.9%) but almost 36.7% have finished their education till the secondary school while only 10% are illiterate (Table – 1) (Table – 3)

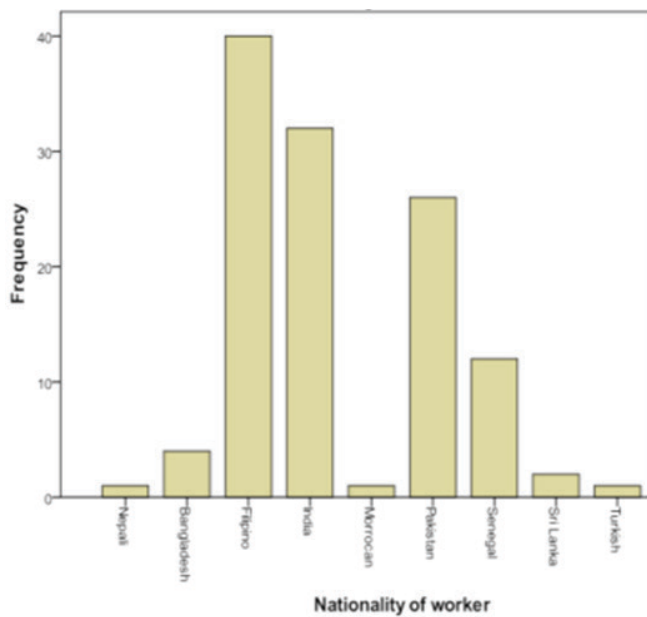


Figure 1: Nationality of the workers.

Table 1: Levels of education

Level of education	Percentages
Illiterate	10 %
Primary	11.7 %
Intermediate	22.5 %
Secondary	36.7 %
College	19.2 %

An analysis of the modifiable and non-modifiable risk factors was done from the data collected and it was found that most of them are at risk of diabetes and hypertension.

It was found that 28.3% of the study populations were more than 40 years old and at an increased risk though the family history for the presence of diabetes and hypertension was not significant.

An analysis of the dietary habit showed that even though almost all of them prefer to have homemade food, the regular intake of fruits and vegetables is abysmally low at 4.2%. The dietary habit as shown in (Table 2)

Table 2: The dietary habits

Type of diet	Frequencies
A All	95.8 %
Fruits and vegetables	4.2 %
B Home food	92.5 %
Outside food	0.8 %
Both	6.7 %

Looking into the lifestyle preferences of the study participants it was found that 69.2% did exercises like brisk walking on a regular basis while the rest either were irregular or didn't do any at all. (Table – 4)

Majority of them were either tea or coffee drinkers (92.5%) while more than half (58.3%) consumed aerated drinks on a regular basis. About 12.5% had a history of alcohol consumption in the past. It was also found that more than 22% of the participants smoke on a regular basis. (Fig – 2) The average duration of sleep for most of the participants (62.5%) was less than the recommended minimum of 7 hours per day for keeping good health. (Table – 3)

On calculating the basal metabolic index (BMI) it was found that more than 21% were in the overweight and obese category. (Fig. 3) Even the waist circumference (mean 90.27±9.5 cm) among the 42.5% participants was more than the recommended 90 cm.³⁵ These are indicative of at risk population for diabetes and hypertension.

The measurement of blood pressure showed that more than 26.5% of the participants were having a high normal systolic reading (120 – 139 mm Hg) while 19.2% recorded more than 140 mm of Hg. Similarly, 33.3% had a diastolic blood pressure reading of more than 90 mm of Hg. A sizeable number of participants (19.2%) had a high normal diastolic reading between 80 – 89 mm of Hg. This is based on the classification given by the Joint National Committee; USA.³⁶

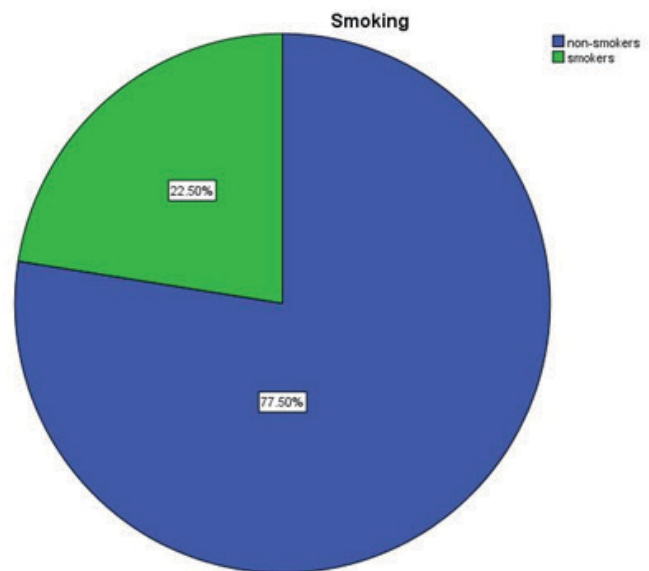


Figure 2: Smoking Habits.

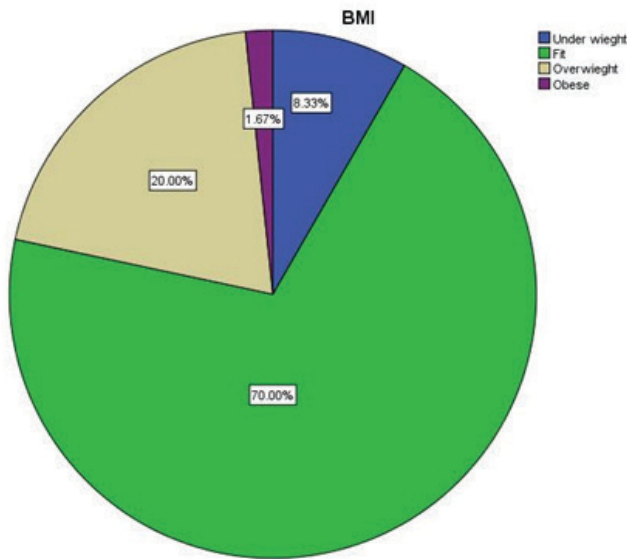


Figure 3: Basal Metabolic Index.

Duration of sleep (%)

Less than 7 hours	62.5
More than 7 hours	37.5

DISCUSSION

Analysis of the data shows that on average the expatriates have a good quality of life during their stay in Saudi Arabia with easy access to basic amenities like food, clothing and proper accommodation. Furthermore, since they don't find the local food acceptable, they prepare the food themselves when they are back from work. This study has shown that there is a significant proportion of expatriates who have non-modifiable and modifiable risk factors for diabetes and hypertension.

The results have shown that more than 28.3% of the study population was aged more than 40 years which according to other studies³⁷ is one of the non – modifiable risk factors for developing diabetes and hypertension. The total number of participants with a positive family history was not significant which was in contrast to other studies^{38, 39, 40} that showed a positive correlation between family history and the risk of getting diabetes and hypertension.

Lots of literatures have discussed the harmful effects of smoking and significantly its association with developing cardiovascular diseases among chronic smokers. Thus, there is documentation of a direct causal association between smoking and diabetes^{41, 42} and this study showed that more than 22.5% of the participants were smokers.

Dietary habit has significantly contributed single handedly to lifestyle diseases both in developed and developing countries. In our study we found that 95.8% of participant ate all types of food while very few took fruits and vegetables in substantial amount for health benefits. Similar studies have indicated that most of the people who consumed non – vegetarian food are at increased risk of diabetes and hypertension.^{43, 44}

The prevalence of overweight among the participants was 20% and around 1.7% was found to be obese. Many studies⁴⁵ have cited a direct association between obesity and non-communicable diseases like diabetes and hypertension. Our study showed that there was little awareness among the expatriate workers regarding obesity being a risk factor for diabetes and hypertension. A significant number of participants (42.5%) had waist circumference above 90 cm which is a risk factor for cardiovascular diseases as given by the WHO.⁴⁶

An assessment of the frequency of doing physical activity among the expatriates showed that around 30.8% were not

Table 3: Marital status, socio-economic status & History of past illness

Marital Status (%)		Socio – economic status (%)	
Married	76.7	Manual skilled	46.9
Single	23.3	Semi – skilled	41.6
		Non manual	9.7
		Others	1.8
History of past illness or medication			
History of Diabetes Mellitus (%)		History of Hypertension (%)	
Yes	1.7	Yes	2.9
No	98.3	No	97.1

Table 4: Lifestyle Preferences

Lifestyle preferences			
Smoking (%)		Chewing tobacco (%)	
Yes	22.5	Yes	10.8
No	77.5	No	89.2
H/o alcohol intake (%)		Drinking tea and/or coffee (%)	
Yes	12.5	Yes	92.5
No	87.5	No	7.5
Consume aerated drinks (%)		Doing regular exercise (%)	
Yes	58.3	Yes	69.2
No	41.7	No	30.8

exercising even for a minimum of 3 days a week as suggested by the WHO⁴⁷ to maintain a healthy lifestyle. This showed that they were at increased risk of developing chronic health disorders as supported by similar articles showing this association⁴⁸

In study done in Guangzhou, China the prevalence estimate of self-reported NCDs was 16.0%. Hypertension and diabetes were reported as the most important NCDs. Of those who responded, 6.8% reported having more than 2 chronic conditions. Since 2002, the prevalence of hypertension has decreased by 13.3%. Awareness, treatment, and control of hypertension and diabetes were improved. The estimated prevalence of current smoking decreased, and the prevalence of former smoking increased from 2002. However, the prevalence of overweight and obesity, especially central obesity, increased.⁴⁹

In a study done in Arab world in 2010, the burden of Disease Study 2010, the burden of non-communicable diseases (cardiovascular disease, cancer, chronic lung diseases, and diabetes) in the Arab world has increased, with variations between countries of different income levels. Behavioral risk factors, including tobacco use, unhealthy diets, and physical inactivity are prevalent, and obesity in adults and children has reached an alarming level. Despite epidemiological evidence, the policy response to non-communicable diseases has been weak.⁵⁰

CONCLUSION

The magnitude of risk factors for chronic non-communicable diseases is quite high in the study population. Appropriate preventive measure should be taken to control and prevent risk factors that increase the prevalence of HTN and DM.

Recommendation

To reduce the prevalence of non-communicable diseases among expatriates working in an alien environment, preventive measures that need to be in place are:

- Regular medical checkup for the workers especially who have risk factors.
- Health promotion programs for the workers.
- Promote balanced healthy diet with regular exercise.
- Educational programs about the HTN and DM.

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