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Assessment of risk of Diabetes Mellitus among National highway truck drivers in Tamil Nadu

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ABSTRACT

Background: Diabetes mellitus, type II, is a major public health concern worldwide. The recent World Health Organization report suggests that over 19% of the world's diabetic population currently resides in India. Indian Diabetes Risk Score (IDRS) developed by Dr.Mohan and his colleagues (Mohan, 2005) is a simplified risk score for identifying undiagnosed diabetic subjects using four simple parameters (age, waist circumference, family history of diabetes and physical activity) in which the minimum score is 0 and maximum is 100 & score 60 and above is indicative of diabetes risk. **Objectives:** To assess the risk of Diabetes mellitus among national highway truck drivers using an IDRS score. **Materials and Methods**: A cross sectional study was conducted during December 2018 to January 2019 among truck drivers aged 18 years and above in the Lay-By, Padalam, Maduranthagam, Kancheepurm District, Tamil Nadu. The participants were interviewed using a structured questionnaire consisting of socio-demographic details and Anthropometric measurement and Indian Diabetic Risk Score (IDRS). **Result:** Among 117 study participants, 71 (60.6%) were 35 to 49 years 81 (69.3%) were literate and 106 (90.6%) were full time drivers. On evaluating the risk status of study subjects using IDRS, 42.7% had moderate risk, 35.8% had high risk score and 21.3% had low risk. With increase in age and waist circumference and not doing physical activity was increase in the risk status for diabetes. **Conclusion:** Majority of the subjects in our study belonged to the moderate risk and high risk category. A statistically significant association was seen between the age, occupation, type of family, Waist circumference and Physical activity.

Key word: Diabetes mellitus, Truck drivers, waist circumference, IDRS.

INTRODUCTION

Diabetes mellitus, type II, is a major public health concern worldwide.[1] The recent World Health Organization report suggests that over 19% of the world's diabetic population currently resides in India.[1] The prevalence is increasing, particularly in low- and middle-income countries. India had 69.2 million people living with diabetes (8.7%) in 2015. It remained undiagnosed in more than 36 million people[2]. This translates to over 35 million diabetic subjects, and these numbers are projected to increase to nearly 80 million by 2030. This rising trend predicts a significant health burden due to diabetes in India[3,4].

Life style modification (LSM) is a Cost-Effective interventional measure for control of DM and prevention of Complications.[5] A study done by Indian Council of Medical Research (ICMR) in 1970 reported a prevalence of 2.3% in urban and 1% in rural areas, which increased to 12-19% in urban and 4-10% in rural areas in 2000. Unfortunately, more than 50% of the diabetic subjects in India remain unaware of their diabetes status, which adds to the disease burden[6]. In Tamil Nadu, studies related to this aspect are very limited. Therefore, a cross sectional on assessment of risk of Diabetes mellitus among national highway truck drivers in Tamil Nadu was done.

Objectives: To assess the risk of Diabetes mellitus among national highway truck drivers using an IDRS scale; To assess the association of the risk factors.

MATERIAL AND METHODS

A cross sectional study was conducted during December 2018 to January 2019 among truck drivers aged 18 years and above in the Lay-By, Padalam, Maduranthagam, Kancheepurm District, Tamil Nadu.

Inclusion criteria and Exclusion criteria:

All truck drivers aged 18 years and above were included in the study after obtaining their informed consent. Those individuals who were not willing to participate were excluded.

Study tool:

A structured questionnaire with socio-demographic details, anthropometric measurements and Indian Diabetic Risk Score (IDRS- scale).

The components of Indian Diabetic risk score include age, waist circumference, physical activity and family history of diabetes. Minimum Score is 0 and Maximum is 100. Interpretation: score <30- low risk, score 30-50- medium risk, score >60- high risk.[7].

The BMI cut off values for Asian Indians as recommended by the WHO was used in the present study. A desirable BMI according to the WHO recommended cut-offs for Asians is considered to be between 18.5 and 22.9 kg/m2. A BMI of 23–24.9 kg/m2 is defined as "overweight" and ≥25 kg/m2 as "obese".[8]

Data collection:

Data was collected by interview method using the structured questionnaire and IDRS-scale.

Data analysis:

Data obtained was entered in Microsoft Excel 2007 and analyzed using IBM SPSS version 16. Association of risk factors was found using Chi-square test. A p-value of <0.05 was considered statistically significant.

Ethical Clearence:

Approval for the Study was obtained from the Institutional of Ethics Committee of Karpaga Vinayaga Institute of Medical Sciences and Research Centre.

RESULT

Among 117 highway truck drivers, 71 (60.6%) were in 35 to 49 years' age group followed by 31 (26.4%) were in <35 years. Majority of the study participants 81 (69.3%) were literate, 106 (90.6%) full time driver and 90 (76.9) belonged to Tamil Nadu. Among the drivers, 85 (72.7%) were from nuclear family and 49 (41.8%) belonged to lower middle class followed by 39 (33.3%) middle class according to modified BG Prasad classification 2018. Among the study subjects 55 (47%) had habit of tobacco chewing, 53 (45.2%) habit of alcohol consumption and 42 (35.8%) had smoking habits. Among the study participants 41(35%) were overweight and 12 (10.6%) obese. (Table 1)

Table 1: Distribution of socio-demographic pattern of the truck drivers. (n=117)

Characteristics	Frequency	Percentage
Age		
<35 years	31	26.4
35 to 49 years	71	60.6
<50 years	15	12.8
Literacy status		
Literate	81	69.3
Illiterate	36	30.7
Occupation		
Part time driver	11	9.4
Full time driver	106	90.6
Resident		
Tamil Nadu	90	76.9
Other state	27	23.1
Socio economic status		
Upper class	5	4.2
Upper middle class	18	15.3
Middle class	39	33.3
Lower Middle class	49	41.8
Lower class	6	5.1
Type of family		
Nuclear	32	27.3
Joint	85	72.7
Type of diet		
Vegetarian	24	20.5
Non-vegetarian	93	79.5
Tobacco consumption		
Yes	55	47
No	62	53
Alcohol Consumption		
Yes	53	45.2
No	64	54.8
Smoking consumption		
Yes	42	35.8
No	75	64.2
BMI		
Underweight	2	1.7
Normal	61	52.1
Overweight	41	35
Obese	12	10.6

On evaluating the risk status of study subjects for truck drivers using IDRS, 42.70% showed moderate risk, 35.80% showed high risk and 21.30% showed low risk score (Figure 1).

Figure 1: Distribution of the truck drivers according to IDRS risk status. (n=117)

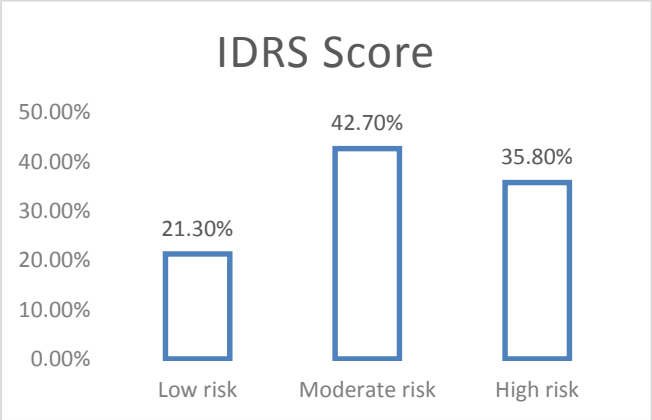

Table 2: Distribution of truck drivers according to IDRS system. (n=117)

Particulars	Score	Frequency (%)
Age (years)		
<35	0	31 (26.5)
36 to 49	20	71 (60.6)
>50	30	15 (12.8)
Abdominal obesity		
Waist <80cm(females) <90cm (male)	0	47 (40.1)
Waist 80 – 89cm(females) 90 -99cm (males)	10	49 (41.8)
Waist >90cm (females) >100cm (males)	20	21 (17.9)
Physical activity		
Exercise (regular)+Strenuous Work	0	-
Exercise (regular) or Strenuous work	20	92 (78.6)
No exercise and sedentary work	30	25 (21.4)
Family History		
No family History	0	104 (88.8)
Either parents	10	13 (11.2)
Both parents	20	-

A total of 50 (42.7%) study subjects belonged to the moderate risk group of them 33 (66%) were found to be 35 to 49 years of age and 10 (20%) of them were in the age group of more than 50 years. Among 42 (35.8%) individuals who belonged to the high risk group, 37 (88%) of them were found to be more than 35 to 49 years of age, 5 (12%) of them were in the age group of more than 50 years. A statistically significant association was seen between the age of the study subjects and the IDRS risk status (p = 0.000) (Table 3).

Table 3: Distribution of truck drivers according to age category and IDRS risk status. (n=117)

Age	IDRS category				p-value
	Low risk (%)	Moderate risk (%)	High risk (%)	Total (%)	
<35 years	24 (96)	7 (14)	0 (0)	31 (26.5)	<0.000
35 to 49 years	1(4)	33 (66)	37 (88)	71 (60.6)	
>50 years	0	10 (20)	5 (12)	15 (12.8)	
Total	25 (21.3)	50 (42.7)	42 (35.8)	117 (100)	

Table 4: Distribution of truck drivers according to occupation and IDRS risk status. (n=117)

Occupation	IDRS category				p-value
	Low risk (%)	Moderate risk (%)	High risk (%)	Total (%)	
Part time	8 (32)	3 (6)	0	11 (9.4)	<0.000
Full time	17 (68)	47 (94)	42 (100)	106 (90.6)	
Total	25 (21.3)	50 (42.7)	42 (35.8)	117 (100)	

Among 50 (42.7) of the moderate risk group, 47 (94%) of them were found to be full time drivers and 3 (6%) of them were in part time drivers. Among 42 (35.8%) individuals of high risk group, all of them were found to be full time drivers. A statistically significant association was seen between the occupation of the study subjects and the IDRS risk status (p = 0.000) (Table 4).

Table 5: Distribution of truck drivers according to type of family and IDRS risk status. (n=117)

Type of family	IDRS category				p- value
	Low risk (%)	Moderate risk (%)	High risk (%)	Total (%)	
Nuclear	11 (44)	7 (14)	14 (33.4)	32 (27.4)	<0.013
Joint	14 (56)	43 (86)	28 (66.6)	85 (72.6)	
Total	25 (21.3)	50 (42.7)	42 (35.8)	117 (100)	

Out of 50 (42.7%) individuals of the moderate risk group, 43 (86%) of them belonged to joint family and 7 (14%) of them belonged to nuclear family. Among 42 (35.8%) individuals of the high risk group, 28 (66.6%) belonged to joint family and 14(33.4%) belonged to nuclear family. A statistically significant association was seen between the type of family of the study subjects and the IDRS risk status (p = 0.000) (Table 5).

Table 6: Distribution of truck drivers according to Physical activity category and IDRS risk status. (n=117)

Physical activity	IDRS category				
	Low risk (%)	Moderate risk (%)	High risk (%)	Total (%)	p-value
Exercise (regular)+Strenuous Work	0 (0)	0 (0)	0 (0)	0 (0)	
Exercise (regular) or Strenuous work	22 (88)	50 (100)	20 (47.6)	92 (78.6)	<0.000
No exercise and sedentary work	3 (12)	0	22 (52.4)	25 (21.3)	
Total	25 (21.3)	50 (42.7)	42 (35.8)	117 (100)	

Among 50 (42.7%) individuals of the moderate risk group, all of them were found to be doing physical activity or any strenuous work. Among the high risk group 42 (35.8%), 22 (52.4%) of them were found to be not doing any exercise and sedentary. A statistically significant association was seen between the physical activity of the study subjects and the IDRS risk status (p = 0.000) (Table 6)

Table 7: Distribution of truck drivers according to waist circumference category and IDRS risk status. (n=117)

Waist circumference	IDRS category				
	Low risk (%)	Moderate risk (%)	High risk (%)	Total	p-value
Cat-1. <80cm(females) <90cm (male)	23 (92)	20 (40)	4 (9.5)	47 (40.1)	
Cat-2.80 – 89cm (females) 90 -99cm (males)	0 (0)	26 (52)	23 (54.7)	49 (41.9)	<0.000
Cat-3. >90cm (females) >100cm (males)	2 (8)	4 (8)	15 (35.7)	21 (17.9)	
Total	25 (21.3)	50 (42.7)	42 (35.8)	117 (100)	

Out of 50 (42.7%) individuals of the moderate risk group, 26 (52%) of them were found to be in waist circumference category 2. Among the high risk group, 42 (35.8%), 23 (54.7%) of them were found to be in waist circumference category 2. A statistically significant association was seen between the waist circumference of the study subjects and the IDRS risk status (p = 0.000) (Table 7)

DISCUSSION

The present study identified 35.80% of the study subjects to be in the high risk category according to IDRS. Similar finding found by Mohan et al (2006) reported that 43% of their study subjects were in high risk group[9] and Brinda P et al (2016), they found 26% of their study population to have a high risk score.[10] In this study, 42.7% of the subjects were found to be in moderate risk category according to IDRS, similar to the findings obtained by Brinda et al (2016).[10]

In the present study it was noted that with higher the age group of the study population, the percentage of the individuals belonging to the high risk group also increased which is similar to the findings obtained by other studies.[11-14]

In this study 104 (88.8%) of the study subjects did not have any family history of diabetes, similar to the finding in the study conducted by Patil RS et al (2016), where 89% of the individuals did not have any family history of diabetes[11] and Gupta SK et al (2006) in urban Pondicherry, in their study observed that 68.5% of the respondents had no family history of diabetes.[14]

Among the 117 study participants in this study 42.70% belonged to moderate risk group according to IDRS, Similar findings was obtained in a study done by Brinda p et al (2016), in which 49% of the study subjects in moderate risk group[10] and Subaramani R et al (2014), in which 74.7% of the subjects in moderate risk group.[16]

Conclusion:

Majority of the truck drivers in this study belonged to the moderate risk followed by high risk category. A statistically significant association was seen between the age, occupation, type of family, waist circumference and physical activity of the truck drivers.

Recommendation:

To implement lifestyle modifications and dietary changes for those truck drivers who were in the high and moderate risk categories observed in this study.

Limitation:

Time duration and number of truck drivers were limited.

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