

## KNOWLEDGE AND RISK ASSESSMENT OF DIABETES MELLITUS AT PRIMARY CARE LEVEL: A PREVENTIVE APPROACH REQUIRED COMBATING THE DISEASE IN A DEVELOPING COUNTRY.

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### ABSTRACT

**Objective:** To assess knowledge about diabetes mellitus and to assess risk of behavioral and environmental factors among non-diabetics attending primary health care centers of Gadap town, Karachi.

**Methodology:** A Cross-sectional study was conducted at Primary health care centers, Gadap Town, Karachi, during the month of July 2005. Data was collected from four primary health care centers, located at Gadap Town, Karachi, and 198 non-diabetic patients, above 18 years of age, and resident of Gadap Town, coming consecutively during study period were enrolled in the study. Knowledge was assessed and risk assessment scoring was performed according to the guidelines of American Diabetic Association. Using SPSS version 11 data was analyzed, frequencies were calculated and p-values were determined to find associations between the variables.

**Results:** Knowledge regarding cause, sign and symptoms and complications was found lacking. Practices regarding diet and life style were also found unsatisfactory. About 27% individuals were found obese and 11% were overweight and on risk assessment score 44% were found at high risk, 38% at low risk of developing diabetes mellitus. Gender male, education and urban residence showed significantly better knowledge regarding diabetes but scored more on risk assessment scale due to poor dietary habits and lack of physical activity.

**Conclusion:** Proportion of non-diabetics coming to primary health care centers were prone towards diabetes mellitus on risk assessment scale. Their knowledge was found lacking. However males, educational status and urban residence came out significant variables having better knowledge. The proportion of individuals found high risk and low risk needs further screening for diabetes and health education regarding diabetes mellitus required in these areas.

**KEY WORDS:** Knowledge, Diabetes mellitus, Risk factor.

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### INTRODUCTION

Diabetes mellitus is a serious public health concern all over the world. In Pakistan diabetes is on rise and if proper intervention and preventive strategies were not adopted the epidemic of diabetes will prove fatal. As we are in the middle of a global epidemic of this disease and projected increase in the preva-

lence of diabetes over the next two decades emphasizes the importance of implementing primary prevention, early detection and imparting educational preventive program.<sup>1</sup> The preventive programs targeted towards general population showed greater benefits rather than targeting only high risk and diseased population.<sup>2</sup> Different studies have proved modifiable risk factors of type II diabetes includes; obesity and physical inactivity.<sup>3-9</sup> If we could detect and prevent these risk factors earlier, the onset of disease can be delayed and prevented. Knowledge about the disease plays a vital role in future development of disease and its early prevention and detection. Research studies have shown that wherever massive education regarding diabetes mellitus is provided to general population, it resulted in significant increase in knowledge about the disease. A study conducted in Singapore among general population who was imparted health education showed that people were well informed about sign and symptoms of diabetes mellitus.<sup>10</sup> Another study regarding public awareness of diabetes symptoms showed poor knowledge, which is contributing to delayed detection of type II diabetes mellitus.<sup>11</sup>

This study was designed to explore the knowledge about diabetes mellitus among people attending primary care clinics and risk assessment of behavioral and environmental factors. This is unique in terms that previous studies have assessed the knowledge and practices regarding diabetes among diabetic patients only and not among the general population. Due to rapid increase in incidence of

diabetes in Pakistan, it is required to target research and preventive strategies towards healthy population to combat the disease in future.

## METHODOLOGY

It was a cross-sectional study based on knowledge and risk assessment of diabetes mellitus. The data was collected from four primary health care centers, located at Gadap town, Karachi, during the month of July 2005. Adults of either gender, at least 18 years of age, and appearing for check-up at either of the four primary health care centers, and resident of Gadap Town, were eligible but did not consent to participate in the study were excluded. One hundred ninety eight non diabetic patients, coming consecutively during the study period and fulfilling the eligibility criteria, were interviewed by using a semi structured pre-tested questionnaire and assessed for knowledge regarding diabetes mellitus and risk assessment scoring was performed according to the guide lines of American Diabetic Association. The data collected was entered and analyzed by using a statistical package SPSS.11.0. For descriptive analysis frequencies were calculated and univariate analysis was performed for comparison of knowledge status between gender, residence and educational status, p-value was calculated to determine statistical associations. Body mass index (BMI) was calculated by the standard formula and obesity was taken as BMI >25kg/m<sup>2</sup> as suggested by the International Obesity task force and risk score was calculated (Table-I).

Table-I: Diabetes risk assessment test.

S #	Variables	Codes	Score
1.	Weight is equal to or above that listed in the weight chart	5.	Yes0. No
2.	Age under 65 years with little or no exercise during a usual day	5.	Yes0. No
3.	Age between 45-64 years	5.	yes 0. No
4.	Age 65 years or older	9.	Yes 0. No
5.	Woman who has had a baby weighing more than nine pounds at birth	1.	yes0. No
6.	Having sister or brother with diabetes	1.	yes0. No
7.	Having parent with diabetes	1.	yes0. No
			Total points =

Scoring below 3 no risk, 3-9 low risks and 10 or more high-risk category.

**RESULTS**

*Characteristics of the study sample:* One hundred ninety eight, (54%) of individuals belonged to urban community and 46% belonged to villages. Among study subjects 37.4% were male and 62.6% were female. Majority (83%) were married, 12% unmarried, and 4.5% were widow and divorced. As regards educational status 36% were illiterate and 64% were having 5-16 years of schooling. Fifty three percent were employed, 7.5% were unemployed and 38.5% were housewives. As regards income 60% had income less than ten thousand rupee, 22% had income range between ten to twenty thousand and 17% had income more than 20,000 rupee. The mean age of group was

40 years with standard deviation of 13. About 57.6% were below 40 years of age, and 42.4% were above 40 years of age. Regarding smoking status 38% were smokers while 62% were non-smokers. Thirty nine percent of people had history of type II diabetes mellitus in their family. Twenty seven percent individuals were found obese and 11% were overweight and on risk assessment score 44% were found at high risk, 38% at low risk of developing diabetes mellitus.

Table-II shows responses to questions regarding knowledge, dietary habits and life style practices, and risk of having diabetes mellitus.

Table-II: Knowledge of diabetes mellitus by sex of respondents (n=198)

Variables	Male (%) n=74	Female (%) n=124	Significance (P-value)
Cause of diabetes mellitus	42 (56.7)	52 (41.9)	0.04
Sign and symptoms	34 (45.9)	25 (20.1)	0.0001
Thirst			
Excess Urination	32 (43.2)	35 (28.2)	0.03
Weight loss	25 (33.7)	25 (20.1)	0.03
Complications	26 (35.1)	12 (9.6)	0.0001
Cardiac			
Renal	21 (28.3)	17 (13.7)	0.01
Eye	31 (41.8)	17 (13.7)	0.0001
Neuropathy	27 (36.4)	12 (9.6)	0.0001
Strokes	31 (41.8)	17 (13.7)	0.0001
Amputation	32 (43.2)	11 (8.8)	0.0001
Dietary habits & life style	22 (29.7)	39 (31.4)	0.79
Whole meal consumption			
Oil use in cooking	59 (79.7)	66 (53.2)	0.0001
Exercise	52 (70.2)	68 (54.8)	0.03
BMI			
Normal	38 (51.3)	85 (68.5)	—
Overweight	27 (36.4)	26 (20.9)	0.01
Obese	9 (12.1)	13 (10.4)	0.35
Waist in <35 inches	51 (68.9)	102 (82.2)	—
>35 inches	23 (31)	22 (17.7)	0.03
Total			
No risk	6 (8.10)	30 (24.1)	—
Low	21 (28.3)	54 (43.5)	0.19
High	47 (63.5)	40 (32.2)	0.0001

N=sample size  
p-value<0.05 significant

Table-III: Knowledge of diabetes mellitus by residence of respondents (n=198)

Variables	Urban (n=107)	Villages (n=91)	Significance (P-value)
Cause of diabetes mellitus	65 (60.7)	29 (23)	0.0001
Sign and symptoms	43 (40.1)	16 (17.5)	0.0001
Thirst			
Excess Urination	44 (41.1)	23 (25.2)	0.01
Weight loss	37 (34.5)	13 (14.2)	0.001
Complications	31 (28.9)	7 (7.6)	0.0001
Cardiac			
Renal	31 (28.9)	7 (7.6)	0.001
Eye	37 (34.5)	11 (12)	0.001
Neuropathy	35 (32.7)	4 (4.3)	0.0001
Strokes	37 (34.5)	11 (12)	0.002
Amputation	36 (33.6)	7 (7.6)	0.0001
Dietary habits and life style	22 (20.5)	39 (42.8)	0.79
Whole meal consumption			
Oil use in cooking	94 (87.5)	31 (34)	0.004
Exercise	70 (65.4)	50 (54.9)	0.1
BMI			
Normal	45 (42)	78 (85.7)	—
Overweight	44 (41.1)	9 (9.8)	0.0001
Obese	18 (16.8)	4 (4.3)	0.0001
Waist in <35 inches	73 (68.2)	80 (87.9)	0.0001
>35 inches	34 (31.7)	11 (12)	
Total			
No risk	10 (9.3)	26 (28.5)	—
Low	40 (37.3)	35 (38.4)	0.01
High	57 (53.2)	30 (32.9)	0.0001

Comparison of knowledge and risk assessment by educational status.

Table-III: shows responses to questions regarding knowledge of diabetes mellitus by place of residence. People living in urban area were found more knowledgeable about diabetes mellitus.

Table-IV: shows responses to question regarding knowledge of diabetes mellitus to the respondent. There was significant difference in knowledge regarding diabetes mellitus observed between the educated and illiterate people.

## DISCUSSION

This study shows that there are significant gaps in knowledge regarding diabetes sign and symptoms, complications, healthy diet and exercise among non-diabetics, which is responsible for contributing in delayed presentation of diabetics especially when incidence of diseases is higher in a country like Pakistan. People lack knowledge about healthy diet and exercise. Overall male knew more than female about knowledge and healthy life style. Risk assessment scale developed by American Diabetic Association showed that more of non-diabetics were in low to high risk of developing diabetes mellitus. Similarly on BMI scale more people were found overweight and obese, 34% had family history of diabetes mellitus Type II. Family history is associated with the increased incidence of diabetes and similar findings have been reported by other studies conducted in Pakistan.<sup>12,13</sup> Living healthy life and consuming healthy food is another important component in prevention of diabetes mellitus. Public education and awareness about beneficial effects of consuming a healthy diet is essential. Our study findings support the result of an Indian study that concept of healthy food consumption among people was not clear.<sup>14</sup> Knowing the facts about the disease and showing positive attitude and behavior plays significant role in occurrence and control of disease. The studies conducted in different parts of the world on diabetes showed different findings. A study conducted in Singapore on public awareness of diabetes mellitus after education was imparted about diabetes mellitus showed

that people were well informed regarding the disease. This study had concluded that health care professionals should be more proactive in disseminating health information about diabetes to the people.<sup>10</sup> There are virtually no epidemiological studies from Pakistan assessing the level of knowledge about diabetes in a whole general and non-diabetic population. Another study carried out in India among general population showed knowledge regarding diabetes was found grossly inadequate and suggested that massive diabetic education program was urgently required.<sup>15</sup> A study conducted in rural Northwest of Pakistan

Table-IV: Knowledge of diabetes mellitus by education of respondents (n=198)

Variables	Illiterate (n=71)	>5years schooling (n=127)	Significance (P-value)
Cause of diabetes mellitus	19 (13%)	75 (95%)	0.0001
Sign and symptoms	10 (14)	49 (38.5)	0.0003
Thirst			
Excess Urination	16 (22.5)	51 (40.1)	0.01
Weight loss	8 (11.2)	42 (33)	0.0007
Complications	5 (7)	33 (25.9)	0.001
Cardiac			
Renal	7 (9.8)	31 (24.4)	0.01
Eye	6 (8.4)	42 (33)	0.0001
Neuropathy	2 (2.8)	37 (29.1)	0.0001
Strokes	4 (5.6)	44 (34.6)	0.0001
Amputation	3 (4.2)	40 (31.4)	0.0001
Dietary habits and life style	25 (35.2)	36 (28.3)	0.3
Whole meal consumption			
Oil use in cooking	22 (30.9)	103 (81.1)	0.0001
Exercise	39 (54.9)	81 (63.7)	0.2
BMI			
Normal	59 (83)	64 (50.3)	—
Overweight	8 (11.2)	45 (35.4)	0.0001
Obese	4 (5.6)	18 (14.1)	0.009
Waist in inches			
<35	61 (85.9)	92 (72.4)	0.03
>35	10 (14)	35 (27.5)	
Total risk			
No	18 (25.3)	18 (14.1)	—
Low	36 (50.7)	39 (30.7)	0.84
High	17 (13.7)	70 (55.1)	0.0006

regarding knowledge of diabetes among patients showed that high proportion of males have better understanding of diabetes sign and symptoms and complication as compared to females and gender was not significant when question about suitable diet was asked.<sup>16</sup> In our study overall males were found more aware about diabetes and contrary to the above-mentioned study in healthy diet and life style males were found more aware and practicing exercise. Knowing complications of diabetes is helpful in reduction of morbidity and health cost.<sup>17,18</sup> In our study lack of knowledge was found about complications of diabetes but men knew more than women.

Obesity is associated with type II diabetes mellitus, recent reports from India, Pakistan and other developing countries indicate increasing prevalence of obesity, and associated risk factors in Urban population.<sup>19</sup> Body mass index (BMI) was calculated by the standard formula and obesity was taken as BMI >25kg/m<sup>2</sup> as suggested by the International Obesity task force.<sup>20</sup> Lower threshold of body mass index (BMI) was suggested for the population due to association of obesity and metabolic syndrome.<sup>21</sup>

In our study a significant number of people were found obese and overweight and people living in urban community and having more than five years of schooling were found more obese as compared to villagers and illiterate people and males were on higher side. Educational status found positively correlated with knowledge of diabetes in a study conducted at the Aga Khan University Hospital Karachi.<sup>22</sup> Our study report similar finding that educated people were more aware about the disease but as regards risk assessment scale, being male, living in urban communities and even educated were prone towards diabetes, possibly due to dietary habits and life style. People living in village areas consume whole meal rather than refined meal and walk more daily for hours. Hence their obesity and overweight problem is less as compared to people living in urban areas. However the people living in urban areas report use of cooking oil more as

compared to pure ghee while villagers reported less cooking oil consumption and more ghee. Our study findings recommend adoption of healthy life style for reduction of risk of developing type-II diabetes mellitus and massive health education program on diabetes at the level of general public. More research studies in general population especially intervention studies are required so that health education interventions can be evaluated.

## CONCLUSION

Our study concluded that proportion of non-diabetics coming to primary care centers were prone towards diabetes mellitus on risk assessment scale. Their knowledge was found lacking. However, males, educational status and urban residence came out significant variables having better knowledge. The proportion of individuals found at high risk and low risk needs further screening for diabetes and health education regarding diabetes mellitus is required in these areas.

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