A SURVEY OF AWARENESS REGARDING DIABETES AND ITS MANAGEMENT AMONG PATIENTS WITH DIABETES IN PESHAWAR, PAKISTAN

Zia Ur Rahman¹, Muhammad Irshad², Imran Khan³, Farhat Ali Khan⁴, Alija Baig⁵, Qazi Yasir Gaohar⁶

ABSTRACT

Objective: To determine and compare the level of awareness regarding diabetes mellitus, its complications and management in male & female diabetic patients of Peshawar, Pakistan.

Methodology: A cross sectional study conducted in Peshawar, from February to July 2013. A well organized questionnaire was used, having fourteen items. The participants were interviewed and the questionnaire was filled by trained persons (Diabetes Educators). The correct answers were marked as aware and incorrect as unaware, and made conversions to percentage. Total 561 diabetic patients were assessed. The data was analyzed using SPSS v.16 software and excel 2007.

Results: The level of awareness regarding diabetes and its management was found inadequate. Amongst, 36.3% male and 13% female diabetics were aware that why glycemic control is important, 63% male and 32.4% females were aware that diabetes could produce some complications. Similarly 23.7% male and 10% female respondents know importance of blood glucose monitoring. Only 181 male and 31 female diabetics were aware of hypoglycemia symptoms and management. Overall level of awareness in female patients as compared to male patients was found low.

Conclusion: The overall level of awareness in both male and female diabetics was found low; and comparatively female patients have poorer awareness.

Key Words: Diabetes Mellitus, Awareness, Diabetes education.

INTRODUCTION

Diabetes mellitus is a complex, chronic illness requiring continuous medical care with multifactorial risk reduction strategies beyond glycemic control. Ongoing patient self-management, education and support are critical to preventing acute complications and reducing the risk of long-term complications. Significant evidence exists that supports a range of interventions to improve diabetes outcomes⁷. Diabetes mellitus is associated with significant rates of morbidity and mortality resulting from micro and macro vascular complications⁸. As a result of associated complications, diabetes intensifies the economic burdens both on Health departments and patient itself in non developed countries like Pakistan. Diabetes is one of the most prevailing disorders worldwide, the prevalence for which was estimated (globally), in 2013, 382 million people live with diabetes and this is expected to rise to 592 million by 2035. According to International Diabetes Federation, currently 6.6 million people live with diabetes in Pakistan, and in 2025 the total number of people with diabetes is estimated to be 14.5 million; Pakistan has the eleventh largest population of diabetes⁹.

The self care practices of individuals are influenced by their knowledge about diabetes; the more they know about their illness, more they would have self management skills⁴. Many research work published⁵,⁶,⁷ have shown that, in Pakistan the diabetic population don’t have enough awareness of diabetes, the proper use of medications, life style modifications, dietary plans, myths associated with insulin and other education programs on health issues⁸.

Patient awareness about diabetes, complications, medications adherence, diet plans and life style modifications can establish patient specific goals, like effec-
tiveness of medications and decrease in like hood of adverse events in all types of diabetes and in all age groups of diabetic population.

The objective of this study was to determine the comparative level of awareness of male and female diabetic patients (irrespective of diabetes type), that to how much extent they know about diabetes, associated complications, problems and management.

METHODOLOGY

The study was based on the collection of data over a period of six months, from February 2013 to July 2013, by visiting three main institutional setups of Peshawar, Pakistan, namely Khyber Teaching Hospital, Lady Reading Hospital, Hayatabad Medical Complex, and private clinical setups of Endocrinologists and Medical specialists consulting in diabetes management, in Peshawar. During whole period of study Medical wards, Endocrinology wards and OPDs of the above mentioned hospitals were visited frequently for collection of data. The data was collected through an interview of diabetic patients after permission of the concern physician, by trained diabetes educators and filling up a questionnaire. All questions were asked in lay man language (local language, pushto) instead of using medical terms, the questions were asked directly from patients and his/her correct response was filled as aware; for example, the patient was asked to be, “Do you know why glycemic control is necessary”, and then his/her correct response was marked as aware. The collected data was analyzed through statistical software SPSS version 16 for windows and excel 2007. For different investigated variables frequency (percentage) were reported. The Chi-square test was used to investigate the association of awareness of diabetes mellitus. A p-value of ≤ 0.05 was taken as significant.

STUDIED DIABETIC POPULATION

Total 561 patients (430 male and 131 female patients) had been assessed during study from all group of age, including individuals with type I diabetes, type II diabetes and patients with gestational diabetes mellitus. The socio-demographic profile of studied diabetic population is shown in table 1.

SCORING CRITERIA

The questionnaire was divided into two sections (Annexure 1). Section I shows socio-demographic details of participants. Section II expresses questions from participants, and total number of basic questions were fourteen. A scoring method was built by marking correct answers as “aware” and incorrect as “unaware”.

RESULTS

Total 561 diabetic patients were interviewed 76.6% (430) male and 23.4% (131) females. Their ages ranged between 15 to 65 years. About 22.3% of the respondents had previously received diabetes education (and remaining 77.7% of them had not been educated previously), as shown in Table 1.

Results of the level of awareness assessed in diabetic population are summarized in tabulated form, and are presented in percent awareness, table 2.

Annexure 1: Questionnaire

<table>
<thead>
<tr>
<th>S.no</th>
<th>Sex</th>
<th>Age</th>
<th>Diabetes mellitus type</th>
<th>Family history of diabetes</th>
<th>Previously counseled (Diabetes education)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although all the associations were statistically significant (P<0.001) except awareness regarding basic diet plan / dietary misconception, and recommended & rational use of insulin (P= 0.983 & 0.367 respectively), that is, majority of both male and female diabetics were
4 Why blood glucose monitoring is important?  
- Aware [ ]  Unaware [ ]

5 About insulin (patients on insulin)  
- Do you know insulin is a life saving agent?  
- Insulin is the last stage- it's a myth  
- Insulin can affect kidney – it's a myth  
- Aware [ ]  Unaware [ ]

6 Target blood sugar levels  
- Do you have knowledge of target FPG levels?  
- Do you have knowledge of target RBS levels?  
- Aware [ ]  Unaware [ ]

7 Management of hypoglycemia  
- Do you know symptoms of hypoglycemia?  
- Do you know how to manage it?  
- Aware [ ]  Unaware [ ]

8 Basics of diet modifications /diet misconceptions  
- Do you know about your diet plan?  
- Diabetics cannot eat fruits- it's a myth  
- Underground vegetables are prohibited- it's a myth  
- All Sugar free stuff can be consumed as much as diabetic patient can- it's a misconception  
- Aware [ ]  Unaware [ ]

9 Basics of life style modifications  
- Do you know advantages of daily exercise in diabetes?  
- Do you follow foot care recommendations?  
- Aware [ ]  Unaware [ ]

10 Recommended and rational use of insulin  
- Do you know administration technique?  
- Do you know proper body sites for injection?  
- Do you know when to be administered your insulin?  
- Aware [ ]  Unaware [ ]

11 Misconception that no dietary modifications with insulin?  
- Aware [ ]  Unaware [ ]

12 Safe fasting, medications/insulin use during Ramadan  
- Do you know how to manage diabetes during Ramadan  
- Do you know recommendations of safe fasting?  
- Aware [ ]  Unaware [ ]

13 Importance of insulin/glycemic control in pregnant  
- Do you know insulin is necessary in pregnancy?  
- Do you know uncontrolled glycemic levels can harm fetus and mother?  
- Aware [ ]  Unaware [ ]

14 Significance of physician follows up  
- Do you know your medication regimen need to be change with time?  
- Do you have any idea that why routine checkup is important?  
- Aware [ ]  Unaware [ ]

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Table 1: Socio-demographic profile of surveyed diabetic population (n=561)

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35 years</td>
<td>70</td>
<td>12.5</td>
</tr>
<tr>
<td>35-45 years</td>
<td>161</td>
<td>28.7</td>
</tr>
<tr>
<td>&gt;45 years</td>
<td>330</td>
<td>58.8</td>
</tr>
<tr>
<td>Sex distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>430</td>
<td>76.6</td>
</tr>
<tr>
<td>Female</td>
<td>131</td>
<td>23.4</td>
</tr>
<tr>
<td>Diabetes mellitus type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type I</td>
<td>42</td>
<td>7.5</td>
</tr>
<tr>
<td>Type II</td>
<td>512</td>
<td>91.3</td>
</tr>
<tr>
<td>GDM</td>
<td>7</td>
<td>1.25</td>
</tr>
<tr>
<td>Family history of diabetes</td>
<td>203</td>
<td>36.2</td>
</tr>
<tr>
<td>Previously counseled (Diabetes education)</td>
<td>125</td>
<td>22.3</td>
</tr>
</tbody>
</table>
Table 2: Awareness regarding diabetes

<table>
<thead>
<tr>
<th>Variables</th>
<th>Males</th>
<th>Females</th>
<th>P-Value</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>1 General idea of diabetes mellitus?</td>
<td>327</td>
<td>76%</td>
<td>70</td>
<td>53.2%</td>
</tr>
<tr>
<td>2 Importance of glycemic control?</td>
<td>156</td>
<td>36.3%</td>
<td>17</td>
<td>13%</td>
</tr>
<tr>
<td>3 General awareness of diabetes complications?</td>
<td>271</td>
<td>63%</td>
<td>42</td>
<td>32.4%</td>
</tr>
<tr>
<td>4 Importance of blood glucose Monitoring</td>
<td>102</td>
<td>23.7%</td>
<td>13</td>
<td>10%</td>
</tr>
<tr>
<td>5 Importance of insulin (as therapeutic agent/myths about insulin)?</td>
<td>66</td>
<td>15.4%</td>
<td>12</td>
<td>9.2%</td>
</tr>
<tr>
<td>6 Target FPG and RBS levels?</td>
<td>151</td>
<td>35.2%</td>
<td>11</td>
<td>8.4%</td>
</tr>
<tr>
<td>7 Management of hypoglycemia?</td>
<td>181</td>
<td>42%</td>
<td>31</td>
<td>23.6%</td>
</tr>
<tr>
<td>8 Basics of diet modifications (diet plan)/diet misconceptions?</td>
<td>135</td>
<td>31.4%</td>
<td>41</td>
<td>31%</td>
</tr>
<tr>
<td>9 Basics of life style modifications (exercise etc)?</td>
<td>272</td>
<td>63.2%</td>
<td>27</td>
<td>20.6%</td>
</tr>
<tr>
<td>10 Recommended and rational use of insulin?</td>
<td>344</td>
<td>80%</td>
<td>100</td>
<td>76.3%</td>
</tr>
<tr>
<td>11 Misconception of no dietary modifications with insulin?</td>
<td>184</td>
<td>42.7%</td>
<td>44</td>
<td>33.5%</td>
</tr>
<tr>
<td>12 Safe fasting, medications/insulin use during Ramadan?</td>
<td>151</td>
<td>35%</td>
<td>15</td>
<td>11.5%</td>
</tr>
<tr>
<td>13 Importance of insulin/glycemic control in pregnancy?</td>
<td>271</td>
<td>63%</td>
<td>50</td>
<td>38%</td>
</tr>
</tbody>
</table>

The number and respective percentage indicates the individuals aware of the concern variable; total diabetic population n=567; male=430 and female=131 *(Chi-Square Test was used; A p-value of ≤ 0.05 was taken as significant)

The data collected empirically shows that the level of awareness of patients about diabetes, its complications and management in the diabetic population of Peshawar - Pakistan is shockingly poor and especially in the females. To our knowledge, this was the first research reporting the level of awareness in diabetic population of Peshawar - Pakistan; and to plan the public health policies with special reference to implementation of National Diabetic Control Program, such data is very important.

**DISCUSSION**

The level of awareness in female population was found inadequate as compared to male patients, as illustrated graphically (figure 1).

Results of the level of awareness assessed in diabetic population are summarized in tabulated form, and are presented in percent awareness, table 2.
Knowledge about complications of diabetes was not satisfactory in female diabetics, only 32.4% female diabetics and 63% of male diabetics were aware of the complications. Ulvi et al. in a study conducted in rural Islamabad and Ali et al in Quetta observed that knowledge about diabetes; including awareness of complications of diabetes was poor. This indicates that majority of the diabetic patients have not been taught about diabetes by their physicians & other healthcare professionals, although some studies have shown that even some healthcare professionals don’t have enough knowledge regarding diabetes. Male and female diabetics are about equally unaware of basic dietary plan and misconceptions, only 31.4% male and 31% female diabetic respondents were aware of the facts, study by Mahmood et al in Karachi also observed that more than 80% of respondents in their study had misconceptions about diet.

Other studies in Pakistan were conducted to evaluate the awareness level in diabetic patients, but unfortunately the overall results are nearly same. In fact not only in Pakistan but the awareness level of diabetic population regarding diabetes, its complications and management is also not good in both developed and developing countries. Studies conducted for this purpose in India, Saudi Arabia, Singapore, Turkey, and Iran also brought such results. In India, Muninarayana et al concluded that more than half (75%) of the participants of their study were not aware of the long term effects of diabetes and diabetic care. Similarly Mohieldin et al in Saudi Arabia observed that the diabetes knowledge score among the study subjects was 67.4%, whereas general knowledge regarding the disease, risk factors, symptoms and complications were 71.1, 63.4, 80.8 and 47.7% respectively. Another study by Wee et al in Singapore presented their results as; 22 to 83% (General knowledge), 31 to 91% (Risk factors), 48 to 81% (Symptoms and complications), 35 to 87% (Treatment and management), meaning that they also noted low level of awareness in some areas. Bahreini et al in Iran concluded that the male awareness rate was more than that of female (P = 0.001). In Turkey, in 2008 Arslantas et al concluded that only 14.5% of the patients were able to check their plasma glucose levels by themselves, and they were found unaware of what HbA1c signifies or what it entails.

It was observed that level of awareness in male diabetic population was found more as compared to female population almost in all aspects, other studies also evaluated that level of awareness in female population was comparatively low as observed by Ulvi et al in 2008 in rural islamabad, and Bahreini et al in 2007 in Iran.

This study reveals that overall level of awareness in diabetic population is very poor. Studies previously conducted in Pakistan also had been evaluated that those who know much about diabetes and its complications, management and other aspects is due to affected family members rather than national education system. A Study of Ulvi et al concluded that participants having family history of diabetes, the percent awareness and unwarness ratio was 65 to 35%. During our whole survey only 22.3% of diabetics were found who had received diabetes education and it was observed that those patients who were frequently in touch with healthcare professionals or had been counseled by a diabetes educator or other healthcare professionals, had some degree of awareness. This highlights the role of healthcare professionals, particularly the professional...
Diabetes Educators but unfortunately this approach is not being fully considered in Pakistan specially in public sectors although some private institutes have established diabetes education system like Baqai Institute of Diabetology and Endocrinology. It had previously been shown that, the management of chronic life lasting disorders like diabetes not only requires rational treatment approaches, but also proper education and counseling by healthcare professionals to prevent long term complications and decrease financial burdens and rates of morbidity and mortality. The shortcomings of this study include the limited pool of sample selection.

## Conclusion

The overall level of awareness in both male and female diabetics was found low; and comparatively female patients have poorer awareness. There is a big space for raising the educational awareness about diabetes through formal, well organized approaches by healthcare professionals in hospitals, clinics and community based healthcare centers. Because the American Diabetes Association, clearly defined, the critical role of diabetes education in quality diabetes care; diabetes self-management education is a critical element of care for all people with diabetes and is necessary in order to improve patient outcomes. It is recommended that healthcare professionals both collaboratively and individually develop programs and projects to meet this objective.

## References


## Contributors

ZUR conceived the idea and helped in manuscript writing. MI, IK, IB, QYG did data collection. FAK did the statistical analysis. All the authors contributed significantly to the final manuscript.