



## Original Article

# Understanding of Diabetes among Nurses in a Teaching Hospital of Bangladesh

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### Abstract

**Objective:** Diabetes mellitus is a growing public health problem in the world. Health education by health workers is a key factor in the prevention of this chronic disease. The objective of the study was to determine nurses understanding of diabetes mellitus.

**Methodology:** This was a cross-sectional descriptive study carried out at Rajshahi Medical College hospital from August 2010 to February 2011. Registered nurses were questioned about the clinical features, diagnosis, complications and management of diabetes mellitus. The results were analyzed using appropriate statistical method.

**Results:** A total of 86 nurses completed the questionnaire. Majorities were below 50 years and were ward nurses. About 97.7% correctly identified the definition of diabetes mellitus ( $p < 0.01$ ) and 94.2% identified  $<7\text{mmol/l}$  as the fasting plasma glucose diagnostic cut off for DM. Cent percent agreed that DM is a chronic disease ( $p < 0.01$ ). Polyuria (90.3%) and polydypsia (63.7%) were the commonest clinical features of DM identified. Insulin therapy was the most common form of management identified by 67.9% of the subjects. Majority (83.2%) agreed that weight reduction is useful. About two-thirds (67.2%) identified two oral hypoglycaemic drugs while 25 (22.1%) could not identify any type of insulin. Most subjects (94.7%) could correctly identify treatment for hypoglycaemia, with 7.1% of the nurses saying that insulin can be used to treat hypoglycaemic coma. The eye (82.3%) was the most common organ identified as being complicated with DM. Less than half of the nurses could identify the symptoms of diabetic ketoacidosis while about half (50.9%) of the nurses could identify at least one symptom of diabetic ketoacidosis.

**Conclusion:** Nurses knowledge of diabetes mellitus in Rajshahi medical college hospital is good; however, there are deficits in certain aspects of diabetes management. Organization of regular diabetes educational programmes for nurses will improve these deficiencies of knowledge.

**KEY WORDS:** Diabetes, Nurses, Knowledge, Awareness.

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### Introduction

Diabetes mellitus is a disease that is undergoing an unprecedented growth globally. This dramatic increase is due to increasing obesity, as a result of unhealthy lifestyle, reduced physical activity and increasing life expectancy since the prevalence increases with age.<sup>1,2</sup> The current prevalence of

diabetes mellitus is put at about 150 million and is projected to increase to 220 million and 300 million by 2010 and 2025 respectively.<sup>3,4</sup> Diabetes is the leading cause of kidney failure, blindness, non traumatic lower extremity amputation and a leading cause of cardiovascular disease.<sup>5</sup> However, diabetes is a largely preventable disease and this is

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where diabetes health education and public awareness becomes critically important. Healthcare workers especially nurses constitute the major channel for the delivery of this important diabetes education both to the public and patients as studies have shown that ward nurses are the patients most frequent contact.<sup>6,7</sup> This study therefore help us to find the awareness and knowledge of diabetes mellitus amongst nurses in a tertiary hospital in Bangladesh.

### Material and Methods

This was a cross sectional descriptive study. It was carried out at the Rajshahi Medical College Hospital from August 2010 to February 2011. This is a tertiary hospital situated in northern part of Bangladesh. A structured questionnaire was administered to consecutive nurses who consented to the study on the clinical features, diagnosis, complications and management of diabetes mellitus. Nurses were drawn from the wards and other departments in the hospital. The collected data were analyzed using SPSS 16 version. Ethical approval was taken before enrollment.

### Results

**Baseline Characteristics:** A total of 112 nurses were distributed but 86 (76.78%) completed the questionnaire. Forty two (48.83%) of them were the age of 40 years and below, while 39.53% of the nurses were below 50 years. Only 11.62% of them were more than 50 years. Nurses from the surgical wards accounted for the largest number with 31 (36.0%) followed by medical wards 25(29.1%) in this study. Ward nurses were 86.0% while 14.0% came from other areas of the hospital (outpatient department, immunization centre, administrative nurses). Less than half (45.1%) of the nurses had less than 10 years experience, but 51.3% had more than 10 years of experience as staff nurses. The characteristics of the respondents were as shown in Table-I.

**Table-1: Base line characteristics of study subjects, n=86**

Age (Years)	Frequeuncy (%)
31-40	42(48.83%)

41-50	34(39.53%)
>51	10 (11.62%)
<b>Working placement</b>	
Surgery ward	31(36.0%)
Medical ward	25(29.1%)
Gynae & Obs	8 (9.3%)
Paediatrics	10 (11.6%)
OPD	9 (10.5%)
Administrative	3 (3.5%)
<b>Experience (years)</b>	
<5	16 (18.60%)
5-10	40(46.51%)
>10	30(34.88%)

**Knowledge on Diagnosis:** Eighty four subjects (97.7%) identified DM as hyperglycaemia secondary to insulin deficiency, while 2.3 % said it was due to excessive weight gain. When those who identified it correctly (86.7%) were compared with those who did not (13.3%), the p value was significant ( $p < 0.0001$ ). Eighty one of the subjects (94.2%) identified  $>7\text{mmol/l}$  as being the diagnostic cut off value for diabetes, 5.8% said it was  $>8\text{mmol/l}$ . Cent per-cent of the subjects agreed that diabetes mellitus is a chronic disease. In terms of the knowledge of the clinical features of diabetes mellitus, 46.51% of subjects identified three clinical features of diabetes mellitus, while 17.44% only were able to identify five clinical features. Polyuria (90.69%) and Polydypsia (62.79%) were the most common clinical features identified by subjects while recurrent infection was the least (23.25%). Of the respondents who answered the question, 48.83% identified one clinical feature of diabetic ketoacidosis, while 24.41% identified four clinical features. Dehydration was the most common clinical feature identified by 48.83% followed by nausea and vomiting (40.69%) with dyspnoea being the least (11.62%).

**Management of Diabetes Mellitus:** In terms of management of diabetes, (69.76%) of the respondents were able to identify three methods of management viz dietary, insulin and oral hypoglycaemic agents. Insulin therapy was the commonest form of management identified by 81.39% of the respondents. Eighty subjects (93.02%) agreed that weight reduction is useful in diabetes management. Majority of the respondents (69.76%) could identify two oral hypoglycaemic agents, while 23.25% of them said they did not know any oral hypoglycaemic agent. When asked to identify 3 types of insulin, 58.13% of the respondents correctly identified 3 types, while 15(17.44%) could not identify any type of insulin. In the identification of site for injection, the thigh was the most common site identified by the respondents (81.39%), followed by the abdomen (69.76%), upper arm (59.30%) and buttocks (17.44%) as the site of insulin injection. Only 17.44% respondents could identify all four sites of insulin injection. Cent percent the respondents said insulin can be given subcutaneously, 37.20% said it can be given intravenously while 23.25% said it can be given intramuscularly. More than half (81.39%) could identify one route of administration of insulin. Few (6.97%) identified three routes. Majority (93.02%) of the respondents agreed that hypoglycaemia can be treated by giving sugary drinks and four respondents (4.65%) said glucagon injection can be useful in its treatment. Majority of the nurses (95.34%) agreed that intravenous dextrose can be used to treat hypoglycaemic coma, while others 4.65% could not answer properly.

**Complication of Diabetes:** In terms of complication the eye was the organ mostly identified to be affected by Diabetes (90.69%) followed by the kidney (69.76%) and the blood vessels (46.51%). Eighty (93.02%) identified excessive insulin dosage as being the cause of the hypoglycaemia, while only 46.67% of them agreed that heavy exercise can cause hypoglycaemia. When asked about diabetic ketoacidosis, most respondents (87.20%) agreed that there will be high blood glucose, 11.62% said there will be ketonuria, 84.88% said

admission is necessary, 58.13% agreed that insulin is necessary. Majority (79.06%) of the respondents agreed that diabetic patients need special foot care examination while 58.13% agreed that all diabetic patients should have an annual eye examination. 96.34% of the respondents agreed that the diabetic diet is suitable for everyone and diabetic patients should increase their consumption of vegetable.

### Discussion

As the incidence, prevalence and diagnosis of diabetes mellitus (DM) increase, so more people will require care from health professionals. One way to reduce the morbidity and mortality from diabetes is to educate people with diabetes in self-care practices.<sup>8</sup> The quality of information they receive will depend on the knowledge and experience of staff in diabetes care.<sup>9</sup> Nurses are often the first point of contact for people seeking information on diabetes care.<sup>10,11</sup> It would therefore be seen necessary for all qualified staff to have sufficient knowledge to educate others appropriately. One of the current diagnostic criteria for DM is a fasting plasma glucose of  $>7\text{mmol/l}$ .<sup>13</sup> The fasting plasma glucose is often used because it is convenient, reliable and reproducible. More than two third of the nurses identified this cut-off. This study correlates with the Tripoli study in which 96% knew the range of fasting plasma glucose.<sup>12</sup> Diabetes mellitus is a chronic disease that requires lifelong management if the patient is to escape the long term complications of the disease. Almost all the nurses agreed with this, similar to the Tripoli study.<sup>12</sup> Diabetes mellitus is a clinical syndrome characterized by hyperglycaemia due to absolute or relative deficiency of insulin. Most of the nurses (97.7%) identified the correct definition of DM as being secondary to insulin deficiency. Insulin deficiency causes hyperglycaemia which causes the acute and chronic complications of diabetes. Some of the nurses said that the definition is excessive weight gain. Diabetes mellitus is not the only cause of weight gain, polyuria and enhanced nurse's education is advocated to correct this misconception. In a similar study among nurses in Tripoli, 95% of them identified DM as being secondary to insulin deficiency.<sup>12</sup>

The clinical features of diabetes include polyuria, polydipsia, weight loss, polyphagia, recurrent infections amongst others. More than 2/3 of the nurses identified polyuria and polydipsia. Many of the persons with diabetes mellitus are likely to present with these symptoms to healthcare personnel, and many people also attribute excessive passage of urine to diabetes in our society. Less than half (44.18%) identified weight loss as a symptom of DM; this may be due to the fact that many adult patients with DM that they see are obese. More than half of the nurses could identify one feature of diabetic Ketoacidosis. This is an acute complication of diabetes with mortality rate of about 5-10%. Most patients present with dehydration and more than 2/3 of the nurses identified this. However, knowledge about other aspects was poor as only 11.62% identified four clinical features. Improved nursing education is advocated to improve this knowledge. Management of diabetes involves dietary therapy, oral hypoglycaemics and insulin. About 4/5 of them identified insulin as a form of management while less than 2/3 identified oral hypoglycaemic agents. Possible reason for this may be that majority of ill patients in the wards receive insulin injection and rarely oral hypoglycaemic agents and also because insulin is almost synonymous with diabetes. Majority identified weight reduction as a form of management, similar to 87% in the Tripoli study.<sup>12</sup> Weight loss ameliorate insulin resistance which is a cause of type 2 DM. Oral hypoglycaemic drugs are the main stay of management of type 2 DM which is the most common form of Diabetes.<sup>13</sup> Some of the medications like biguanides also have favourable effects on weight loss. Knowledge about this was poor as about 1/5 of the nurses could not identify any oral hypoglycaemic agent. This is similar to the Tripoli study where 13% could not say any name of drugs. This is rather poor and adequate nursing education is advocated to improve this knowledge. A similar study in the UK showed poor knowledge about type 2 diabetes amongst nurses.<sup>14</sup> With the increasing worldwide prevalence of type 2 DM this gap in knowledge must be addressed amongst these nurses.

Knowledge about insulin was also poor as more than 1/5 was not able to name any type of insulin. Insulin therapy is useful in hyperglycaemic emergencies and also for treatment of patients with type 1 Diabetes. This deficit in knowledge should also be addressed by regular education of the nursing staff. At least 81.39 % could identify one injection site of insulin correctly. This knowledge however is in contrast to a study in the UK that showed that 67% of the study subjects could not identify the correct site for insulin injection.<sup>14</sup> Majority of the subjects correctly identified the treatment of hypoglycaemia. This is rather encouraging since hypoglycaemia carries a substantial mortality if not correctly treated. Other studies showed similar high knowledge among the nurses.<sup>12,14</sup> Majority also knew the correct treatment of hypoglycaemic coma. However, few of the nurses said that insulin can be used in the treatment of hypoglycaemia. This is rather dangerous, and continuous nursing education to correct this gap in knowledge is advocated. In the UK study majority of the nurses were lacking in knowledge about recognizing and treating hypoglycaemia correctly.<sup>14</sup> Diabetes mellitus can lead to microvascular and macrovascular complications. Macrovascular disease is the leading cause of death in diabetic, while microvascular disease like diabetes nephropathy is the leading cause of kidney failure worldwide.<sup>15</sup> Majority of the nurses identified the eye as the most common organ affected, and blood vessel the least. Although Diabetes is the leading cause of blindness worldwide, majority of the deaths are from macrovascular disease like stroke and myocardial infarction. Education to fill this gap in knowledge is advocated. Majority of the nurses identified the cause of hypoglycaemia in diabetic similar to earlier studies.<sup>14</sup> Diabetic ketoacidosis is an acute complication of diabetes seen in type 1 diabetes with a mortality of about 5 - 10%. There was a below average awareness about the symptoms of diabetic ketoacidosis. This is in contrast with a very good knowledge seen in studies elsewhere.<sup>12,14</sup> It is encouraging that majority of the nurses agreed that diabetes need special foot care. The cost of diabetes foot ulcer is enormous and hence foot care is essential to prevent this complication.<sup>16,17</sup> In the UK



study 100% of the respondents agreed that foot care is important in diabetes.<sup>14</sup> Less than 96.34% of the nurses agreed that the diabetic diet is good for everyone. This is rather in contrast to African study where deficiency in knowledge was shown amongst nurses.<sup>18</sup> Jayne and Rankin in an earlier study identified areas in which there were lacks of knowledge amongst nurses as site of insulin injection, clinical signs of hypoglycaemia and hyperglycaemia and effects of illness on blood sugar.<sup>19</sup> Also a positive correlation between nurses actual and perceived knowledge was shown by El Dierawi and Zuraikat.<sup>20</sup> Similar studies elsewhere have also shown similar deficiencies in knowledge amongst nurses, in certain aspects of diabetic care.<sup>21,22</sup> With the increasing prevalence and incidence of diabetes, nurses must improve their understanding of diabetes in order to care for patients since they are the patients most frequent contact and this will improve overall diabetic control.<sup>23</sup>

### Conclusion

This study revealed that overall nurses' knowledge was good, but there was a deficiency in certain aspects of diabetes management. Therefore, Diabetic educational programmes to enhance nurses understanding are advocated. These would improve their ability to care for patients and contribute positively towards diabetic management.

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