# Knowledge on Complications of Diabetes Mellitus Among Senior Citizens in Urban Community, Dhaka, Bangladesh

Shamima Nasrin[1], Prof. Dr. Md. Emdadul Haque[2]

*[1]Nursing Instructor, Dhaka Nursing College, Dhaka*
*[2] Department of Nutrition and Bio-chemistry,*
*National Institute of Preventive and Social Medicine (NIPSOM),*
*Dhaka, Bangladesh*

***Abstract:*** *This cross sectional type of descriptive study was conducted in urban community in Dhaka city with the **objective** to assess the level of knowledge about different types of complications and knowledge about control and prevention on complications of diabetes mellitus. Data were collected from 214 male and female senior citizens by face to face formal interview using a pre-tested questionnaire. The study revealed that majority of the respondents (69.6%) were between 60-63 years of age and 56.5% respondents were male. Majority of respondents were Muslim (75.2%) and more than were married (85.0%) and belonged to joint family (78.5%). About educational level highest number of respondents (20.1%) was degree passed and majority of the respondents (28.0%) were retired and mean monthly family income was 27,457.94 taka and minimum 2,000 and maximum 80,000 taka. About diabetes near half of the respondents (39.3%) were suffering from diabetes and majority of the respondents suffering from diabetes between 1-5 years and more than half respondents (55.1%) was positive family history of diabetes and majority of the respondents (73.4%) and (72.4%) knew about control and complications of diabetes, respectively. More than half of the respondents (70.6%) knew regarding eye problem and majority of them mentioned retinopathy (35%) and retinopathy and (24.8%) cataract both complications of diabetes. Majority of the respondents (70.1%) knew about diabetes related heart problem among them 28.0% mentioned chest pain and heart attract both complication of diabetes. About diabetes related complications on kidney and brain, more than half of the respondent (55.6%), (60.3%) and (34.6%) was not oriented kidney brain, and foot complications, respectively. The study showed that a good proportion of respondents (86.4%) were found having knowledge on control of diabetes and among them only (35%) correctly knew and (79.0%) were found having knowledge on prevention of complication of diabetes among them only (36.0%) correctly knew about prevention of complications. From this study it is mentionable that the health education programme to impart knowledge on prevention and control of diabetes and its complications is an urgent need in current perspective.*

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## I. Introduction

Diabetes mellitus is one of the major health problems around the world. World Health Organization (WHO) estimates that more than 346 million people worldwide have DM. This number is likely to more than double by 2030 without any intervention. Almost 80% of diabetes deaths occur in low and middle-income countries (WHO, 2012). The incidence of this disease has been showing a sharp increase in the South-East Asia Region, diminishing the myth that is largely a problem of developed countries (Rashid, Khabiruddin & Sayeed, 1999). Diabetes from the Region constituted 20% of the world's 135 million diabetes population in 1995, and this proportion is expected to increase to 27% by 2025 (Rashid, Khabiruddin & Sayeed, 1999). In urban population, more than two fold increases in diabetes mellitus has been reported. On a global scale, female diabetics outnumber males. In South-East Asia Region, however, the ratio in reversed. The prevalence and the mortality and morbidity data grossly underestimate the real magnitude of the problem. Because 'once a diabetic, always a diabetics' – he or she has to control the disease for the rest of his or her life (Rashid, Khabiruddin & Sayeed, 1999). World Health Organization (WHO) estimates that more than 346 million people worldwide have DM. This number is likely to more than double by 2030 without any intervention. Almost 80% of diabetes deaths occur in low and middle-income countries (WHO, 2012). According to WHO report, India today heads the world with over 32 million diabetic patients and this number is projected to increase to 79.4 million by the year 2030 (Mohan, 2005). Recent surveys indicate that diabetes now affects a staggering 10-16% of urban population and 5-8% of rural population in India and Sri Lanka (Wild, et al., 2004). According to recent study conducted by Rahim, et al. 2006, in Bangladesh the prevalence rate of diabetes mellitus (DM) was 5.63% and impaired glucose tolerance (IGT) was 14.14%. The prevalence rate of diabetes in male and female was 5.41%

and 5.96% respectively. Patients' knowledge about their illness is considered important in controlling diabetes and preventing complications.

Diabetes mellitus (DM) is a chronic progressive metabolic disorder characterized by hyperglycemia mainly due to absolute (Type 1 DM) or relative (Type 2 DM) deficiency of insulin hormone (World Health Organization, 1999). Diabetes mellitus, with its two main types, Type 1 diabetes (T1D) and Type 2 diabetes (T2D) represents a global health problem due to increasing prevalence and associated risk of devastating complications such as gangrene, blindness, kidney failure as well as premature morbidity and mortality due to heart and vascular diseases (International Diabetes Federation,2003). Diabetes is still a serious disease even in countries where treatment is available. Furthermore, lifestyle-induced health problems combined with ageing of populations in the developed world and improved general living standards and survival in the developing world are producing more, not less people with diabetes (Kristensen, 2000).

DM virtually affects every system of the body mainly due to metabolic disturbances caused by hyperglycemia, especially if diabetes control over a period of time proves to be suboptimal (WHO, 1999). Until recently it was believed to be a disease occurring mainly in developed countries, but recent findings reveal a rise in number of new cases of type 2 DM with an earlier onset and associated complications in developing countries (Knip, et al., 2005). Diabetes is associated with complications such as cardiovascular diseases, nephropathy, retinopathy and neuropathy, which can lead to chronic morbidities and mortality (American Diabetes Association, 2004).

Diabetes mellitus type 1 (also known as type 1 diabetes, or T1DM; formerly insulin dependent diabetes or juvenile diabetes) is a form of diabetes mellitus that results from autoimmune destruction of insulin-producing beta cells of the pancreas. The subsequent lack of insulin leads to increased blood and urine glucose. The classical symptoms are polyuria (frequent urination), polydipsia (increased thirst), polyphagia (increased hunger), and weight loss (Cooke & Plotnick, 2008). Type 1 diabetes can be distinguished from type 2 by autoantibody testing - glutamic acid decarboxylase autoantibodies (GADA), islet cell autoantibodies (ICA), insulinoma-associated (IA-2) autoantibodies, and zinc transporter autoantibodies (ZnT8) are present in individuals with type 1 diabetes, but not type 2. The C-peptide assay, which measures endogenous insulin production, can also be used. Incidence varies from 8 to 17 per 100,000 in Northern Europe and the U.S. with a high of about 35 per 100,000 in Scandinavia to a low of 1 per 100,000 in Japan and China (Kasper, et al., 2005).

Type 1diabetes causes an estimated 5–10% of all diabetes cases (Daneman, 2006) or 11–22 million worldwide. In 2006 it affected 440,000 children under 14 years of age and was the primary cause of diabetes in those less than 10 years of age. The incidence of type 1 diabetes has been increasing by about 3% per year (Aanstoot, et al., (2007).

Rates vary widely by country. In Finland, the incidence is a high of 35 per 100,000 per year, in Japan and China a low of 1 to 3 per 100,000 per year, and in Northern Europe and the U.S., an intermediate of 8 to 17 per 100,000 per year (Soltesz, Patterson & Dahlquist, 2007).

Type 1 diabetes was previously known as juvenile diabetes to distinguish it from type 2 diabetes, which generally has a later onset; however, the majority of new-onset type 1 diabetes is seen in adults. Untreated, type 1 diabetes is ultimately fatal, but the disease can be controlled with supplemental insulin. Insulin is most commonly administered by injection at periodic intervals several times per day, though other options, such as insulin pumps, exist. Transplantation, both of the entire pancreas and pancreatic islet cells, is a possible cure in some cases.

Treatment must be continued indefinitely and does not usually impair normal daily activities. Patients are usually trained to manage their disease independently, but for some individuals this can be a challenge. Complications may arise from both low blood sugar and high blood sugar, both due to the non-physiological manner in which insulin is replaced. Low blood sugar may lead to seizures or episodes of unconsciousness, and requires emergency treatment. High blood sugar may lead to increased fatigue and can cause long-term damage to organs.

After diagnosis of diabetes, the importance of protecting the body from damage caused by hyperglycemia cannot be overstated. In the United States, 57.9% of diabetic patients have 1 or more diabetes-related complication, and 14.3% have 3 or more (Mitka, 2007). Strict glycemic control reduces the development and progression of micro vascular complications, such as retinopathy, nephropathy, and neuropathy. Aggressive treatment of dyslipidemia and hypertension decreases macrovascular complications (Welschen, et al., 2005). Complications of poorly managed type 1 diabetes mellitus may include cardiovascular disease, diabetic neuropathy, and diabetic retinopathy, among others. However, cardiovascular disease as well as neuropathy (Granberg, 2005) may have an autoimmune basis, as well.

Studies conducted in the United States (Songer, 2002) and Europe (Trief, et al., 2003). Showed that drivers with type 1 diabetes had twice as many collisions as their non-diabetic spouses, demonstrating the increased risk of driving collisions in the type 1 diabetes population. Diabetes can compromise driving safety in several ways. First, long-term complications of diabetes can Incidence varies from 8 to 17 per 100,000 in

Northern Europe and the U.S. with a high of about 35 per 100,000 in Scandinavia to a low of 1 per 100,000 in Japan and China (Kasper, et al., 2005).interfere with the safe operation of a vehicle. For example, diabetic retinopathy (loss of peripheral vision or visual acuity), or peripheral neuropathy (loss of feeling in the feet) can impair a driver's ability to read street signs, control the speed of the vehicle, apply appropriate pressure to the brakes, etc.

Second, hypoglycemia can affect a person's thinking processes, coordination, and state of consciousness. This disruption in brain functioning, neuroglycopenia, can impair driving ability (Cox, Gonder-Frederick & Clarke, 1993). A study involving people with type 1 diabetes found that individuals reporting two or more hypoglycemia-related driving mishaps differ physiologically and behaviorally from their counterparts who report no such mishaps (Cox, 2000). For example, during hypoglycemia, drivers who had two or more mishaps reported fewer warning symptoms, their driving was more impaired, and their body released less epinephrine (a hormone that helps raise BG). Additionally, individuals with a history of hypoglycemia-related driving mishaps appear to use sugar at a faster rate (Cox, 2002) and are relatively slower at processing information (Campbell, 2010). These findings indicate that although anyone with type 1 diabetes may be at some risk of experiencing disruptive hypoglycemia while driving, there is a subgroup of type 1 drivers who are more vulnerable to such events. drivers with type 1 diabetes and a history

of driving mishaps are recommended to never drive when their BG is less than 80 mg/dl. Instead, these drivers are advised to treat hypoglycemia and delay driving until their BG is above 90 mg/dl (Cox, 2000).

It provides a provisional picture of the characteristics of the epidemic. Worldwide surveillance of diabetes is a necessary first step toward its prevention and control, which is now recognized as an urgent priority. Though multiple demographic, socio-economic and social support factors can be considered as positive contributors in facilitating self-care activities in diabetic patients, role of clinicians in promoting self-care is vital and has to be emphasized. Realizing the multi-faceted nature of the problem, a systematic, multi-pronged and an integrated approach as well as knowledge is required for promoting self-care practices among diabetic patients and prevents diabetes among non-diabetic people.

The prevalence of diabetics is increasing rapidly in the developing countries including Bangladesh (Ali, 2003). It is a chronic disease which is never cured, but a diabetic's patient can lead a normal life by controlling the disease through balanced diet, taking appropriate drug, and exercising regularly (Syad, Hussain,& Khana, 2004). In 2007, the International Diabetes Federation (IDF) estimates that 3.8 million or 4.8% of people living in Bangladesh will have diabetes. By 2025, that number is expected to grow to 7.4 million or 6.1% of the population. This explosion in diabetes prevalence will place Bangladesh among the top ten countries in terms of the number of people living with diabetes in 2025. At that date, 80% of all diabetes cases will be in low-and-middle income countries (Knowler, 2002). The increase in diabetes in Bangladesh is expected to follow global gender patterns, whereby more women than men will live with diabetes. IDF and WHO predict that the number of women in the world with diabetes will double in less than 20 years. In Bangladesh the number of women with diabetes will grow from the current 2 million to 4 million by 2025. During the same period, men with diabetes will rise from 1.8 million to 3.4 million.

**1.1. Research question:**
What is the level of knowledge about complications of diabetes mellitus among senior citizens in urban community?

**1.2. Objectives:**
**General objective**
To assess the level of knowledge about complications of diabetes mellitus among senior citizens

**Specific objectives:**
1. To assess the level of knowledge about different types of complications of diabetes mellitus.
2. To assess the level of knowledge about control and prevention on complications of diabetes mellitus.
3. To assess the socio demographic characteristics of the respondents.

## II. Methodology Of The Study

This chapter described the methodology of the study. It included description of study design, study population, selection criteria, study place, study period; research tools sample size, Data collection procedure, ethical issues and data analysis procedure

**2.1. Study design:** A cross- sectional descriptive study was conducted to find out knowledge on complications of diabetes mellitus among senior citizens in urban community, in Dhaka city

2.2. **Study population:** Both male and female senior citizens in urban community in Dhaka city were the study population.

2.3. **Sample size:** Sample size was estimated on the basis of availability of both male and female senior citizens in selected urban community in Dhaka city.

**2.3.1.** **Inclusion criteria:**
1. All senior citizens in selected urban community
2. Age above 60 years
3. Voluntary participation
4. Able to communicate with researchers

**2.3.2.** **Exclusion criteria:**
1. Unwilling to participate
2. Ill senior citizens
3. Mentally disable

**2.4. Study place:** The study was conducted at urban community in Dhaka city.

**3.5 Study Period:** The study was conducted from 1st July 2013 to 31st December 2013. The protocol was approved in 2nd week of July and then review of literature and developed of research instruments were performed. Data will be collected from 15th October to 30th October 2013.

**3.6 Sampling Technique:** A purposive sampling technique was used for sample selection.

**3.7 Research Instrument:** A written structured questionnaire was developed in English (Annexure-3) and then translated into Bangla. The questionnaire was prepared by using the selected variables according to objectives. The questionnaire was pretested on 10 respondents. The questionnaire was finalized after necessary modification based on the finding of pre-test. Data were collected by a face to-face interview.

**3.8 Ethical consideration:** Ethical approval for the study protocol was obtained from the Institutional Review Committee of the National Institute of preventive and social Medicine (NIPSOM), and written informed consent was obtained from all the participants.

**3.9 Data collection procedures:** Data was collected by face to face interview by pre tested structured questionnaire.

**3.10 Data analysis**: A software package of SPSS (version 20) was used to analyze data. Descriptive statistics was used for all variables. Values were expressed as percentage and mean.

## III.     Finding of the study

The aim of this cross-sectional-descriptive study was to assess the level of knowledge about different types of complications of diabetes mellitus among senior citizens urban community in Dhaka city. A total of 214 respondents were selected for this study. Their socio-economic condition, demographic characteristics, knowledge about complications, management and control of diabetes were mainly investigated.

**Table no. 1. Distribution of the respondents by age in year**

| Distribution of the respondents by age | Frequency | Percent |
|---|---|---|
| 60-63 | 149 | 69.6 |
| 64-67 | 41 | 19.2 |
| 68-71 | 21 | 9.8 |
| 72-75 | 3 | 1.4 |
| **Total** | **214** | **100.0** |

The mean age was 62.78 and standard deviation was 3.075. Table 1 shows that the majority 149(69.6%) of the respondents were 60-63 years age group, 41(19.2%) respondents were 64-67 years age group and. On the other hand, lowest number of respondents 21(9.8%) and 3(1.4%) belonged to 68-71 and 72-75 years group, respectively.

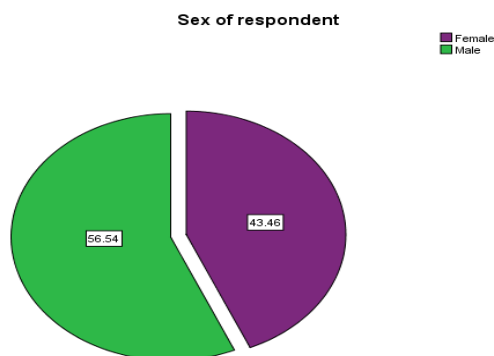**Figure -1 Distribution of the respondents by sex**:



Figure- 1 shows the percentage distribution of respondents by their sex. It was observed that more than half of the respondents (56.5%) were male and 43.5% were female.

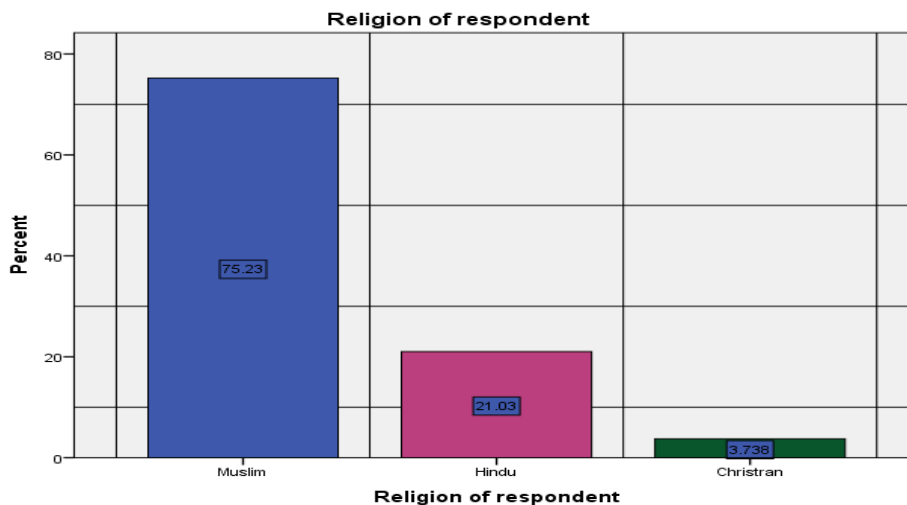**Figure: 2 Distribution of the respondents by religion**:



Figure 2 shows that the percentage distribution of respondents by their religion. It was observed that majority of the respondents 161 (75.2%) were muslin and 45(21.0%) were Hindu and only of 8(3.7%) respondents was Christian.

**Table: 2 Distribution of the respondents by Marital Status**:

| Marital Status | Frequency | Percent |
|---|---|---|
| Married | 182 | 85.0 |
| Widowed | 25 | 11.7 |
| Divorced | 4 | 1.9 |
| Widow | 3 | 1.4 |
| **Total** | **214** | **100.0** |

Table 2 shows that the percentage of distribution respondents by their marital status. It was observed that majority of the respondents 182(85.0%) were married, and 25 (11.7%) were widowed, and 4(1.9%) were divorced and 3(1.4%) respondents were widow.

**Table: 3 Distribution of the respondents by educational status of respondent**

| Educational status | Frequency | Percent |
|---|---|---|
| Illiterate | 8 | 3.7 |
| Primary | 25 | 11.7 |
| Class eight | 26 | 12.1 |
| SSC | 22 | 10.3 |
| HSC | 33 | 15.4 |
| Degree | 43 | 20.1 |
| Master Degree, | 24 | 11.2 |
| Diploma, Vocational | 33 | 15.4 |
| **Total** | **214** | **100.0** |

Table 3 shows the percentage distribution of level of education of respondents. It was observed that highest number 43(20.1%) respondents were degree passed and similar number of respondents 33(15.4) were HSC passed and 33(15.4) were diploma/vocational degree. It also was observed that 25(11.7%) were primary passed, and 26(12.1%) were class eight passed, and 22(10.3%) were SSC passed, and 24(11.2%) were master degree passed and lowest number of respondent were illiterate.

**Table: 4 Distribution of the respondents by Occupation**

| Occupation | Frequency | Percent |
|---|---|---|
| Daily labour | 9 | 4.2 |
| Retired | 60 | 28.0 |
| Non-govt service | 41 | 19.2 |
| Business | 57 | 26.6 |
| House wife | 46 | 21.5 |
| others | 1 | .5 |
| **Total** | **214** | **100.0** |

Table 4 shows that percentage distribution of the respondents by their occupation. It was observed that among the total respondents, majority 60(28.0%) were retired and 57(26.6%) were businessman. Followed by 46(21.5%) were house wife, 41(19.2%) were non-governmental service, 9(4.2%) were daily labour and 1(.5%) were engaged in other occupation.

**Figure: 3 Distribution of the respondents by types of family**
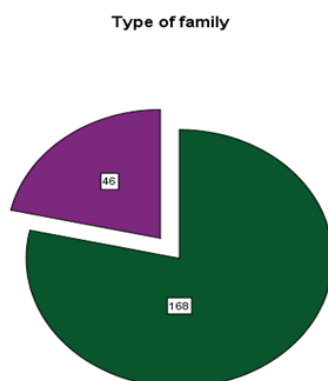


Type of family

Figure 3 shows that the percentage distribution of the respondents by their family types. It was observed that among the total respondents, majority 168(78.5%) were belonging in nuclear family and 46(21.5%) were belonging in joint family.

**Table: 5 Distribution of the respondents by monthly family income in taka**

| Monthly family income | Frequency | Percent |
|---|---|---|
| 2000-10,000/- | 22 | 10.3 |
| 11,000-20,000/- | 49 | 22.9 |
| 21,000-30,000/- | 85 | 39.7 |
| 31,000-40,000/- | 30 | 14.0 |
| 41,000-50,000/- | 19 | 8.9 |
| 51,000-60,000/- | 6 | 2.8 |
| 61,000-70,000/- | 2 | .9 |
| 71,000-80,000/- | 1 | .5 |
| **Total** | **214** | **100.0** |

The mean monthly family income was 27,457.94 with standard deviation 13927.57 and minimum monthly family income 2,000 and maximum 80,000 taka.

Table 5 shows the percentage distribution of respondents by their average monthly family income. It was observed that highest proportion 85(39.7%) of respondents had monthly income from 21,000-30,000/- and followed by 49(22.9%) respondents had income from 11, 000-20,000 taka 30(14.0%) respondents had income from 31,000-40,000 taka, 22(10.3%) respondents had income from 2,000-10,000 taka, 19(8.9%) respondents had income from 41,000-50,000 taka and 6(2.8%) respondents had income from51,000-60,000 taka . However, very few number 2(.9%) and 1(.5%) respondents had average monthly income from 61,000-70,000 taka and 71,000-80,000 taka, respectively.

**Table: 6 Distribution of the respondents by Suffering from diabetes**

| Suffering of diabetes | Frequency | Percent |
|---|---|---|
| Yes | 84 | 39.3 |
| No | 112 | 52.3 |
| Don't Know | 18 | 8.4 |
| **Total** | **214** | **100.0** |

Table 6 shows distribution of the respondents by their Suffering of diabetes. It was observed that among the total respondents, more than half 112(52.3%) respondents were not suffering from diabetes and 84(39.3%) were suffering from diabetes and 18(8.4%) respondents do not know, they are suffering or not.

**Table: 7 Distribution of the respondents by Length of suffering from Diabetes mellitus**

| Length of diabetes | Frequency | Percent |
|---|---|---|
| 1-5 years | 34 | 15.9 |
| 6-10 years | 18 | 8.4 |
| 11-15 years | 12 | 5.6 |
| 16-20 years | 8 | 3.7 |
| 21-25 years | 11 | 5.1 |
| 26-30 years | 1 | .5 |
| **Total** | **84** | **39.0** |

Table 7 shows that the percentages Distribution of the respondents by Length of suffering in Diabetes mellitus. The minimum length of suffering in Diabetes mellitus was 1 year and maximum length of suffering in Diabetes mellitus was 28 years, and mean length was 3.56 years. Among the total respondents majority 34(15.9%) was suffering from diabetes between 1-5 years. However, 18(8.4%) between 6-10 years, 12(5.6%) between 11-15 years, 8(3.7%) between 16-20 years and 11(5.1%) between 21-25 years were suffering from diabetes. On the other hand, very few 1(.5%) number of respondents was suffering from diabetes between 26-30 years.

**Table: 8 Distribution of the respondents by family history of diabetes**

| Family history of diabetes | Frequency | Percent |
|---|---|---|
| Yes | 118 | 55.1 |
| No | 96 | 44.9 |
| **Total** | **214** | **100.0** |

Table 8 shows the percentage distribution of respondents by their family history of diabetes. It was found that among the total respondents more than half 118(55.1%) family history have diabetes and 96(44.9%) respondents have not history of diabetes.

**Table 9 distributions of the respondents by Knowledge on control of diabetes**

| Knowledge on control of diabetes | Frequency | Percent |
|---|---|---|
| Yes | 157 | 73.4 |
| No | 57 | 26.6 |
| **Total** | **214** | **100.0** |

Table 9 shows the percentage distribution of respondents by their Knowledge on control of diabetes. It was found that majority of the respondents 157(73.4%) told they know control of diabetes and 57(26.6%) told they do not know about control of diabetes.

**Table: 10 Distribution of the respondents by Knowledge on complication of diabetes**

| Knowledge of complication of diabetes | Frequency | Percent |
|---|---|---|
| Yes | 155 | 72.4 |
| No | 59 | 27.6 |
| **Total** | **214** | **100.0** |

Table10 shows the percentage distribution of respondents by their Knowledge on complications of diabetes. It was found that majority of the respondents 155(72.4%) told they have knowledge complication of diabetes and 59(27.6%) told they haven't know knowledge about complication of diabetes.

**Table: 11 Distribution of the respondents by Knowledge on complication of eye**

| Complication of eye | Frequency | Percent |
|---|---|---|
| Yes | 151 | 70.6 |
| No | 63 | 29.4 |
| **Total** | **214** | **100.0** |

Table 11 shows the percentage distribution of respondents by their Knowledge on complications of diabetes on eye. It was found that majority of the respondents 151(70.6%) told they know about complication of eye and 63(29.4%) told they do not know about complications of eye.

**Table: 12 Distribution of the respondents by Knowledge on eye problem**

| Eye problems | Frequency | Percent |
|---|---|---|
| Retinopathy | 75 | 35.0 |
| Cataract | 15 | 7.0 |
| Decrease vision | 13 | 6.1 |
| Retinopathy & cataract | 53 | 24.8 |
| Don't Know | 58 | 27.1 |
| **Total** | **214** | **100.0** |

Table 12 shows the percentage distribution of the respondents by their knowledge on eyes problems. It was observed that majority 75 (35.0%) of the respondents were mentioned retinopathy and 15(7.0%) of the respondents were mentioned cataract as eyes problems. On the other hand, 53(24.8%) of the respondents were mentioned both retinopathy and cataract as eyes problems. It also was observed that 58 (27.1%) respondents told they don't know the problem of eye. The findings indicate that a good number of respondents do not know about complications of eyes on diabetic condition.

**Table: 13 Distribution of the respondents by Knowledge on heart problem**

| Knowledge on heart problem | Frequency | Percent |
|---|---|---|
| Yes | 150 | 70.1 |
| No | 64 | 29.9 |
| **Total** | **214** | **100.0** |

Table 13 shows the percentage distribution of respondents by their Knowledge on heart problem. It was found that majority of the respondents 150(70.1%) told they know about heart problems and 64(29.9%) told they do not know about heart problems.

**Table: 14 Distribution of the respondents by Knowledge of heart problems**

| Name of heart problem | Frequency | Percent |
|---|---|---|
| Chest pain | 38 | 17.8 |
| Heart attack | 52 | 24.3 |
| Both | 60 | 28.0 |
| Don't Know | 64 | 29.9 |
| **Total** | **214** | **100.0** |

Table 14 shows the percentage distribution of the respondents by their knowledge on heart problems. It was observed that majority 64(29.9%) of respondents told, they do not know about complications of diabetes on heart. On the other hand, 38 (17.8%) of the respondents were mentioned chest pain and 52(24.3%) of the respondents were mentioned heart attract and 60(28.0%) of the respondents were mentioned both chest pain and heart attract are complications of diabetes on heart. The findings indicate that majority of respondents do not know about complications of diabetes on heart.

**Table: 15 Distribution of the respondents by their Knowledge of kidney problem**

| Knowledge Problem of kidney | Frequency | Percent |
|---|---|---|
| Yes | 95 | 44.4 |
| No | 119 | 55.6 |
| **Total** | **214** | **100.0** |

Table 15 shows the percentage Distribution of the respondents by their Knowledge on kidney problems. It was found that majority 119 (55.6%) of the respondents told, they do not know about kidney problems and 95(44.4%) of the respondents know about kidney problems as a complication of diabetes. The findings indicate that majority of the respondents do not know about complications of diabetes on kidney of diabetes.

**Table: 16 Distribution of the respondents by their Knowledge of kidney problem**

| Name of kidney problem | Frequency | Percent |
|---|---|---|
| Funk pain | 26 | 12.1 |
| Kidney failure | 22 | 10.3 |
| All | 47 | 22.0 |
| Don't know | 119 | 55.6 |
| **Total** | **214** | **100.0** |

Table 16 shows the percentage distribution of the respondents by their knowledge on kidney problems. It was observed that majority 119(55.6%) of the respondents told, they haven't knowledge about of kidney problems. It also was observed that 47 (22.0%) respondents told that funk pain kidney failure is complication of diabetes and 26(12.1%) told funk pain, and 22(10.3%) told kidney failure are the complications of diabetes. The findings indicate that majority of the respondents do not know about complications of diabetes on kidney.

**Table: 17 Distribution of the respondents by Knowledge of brain problem**

| Knowledge of Brain problem | Frequency | Percent |
|---|---|---|
| Yes | 85 | 39.7 |
| No | 129 | 60.3 |
| **Total** | **214** | **100.0** |

Table 17 shows the percentage Distribution of the respondents by their Knowledge on brain problems. It was found that majority 129 (60.3%) of the respondents told, they do not know complication on brain and 85(39.7%) of the respondents told, they know about complication of brain on diabetic condition. The findings indicate that majority of the respondents do not know about complications of diabetes on brain.

**Table: 18 Distribution of the respondents by Knowledge brain problem**

| Name of brain problem | Frequency | Percent |
|---|---|---|
| Headache | 12 | 5.6 |
| Brain stock | 42 | 19.6 |
| Headache and brain stock | 31 | 14.5 |
| Don't know | 129 | 60.3 |

| | | |
|---|---|---|
| **Total** | **214** | **100.0** |

Table 18 shows the percentage distribution of the respondents by their knowledge on brain problem.  It was observed that majority 129(60.3%) of the respondents told, they do not know about problem of brain due to diabetes. On the other hand, it was observed that 42 (19.6%) respondents were mentioned brain stock and 12(5.6%) were mentioned black headache and 31(14.5%) were mentioned headache and brain stock both are complications of diabetes. The findings indicate that majority of the respondents do not know about complications of diabetes.

**Table: 19 Distribution of the respondents by Knowledge Foot problem**

| Foot problem | Frequency | Percent |
|---|---|---|
| Yes | 140 | 65.4 |
| No | 74 | 34.6 |
| **Total** | **214** | **100.0** |

Table 19 shows the percentage Distribution of the respondents by their Knowledge on foot problems. It was found that majority 140 (65.4 %) of the respondents told, they know about complication of diabetes on foot and 74(34.6%) of the respondents told, they do not know about complication of diabetes on foot. The findings indicate that majority of the respondents know about foot complications of diabetes.

**Table: 20 Distribution of the respondents by Knowledge name of Foot problem**

| Name of foot  problem | Frequency | Percent |
|---|---|---|
| Black in foot finger | 11 | 5.1 |
| Ulcer in food | 68 | 31.8 |
| Delayed dry ulcer | 10 | 4.7 |
| All | 51 | 23.8 |
| Don't know | 74 | 34.6 |
| **Total** | **214** | **100.0** |

Table 20 shows the percentage distribution of the respondents by their knowledge on foot problems. It was observed that majority 74(34.6%) of the respondents told, they do not know about of problems of diabetes on foot. On the other hand, it was observed that 68 (31.8%) respondents were mentioned ulcer in foot, and 11(5.1%) were mentioned black in foot finger and 10(4.7%) were mentioned delay dry ulcer complications of diabetes on foot. The findings indicate that majority of the respondents do not know about complications of diabetes on foot.

**Table: 21 Distribution of the respondents by Knowledge Diabetes control**

| Diabetes control | Frequency | Percent |
|---|---|---|
| Yes | 185 | 86.4 |
| No | 29 | 13.6 |
| **Total** | **214** | **100.0** |

Table 21 shows the percentage distribution of the respondents by their Knowledge on diabetes control. It was found that majority 185 (86.4 %) of the respondents told, they know about control of diabetes and 29(13.6 of the respondents told, they do not know about control of diabetes. The findings indicate that majority of the respondents know about control of diabetes.

**Table: 22 Distribution of the respondents by Knowledge Diabetes control**

| Knowledge on  diabetes control | Frequency | Percent |
|---|---|---|
| Treatment | 15 | 7.0 |
| Control Diet | 36 | 16.8 |
| Regular walk/exercise | 3 | 1.4 |
| All | 75 | 35.0 |
| Treatment & Diet | 12 | 5.6 |
| Regular walk/exercise, treatment | 46 | 21.5 |
| Don't know | 27 | 12.6 |
| **Total** | **214** | **100.0** |

Table 22 shows the percentage distribution of the respondents by their knowledge on diabetes control. It was observed that majority 75(35.0%) of the respondents mentioned treatment, diet control and regular exercise/walk control diabetes and 15 (7.0%) told treatment, 36(16.8%) told control diet, only 3(1.4%) told regular walk/exercise, 12(5.6%) told treatment and diet control and 46(21.5%) told exercise and treatment control diabetes. On the other hand, 27(12.6%) respondents told they do not know about control of diabetes. The findings indicate that majority of the respondents do not know properly procedure about control of diabetes.

**Table: 23 Distribution of the respondents by Knowledge on prevention of complication of diabetes**

| Knowledge on complication of diabetes | Frequency | Percent |
|---|---|---|
| Yes | 170 | 79.4 |
| No | 44 | 20.6 |
| **Total** | **214** | **100.0** |

Table 23 shows the percentage Distribution of the respondents by their Knowledge on diabetes prevention. It was found that majority 170 (79.4%) of the respondents told, they know about prevention of diabetes and 44(20.6%) of the respondents told, they do not know about prevention of diabetes. The findings indicate that majority of the respondents know about prevention of diabetes.

**Table: 24 Distribution of the respondents by Knowledge Process of prevention of complication**

| Process of complication prevention | Frequency | Percent |
|---|---|---|
| Regular Diet | 27 | 12.6 |
| Walking at 30 minutes | 1 | .5 |
| Regular Medication | 11 | 5.1 |
| Regular diet, Regular Medication | 45 | 21.0 |
| Medication & exercise | 9 | 4.2 |
| Regular diet, Medication & exercise | 77 | 36.0 |
| Don't know | 44 | 20.6 |
| **Total** | **214** | **100.0** |

Table 24 shows the percentage distribution of the respondents by their knowledge on presentation of complications of diabetes. It was observed that majority 77(36.0%) of the respondents mentioned regular diet, medication and exercise prevent complication of diabetes and 45 (21.0%) told only regular diet and medication, 9(4.2%) medication and exercise prevent complications. On the other hand, 27(12.6%) respondents told regular diet and 1(.5%) mentioned walking at 30 minutes and 11(5.1%) regular medication prevent complications. However, 44(20.6%) told they do not know about prevention of complication. The findings indicate that majority of the respondents do not know prevention of complications.

## IV. Discussion

This study was carried out with the aim to assess the level of knowledge about different types of complications and knowledge about control and prevention on complications of diabetes mellitus. A total number of 214 respondents were interviewed with the help of questionnaires. Collected data entered into computer by using code number and analyzed through SPSS program according to the objectives of the study. This chapter presents the research findings followed by the related discussion focusing on the research objectives. The study revealed that the mean age was 62.78 years (SD = 3.075), range 60-63 years. More than half 56.5% of the respondents were male and 43.5% were female. Majority of the respondents 75.2% were muslin and 21.0% were Hindu and only of 3.7% respondents was Christian. Regarding marital status, the majority of the respondents 85.0% were married, and 11.7% were widowed, and 1.9% were divorced and 1.4% respondents were widow. The literacy rate was 96.3%, while 20.1% respondents had received degree education, 15.4% had education, 15.4 had diploma/vocational education, 11.7% had primary education, 12.1% had class eight education, and 10.3% had SSC education, and 11.2% had master degree education and 3.7% had no formal education. Regarding occupation the majority 28.0% was retired and 26.6% were businessman. Followed by 46(21.5%) were house wife, 41(19.2%) were non-governmental service, 4.2%) were daily labour and 1(.5%) were engaged in other occupation. The majority 78.5% were belonging in nuclear family and 21.5% were belonging in joint family. The mean monthly family income was taka 27,457.94 (SD=13927.57). Range family income taka 2,000 - 80,000.

This findings indicate that proportion of the respondents are educated, reasonable income and belonging in nuclear family. It is not usual in Bangladesh perspective where a number of limitations are responsible for regard. This might be due to fact that this study is conducted only one in government staff quarter colony, where most of the people were engaged in job and live.

The socioeconomic characteristics observed in this study are different to other studies addressing the same population and different setting. This finding was inconsistent with a previous study conducted in Sri Lanka by (Perera, Silva & Perera, 2013); in Fortaleza, CE, Brazil by (Marques, et al.2013).

Perera, Silva & Perera, 2013 found that the mean age of the participants was 56.3 years (SD 10.1), range 30–71 years. The majority of the 150 respondents were married (96.0%), dependent on others for their income (94.0%), female (90.0%) and living within 5 km of the hospital (98.0%). The illiteracy rate was 8.0%, while 42.6% had received primary education and 49.3% secondary education. A majority of respondents (83.3%) had a family income below rupees (Rs) 10 000 per month (US$ 90 approximately)

Another study conducted by Marques, et al.2013 on Assessment of self-care competence of elderly people with diabetes. They found The following patient demographics were noted: 76% were women; 43% were married; 36% were widowed; 77% of the widowed individuals were women; the average age was 71 years (standard deviation = 6.4 years old); 37% were illiterate; 52% completed primary/middle school; 2% had bachelor's degrees; 36% earned between R$ 465.00 and R$ 930.00; 73% were retired, and 5% lived alone. As for DM, the time since diagnosis ranged from four to 46 years, with an average of 10 years (SD= 6.9 years).

Shah, Kamdar, and Shahnother, 2009 they found that total Out of these 238, 120 (50.42%) were males. 178 (74.78%) were Hindu by religion, 53 (22.26%) were Muslim. 192 (80.27%) cases were from urban area while 46 (19.32%) were from rural area. Mean age of patients was 55.82±10.2 years.

This might be due to fact that different country situation, different study setting situation study population was different well.

Regarding diabetes in this study reveal that 39.3% respondents were suffering from diabetes and 8.4% respondents do not know, they have diabetes or not. The duration of suffering from Diabetes mellitus range from 1 year to 28 years, and mean duration was 3.56 years. More than half 55.1% of the respondent had positive family history of diabetes. 26.6% respondents told they do not know about control of diabetes.

This finding was conflicting with a previous study conducted by Perera, Silva & Perera, 2013. They found almost half of the participants (49.3%) had been diagnosed with type 2 diabetes for > 5 years, 36.7% for 1–5 years and 14.0% for < 1 year. Another study found Mean duration of diabetes was 8.2±6.8 years (Shah, Kamdar, and Shah, 2009).

Bhowmik et al. (2013) found that the prevalence of DM in the study population was higher in 2009 compared to 1999 and 2004. The prevalence of DM increased 66% (from 2.3% to 6.8% during 1999 to 2004) and a further increase of 14% (from 6.8% to 7.9% during 2004 to 2009). Female participants had a higher prevalence of DM in 1999 and 2004. Male participants had a higher prevalence of DM in 2009. The prevalence of DM increased with age in both sexes.

Another study conducted by (*Ahasan et al. 2011) they found* the prevalence of diabetes was 12.3% and 7.5% according to FBG and 2-hours after 75gm glucose, respectively. Age of study population was e"20 years and male, female ratio was 4.75:1. The prevalence was almost similar among men (12.35%) and women (12.05%) considering FBG. While a higher prevalence among women (9.8%) was noticed than men (7%) after 75gm glucose. Pre-diabetic employees were 13.7 %( impaired glucose tolerances) and 31.8% (impaired Fasting glucose).

Saquib, et al.( 2013) found that Mean age were 49.4 ± 12.6 years ; 83% were married, 41% had ≥12 years of education, 47% were employed, 47% had a family history of diabetes. Thirty-five percent had type-2 diabetes and 45% had metabolic syndrome. In multivariate models older age and family history of diabetes were significantly associated with type-2 diabetes. Older age, female sex, overweight or obese, high wealth index and positive family history of diabetes were significantly associated with insulin resistance.

About knowledge on of diabetes the study result revealed that 27.6% respondents had not knowledge about complication of diabetes. The majority of the respondents 70.6% had knowledge about complication of eye and 29.4% respondent had not knowledge about complications of eye. It was observed that the majority 35.0% of the respondents mentioned retinopathy, and 7.0% mentioned cataract as eyes problems. On the other hand, 24.8% of the respondents were mentioned both retinopathy and cataract as eyes problems (Table-12). The majority of the respondents 70.1% respondents were known and 29.9% were unknown about heart problems. However, 17.8% of the respondents were mentioned chest pain, 24.3% of the respondents were mentioned heart attract and 28.0% of the respondents were mentioned both chest pain and heart attract are complications of diabetes on heart (Table-14). The majority 55.6%) of the respondents were unknown and 44.4% of the respondents were known complications kidney (Table-15). It also was observed that 47 (22.0%) respondents were mentioned funk pain and kidney failure are complications of diabetes, 12.1% were mentioned only funk pain, and 10.3% were mention kidney failure are the complications of diabetes (Table-16). Regarding brain complication the majority 60.3% of the respondents were unknown complication on brain and 39.7% were known about complication of brain on diabetic condition (Table-17). However, it was observed that 19.6% respondents were mentioned brain stock and 5.6% were mentioned headache and 14.5% were mentioned headache and brain stock both are complications of diabetes (Table-18). About foot problem the majority 140

(65.4 %) of the respondents were known about complication of diabetes on foot and 74(34.6%) of the respondents were unknown about complication of diabetes on foot (Table-19). It was observed that 31.8% respondents were mentioned ulcer in foot, 5.1% were mentioned black in foot finger and 4.7% were mentioned delay dry ulcer complications of diabetes on foot (Table-20). The findings indicate that majority of the respondents were unknown concerning complications of diabetes on foot. The findings indicate that majority of the respondents do not know about complications of diabetes.

This finding was consistent with the study conducted by Shah, Kamdar, and Shah, 2009. They found among the knowledge of complications of diabetes, renal complication was least known to patients. Most were afraid of heart related complications.

Regarding control of diabetes the study found that the majority 86.4 % of the respondents was known about control of diabetes and 13.6 of the respondents were unfamiliar about control of diabetes (Table-21). It was observed that majority 35.0% of the respondents were mentioned treatment, diet control and regular exercise/walk control diabetes and 7.0% respondents were mentioned treatment, 16.8% respondents were mention control diet, and only 1.4% respondents were mention regular walk/exercise, 5.6% respondents were mention treatment and diet control and 21.5% respondents were mention exercise and treatment control diabetes. The findings indicate that majority of the respondents were unknown properly process of control of diabetes (Table-22).

Shah, Kamdar, and Shah, 2009 found the responder knowledge regarding diet and exercises is was shows that Dietary modifications were relied more than exercises among the evaluated patients. Most of the participant in knowledge prevailed in drug therapy of diabetes. This finding differs from current study. This might be due to facts that study population because in this study only senior citizen was added as study population and both diabetic and non-diabetic respondent were added. Diabetes was not well known disease in 15 years ago.

About knowledge on prevention of complications of diabetes the study reveal that the majority 79.4% of the respondents were known and 44(20.6%) about prevention of diabetes (Table-23). It also was observed that majority 36.0% of the respondents were mentioned regular diet, medication and exercise, 21.0% were mentioned only regular diet and medication, 4.2% were medicine and exercise prevent complications. On the other hand, 12.6% were mention regular diet and only .5% was mentioned walking at 30 minutes, and 5.1% were mentioned regular medicine taking prevent complications of diabetes. However, 20.6% were mentioned they do not know about prevention of complications. The findings indicate that majority of the respondents do not know prevention of complications (Table-24). This might be due to facts that study population because in this study only senior citizen was added as study population and both diabetic and non-diabetic respondent were added.

Perera, Silva & Perera, 2013 revealed that the overall mean knowledge score of the participants was 68.1% (SD 9.0%). A majority of participants (70.0%) had a good or very good score (> 65) on the knowledge test, while 26.76% had a very good score (> 75). only around 60% knew the normal range of fasting blood sugar, that blood sugar should be measured regularly to assess control, that regular exercise is helpful to control diabetes and that it is important to control the diet in addition to taking medication in the management of diabetes. Only two thirds of the sample (68.0%) knew that feet should be examined regularly for any lesions and even fewer (50.0%) knew the importance of assessing vision annually (Perera, Silva & Perera, 2013).

It is already reported that increasing prevalence of diabetes and its complications in the developing communities would pose a real threat in respect to their existing health care service. As with the increasing number of diabetic patients more and more will need specialized diabetic care, and failure to provide the care they will develop more complications like CHD, diabetic foot, chronic renal failure and blindness. Considering the higher prevalence in our population it may be concluded that the increasing need of diabetic health care at present and in future must be given priority to reduce the ensuing diabetes morbidity and mortality. Therefore, all concerned personnel like health care planners and health care providers must give priority in this regard.

## V. Conclusion

Diabetes is still a serious disease even in countries where treatment is on hand. It is essential that diabetic patients should possess good knowledge about their illness in order to improve their self-management skills and thereby control and prevent complications. The study aimed to assess the level of knowledge about different types of complications and knowledge about control and prevention on complications of diabetes mellitus.

It was cross sectional descriptive study. Total 214 respondents were selected by purposive sampling technique. Structure questionnaire were used to collect data. The study revealed that near half of the respondents 39.3% were suffering from diabetes and majority of the respondents suffering from diabetes between 1-5 years and more than half respondents 55.1% was positive family history of diabetes. The majority of the respondents 73.4% and 72.4% were known about control and complications of diabetes, respectively. More than half of the

respondents 70.6% knew regarding eye problem. Majority of the respondents 70.1% knew about diabetes related heart problem. About diabetes related complications on kidney and brain, more than half of the respondent 55.6%, 60.3% and 34.6% was not oriented kidney brain, and foot complications, respectively. The study showed that only 35% respondents having knowledge on control of diabetes, and only 36.0% correctly having knowledge on prevention of complication of diabetes.

In particular, knowledge about the control of diabetes, management of diabetes and diabetic complications was insufficient. From the above facts, appropriate health education programme and behavioral change interventional program could play role to improve knowledge of risk population guide them to modify their life style to prevention and control of diabetes and prevent it complications. It could be done by both government and non-government organization. Since this study was conducted at a single community health care centre the results do not reflect the knowledge of the general population and further studies are required particularly in different settings to identify patient educational needs and methods to improve self management of diabetes to prevent diabetic complications.

### 5.1. Recommendations

In the light of findings the following recommendation were put forwards so that a suitable programmed can be lunched for solving the long felt needs of diabetes in the community people. Health education on diabetes and it complications in the community. Regular behavior change intervention programs regarding diet and physical exercise, avoid intake of refine sugar and sweet, among the high risk groups Mass education through electronic media to general populations. Media and Non Government Organization should be involved in the daunting task of removing misbelieves, ignorance and instituting diabetes preventive measures in the community.

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