A Study to Assess the Knowledge and Practice Regarding Prevention and Management of Hypoglycemia Among Patients with Diabetes Mellitus

Revathy K D[1], Asha C G[2]

Abstract

The present study was conducted to assess the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus in a selected hospital, Thrissur. The objectives of the study were to assess the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus, to find out the relationship between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus, to associate the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with their selected demographic variables and to prepare and distribute a self-instructional module regarding prevention and management of hypoglycemia among patients with Diabetes mellitus. Quantitative research approach with a descriptive cross sectional survey design was used in this study. One hundred samples were selected by using purposive sampling technique from selected medical OPDs of Aswini Hospital Ltd. The data collection was done with a structured knowledge questionnaire and a self-reported practice checklist regarding prevention and management of hypoglycemia. The study results showed that, 71% had good knowledge, 26% had average knowledge and 3% had excellent knowledge, regarding prevention and management of hypoglycemia. In terms of practice, 62% had average practice, 29% had good practice and 9% had poor practice regarding prevention and management of hypoglycemia. There was no significant relationship between knowledge and practice regarding prevention and management of hypoglycemia ($r = 0.05$ ns, $p = 0.625$) and there was no association between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with any one of their selected demographic variables. A self-instructional module regarding prevention and management of hypoglycemia was prepared and distributed to the patients to enhance their knowledge and practice.

Keywords: Hypoglycemia; Diabetes mellitus; Knowledge; Practice.

Author's Affiliation: [1]MSc Nursing, [2]Assistant Professor Department of Medical Surgical Nursing, Aswini College of Nursing, Thrissur, Kerala 680751, India.
Corresponding Author: Revathy K D, MSc Nursing Department of Medical Surgical Nursing, Aswini College of Nursing, Thrissur, Kerala 680751, India.

E-mail: revathydhruvakumar@gmail.com

Introduction

Background of the study

In the twenty-first century, we could see more globalization and industrialization, longer life spans and changes in lifestyles worldwide. As a consequence of these changes there was a shifts in the pattern of diseases, with non-communicable diseases such as Diabetes mellitus.[1] According to the International Diabetic Federation, one out of 11 adults have Diabetes mellitus (415 million worldwide) and by the year 2040, one adult in 10 (642 million worldwide) will suffer from Diabetes mellitus. The fearful fact is that 46.5% of adults with Diabetes mellitus are kept undiagnosed.[2]

Hypoglycemia is one of the frequent complication of diabetes therapy. Hypoglycemia means low (hypo) sugar in the blood (glycemia) and occurs when the blood glucose level falls to less than 70 mg/dl.[3] Studies showed that, in the course of a year, one by fifth of T2DM treated with insulin have at least one episode of severe hypoglycemia,

which often requires hospitalization.[4] Most of the patients who lack the knowledge to recognize all the symptoms of hypoglycemia may lead to delayed treatment which cause even death. The individual fails to become aware of symptoms of hypoglycemia due to lack of knowledge, can result in prolonged hypoglycemia with consequent brain injury, seizure and loss of consciousness. Severe hypoglycemia is usually associated with increased mortality and impaired cognitive function and affects patient's quality of life.[5]

Hypoglycemia can disrupt many everyday activities such as driving, work performance and recreational pursuits.[6] It is also considered as the neglected complications of Diabetes mellitus therapy and has far reaching clinical, economical and social impacts. Hypoglycemia reduces the quality of life, while severe hypoglycemia is life threatening and can precipitate major cardiovascular and cerebrovascular events.[7]

Hypoglycemia is a true emergency and has a critical effect on mortality, morbidity and quality of life. It is a major barrier for attaining treatment goals and reduction of long term complications in diabetes management and therefore it is an important reason for increased costs of medical care.[8]

Need and significance of the study

Hypoglycemia has a substantial clinical impact in terms of mortality, morbidity and quality of life.[9] Hypoglycemia is one of the leading cause for emergency and the most common and easily preventable endocrine emergency. With an increasing incidence of Diabetes mellitus, there is a risk for an increase in the incidence of hypoglycemia though with various treatment modalities available to control blood glucose level.[5]

The largest real-world crude incidence rate of hypoglycemia investigation conducted in Canada, in the year of 2015 suggested that, the incidence of hypoglycemia among adults with Diabetesmellitus was higher. A total of 552 people (T2DM : 83% ; T1DM : 17%) participated in the study. Over half (65.2%) of the total respondents reported experiencing at least one event of hypoglycemia (non-severe or severe) at an annualized crude incidence density of 35.1 events per person per year. Severe hypoglycemia was reported by 41.8% of all respondents, at an average rate of 2.5 events per person per year.[10]

By reviewing the articles, it is found that severe hypoglycemia is more serious, particularly in the elderly. It is also associated with increased mortality.[14] A medication record based observational study was conducted from February to September 2015, to assess the prevalence of hypoglycemia among diabetic old age home residents in Kerala. The study was prospective in design and it was conducted among 9 facilities having 189 samples. The results showed that, 33.86% of patients developed hypoglycemia at least at some point during their therapy.[11]

A cross sectional descriptive research study was conducted in 2019, to assess the demographic and clinical profile among patients with T2DM in selected medical OPDs, Aswini Hospital Ltd, Thrissur. The study found that, among 30 samples, 53.33% of the samples had some complications of Diabetes mellitus such as, cardiovascular diseases, arthritis, hypothyroidism and hypoglycemia. In which 53.25% of the patients reported with hypoglycemic attacks.[12]

During the clinical experience of the researcher in the emergency department, many patients with Diabetes mellitus had come in a critical stage with very low blood sugar level. Majority of those patients and their relatives were unaware about hypoglycemia and its management measures. By reviewing the literature too, the researcher felt the same. Therefore, the researcher was interested to assess the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus, with a view to prepare a self-instructional module regarding prevention and management of hypoglycemia.

Statement of the problem

A study to assess the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus in a selected hospital, Thrissur.

Objectives

1. To assess the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

2. To elicit the relationship between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

3. To associate the knowledge and practice regarding prevention and management of

hypoglycemia among patients with Diabetes mellitus with their selected demographic variables and clinical profile.

4. To prepare and distribute a self-instructional module regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

Operational definitions

• Knowledge : Refers to the correct response of patients with Diabetes mellitus to a structured knowledge questionnaire on prevention and management of hypoglycemia.

• Practice : Refers to the activities that are performed by patients with Diabetes mellitus for prevention and management of hypoglycemia, which is measured by using self-reported practice checklist.

• Prevention and Management of hypoglycemia : Refers to early detection of symptoms of hypoglycemia and actions taken to maintain normal blood sugar level by the samples.

• Patients with Diabetes mellitus : Refers to the patients who are diagnosed with T2DM within one year.

Assumptions

1. Patients with Diabetes mellitus may have inadequate knowledge and practice regarding prevention and management of hypoglycemia.

2. Knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus may be influenced by their selected demographic variablesand clinical profile.

Hypotheses

H1: There is a significant relationship between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

H2: There is a significant association between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with their selected demographic variablesand clinical profile.

Conceptual Framework: Based on Pender's health promotion model.[13]

Methodology

Research approach

In this study quantitative research approach was used to assess the knowledge and practice regarding the prevention and management of hypoglycemia among patients with Diabetes mellitus.

Research design

In this study, descriptive cross sectional survey design was adopted to assess the knowledge and practice regarding the prevention and management of hypoglycemia among patients with Diabetes mellitus.

Setting of the study

The study was carried out in Aswini Hospital Ltd, Thrissur, which is 7 kilometers away from Aswini College of Nursing, Thrissur. The hospital has bed strength of 300 with both OP and IP department and various specialties like Nephrology,Neurology, General Medicine, Urology, Gynecology, ENT, Ophthalmology etc. The general medicine OPDs operates from Monday to Saturday.Special evening OPDs for the same are also available in this setting. In this study, four medical OPDs were selected for the study, which consisted an average of 200 outpatients with Diabetes mellitus per month in each.

Population

In this study, the population comprised of patients who were diagnosed with Diabetes mellitus. The target population comprised of all patients diagnosed with Diabetes mellitus in Thrissur. In this study, accessible population comprised of patients with Diabetes mellitus in selected Medical OPDs of Aswini Hospital, Ltd Thrissur.

Sample

In this study sample comprised of patients who were diagnosed with Diabetes mellitus in selected medical OPDs of Aswini Hospital Ltd, Thrissur.

Sampling technique

In this study, purposive sampling technique was adopted. Purposive sampling is a non probability

sampling method in which the researcher selects participants based on personal judgement about which ones will be most informative.

Sample size

In this study, 100 samples were selected from the selected medical OPDs of

Aswini Hospital Ltd, Thrissur.

Inclusion criteria For this study the inclusion criteria were, patients who were;

• on hypoglycemic agents only.

• in the age group between 30-60 years.

• willing to participate in the study.

• available during the time of data collection.

Exclusion criteria For this study, exclusion criteria were, patients who: w

• were not able to read and write Malayalam.

• who were diagnosed with Diabetes mellitus for more than one year.

Tool/ Instrument

The tools used in the present study consisted of four sections which helped to assess the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

Section A : Demographic and clinical profile.

Section B : Structured knowledge questionnaire on prevention and management of hypoglycemia.

Section C : Self-reported practice checklist on prevention and management of hypoglycemia.

Section D : Self-instructional module on prevention and management of hypoglycemia.

Section A: Demographic and clinical profile

Demographic profile of Diabetes mellitus patients includes age, gender, religion, marital status, educational status, occupation, type of family, monthly income, personal habits and any source of information related to Diabetes mellitus. Clinical profile includes duration of using hypoglycemic agents, family history of Diabetes mellitus, any other medical conditions and type of diabetic management.

Section B: Structured knowledge questionnaire on prevention and management of hypoglycemia.

The related literature was reviewed for the construction of knowledge questionnaire. The structured knowledge questionnaire consisted of 20 multiple choice items to assess the knowledge on prevention and management of hypoglycemia among patients with Diabetes mellitus. Each item had four alternative responses; among them three were distractors and only one was correct response. The knowledge questionnaire consisted of 6 general questions, 8 questions related to prevention of hypoglycemia and 6 questions related to management of hypoglycemia. A score value of 'one' was allotted for each correct response and 'zero' for the wrong response. The maximum score was '20' and minimum was 'zero'. The score was categorized as follows:-

Table 1: The self-reported practice check list was constructed to identify the practice of patients

Level of knowledge	Scoring range	Percentage
Excellent knowledge	16-20	≥76%
Good knowledge	11-15	51-75%
Average knowledge	6-10	26-50%
Poor knowledge	0-5	≤25%

Score Key:

Section C: Self-reported practice checklist on prevention and management of hypoglycemia.

The self-reported practice check list was constructed to identify the practice of patients with Diabetes mellitus regarding prevention and management of hypoglycemia. It consisted of 15 questions, with two options such as 'YES' and 'NO'. For each 'YES' response 'one' point was given and each 'NO' response 'zero' was provided. The maximum score was 15 and the minimum was 'zero.' The score was categorized as follows:-

Table 2: Self-instructional module regarding prevention and management of hypoglycemia.

Level of Practice	Scoring range	Percentage
Good practice	11-15	≥68%
Average practice	6-10	34-67%
Poor practice	0-5	≤33%

Score Key:

Section D : Self-instructional module on prevention and management of hypoglycemia.

Self-instructional module regarding prevention and management of hypoglycemia was prepared based on the objectives of the study. It consisted of causes, risk factors, signs and symptoms, prevention, management and complications of hypoglycemia. It was developed by reviewing text books, literatures and consultation with experts. It was sent to experts for content validity. The Malayalam translation was done.

Content validity

The content validity was established by submitting the tool to the experts in the field of Medical Surgical Nursing and Physicians. Necessary modifications were done based on the expert's opinion and suggestions and the tool was finalized.

Ethical consideration

Ethical clearance was obtained from the institutional ethical committee constituted by Aswini College of Nursing on 29/06/2019 as per letter no ACN/150/2019. An informed consent was obtained from the study participants with the right to withdraw during the study if they so desire. In this study the human dignity were preserved and human right was protected.

Pilot study

Pilot study was conducted among 10 samples at Medical OPDs of Daya General Hospital, Thrissur from 30-12-2019 to 11-01-2020. The researcher met the HR department of Daya General Hospital and explained the need, purpose and objectives of the study for assuring their full support and cooperation. Based on the pilot study the difficult questions were modified and final version was constructed. Considering the feasibility and practicability, the researcher proceeded with main study.

Reliability of the tool

Reliability of the structured knowledge questionnaire and self-reported practice checklist were established through split half method by using Spearman's Rank correlation coefficient. The correlation score was, r = 0.84. This indicated that, the tool was reliable for the study.

Data collection process

The researcher obtained written permission from the authorities of Aswini Hospital Ltd, Thrissur in order to proceed with data collection. The data collection was done with in a period of 4 weeks from 13-01-2020 to 08-02-2020. Patients with Diabetes mellitus attending the selected medical OPDs in Aswini Hospital, Ltd was the accessible population and based on the inclusion and exclusion criteria the samples were selected. The data collection started from 9:30 am in morning OPDs and from 2:00 pm in afternoon OPDs. The samples were selected by purposive sampling technique. After sample selection, the samples were comfortably seated in front of the OPDs. The researcher did self-introduction and explained the purpose of the study to the samples. After establishing a good rapport, the researcher explained the research study and obtained written consent from samples. Socio-demographic data was collected initially. Then the knowledge questionnaire and self-reported practice check list were administered. Each patient took 15 minutes to complete the questionnaire. After completing the questionnaire the researcher provided a self-instructional module regarding hypoglycemia. Ensured that the samples read the self-instructional module and their doubts were clarified.. The data collection was completed on 08-02-2020.

Plan for data analysis

The collected data was organized, tabulated and analysed based on the objectives of the study by using descriptive and inferential statistics.

- The demographic and clinical variables were analyzed by using frequency and percentage distribution.

- Knowledge and practice of patients with Diabetes mellitus on hypoglycemia was analyzed by using frequency and percentage distribution.

- Relationship between knowledge and practice on prevention and management of hypoglycemia among patients with Diabetes mellitus was analyzed by using Karl Pearson's correlation coefficient.

- Association between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with their selected demographic variables and clinical profile were analysed by Chi-Square test.

Results

Section A: Description of demographic and clinical profile of the patients with Diabetes mellitus.

- Regarding the age, it revealed that majority samples, 35% belonged to the age group between 41-50 years, 33% belonged to age group of 51- 60 years and 32% belonged to the age group of 30- 40years. With reference to gender, majority samples 58% were male, and 42% were females. ((Fig. 2,3)
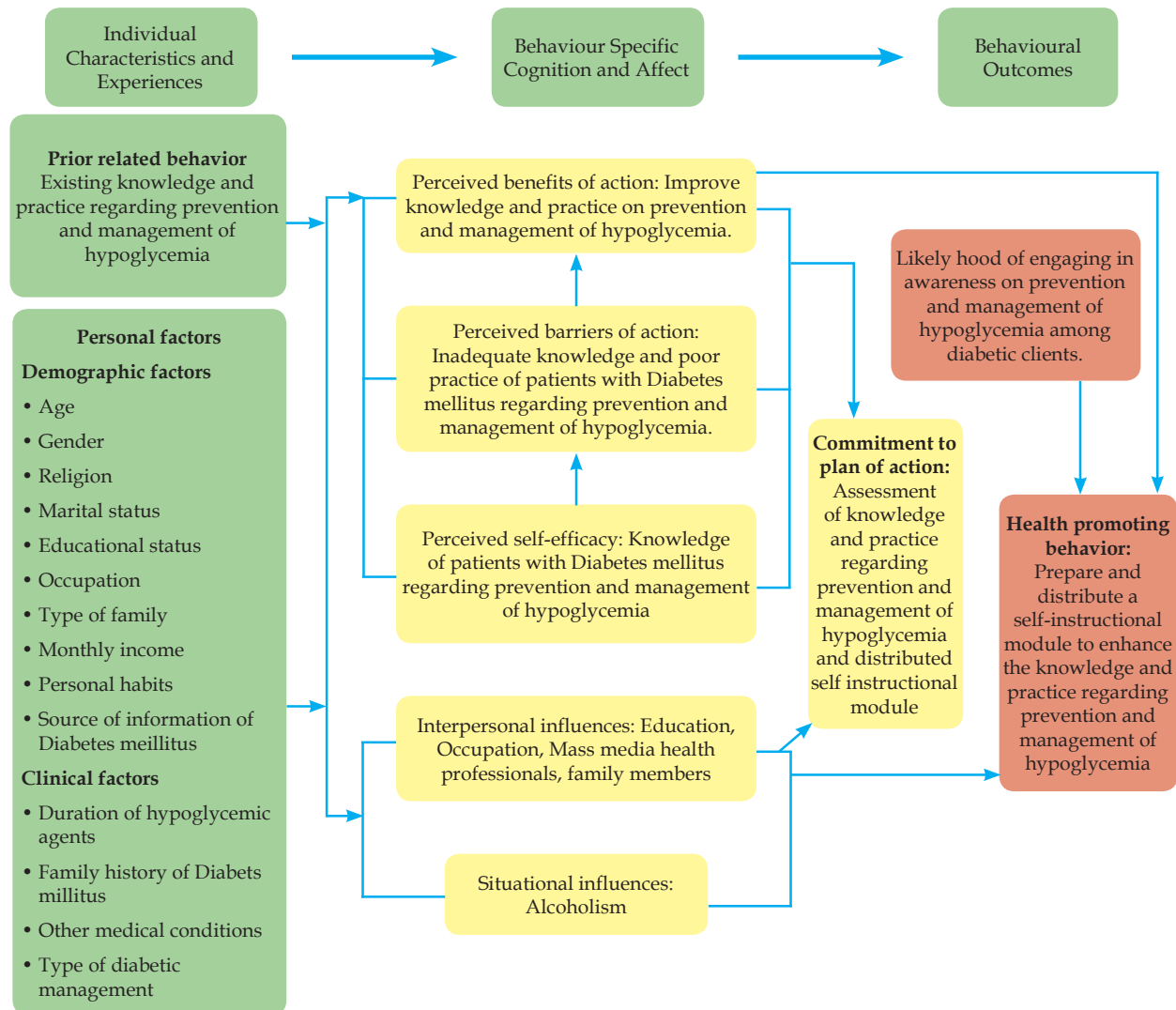
Fig. 1: Conceptual frame work based on modified Pender's health promotion model (2006).

- With respect to religion, majority of the samples 69% belonged to Hindu, 22% were Christian and the remaining 09% were Muslims. (Fig. 4)

- In relation to marital status, 95% of the samples were married, 04% were unmarried and 01% was divorced. (Fig. 5)

- With reference to the educational status of the samples, majority 43% had higher secondary level of education, 35% had secondary and below secondary level of education, 17% had diploma and the remaining 05 % were graduate and above. (Fig. 6)

- In terms of occupation of the samples, majority of the samples 49% were in private employee status, 29% were home maker, 09% had a government job, 07% were self-employed and remaining 03% were included in the daily wages and unemployed categories for each.

(Fig. 7)

- While considering the type of family, most of the samples 87% belonged to nuclear family, 12% belonged to joint family and the remaining 01% belonged to extended family. (Fig. 8)

- In accordance with the monthly income of the samples, majority of the samples, 74% had an income between Rs. 20,001-30,000/-, 13% had an income between Rs.10,001-20,000/-, 11% had an income of ≥ Rs.30,001/-, and the remaining 02% had an income of ≤ Rs.10,000/- per month. (Fig. 9)

- Related to the personal habits of the samples, majority 77% do not had any personal habits, but 12% had a habit of alcoholism and 07% had a habit of smoking, 03% had a habit of both smoking and alcoholism and the remaining 01% had a habit of betel chewing. (Fig. 10)

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- In terms of source of information related to Diabetes mellitus, 85% sample had some information related to Diabetes mellitus from various sources and among them, 52 (61.18%) had information from health professionals, 23 (27.06%) had information from mass media and the remaining 10 (11.76%) had information regarding Diabetes mellitus from their family members. The remaining 15% samples did not have any source of information related to Diabetes mellitus. (Fig. 11,12)

agents, majority of the samples 76% had a duration between 6 months to 1 year, and 24% had duration less than 6 months. (Fig. 13)
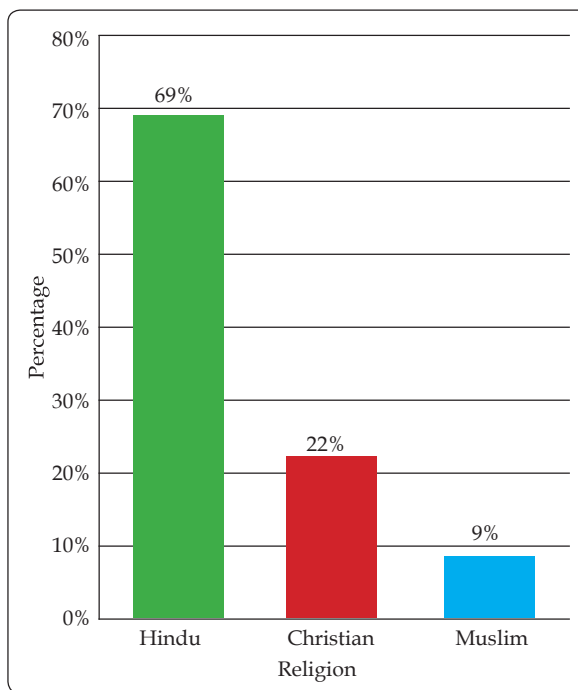

Fig. 4: Percentage distribution of patients with Diabetes mellitus according to religion to marital status. (N =100)

Fig. 2: Percentage distribution of patients with Diabetes mellitus according to age. (N =100)
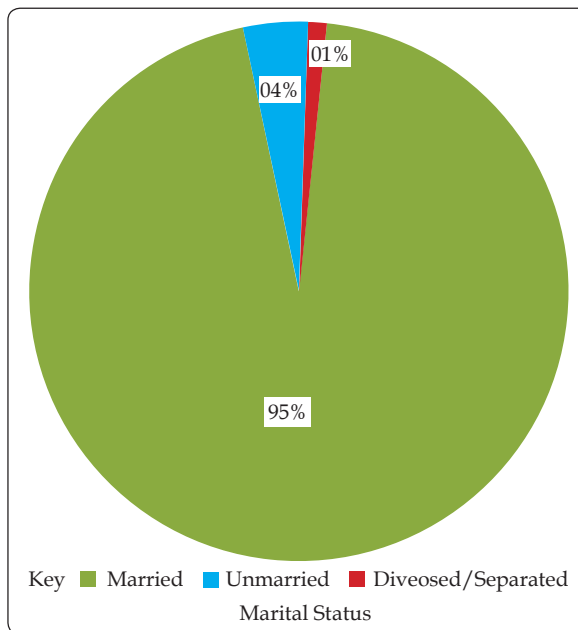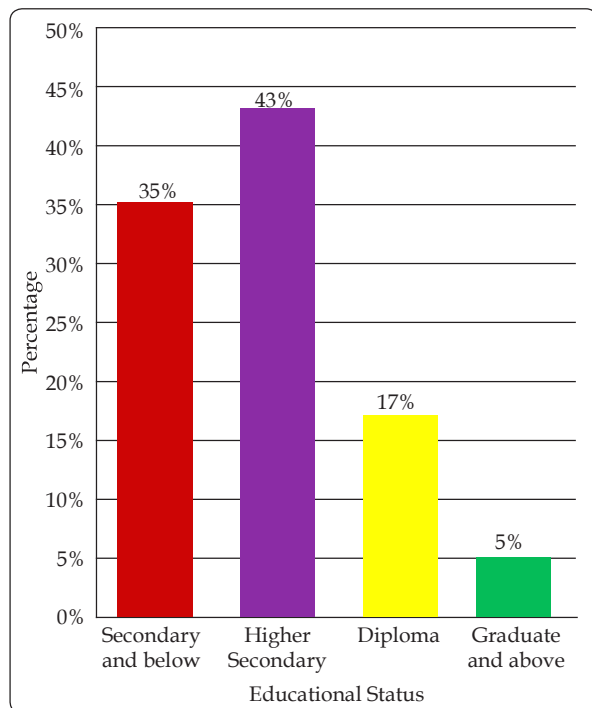

Fig. 5: Percentage distribution of patients with Diabetes mellitus according to marital status. (N =100)

- Regarding the family history of Diabetes mellitus, 56% of the people had a family history of Diabetes mellitus and 44% did not have a family history of Diabetes mellitus. (Fig. 14)

Fig. 3: Percentage distribution of patients with Diabetes mellitus according to gender. (N =100)

- In terms of duration of using hypoglycemic

- In relation to other medical conditions of

the samples, 24% had some kind of medical conditions, in which 23 (95.83 %) had cardiovascular diseases and 01 (4.17%) had allergy and asthma. The rest of 76% never had any kind of other medical conditions.(Fig.15,16)

• About the type of diabetic management, 94% samples were under the oral medication treatment, 03% were in insulin injection and rest of the samples, 03% were taking both oral medication and insulin injection. (Fig. 17)

Fig. 6: Percentage distribution of patients with Diabetes mellitus according to educational status. (N = 100)

Section B: Description of assessment of knowledge regarding prevention and management of hypoglycemia among patients with Diabetes mellitus

• The overall level of knowledge scores of patients with Diabetes mellitus regarding hypoglycemia, 71% had good knowledge, 26% had average knowledge, 03% had excellent level of knowledge and no one had poor knowledge. (Fig. 18) In terms of knowledge regarding the general aspects of hypoglycemia, 54% had good knowledge 23% had an average knowledge, 23% had excellent knowledge and no one had poor knowledge. In terms of knowledge regarding prevention of hypoglycemia, 44% had average knowledge, 45% had good knowledge, 10% had excellent knowledge and only 01% had poor knowledge. In terms of knowledge regarding management of hypoglycemia, 43% had adequate knowledge, 35% had good

knowledge, 14% had excellent knowledge and remaining 08% had poor knowledge.

Section C: Description of assessment of practice regarding prevention and management of hypoglycemia among patients withDiabetes mellitus

• Regarding the practice of the patients with Diabetes mellitus regarding prevention and management of hypoglycemia, among total samples, 62% had average practice, 29% had good practice and 09% had poor practice.
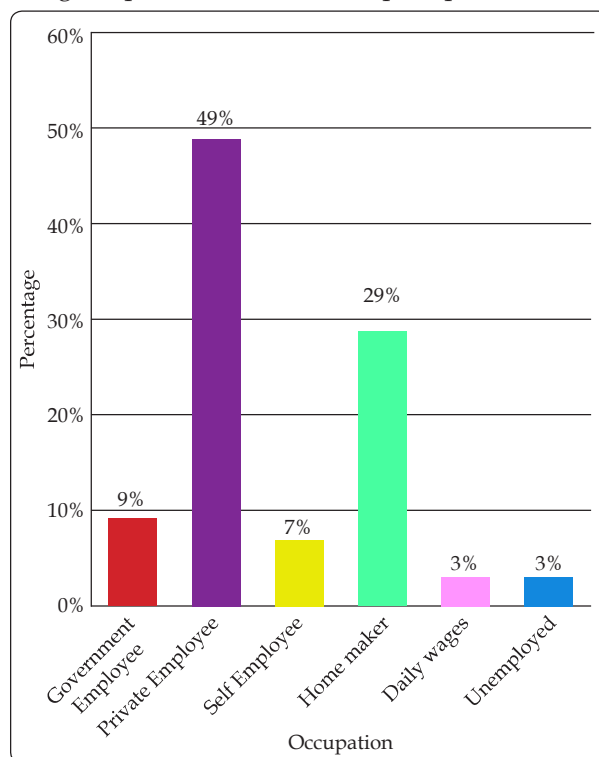
Fig. 7: Percentage distribution of patients with Diabetes mellitus according to occupation. (N = 100)

Section D: Description of correlation between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus

The study findings revealed that, there was no correlation between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus. The 'p' value was 0.625 which was not statistically significant at 0.05 level, by using Karl Pearson correlation coefficient. This implies that the null hypothesis H01, was accepted and the research hypothesis H1 was rejected. In conclusion, there was no significant relationship between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

Section E: Description of association between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with their selected demographic variables and clinical profile.
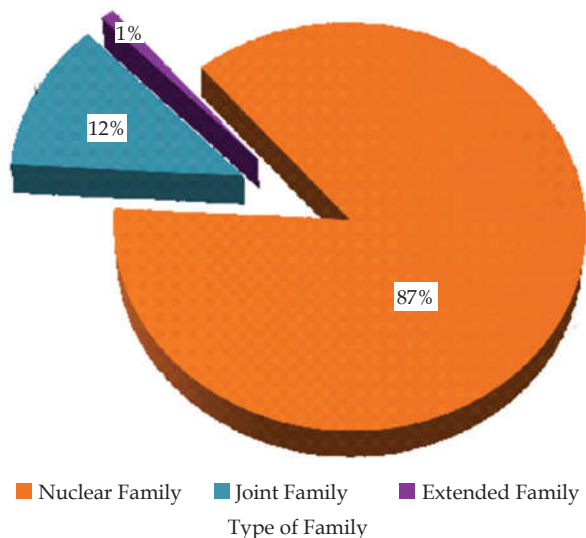
This section described the association between the level of knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with selected demographic variables and clinical profile by using Chi-Square test.

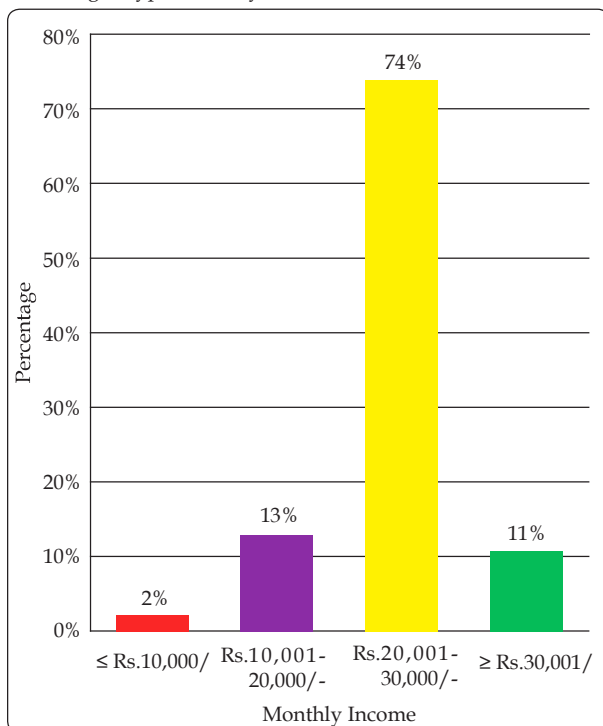**Fig. 8:** Percentage distribution of patients with Diabetes mellitus according to type of family.

Fig. 9: Percentage distribution of patients with Diabetes mellitus according to monthly income.
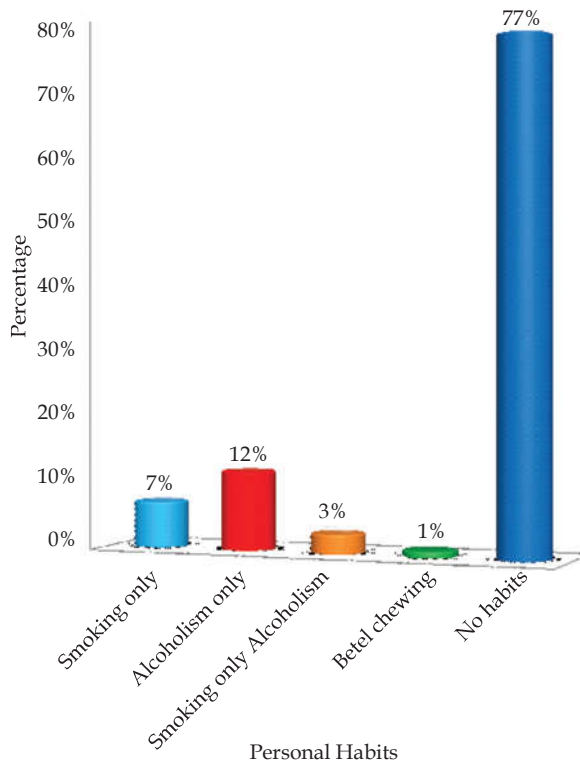

Fig. 10: Percentage distribution of patients with Diabetes mellitus according to personal habits. (n = 100)

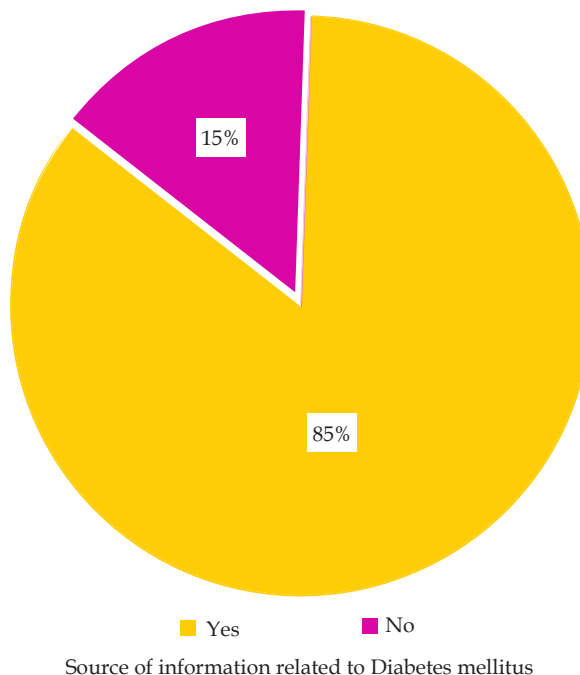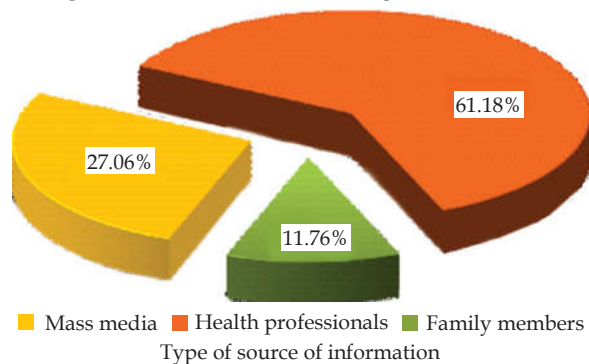Source of information related to Diabetes mellitus

Fig. 11: Percentage distribution of patients with Diabetes mellitus according to source of information related to Diabetes mellitus.

In relation to the association between the level of knowledge regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with selected demographic variables and clinical profile such as age ($\chi2=0.59$,

p=0.745), gender (χ2=0.18, p=0.671), religion (χ2=0.92, p=0.631), education status (χ2=2.12, p=0.347), occupation (χ2=0.11, p=0.740), source of information related to Diabetes mellitus (χ2=0.33, p=0.566), duration of using hypoglycemic agents (χ2=0.44, p=0.508) family history of Diabetes mellitus (χ2=0.07, p=0.797), other medical conditions (χ2=2.99, p=0.084) and type of diabetic management (χ2=0.18, p=0.673), all the 'p' values were greater than 0.05 level of significance

Fig. 12: Percentage distribution of patients with Diabetes mellitus according to type of source of information related to Diabetes mellitus. (N = 100)
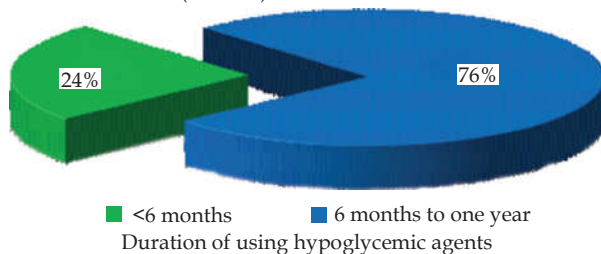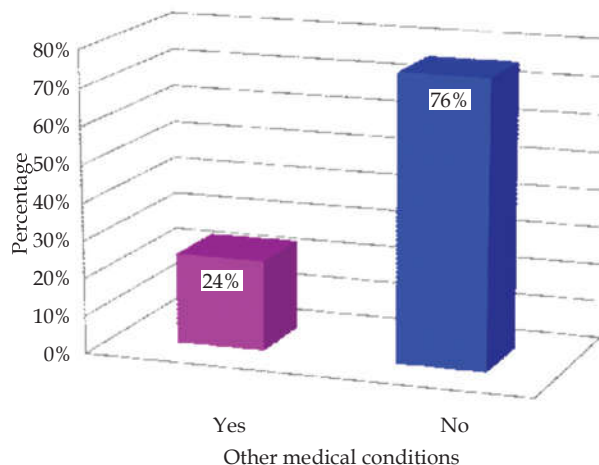

Fig. 13: Percentage distribution of patients with Diabetes mellitus according to duration of using hypoglycemic agents. (n = 100)
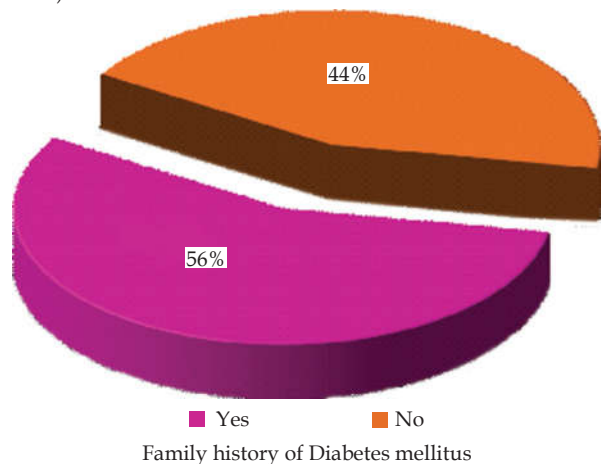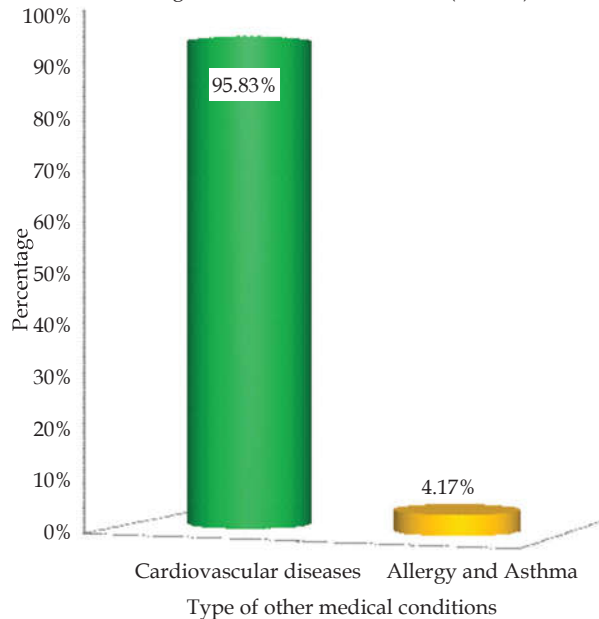

Fig. 14: Percentage distribution of patients with Diabetes mellitus according to family history of Diabetes mellitus. (N=100)

In relation to the association between practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with selected demographic variables and
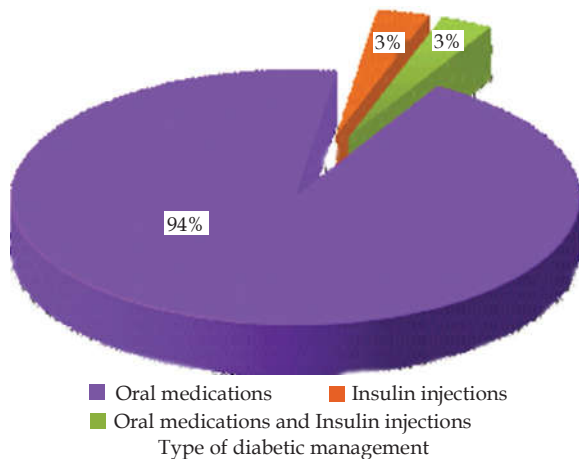

Fig. 15: Percentage distribution of patients with Diabetes mellitus according to other medical condition. (n = 100)
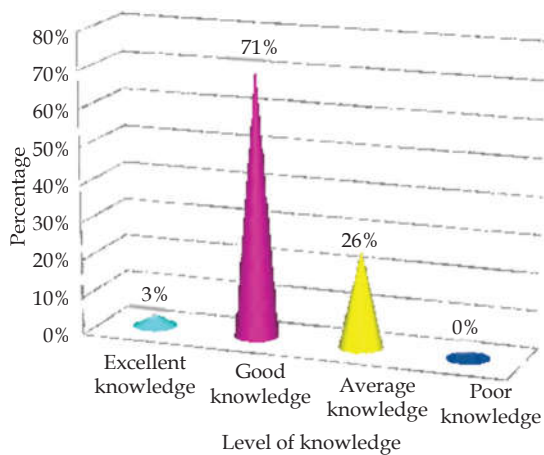

Fig. 16: Percentage distribution of patients with Diabetes mellitus according to type of other medical conditions.

clinical profile such as age (χ2=4.2, p=0.122), gender (χ2=2.02, p=0.156), religion (χ2=3.81, p=0.149), education status (χ2=0.07, p=0.967), occupation (χ2=1.65, p=0.199), source of information related to Diabetes mellitus (χ2=0.69, p=0.405), duration of using hypoglycemic agents (χ2=0.25, p=0.620) family history of Diabetes mellitus (χ2=0.99, p=0.320), other medical conditions (χ2=0, p=0.984) and type of diabeticmanagement (χ2=0.47, p=0.492), all the 'p' values were greater than 0.05 level of significance.

The association between demographic variables and clinical profile with knowledge and practice, all the 'p' values were greater than 0.05 level of significance. Hence, null hypothesis H02 was accepted and research hypothesis H2 was rejected. Thus it concluded that, there was no

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Fig. 17: Percentage distribution of patients with Diabetes mellitus according to type of diabetic management measures.

Fig. 18: Percentage distribution of patients with Diabetes mellitus according to level of knowledge regarding prevention and management of hypoglycemia. (N = 100)
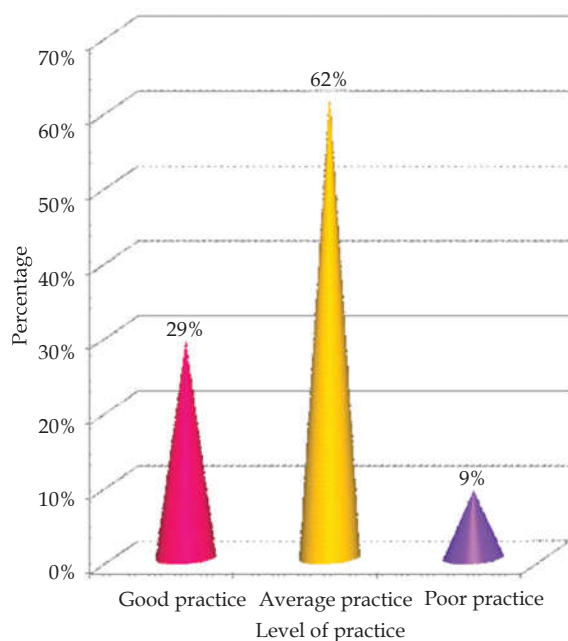
Fig. 19: Percentage distribution of patients with Diabetes mellitus according to practice regarding prevention and management of hypoglycemia.

significant association between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

Discussion

The first objective of the study states that, to assess the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus.

In this study, overall knowledge scores of patients with Diabetes mellitus regarding prevention and management of hypoglycemia, 71% samples had good knowledge, 26% had average knowledge and 03% had excellent level of knowledge, and no one had poor knowledge. In terms of general knowledge regarding hypoglycemia, 54% had good knowledge, 23% had an average knowledge, 23% had excellent knowledge and no one had poor knowledge. In terms of knowledge regarding prevention of hypoglycemia, 44% samples had an average knowledge, 45% had good knowledge, 10% had excellent knowledge and only 01% had poor knowledge. The knowledge level of the patients with Diabetes mellitus regarding management of hypoglycemia, 43% had adequate knowledge, 35% had good knowledge, 14% had excellent knowledge and the remaining 08% had poor knowledge.

With reference to the level of practice of thepatients with Diabetes mellitusregarding prevention and management of hypoglycemia, among the total samples, only 29% had good practice, 62% had average practice and 09% had poor practice. (Fig. 19)

This study findings in relation to knowledge was supported by a study to assess the knowledge and its associated factors among T2DM patients in a tertiary care hospital, South India. The study was conducted among 366 patients with T2DM, who were attending the diabetic clinic of the endocrinology department. A systematic random sampling was done with a sampling interval of five. The knowledge level of patients were assessed with a help of questionnaire. The study found that, overall, 242 (66.1%) diabetic patients had good knowledge on hypoglycemia.

This study findings, regarding practice was supported by an institutional based cross sectional study which was conducted to identify the knowledge and practice on prevention of hypoglycemia among diabetic patients. The study found that from the total 416 respondents 89

(21.4%) samples had good practice in prevention of hypoglycemia. The study concluded that practice of hypoglycemia prevention among diabetic patients were low.[52]

The second objective of the study states that,to find out the relationship between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus

In this study the correlation between knowledge and practice among patients with Diabetes mellitus regarding prevention and management of hypoglycemia was assessed by using Karl Pearson's correlation coefficient. It exhibit the 'r' value was 0.05 with a 'p' value of 0.625, which was not significant at 0.05 level. Hence the null hypothesis H01was accepted and rejected the research hypothesis H1. Therefore it was concluded that, there was no significant relation between knowledge and practice regarding prevention and management of hypoglycemia.

The study finding was supported by a longitudinal study which was conducted to assess the effect of diabetic education on knowledge, attitude and practices of diabetic patients towards prevention of hypoglycemia among 109 samples. The study result showed that, the frequency distribution of patients according to their knowledge of hypoglycemia was almost above 75%, while in terms of self-reported practices regarding hypoglycemia prevention was only 60%. In this study many patients who had good knowledge and beliefs about hypoglycemia, but they did not still put it into practice.[53]

The third objective of the study states that, to associate the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with their selected demographic variables and clinical profile.

In this study the association between knowledge and practice among patients with Diabetes mellitus regarding prevention and management of hypoglycaemia with their selected demographic variables and clinical profile were assessed by Chi-Square test. It exhibited that the 'p' values of all the variables were greater than 0.05 level of significance. Hence, it was concluded that there was no significant association between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus with their selected demographic variables and clinical profile.

This finding was supported by a descriptive survey study conducted to assess the awareness on management of hypoglycemia among diabetic clients in PSG hospitals, Coimbatore. In this study they found that, there was no association between knowledge regarding awareness on management of hypoglycemia with their selected demographic variables and clinical profile such as gender, education status, occupation, income, religion, duration of diagnosis, usage of hypoglycemic agents, treatment for Diabetes mellitus and information related to hypoglycemia.[54]

Summary

Hypoglycemia is a true emergency and has a critical effect on mortality, morbidity and quality of life. In the present study, the researcher investigated the knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus. The study consisted of 100 samples which were selected by a purposive sampling technique. The results showed that, majority samples 71% had good knowledge regarding prevention and management of hypoglycemia. Only 62% had an average level of practice regarding prevention and management of hypoglycemia. There was no significant relationship between knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus. The results also found that there was no association between knowledge and practice regarding hypoglycemia among patients with Diabetes mellitus with their selected demographic variables and clinical profile.

Conclusion

Hypoglycemia is a major limiting factor in overall glycemic management of Diabetes mellitus and may lead to other possible detrimental effects. From this study it was evident that the level of knowledge and practice regarding prevention and management of hypoglycemia among patients with Diabetes mellitus needs to improve. Early recognition of hypoglycemia and its prevention and management was a vital part for the glycemic management and it helps to improve the quality of life of patients with Diabetes mellitus.

Nursing implications
Nursing practice

• The self-instructional module can be distributed to all patients with Diabetes mellitus in Medical

OPDs to enhance knowledge and practice regarding prevention and management of hypoglycemia.

- Community health nurses can use the knowledge questionnaire and practice checklist to assess the knowledge and practice of patients about prevention and management of hypoglycemia.

- Staff nurses can utilize the information in self-instructional module while giving care to the patients with Diabetes mellitus.

Nursing education

- educators can use the knowledge questionnaire regarding prevention and management of hypoglycemia among nursing students to assess their knowledge.

- The nurse educator can conduct bedside clinics for students on prevention and management of hypoglycemia.

- The nurse educator can administer various teaching strategies like role play, drama and drill based on the study to educate the students regarding prevention and management of hypoglycemia.

- The nurse educator can encourage the students to conduct health education programme in hospital and community regarding prevention and management of hypoglycemia based on the study.

Nursing administration

- Based on the present study findings the nurse administrator can develop a protocol to overcome and prevent hypoglycemia in the hospital settings.

- The administrator can work as a resource person in providing education regarding prevention of hypoglycemia among patients and their relatives attending diabetic OPDs.

- Nurse administrator should plan, organize and conduct in service education programme based on the study to upgrade the knowledge of nurses about prevention and management of hypoglycemia which will help them to plan effective care for the patients.

Nursing research

- Research tools of this study can be used in framing out newer ones for future studies in the field of nursing.

- Findings of this study can be utilized as reference to conduct qualitative studies in diabetic patients.

- The present study findings could be presented in international, national and state level conferences and should publish in nursing journals which will help all the nurses to be aware of the finding and help them to strengthen their research.

Limitations

- The study period is limited to 4 weeks.

- The study being limited to one setting may limit the generalization of the study result.

- The researcher had found difficulty in collecting review of literature as there were limited number of nursing studies on prevention and management of hypoglycemia knowledge and practice assessment.

- The limited sample size restricts the generalization of the study findings.

Recommendations

On the basis of study had been conducted, certain suggestions have been given and these are the following,

- A similar study can be done on large sample to generalize the findings.

- A similar study can be conducted in the community setting.

- A qualitative study can be conducted to assess the lived-in experience of patients who undergone severe hypoglycemia.

- A study can be conducted to assess the effectiveness of self-instructional module regarding prevention and management of hypoglycemia.

- A longitudinal study can be conducted to assess the incidence of mild, moderate and severe hypoglycemia, among diabetic patients.

- A research study can be conducted about the first aid management measures of hypoglycemia among patients with Diabetes mellitus.

References

1. Kumar Prayaga, Agarwal Neeraj, Singh Mani Chandra, Sanjay Pandey, et al., Diabetes and

quality of life- a pilot study. International Journal of Medical Science and Public Health. 2016; 5(6):1143-1147.

2. Trikkalinou Aikaterini, Papazafiropopulou K.Athanasia, Melidonis Andreas. Type 2 diabetes and quality of life. World Journal of Diabetes. 2017; 8(4): 120-129.

3. Sharma K. Suresh, Madhavi M. Brunner and Suddarth's Textbook of Medical Surgical Nursing. South Asian Edition. Lippencot: Wolters Kluver publications; 2018; 1043.

4. Giorda Carlo, Ozzello Alessandro, Gentile Sandro, Corsi Andrea, et al., Incidence and Correlates of Hypoglycemia in Type 2 Diabetes. The Hypos-1 Study. Journal of Diabetes and Metabolism. 2014; 5 (3): 1-8.

5. Thenmozhi, M. Vijayalakshmi. Knowledge on hypoglycemia among patients with Diabetes mellitus. Asian Journal of Pharmaceutical and Clinical Research. 2018; 11(1): 236- 239.

6. Frier. M. Brian. Hypoglycemia in diabetes mellitus: Epidemiology and clinical implications. Nature reviews endocrinology. 2014 ; 10(12): 711-722.

7. Kalra Sanjay, Mukherjee Jyoti Jagat, Venkatraman Subramanium, Bantwal Ganpathi, et al., Indian Journal of Endocrinology Metabolism. 2013, 17 (5): 819-834.

8. Madani Mustafa Abdelhaleem, Mahmoud Noureldaim Asma, Hisham Mohammedh Abdelrahim, et al., Assessing knowledge of hypoglycemia symptoms among Type 2 Diabetic patients using Insulin, Khartoum, Sudan. Journal of Pharmacology and Pharmacy. 2019;10: 21-30.

9. Amiel A. S, Dixon T, Mann R, Jameson K. Hypoglycemia in Type 2 Diabetes. Diabetes Medicine. 2008; 25: 245- 254.

10. Leewing Ratzki Alexandria, Harris B Stewart, Mequanint Selam, Reichert M. Sonja, et al.,Real-world crude incidence of hypoglycemia in adults with diabetes: Results of the InHypo-DM Study, Canada. BMJ Open Diabetes and Research Care 2018; 6:e000503: 1-9.

11. Chandrakumar Abin, Vikas V, Tharakan G. Pretty, Aravind C. Prevalence of Hypoglycemia among diabetic old age home residents in South India. Diabetes and metabolic syndrome. 2016; 10 (1) : 144-146.

12. D. K. Revathy, C. G. Asha, C. J. Ansa. A study to assess the demographic and clinical profile among patients with type 2 diabetes mellitus in a selected hospital Thrissur. Journal of nursing today. 2020, 11(2): 1-19.

13. George B. Julia. Nursing theories. The base for the professional nursing practice 6th edition. Noida: Dorly Kinersly Publications Pvt Ltd; 2011; 544-568.