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**Original Research Article**

# A study to assess the knowledge on hypoglycemia among the diabetic patient in selected hospital, Siliguri

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## ABSTRACT

**Background:** The prevalence of diabetes mellitus, is a major health concern that affects people around the world, and is increasing yearly. When blood glucose levels go below normal, a condition known as hypoglycemia, an immediate consequence of diabetes mellitus, occurs. The International Diabetes Federation reported that there were 451 million diabetics globally in 2017 and by 2045, it is anticipated that there will be 693 million. The objective of this study was to assess the level of knowledge of diabetic patient regarding hypoglycaemia and to find out the association between the levels of knowledge of diabetic patient on hypoglycaemia with their selected demographic variable.
**Methods:** A descriptive cross-sectional study, was carried out in the month of June 2022. A semi-structured questionnaire was used to interview 100 study participants who were diabetes patients who had been admitted to the medical ward and who had visited the endocrinology outpatient department.
**Results:** 52% of the samples had fair knowledge on hypoglycemia, while 23% of them had poor knowledge. Demographic variable such as age, income, treatment, frequency of taking medicine, experience of symptoms of hypoglycemia and dietary habit were statistically significant with the level of knowledge, $p<0.05$.
**Conclusions:** The study's findings highlighted the fact that most diabetes mellitus patients had a fair understanding of hypoglycemia. The health care personnel should also take time and efforts to educate patients about the sign of hypoglycemia. So that hypoglycemic episodes and morbidity could be reduced or prevented at primordial level.

**Keywords:** Diabetes mellitus, Hypoglycemia, Knowledge, Insulin, Oral hypoglycemic drugs

## INTRODUCTION

Diabetes is well recognized as a global health burden of the 21st century. The number of patients with DM has continued to rise over the last few decades. In India, where more than 62 million people have diabetes. The management of diabetes is frequently made more difficult, despite the availability of numerous effective anti-diabetic medications and regimens.

One of the most important effects of diabetes mellitus is hypoglycemia, which happens when the blood sugar level drops below the ideal range.[1-3] The prevalence of diabetes is expected to double worldwide, from 171 million in 2000

to 366 million in 2030, with a peak increase in India. In India, 79.4 million people could have diabetes mellitus by 2030. Hypoglycemia is thought to be the cause of death for 2-4% of patients with type 1 diabetic each year.[4,5]

Hypoglycemia imposes a significant financial burden on the health care system, because of the frequent hospitalizations and costs, as well as the unnecessary ambulance utilization. As a result, patients must be aware of all signs and symptoms in order to detect them early and take appropriate action.[5]

### *Objectives*

The objectives of this study were (a) to assess the level of knowledge of diabetic patient regarding hypoglycaemia; and (b) to find out the association between the level of knowledge of diabetic patient on hypoglycaemia with their selected demographic variable.

## METHODS

An institution-based, descriptive, cross-sectional study was conducted among 100 sampled diabetic patients admitted to medicine ward and visiting endocrinology OPD, from 13th June 2022 to 27th June 2022, who were selected through purposive sampling technique at Siliguri district Hospital, West-Bengal.

Data were collected semi-structured questionnaire on knowledge on hypoglycemia. Descriptive data were subjected to analyse by using percentages and frequency distribution with mean and standard deviation and inferential data was interpretated by Chi- square test in SPSS version 21 at a 0.05% level of significance, to determine the association between selected demographic variables and research variable.

### *Inclusion criteria*

Patients with following criteria were included- (a) who has been diagnosed as diabetes mellitus from not more than 1 year; and (b) those who were willing to participate.

### *Exclusion criteria*

Patients with following criteria were excluded- (a) those who are not available during data collection; and (b) who were seriously ill and unable to communicate, patients who were unwilling to participate, and women with gestational diabetes

### *Data analysis*

Data entry and analysis of the variables was done using Statistical Package for Social Sciences (SPSS) version 21. The categorical variables were analysed using descriptive statistics like frequency, percentages with mean±standard deviation. Inferential statistics such as a Chi-square test were performed to find out the association between the different demographic variables with the level of knowledge on hypoglycemia.

### *Ethical considerations*

Ethical clearance for the study was obtained from the Institutional ethics committee of Anandaloke Institute of Nursing Education.

Participation of the subjects in the study was voluntary and informed consents were obtained from all participants. Confidentiality and anonymity of information were maintained.

## RESULTS

There are 100 samples were recruited for the study. Of 100 samples, a majority (52%) of them were in the age group above 40% years, and 52% of them were female. Regarding educational status, 47% had obtained primary level of education, remaining 6% of them had completed above secondary level of education, and most of them 36% were unemployed, majority 44% of them had an earning income between (Rs. 5000-9000).

Maximum 92% of them fallows Hinduism, 77% of them had have diabetes mellitus with a duration between 1-10 years, 75% of them were on the treatment of oral drug therapy, and less than half of the sample 45% were taking oral medication once a day and out of 10% of them with the insulin therapy contributes 8% with twice a day and remaining 2% of them were on once a day.

Regarding symptoms, nearly 72% of the sample had experienced hypoglycemic. More than half of the sample 62% had a dietary pattern of 3 times a day as summarized in Table 1.

The level of knowledge of diabetic patient on hypoglycemia depicted in Table 2, More than half of the samples 52% of them had fair knowledge on hypoglycemia and 25% of them were having good knowledge and the remaining 23% of them had poor knowledge regarding hypoglycemia respectively with the overall mean and SD 33.3±13.22.

From Table 3, it is evident that, there was a significant association between the level of knowledge of diabetic clients on hypoglycemia with their selected demographic variable in terms of age ($\chi^2$=6.644), income ($\chi^2$=12.18), treatment ($\chi^2$=32.17), frequency of taking medicine ($\chi^2$=14.36), experience of symptoms of hypoglycemia ($\chi^2$=6.24) and dietary habit ($\chi^2$=9.84), ($p<0.05$).

Therefore, the demographic factors like gender, educational status, occupation, religion and duration of illness did not have an impact on knowledge of diabetic patient on hypoglycemia.

**Table 1: Frequency and percentage distribution of diabetes mellitus patient with hypoglycemia according to demographic variables (N=100).**

| Demographic characteristics | Frequency (N) | Percentage (%) |
|---|---|---|
| **Age in year** | | |
| 15 to 25 | 48 | 48 |
| Above 40 | 52 | 52 |
| **Gender** | | |
| Male | 48 | 48 |
| Female | 52 | 52 |
| Other | | |
| **Educational status** | | |
| Illiterate | 21 | 21 |
| Primary level | 47 | 47 |
| Secondary level | 26 | 26 |
| Above higher secondary level | 6 | 6 |
| **Occupation** | | |
| Unemployed | 36 | 36 |
| Labour | 29 | 29 |
| Farmer | 9 | 9 |
| Government service | 8 | 8 |
| Self-employed | 18 | 18 |
| **Income in Rupees** | | |
| 1000-4000/- | 38 | 38 |
| 5000-9000/- | 44 | 44 |
| 10000 and above | 18 | 18 |
| **Religion** | | |
| Hindu | 92 | 92 |
| Muslim | 6 | 6 |
| Christian | 0 | 0 |
| Buddhist | 2 | 2 |
| Others | 0 | 0 |
| **Duration of diabetes mellitus (years)** | | |
| 1 to 10 | 77 | 77 |
| 11 to 20 | 18 | 18 |
| Above 20 | 5 | 5 |
| **Treatment for diabetes mellitus** | | |
| Insulin therapy | 25 | 25 |
| Drug therapy | 75 | 75 |
| **Frequency of taking medication** | | |
| Oral drug once in a day | 46 | 46 |
| Oral drug twice in a day | 40 | 40 |
| Oral drug thrice in a day | 4 | 4 |
| **Insulin users** | | |
| Once in a day | 2 | 2 |
| Twice in a day | 8 | 8 |
| **Experience any symptoms of hypoglycemia** | | |
| Yes | 72 | 72 |
| No | 28 | 28 |
| **Dietary habit** | | |
| 2 times in a day | 37 | 37 |
| 3 times in a day | 62 | 62 |
| 4 times in a day | 1 | 1 |

**Table 2: Frequency percentage distribution of patient according to their level of knowledge on hypoglycemia among the diabetic patient (N=100).**

| Level of knowledge on hypoglycemia | Frequency (N) | Percentage (%) | Mean±SD |
|---|---|---|---|
| **Good** | 25 | 25 | 33.3±13.22 |
| **Fair** | 52 | 52 | |
| **Poor** | 23 | 23 | |

**Table 3: Chi-square association between the knowledge of diabetic patient on hypoglycemia with the demographic characteristics (N=100).**

| Demographic characteristics | Level of knowledge on hypoglycemia | | | Total | df | Chi square ($\chi^2$) | Prevalence |
|---|---|---|---|---|---|---|---|
| | Good | Fair | Poor | | | | |
| **Age in year** | | | | | | | |
| 25-40 | 13 | 12 | 9 | 34 | 1 | 6.6443* | 0.036* |
| Above 40 | 12 | 40 | 14 | 66 | | | |
| **Gender** | | | | | | | |
| Male | 12 | 23 | 13 | 48 | 1 | 0.965 | 0.617 |
| Female | 13 | 29 | 10 | 52 | | | |
| **Educational status** | | | | | | | |
| Illiterate | 2 | 11 | 8 | 21 | 3 | 7.208 | 0.320 |
| Primary level | 13 | 24 | 10 | 47 | | | |
| Secondary level | 9 | 14 | 3 | 26 | | | |
| Above higher secondary level | 1 | 3 | 2 | 6 | | | |
| **Occupation** | | | | | | | |
| Unemployed | 12 | 16 | 7 | 35 | 4 | 6.59 | 0.581 |
| Labour | 5 | 15 | 8 | 28 | | | |
| Farmer | 1 | 6 | 3 | 10 | | | |
| Government service | 1 | 5 | 3 | 9 | | | |
| Self-employed | 6 | 10 | 2 | 18 | | | |
| **Income in Rupees** | | | | | | | |
| 1000-4000/- | 3 | 22 | 13 | 38 | 2 | 12.1896* | 0.159* |
| 5000-9000/- | 14 | 23 | 7 | 44 | | | |
| 10000 and above | 8 | 7 | 3 | 18 | | | |
| **Religion** | | | | | | | |
| Hindu | 22 | 48 | 20 | 90 | 2 | 2.170 | 0.70 |
| Muslim | 2 | 3 | 1 | 6 | | | |
| Others | 2 | 10 | 6 | 4 | | | |
| **Duration of diabetes mellitus (years)** | | | | | | | |
| 1 to 10 | 20 | 40 | 15 | 65 | 2 | 4.397 | 0.35 |
| 11 to 20 | 2 | 10 | 6 | 18 | | | |
| Above 20 | 3 | 2 | 2 | 7 | | | |
| **Treatment for diabetes mellitus** | | | | | | | |
| Insulin therapy | 10 | 6 | 18 | 34 | 1 | 32.17* | 0.0001* |
| Drug therapy | 15 | 46 | 5 | 66 | | | |
| **Frequency of taking medication** | | | | | | | |
| Oral drug once in a day | 5 | 28 | 15 | 48 | 3 | 14.36* | 0.25* |
| Oral drug twice in a day | 14 | 16 | 6 | 36 | | | |
| Oral drug thrice in a day | 3 | 1 | 1 | 5 | | | |
| Insulin users | 3 | 7 | 1 | 11 | | | |

Continued.

| Demographic characteristics | Level of knowledge on hypoglycemia | | | Total | df | Chi square ($\chi^2$) | Prevalence |
|---|---|---|---|---|---|---|---|
| | Good | Fair | Poor | | | | |
| **Experience any symptoms of hypoglycemia** | | | | | | | |
| Yes | 23 | 34 | 16 | 73 | 1 | 6.246* | 0.44* |
| No | 2 | 18 | 7 | 27 | | | |
| **Dietary habit** | | | | | | | |
| 2 times in a day | 3 | 23 | 11 | 37 | 2 | 9.84* | 0.043* |
| 3 times in a day | 20 | 28 | 11 | 59 | | | |
| 4 times in a day | 2 | 1 | 1 | 4 | | | |

Note: *Significance

## DISCUSSION

The prevalence of diabetes has been increasing globally, with an estimated number of 592 million diabetes cases by 2035. In China, more than 100 million people (approximately 1 in 10) have diabetes, because of unstable glycemic control, diabetes can affect any organ in the body, leading to serious complications over time.[6-8] Diabetes and its complications result in significant economic burden for individuals, families, and health care systems.[9]

Many studies have mentioned knowledge on hypoglycemia, which is consistent with the current findings. The present study shows that 72% of study participants had experience the symptoms of hypoglycemia. Similarly, a study conducted in Nepal showed that 45.1% of total patients reported symptoms suggestive of hypoglycaemia.[10] The study conducted by Shriraam et al, depicted that 85% of the study population are diabetic for more than 5 years.[11]

Similarly, in our present study majority (77%) of the patient has a duration of DM between 1-10 years. The findings showed that out of 60 samples, 38 (63.33%) had inadequate knowledge, 12 (20%) of them had moderately adequate knowledge, and 10 (16.67%) of them had adequate knowledge.

In current study, more than half of the samples 52% of them had fair knowledge on hypoglycemia and 25% of them were having good knowledge and remaining 23% of them had poor knowledge regarding hypoglycemia. This finding is higher than the study conducted in South Gondar, Ethiopia shows that 25.5% of the participants had good knowledge on hypoglycaemia.[12]

Similarly, in a study carried out among patients with diabetes mellitus by Sharma et al who stated that overall (64.4%) diabetic patients had good knowledge of hypoglycaemia.[13] Another study conducted in Nepal revealed that among them 27% of participants has inadequate knowledge, remaining 23% has adequate knowledge.[14] A lower level of awareness was reported in the study conducted by Thenmozhi et al who found that (20%) of the participants had moderately adequate knowledge, and 16.67% of them had adequate knowledge.[15] In our present study, the association of the knowledge of hypoglycemia with certain important background characteristics is seen in age, income, treatment, frequency of taking medicine, experience of symptoms of hypoglycemia and dietary habit ($p<0.05$). Study conducted in Tamil Nadu revealed that there is a significant association with type of treatment at the level of $p<0.05$ with the level of knowledge.[16] The findings are consistent with the study conducted by Shriraam et al and found that 66.1% of diabetic patients had good knowledge on hypoglycemia, however, use of medicine of the client is associated with the level of knowledge ($p<0.05$).[16]

Another study conducted in South India showed that, the type of treatment (diabetes mellitus) had significant association with the knowledge.[17] The study conducted by Shriram et al revealed the knowledge on hypoglycemia was significantly associated with age.[17] This finding is also shown in other studies conducted by Thomson et al and Al-Adsani et al this might have been because of age-related cognitive decline insisting the importance of periodical educational programs to reinforce their knowledge.[18,19]

Study conducted by Suzy et al hope showed the findings that the knowledge on the symptoms of hypoglycemia were significantly associated with the advancement of age.[20] A study was conducted in Saudi Arabia depicted the significant association seen among monthly income, patient having previous hypoglycemia experience ($p<0.05$).[21]

### *Limitations*

The current study had only a small number of patient who willingly agreed to participate. A larger study sample including all the diabetic patient from private hospitals and multispecialty clinics would have been taken as a participants in order to compare trends in t the knowledge of hypoglycemia, prevention and its treatment modality. This study could not be generalized at the national level because it was conducted in a limited geographical area. Future studies with a larger and more representative sample size that include patients with gestational DM and pediatric patients with DM is required.

## CONCLUSION

Hypoglycemia is quite prevalent amongst people with type 2 diabetes on treatment particularly those on insulin. The study findings concluded that the participants had fair level of knowledge on hypoglycemia among patients with diabetes mellitus. Health-care professionals have a major role in educating clients with diabetes mellitus about hypoglycemia risk factors, recognition of symptoms of hypoglycemia, first aid measures of hypoglycemia, blood glucose monitoring, and selection of appropriate regimens, thereby minimize the risk of hypoglycemia, and prevent the potential complications of hypoglycemia at primordial level.

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