Knowledge, attitude and practice among diabetic patients on insulin therapy towards the disease and their medication at a university hospital in Northwestern Ethiopia: a cross-sectional study

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Abstract

Objective: to assess the knowledge, attitude and practice of diabetic patients who were self-administering insulin towards their management of disease and medication.

Materials and Methods: a cross-sectional study was done in the hospital from 1st of April to 16th of May 2013 through a structured interview with 150 diabetes mellitus patients who were self administering insulin as part of their therapy. Data collected was analyzed descriptively using SPSS version 19.0.

Results: majority (61.3%) were men and those in the age group of 14-29 years (47.3%). Among those who experienced hypoglycemia, 135 (90%) knew the home management of hypoglycemic effect of insulin. More than three quarters (78%) reported they were comfortable with their insulin therapy. More than half (54.7%) of the participants had their blood sugar level monitored every month. Forty six (30.7%) of the patients reported they had missed their insulin due to different reasons at different times. Insulin storage appropriateness was significantly associated to educational level.

Conclusions: this study showed that there was poor practice among the patients regarding diabetes and self insulin therapy which calls for education on self-care management and insulin self-therapy for diabetes mellitus patients by skilled health care providers.

Keywords: diabetes mellitus, insulin, knowledge, attitude, practice, patients, Ethiopia

Introduction

Diabetes mellitus is a metabolic disorder of multiple etiological factors characterized by chronic hyperglycemia with disturbance of carbohydrate, fat and protein metabolism which resulted from either insufficient Insulin secretion, resistance to the action of Insulin or both [1,2]. International diabetes federation's report described that 382 million had diabetes in the year 2013 and it was estimated to reach 592 million in the year 2035. In the same report it was shown that there were more than 1.8 million diabetes patients in Ethiopia with an estimated national prevalence of 4.36% among adult population [3].

Diabetes mellitus is classified in to type I, type II and gestational diabetes mellitus type I being characterized by insulin deficiency which needs daily administration of insulin. Type II diabetes mellitus results from the body's ineffective use of insulin while gestational diabetes is hyperglycemia with onset or first recognition during pregnancy [4]. Insulin therapy is an important part of diabetes treatment often and is a cornerstone of treatment in type I diabetes and also critical, in many cases, to the management of type II diabetes. Despite this at least one-third of patients fail to take their insulin as prescribed, and 20% of adults intentionally skip their doses [5].

Participation of patients is very crucial in the management of diabetes mellitus as medications alone aren't enough to manage the disease without different non-pharmacological measures taken [6].

Various studies have been conducted in various parts of the world regarding the awareness and practice of diabetes patients towards the self-administration of insulin therapy and overall management of the disease [7-15]. In Ethiopia, some studies on the prevalence, [16,17] complications, [18] adherence of patients to their medications, [19] and self care practices were conducted in different parts of the nation [20-23] but studies regarding patients awareness and practices are still scarce. The objective of this study was to assess the

knowledge, attitude and practice of diabetic patients who were self-administering insulin towards their management of disease and medication.

Materials and Methods

A cross-sectional study was conducted in the in University of Gondar Hospital (UoGH) to assess the knowledge, attitude and practice of diabetes mellitus patients towards the disease and insulin therapy. Data was collected through a structured interview with patients attending the chronic illnesses clinic of the hospital during the study period from the 1st of April to 16th of May 2013. The inclusion criteria required that patients visiting the clinic be diabetes mellitus patients and those getting insulin treatments. The exclusion criteria precluded patients who were not physically or mentally able to conduct the interview. In the present study 150 patients who fulfilled the inclusion criteria and were willing to participate in the study were interviewed.

In the data collection process a structured questionnaire comprised of questions pertinent to socio-demographic profiles of the patients and their knowledge, attitude as well as practice in relation to their illness and the insulin medication they were self-administering was employed. The questionnaires were pretested on 15 interview encounters, which were excluded from the final analysis, before the actual data collection and appropriate modifications were instituted. The interviews with the patients were conducted by three graduating class pharmacy students.

The study was approved by the school of pharmacy in the university hospital. In addition letter of request for cooperation was written to and accepted by the chronic illness department of the hospital to proceed with the study. The patients attending the clinic were asked for their consent to participate in the study after the nature and aim were explained to each by the investigators. Furthermore the data collected through the interviews was kept confidential and used strictly for the purpose of the study. The data collected was entered to and descriptively analyzed using Statistical Packages for Social Sciences (SPSS) for windows version 19. In the analysis to delineate statistical significance of relationships 95% confidence interval (CI) and p-value of 0.05 were employed [24].

Results

Socio-demographic characters

A total of 150 people were included in the present study of which the majority (61.3%) were men and those in the age group of 14-29 years (47.3%). Most of the respondents weighed fifty six kilograms or more (43.3%) followed by those in the range of 46 to 55 kilograms (42.7%). Regarding religion, much more than three quarters of the respondents (86%) were followers of Orthodox Christianity. More than a third of the respondents (34.7%) were not able to read and write whereas those who completed high school education or more consisted of about a quarter of respondents (25.3%). As to their occupation farmers (40%) were of the highest proportion and just above half (52.7%) of the respondents lived in urban areas [Table 1].

Table 1 Socio-demographic characteristics of respondents

Variable	Frequency (%)
Sex	
Male	92 (61.3)
Female	58 (38.7)
Age(years)	
10-14	3 (2)
15-29	71 (47.3)
30-49	52(34.7)
50+	24 (16)
Weight (kilograms)	
26-35	3 (2)
36-45	18 (12)
46-55	64 (42.7)
56+	65 (43.3)
Religion	
Orthodox Christianity	129 (86)
Islam	20 (13.3)
Protestantism	1 (0.7)
Education level	
Can't read and write	52 (34.7)
Can read and write	33 (22)
Elementary	27 (18)
High school and above	38 (25.3)
Occupation	
Merchant	12 (8)
Employee	15 (10)
Daily laborer	14 (9.3)
Farmer	60 (40)
Student	32 (21.3)
House wife	16 (10.7)
Other	1 (0.7)
Residence	
Urban area	79 (52.7)
Rural area	71 (47.3)

Health conditions of the respondents

Among the participants of the study 21 (14%) had insulin treatment history of less than 1 year duration, 63 (42%) had been in treatment for a period of 1 to 5 years and the remaining 66 (44%) patients had been on insulin therapy for more than 5 years.

As to the occurrence of complications, 57 (38%) of the respondents developed peripheral neuropathy while 26 (17.3%) and 7 (4.7%) developed heart and kidney problems, respectively. Regarding erectile dysfunction, out of 92 (61.3%) male respondents, 20 (13.3%) developed erectile dysfunction [Figure 1].

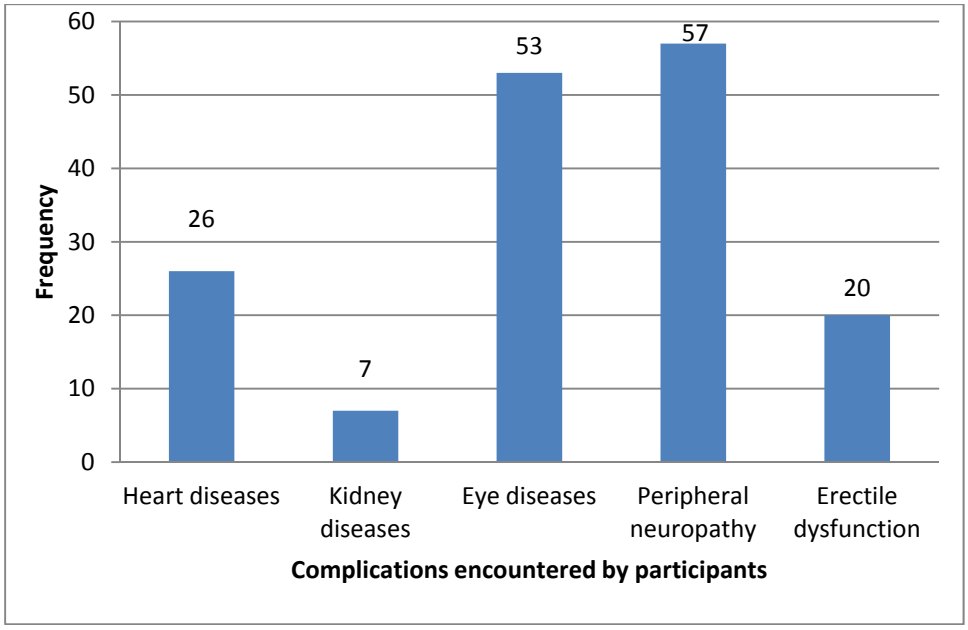

Figure 1: Frequency distribution of patients by complications encountered

The occurrence of complications among patients showed a pattern of higher proportion with complication as duration of insulin therapy increased. However the relation was not statistically significant [Table 2].

Table 2: Fisher's exact test on difference of occurrence of complication by duration on insulin therapy

Duration on insulin therapy	Complications		Total (%)	P-value
	Yes (%)	No (%)		
Less than one year	6 (28.6)	15 (71.4)	21 (100)	0.483
One to five years	25 (39.7)	38 (60.3)	63 (100)	
More than five years	29 (43.9)	37 (56.1)	66 (100)	
Total	60 (40)	90 (60)	150 (100)	

Knowledge and attitude towards insulin self-administration and management of diabetes mellitus

Almost all of the respondents (98.7% and 98%) knew what and why they took their medication, respectively. The study result also revealed that 90 (60%) of participants were aware of diabetes mellitus complications. In addition, among the participants more than two-third (68%) knew about the benefit of life style modification for the management of DM.

Among the total respondents 107 (69.3%) reported they experienced hypoglycemia when they took insulin. Of these 135 (90%) knew the home management of hypoglycemic effect of insulin by taking sugar, candy, honey and other methods while the remaining patients were not aware of these schemes of managing the condition.

Of the 150 participants, more than three quarters (78%) reported they were comfortable with their insulin therapy whereas the remaining complained they were not comfortable. Among these, nearly half (48.5%) attributed it to pain, nearly a fifth to swelling (18.2%) and the remaining one-third (33.3%) described both pain and swelling as the reasons for discomfort with their therapy. Regarding the attitudes of the patients towards their insulin therapy a considerable proportion (7.3%) reported to believe that regular use of insulin leads to addiction.

Of the study participants, about one-fifth (19.3%) had complained about the cost of insulin. This showed statistically significant difference in relation to types of occupations with merchants (P = 0.020) and farmers (P = 0.020) showing this difference compared to the others [Table 3].

Table 3: Fisher's exact test on difference of complain about the cost of insulin among respondents of different occupations

Occupation	Complained towards cost		Total (%)	P-value
	Yes (%)	No (%)		
Employee of government/ private institutions	5 (33.3)	10 (66.7)	15 (100)	0.169
Merchant	6 (46.2)	7 (53.8)	13 (100)	0.020*
Daily labourer	4 (28.6)	10 (71.4)	14 (100)	0.474
Farmer	6 (10)	54 (90)	60 (100)	0.020*
Housewife	1 (6.2)	15 (93.8)	16 (100)	0.311
Student	6 (19.4)	25 (80.6)	31 (100)	1.000
Other	1 (100)	0 (0)	1 (100)	0.193
Total	29 (19.3)	121 (80.7)	150 (100)	

* P-value < 0.05

Practice of patients in relation to insulin therapy and management of diabetes mellitus

Among the total patients more than half (52.6%) reported that they keep their insulin medication in a sand soaked with water. On the other hand a considerable proportion of the patients (16.7%) reported they use boxes and other places to keep the medication which constituted inappropriate storage [Figure 2].

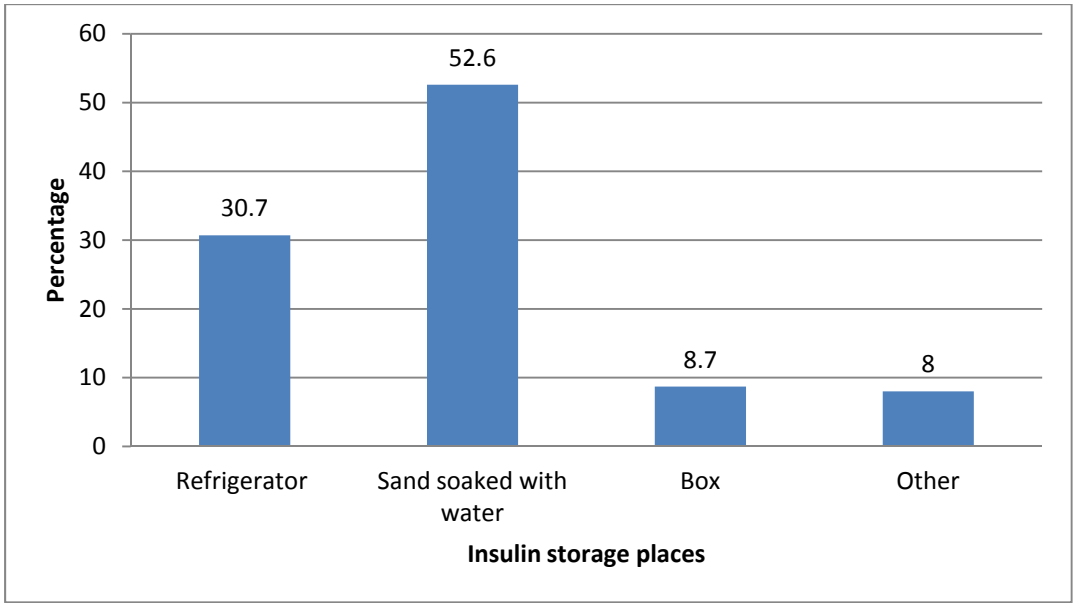

Figure 2: Percentage distribution of the patients by insulin storage places

Appropriateness of insulin storage was shown to have a statistically significant difference (p=0.005) among patients in different educational levels based on the Fisher's exact test performed [Table 4]. A higher proportion of patients who were illiterate kept insulin inappropriately compared to the literate ones. However, no statistical significance difference between residents of urban and rural areas in relation to insulin storage condition [Table 5].

Table 4: Fisher's exact test for significance level of difference of insulin storage place by educational level

Educational level	Storage condition			p-value
	Appropriate (%)	Inappropriate (%)	Total (%)	
Illiterate	37 (71.2)	15 (28.8)	52 (100)	0.005*
Literate	88 (89.8)	10 (10.2)	98 (100)	
Total	125 (83.3)	25 (16.7)	150 (100)	

* p-value < 0.05

Table 5: Fisher's exact test for significance level of difference of insulin storage by residence

Residence	Storage condition			P-value
	Appropriate (%)	Inappropriate (%)	Total (%)	
Urban	70 (88.6)	9 (11.4)	79 (100)	
Rural	55 (77.5)	16 (22.5)	71 (100)	0.081
Total	125 (83.3)	25 (16.7)	150 (100)	

With regards the time of insulin administration injection of insulin after meal (40.7%) was the leading administration time among respondents [Figure 3].

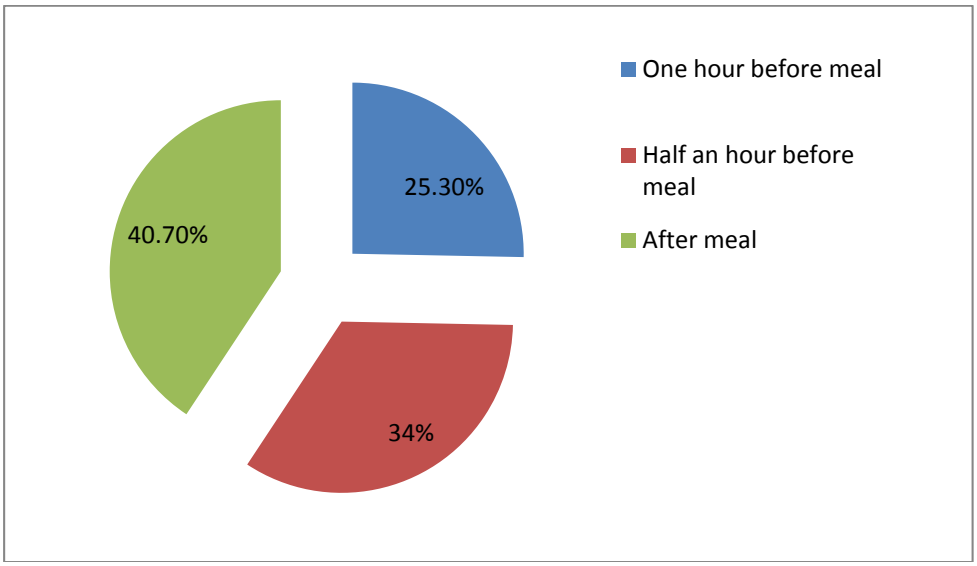

Figure 3: Percentage distribution of respondents by insulin administration time

Regarding the practice of regular eye examination, more than half of the respondents (54.7%) had their eyes checked up at least a year ago, about a fifth in the past six months (19.3%) while just above a quarter (26%) of them never had.

More than half (54.7%) of the participants had their blood sugar level monitored every month, followed by those who practiced it every 2 months (22.7%) [Figure 4].

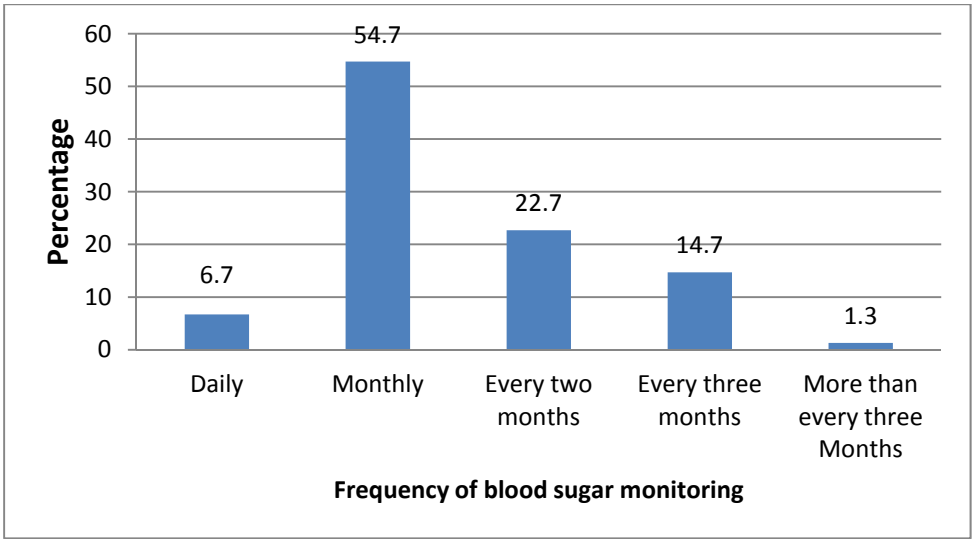

Figure 4: Frequency of blood sugar measurement among participants

Forty six (30.7%) of the patients reported they had missed their insulin due to different reasons at different times. Among these, nearly two-third missed their doses rarely while about one-fifth (19.6%) reported to have had missed once a month and the rest 15.2% at least once a week. The measure taken by nearly three quarters (69.6%) of the patients who missed doses was continuing with the next dose but doubling the next dose (23.9%),

and administering the insulin with slight increase to compensate for the missed dose (6.5%) were also reported by the participants.

Discussion

Many studies have shown a correlation between good knowledge among patients and good therapeutic outcomes [6]. In this study almost all of the patients knew what medications they were taking and why. Considering their awareness on the complications of the disease less than two-third (60%) knew about them. This showed a gap in knowledge and idea about monitoring towards complications is of paramount importance to patients. A higher proportion of patients (73.4%) who knew complications were reported by a study done in Kenya [11]. But the figure in the present study was higher compared to a study done at a hospital in Bahir Dar, Ethiopia [21]. On the other hand in this study 90% of the patients were aware of home management of the disease by taking sugar, candy, honey and so on which was higher compared to the 76.9% reported by a study done in Pakistan [8].

More than three quarters of the patients in this study reported to be comfortable with the insulin therapy. A similar feeling was shared by 82% of the participants of a study in London, England about the insulin therapy [25]. On the other hand a considerable proportion of the patients (7.3%) involved in this study believed that regular insulin use would result in addiction. A similar thought was reported by a study done in Vietnam [26].

Nearly half of the participants in this study kept insulin inappropriately. This is a very worrisome situation as it will affect the proper treatment of the patients if the medication is not stored properly. Appropriateness in storage was also shown to be different between patients of different education levels.

As to the schedule of blood glucose monitoring, more than half of the patients in this study reported they did it on a monthly basis. This was better as compared to a finding in Malaysia in which most patients reported to have had their blood glucose level checked only during their scheduled consultation with the doctor every three months [27].

With regards to blood glucose level monitoring more than half of the patients reported they were doing it monthly while about 7% daily. A similar failure of regular monitoring was reported by a study done at a hospital in Addis Ababa [20].

In this study missing of doses in insulin therapy was reported by nearly a third of the patients at different times with the frequency being different among them. A similar pattern was observed in another online multinational cross-sectional study [28].

Conclusion

This study showed that there was poor practice among patients regarding insulin self therapy. There was statistically significant association between educational status and inappropriateness of insulin handling. Therefore, health care providers should educate patients on diabetes self-care management, insulin storage and insulin self-therapy.

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