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Knowledge Regarding Self-Administration of Insulin Among the Diabetic Patient Attending the Diabetic Clinic of Tertiary Care Center of Eastern Nepal

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Abstract

Background: Diabetes Mellitus(DM), usually called diabetes or sugar is the condition that occurs when one's body does not produced enough insulin or body is unable to use normal amount of insulin properly. Objectives: The objectives of this study were to assess the Knowledge and Practice Regarding Self-administration of insulin among the diabetic patient attending the diabetic clinic of BPKIHS, to find out the association between knowledge and Practice with their selected socio-demographic variables and to find out association between knowledge and practice regarding self-administration of insulin.

Methods: A descriptive cross-sectional study design was used to conduct the study among the Diabetic patient attending the diabetic clinic of BPKIHS. Data were collected using the self structured questionnaire.

Results: The findings revealed that mean knowledge of the participants was 57.55% and practice was 73.98%. Among them 54%(27) of participants has inadequate knowledge, remaining 46%(23) has adequate knowledge. Similarly, 48%(24) of participants has inadequate practice, and remaining 52%(26) has adequate practice. There was significant association of educational status with knowledge regarding self administration of insulin with pvalue 0.03 and there was significant association with occupation with knowledge regarding self administration of insulin with pvalue 0.047. There was also association between knowledge and practice regarding self administration of insulin with pvalue 0.049

Conclusion: Educational and ccupational status has influence on knowledge regarding self administration of insulin. Thus it is essential to focus on improving the patient's knowledge on the related topic so that the participants can enhance their practice as well. Diabetes & Insulin Self Administration education must be imparted by physicians by counselling patients at each follow up visit.

Key Words: Knowledge, Practice, Diabetes Mellitus and Self administration of insulin

Introduction:

Diabetes is a serious, chronic disease that occurs either when the pancreas does not produce enough insulin (a hormone that regulates blood glucose), or when the body cannot effect ively use the insulin it produces¹.

Lifestyle modification i.e. nutritional management, exercise, monitoring blood glucose level, education, etc. plays a vital role in the management of diabetes².

With the advancement in medical science and technology, pharmacological therapy i.e. oral anti-diabetic agents and insulin therapy has an important role in maintaining the blood glucose level among diabetic patients¹. Successful self management in Diabetes helps the patient feel better. Education is an important aspect of self-management, teaching the client on self administration of insulin helps the patient helps to build self confidence and pride of contribution in their management³. Insulin therapy

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has been proven to be effective in controlling blood glucose level among the diabetic patients. Insulin is used to treat a number of diseases including diabetes and its acute complications such as diabetic ketoacidosis and hyperosmolar hyperglycemic states. It is also used along with glucose to treat high blood potassium levels¹.

The objectives of this study were to assess the Knowledge and Practice Regarding Self-administration of insulin among the diabetic patient attending the diabetic clinic of BPKIHS, to find out the association between knowledge and Practice with their selected socio-demographic variables and to find out association between knowledge and practice regarding self-administration of insulin.

Methods

This study was descriptive cross-sectional study design done in Diabetic Clinic of Medical OPD of BPKIHS, Dharan. Patient who are clinically diagnosed by certified physician with diabetes mellitus and are under self-administration of insulin were taken for the study. This study considers 95% confidence interval and 80.5 power to estimate the sample size. For this purpose, study considers 52.5% of prevalence of knowledge regarding self-administration of insulin among the diabetic patient. Using The formula the sample were 50. Non Probability Purposive Sampling technique was used.

The Exclusion Criteria Patient who were unable to communicate and patients who takes assistance from others in administration of insulin.

A pre-tested self prepared interview questionnaire was developed on the basis of objectives, review

of literature and the opinion from the experts to assess the Knowledge and Practice Regarding Self-Administration of Insulin among the Diabetic Patients Attending the Diabetic Clinic of BPKIHS. This tools were used to collect data from each study subject in the study settings. It was divided into 2 parts.

Part I consist socio-demographic data of the study subject like address, age, sex, marital status, religion, educational status, occupation, economical status, duration of illness and family history. Part II consist of self structured interview questionnaire related to Knowledge Regarding Self-Administration of Insulin among the Diabetic Patient Attending Diabetic Clinic of BPKIHS. It consists total of 23 questions. Section C: It consist of self structured interview questionnaire related to Practice Regarding Self-Administration of Insulin Among The Diabetic Patient Attending Diabetic Clinic Of BPKIHS. It consists total of 18 questions.

The written permission was obtained from the Institutional Review Committee of College Of Nursing. Informed consent was taken from the clients.

Data was entered in MS-Excel 2011 and converted into SPSS version 11.5 for statistical analysis. Descriptive Statistics such as Percentage, mean, median, interquartile range, and standard deviation was used for analyzing the data. Appropriate inferential statistics was used as per need. The findings were presented in the form of tables or graphs as applicable.

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Results:

Table 1: Socio – Demographic Characteristics of The Participants (n=50)

Characteristic	Category	No.of sample	Percentage
Age	<30 years	2	4.0
	30-50 years	9	18.0
	50-70 years	32	64.0
	>70 years	7	14.0
Mean Age± SD (Min- Max)		57.30±12.156 (14-75)	
Sex	Male	29	58.0
	Female	21	42.0
Marital status	Unmarried	2	4.0
	Married	44	88.0
	Divorced	1	2.0
	Widow / Widower	3	6.0
Religion	Hindu	42	84.0
	Buddhist	5	10.0
	Christian	3	6.0
Educational status	Primary level	29	58.0
	Secondary level	14	28.0
	Higher secondary & above	7	14.0
Occupational status	Homemaker	18	36.0
	Agriculture/ Labour	7	14.0
	Business	8	16.0
	Service	7	14.0
	Others	10	20.0
Economical status	<10,000	4	8.0
	10,000 - 20,000	22	44.0
	20,000 – 30,000	20	40.0
	>30,000	4	8.0
Family h/o DM	No	37	74.0
	Yes	13	26.0
Relationship with diabetic person	First degree relative	12	92.3
	Second degree relative	1	7.7
Duration of DM	< 1 years	3	6.0
	1-10 years	16	32.0
	10-20 years	23	46.0
	>20 years	8	16.0
Mean Age ± SD(Min-Max)		11.172 ± 8.6522 (0.5-43.0)	
Characteristic	Category	No. of sample	Percentage
Duration of insulin	3 months-1 year	24	48.0
	1-5 years	17	34.0
	>5 years	9	18.0
Mean Age ± SD(Min-Max)		2.964 ± 4.3752 (0.3-21.0)	
Device used	Pen injector	41	82.0
	Insulin syringe	6	12.0
	Both	3	6.0
Information about DM	Yes	25	50.0
	No	25	50.0
means of information	Mass media	6	24.0
	Health personnel	1	4.0
	Relatives	12	48.0
	Mass media & relatives	2	8.0
	Health personnel & realtive	1	4.0
	mass media, health personal & realtives	3	12.0

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Table 2: Knowledge & Practice Regarding Self Administration Of Insulin(n=50)

Characteristics	Category	No.of sample	Percentage (%)
Knowledge	Inadequate	28	56
	Adequate	22	44
Practice	Inadequate	24	48
	Adequate	26	52

Table 3: Knowledge Regarding Storage of Insulin (n=50)

Storage of Insulin	Correct Responses		Incorrect response	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Appropriate place for storage of insulin at home	45	90	5	10
Temperature of refrigerator for Insulin Storage	25	50	25	50
Room Temperature for insulin storage	3	6	47	94
Appropriate technique for insulin storage	24	48	26	52
Rationale storing insulin in cool & dry place	19	38	31	62
Duration for the usage of single insulin vial	40	80	10	20
Duration for the usage of single insulin syringe	50	100	0	0

The above table depicts that 90% of the participants had knowledge regarding the appropriate place for the storage of insulin. Only half of the participants i.e. 50% had knowledge regarding the required temperature of the refrigerator for storage of insulin whereas only 6% of the participants knew about the required room temperature for the storage of insulin.

Table 4: Knowledge Regarding Techniques Of Insulin Administration(n=50)

Techniques Of Insulin Administration	Correct Responses		Incorrect response	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Appropriate time for administration of insulin	39	78	11	22
Rolling the vial of insulin in between hands before administration	25	50	25	50
Sites of administration of insulin				
Abdomen	47	94	3	6
Thigh	45	90	5	10
Upper arm	16	32	34	69
Buttocks	12	24	38	76
Insulin can be administered in the site of swelling/ tenderness/scars/lipodystrophy	50	100	0	0
Technique to dry the alcohol wipe sites before administration of insulin	28	56	22	44
Correct angle for the administration of insulin	23	46	27	54
Distance to be considered for the rotation of insulin administration	20	40	30	60
Ways to reduce pain during insulin administration	28	56	22	44
Rationale for the rotation of insulin administration site				
To reduce pain	37	74	13	26
To prevent from lipodystrophy	8	16	42	84

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Table 5: Knowledge Regarding Complication of Insulin Therapy (n=50)

Complication of Insulin Therapy	Correct Responses		Incorrect response	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Complications of Insulin therapy				
Low Blood Sugar	15	30	35	70
Lipodystrophy	8	16	42	84
Insulin Allergy/Resistance	7	14	43	86

The above table depicts that only 30% of the participants had knowledge regarding low blood sugar as a complication of insulin therapy followed by lipodystrophy 16% and insulin allergy/resistance 14%.

Table 6: Practice Regarding Self Administration of Insulin (n=50)

S.N	Insulin self administration technique	Always		Sometime		Never	
		Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
38.	Handwashing .	44	88	2	4	4	8
39.	Check the blood glucose level before and after administration of insulin.	3	6	22	44	25	50
40.	Observe the insulin characteristics.	48	96	1	1	1	1
41.	Use insulin without shaking it.	38	76	12	24	0	0
42.	Check whether insulin device is broken/damaged.	50	100	0	0	0	0
43.	For Insulin Syringe						
a.	Wipe the rubber top of insulin with alcohol at 70%.	2	4	0	0	7	14
b.	Inject air into insulin bottle.	2	4	0	0	7	14
c.	Draw up the quantity of insulin necessary to complete the prescribed dose.	9	18	0	0	0	0
d.	Remove the bubble from syringe	8	16	0	0	1	2
44.	For Pen Injector						
a.	Clean the air from needle	16	32	7	14	21	42
b.	Set up the dial at zero after removing air from needle.	19	38	5	10	20	40
c.	Fix the unit/dose of insulin as prescribed.	44	88	0	0	0	0
45.	Recap the needle upto the moment of administration.	47	94	2	4	1	2
46.	Cleanse the skin with alcohol at 70% and allows it to dry.	21	42	19	38	10	20
47.	Pinch a fold of skin.	41	82	1	2	8	16
48.	Inject the needle at 45°/90° angle.	1	2	2	4	47	94
49.	Aspirate the fluid back into the syringe to check for the blood return, if insulin syringe.	2	4	2	4	5	10
50.	Wait 5 second to withdraw the needle.	39	78	4	8	7	14
51.	Compress the skin without massaging it.	33	66	5	10	12	24
52.	Dispose the syringe after single use safely.	50	100	0	0	0	0
53.	Do you have the habit of skipping/ adjusting the dose without your doctor concern?	50	100	0	0	0	0
54.	Regular examination of blood glucose level and examination as advised by doctor.	50	100	0	0	0	0
55.	Do you have habit of doing exercise as advicee by your doctor?	22	44	20	40	8	16

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Table 7: Correlation between Knowledge & Practice regarding Self Administration of Insulin (n=50)

	Mean ± Sd. Deviation	Correlation value	P value
Knowledge total score	23.02±5.200	0.28	0.049
Practise_total_score	29.54±3.072		

DISCUSSION

A similar study was conducted by a Surendranath on October 2011 to assess the knowledge and practice of insulin self administration among patient with diabetic mellitus, knowledge assessment on self insulin administration revealed that 41 (68%) of the subjects had inadequate knowledge; and remaining 19 (32%) of them had moderately adequate knowledge. None of them had adequate knowledge. Assessment of the practice revealed that 43 (72%) of the subjects had poor practice; 17 (28%) of them had fair practice, and none of them had good practice. There was a statistically significant positive correlation between knowledge and practice on is a ($p < 0.05$)⁴. In a study conducted by Hadeгу Grensae et al 2015, the mean knowledge score of study subjects was 7.07 with a maximum possible score of 13. Only 18 (13.07%) of participants had good knowledge, 78 (55%) participants had average knowledge and 45 (31.8%) had poor knowledge regarding diabetes and insulin self administration⁵. In a similar study conducted by Manish C Gholap et al 2016, the mean knowledge score was 7.225 ± 1.405 and practice score was 6.000 ± 1.519 . Out of 40 samples, 21 (52.5%) were having good knowledge, 19 (47.5%) were having average knowledge; none of them were having poor knowledge. Out of 40 samples 1 (2.5%) having poor practice, 33 (82.5%) having average practice, and 6 (15%) having good practices⁶. Our study revealed that mean knowledge of the participants was 57.55% and practice was 73.98%. Among them 54% (27) of participants has inadequate knowledge, remaining 46% (23) has adequate knowledge. Similarly, 48% (24) of participants has

inadequate practice, and remaining 52% (26) has adequate practice. There was significant association of educational status with knowledge regarding self administration of insulin with pvalue 0.03 and there was significant association with occupation with knowledge regarding self administration of insulin with pvalue 0.047. There was also association between knowledge and practice regarding self administration of insulin with pvalue 0.049.

In our study, the majority 58% of the participants had studied upto primary level whereas in the similar study conducted by Manish C Gholap et al⁶ 2016 majority 42.5% of the participants had attended primary education and in a similar study conducted by Hadgu Grensae et al⁵ majority 47.5% had attended primary education.

In our study majority 74% of the participants didn't had family history of DM whereas in a similar study conducted by Manish Gholap et al 2016, similar result i.e majority 80% of the participants & 73.5% in a study conducted by Hadgu Grensae et al 2015 didn't had family history of DM^{5,6}.

In our study majority 48% of the participants were under insulin therapy since 3 months -1 year whereas in a similar study conducted by Manish Gholap et al 2016, majority 50% of the participants were under insulin therapy for less than 1 year and % in a study conducted by Hadgu Grensae et al 2015, majority of the participants were under insulin therapy for 1-3 years^{5,6}.

In our study majority 90% of the participant had knowledge that insulin should be stored in the refrigerator but only 50 m% of the participants knew about the temperature to be maintained in refrigerator for the storage of insulin, only 6 %/ knew about the room temperature to be maintained for the storage of insulin and only 48% knew about the technique for storage of insulin incase the refrigerator is not available whereas in a study conducted by Hadgu Grensae et al⁵ 68.7 % of the participants had knowledge that insulin should be stored in a refrigerator or cool & dry place.

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In our study majority, 78% of the participants had appropriate knowledge regarding the time for insulin administration whereas in a similar study conducted by Hadgu Gensea et al⁵. 82.9% of the participants had knowledge regarding time for administration of insulin.

In our study, among various sites abdomen (94%) was most known sites of administration to the participants followed by thigh (90%), upper arm (32%) & buttocks (24%). In a study conducted by Hadgu Gensea et al⁵ 39% of the participants had knowledge about the sites of administration of insulin.

In our study, only 46% of the participants had knowledge on correct angle for the administration of insulin whereas in a similar study conducted by Hadgu Gensea et al⁵ only 16.3% of the participants had knowledge on correct angle for the administration of insulin.

In our study, 56% of the participants had knowledge regarding ways to control pain during ISA whereas the study conducted by Hadgu Gensea et al⁵ only 21% of the participants had knowledge regarding self administration of insulin.

In our study, among the various complication of insulin therapy low blood sugar (30%) is the most known complication to the participants followed by lipodystrophy (16%) & insulin resistance/allergy (14%), similarly in a study conducted by Hadgu Gensea et al⁵ only 10.14% of the participants had knowledge regarding complication of insulin therapy.

In our study only 42 % of the participants always wipes the skin with alcohol whereas 38% wipes sometimes only & 20% never wipes the skin with alcohol before administration of insulin whereas in the study conducted by sarungbam et al⁷ majority of patients (72.42%) didn't clean the injection site.

In our study, only 22.22 % of the participants withdraws syringe partly to check the blood, 22.22%

of the participants withdraw the syringe sometimes & 55.55% of the participants never withdraw the syringe to check the blood during administration of insulin whereas in a similar study conducted by sarungbam et al⁷ none of them withdrew syringe partly to check for presence of blood.

In our study, only 6% of the participants always check their blood glucose level before the administration of insulin while 44% of them checks sometime and 50% never checks their blood glucose level before administration of insulin, similarly in a study conducted by various other authors none of them checked their blood glucose level before administration of insulin while majority of patients checked their blood sugar levels infrequently at 3-4 months interval⁸⁻¹⁰.

In our study, all the participants (100%) didn't self-adjust dose of insulin without consulting physician whereas in a study conducted by sarungbam et al⁷ most of the patients 51(91.07%) didn't self-adjust dose of insulin without consulting physician.

Conclusions

knowledge and practice has a significant association with each other. Thus it is essential to focus on improving the patient's knowledge on the related topic so that the participants can enhance their practice as well. Diabetes & Insulin Self Administration education must be imparted by physicians by counselling patients at each follow up visit while physicians, nurses & other health care provider themselves should be enriched with more knowledge through CME/ CNE and other programmes. Other sources of information like articles, newspapers, television, NGOs (Non-Government Organisations) can play vital role in imparting knowledge regarding diabetes and insulin use in the community.

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