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Barriers to self-injection of insulin among patients attending the diabetes clinics at the three referral hospitals in Bhutan: a cross-sectional study

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ABSTRACT

Introduction: Insulin, despite its increasing cost, is prescribed to selected cases of diabetes patients with an aim to achieve good glycaemic control. However, many on insulin do not achieve glycaemic control. We, therefore, studied the possible factors that may act as barriers to effective self-injection of insulin among diabetes patients at the three referral hospitals in Bhutan. **Methods**: This was a cross-sectional study, conducted from January-June 2017, involving all patients on insulin therapy for more than three months duration. Convenience sampling was used. Respondents' basic details and self-reported barriers to insulin therapy under various domains were collected using an interviewer-administered questionnaire. Ethics approval was granted by the Research Ethics Board of Health, Bhutan. **Results**: There were 207 respondents on insulin therapy. The mean age of the sample was 55 years (±13.8 years) and the mean duration of diabetes was 10.6 years (± 7.8 years). Injection dexterity was an issue in 77 respondents (37.2%) while 37 respondents (17.8%) reported that they would miss their insulin shots if their caregiver were unavailable. Insulin regimens were burdensome and interfered with their daily activities (80; 38.7%) and meal timings (64; 30.9%). Although the majority (179; 86.4%) knew why insulin was indicated for them, 149 (72.0%) found that the healthcare personnel's demonstration on the use of insulin was inadequate and 50 respondents (24.2%) felt that they did not receive enough information on how to inject insulin. **Conclusions**: Barriers to self-injection are common among insulin users and coordinated efforts are needed to overcome them.

Keywords: Diabetes mellitus; Insulin; Psychological insulin resistance; Self-medication.

INTRODUCTION

With an increasing burden of diabetes mellitus[1] and having an estimated 40,000 persons with diabetes across the country[2], injectable insulin is made available up to the district hospitals in Bhutan's free healthcare system[3]. Insulin is prescribed with the aim to increase patients' understanding about their medication, to promote their autonomy and to achieve adequate glycaemic control[4]. The benefits of adequate glycaemic control in reducing complications[5], morbidity and mortality risks[6,7] are well established. However, a review in 2015 showed that glycaemic control was achieved only in 38% of diabetic patients in general in Bhutan[8]. We, therefore, studied the possible factors that may act as barriers to effective self-injection of insulin among those attending the diabetes clinics at the three referral hospitals. Understanding the barriers will contribute towards increasing the effectiveness of physician communication[9], ensuring better medication adherence, achieving glycaemic control and preventing complications of diabetes.

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METHODS

Study design and setting

This was a cross-sectional study done at the Jigme Dorji Wangchuck National Referral Hospital, Central and Eastern Regional Referral Hospitals. The study was conducted between 01 January 2017 and 30 June 2017. Ethical approval was obtained from the Research Ethics Board of Health, Bhutan.

Study participants

Convenience sampling method was used for this study. Respondents aged ≥18 years on self-administration of insulin for more than three months and those who provided valid consent were included. Respondents with gestational diabetes were excluded.

Data collection

Data was collected using an interviewer-administered questionnaire by trained data collectors. Basic details such as age, sex, type of diabetes and the duration of insulin treatment were collected. After a review of literature on subcutaneous injection techniques and self-injection drugs, the variables for perceived barriers were collected under broad domains – injection dexterity,

Table 1. Patients' perceived barriers to self-injection of insulin among those attending the diabetes clinics at the three tertiary hospitals in Bhutan, January-June 2017, *n*= 207

	Strongly disagree		Disagree		Agree		Strongly agree	
	n	%	n	%	n	%	n	%
Injection dexterity								
It is a difficult task to self-inject insulin	89	43.0	41	19.8	28	13.5	49	23.7
Self-injection is a time-consuming process	105	50.7	40	19.4	46	22.2	16	7.7
I would miss my insulin doses if my caregiver is unavailable	144	69.6	26	12.6	15	7.2	22	10.6
Fear of pain								
I fear injection site pain	91	44.0	39	18.8	38	18.4	39	18.8
I have a very strong fear of all needles and injections	86	41.5	41	19.8	32	15.5	48	23.2
I fear that insulin injection will cause as much pain as other injections	96	46.4	36	17.4	35	16.9	40	19.3
Long needles cause me more injection site pain	49	23.7	31	15.0	33	15.9	94	45.4
Fear of side effects								
I fear it might cause hypoglycaemia	43	20.8	45	21.7	71	34.3	48	23.2
I think insulin will cause weight gain	96	46.4	46	22.2	32	15.5	33	15.9
I fear for injection site reactions	92	44.4	32	15.5	33	15.9	50	24.2
I fear insulin has lots of side effects	92	44.4	37	17.9	43	20.8	35	16.9
Burdensome regimens								
I feel that the use of insulin affects my daily activities	94	45.4	33	15.9	60	29.0	20	9.7
I feel that the use of insulin disturbs my meal timings	94	45.4	49	23.7	48	23.2	16	7.7
Attitudes towards insulin								
I think it's okay to miss a few doses of insulin	101	48.8	54	26.1	37	17.9	15	7.2
I am both on oral drugs and insulin, so I can omit insulin	112	54.1	36	17.4	32	15.5	27	13.0
I miss insulin doses because I am forgetful	130	62.8	42	20.3	21	10.1	14	6.8
Social barriers								
I feel embarrassed to inject insulin in front of others	89	43.0	34	16.4	41	19.8	43	20.8
Patient-healthcare provider communication								
I don't know why my doctor prescribed me insulin	145	70.0	34	16.4	14	6.8	14	6.8
I don't feel I got enough instructions on the use of insulin	121	58.4	36	17.4	24	11.6	26	12.6
The methods demonstrated by the healthcare personnel was adequate for me to learn self-injection of insulin	31	15.0	27	13.0	50	24.2	99	47.8

psychological and social barriers to self-injection and perception about insulin[4,10,11]. Each variable was a statement with a four-point rating scale. The questionnaire was pre-tested (n = 20) at the National Referral Hospital to assess their face and content validity.

Data entry and analysis

Data was entered and analysed using a trial version of IBM SPSS 23.0. Descriptive statistics was used to describe the variables.

RESULTS

There were 207 participants in this study: 101 from the National Referral Hospital, 91 from the Central Regional Referral Hospital and 15 from the Eastern Regional Referral Hospital. There were 128 (61.8%) males; 195 (94.2%) had Type 2 and 12 (5.8%) had Type 1 diabetes. The mean age was 55 years (±13.8 years) and the mean duration of diabetes was 10.6 years (± 7.8 years).

Patient-associated barriers

Self-injection of insulin was a difficult task to perform for 77 respondents (37.2%) and 37 respondents (17.8%) reported that they would miss their insulin shots if their caregiver were unavailable. When the supply of insulin syringes were out of stock, the "1 mL syringe" was given as a substitute. This syringe comes with a bigger needle and 127 participants (61.4%) said that longer needles caused more pain at the injection site. Respondents also found it difficult to adjust insulin dosing with their daily activities (80; 38.6%) and meal timings (64; 30.9%). The other barriers to self-injection are shown in Table 1.

Provider-associated barriers

Although the majority (179; 86.5%) knew why insulin was indicated for them, 149 respondents (72.0%) found that the healthcare personnel's demonstration on the use of insulin was inadequate and 50 respondents (24.2%) felt that they did not receive enough information on how to inject insulin.

DISCUSSION

While many of the respondents interviewed had been using insulin for a long time, the findings from this survey suggest that barriers to insulin therapy are common and remain unaddressed. Potential solutions for the management of domains such as fear of pain and side effects, burdensome regimens, social barriers to self-injection and poor communication have been studied for insulin and other self-injectable drugs[10].

We found that injection dexterity was a major problem so much so that one-fifth of the respondents reported that they would miss their insulin doses if their caregivers were unavailable. Injection dexterity is a key factor in improving the injection technique[12] and requires repeated assessment of their techniques, reinforcement of correct steps and correction of mistakes in the interactive communication loop[9].

In our sample, the fear of injection was more common when respondents were supplied with the "1 mL syringe" instead of the insulin syringe. Patients also had fear of side effects such as weight gain and hypoglycaemia. These factors act as an inertia for both the initiation of therapy and titration of insulin doses[10]. Patients also had difficulties in adjusting their daily activities and meal timings with insulin dosing while some had negative attitudes towards insulin. All these factors emphasize the crucial roles of diabetes educator nurses[13] and dieticians[14] in filling the gap in patient education posed by the inadequate doctor-patient contact time. The use of an insulin pen has better uptake compared to conventional insulin syringes[15,16] but in Bhutan, the essential medicine list neither provides insulin pen nor its cartridge[3].

Diabetes in its natural course has a progressive depletion of insulin and requires it to be supplemented as the duration of disease increases[17]. However, in many doctor-patient encounters, insulin is often used as a threat and is projected that patients are given insulin because of their poor compliance with oral drugs and lifestyle modifications[18,19]. This is coupled with, as noted in our study, some respondents not being aware why they were prescribed with insulin. "Psychological insulin resistance" is observed to be a common phenomenon[10,20]. It refers to the reluctance of physicians to prescribe or escalate the dose of insulin based on the misplaced judgment on patients' willingness to accept and adhere to insulin regimen; and various factors related to patients' resistance to self-inject insulin[20]. Therefore, whenever insulin is indicated, before starting insulin therapy the healthcare provider and the patient need to discuss and plan the therapy.

With a steady increase in the burden of diabetes and other non-communicable diseases in Bhutan[1,21], insulin may be made available even to the primary level hospitals[22]. Analogue insulin contributes a significant share to the increasing cost of diabetes treatment[23,24] and more efforts are needed to address the barriers to insulin therapy to bring about improved glycaemic control in our patients.

LIMITATIONS

This study was conducted in the three referral hospitals where there are dedicated physicians and nutritionists to provide care for patients with diabetes. The situation might be different in district hospitals where care is provided by general doctors. The use of Likert scale using an interviewer-administered questionnaire in the assessment of perception is prone to central tendency, acquiescence and social desirability biases. Therefore, a qualitative analyses of their views and perceptions is recommended. Another limitation is the limited number of participants from the Eastern Regional Referral Hospital due poor availability of data.

CONCLUSIONS

In Bhutan, barriers to self-injection are common among the diabetes patients on insulin. More efforts are needed to overcome these barriers and achieve good glycaemic control.

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AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

TD: Concept, design, data collection and analysis, manuscript writing and review.

PL: Concept, design, data collection and analysis, manuscript review.

TT: Concept, design, data collection and analysis, manuscript review.

LZ: Concept, design, data collection and manuscript review.

KC: Concept, design, data collection and manuscript review.

DC: Concept, design, data collection and manuscript review.

KN: Concept, design and manuscript review.

Author agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None

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