

## Research Article

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# Beliefs about Insulin Treatment of Type 2 Diabetic Patients in Kinshasa, Democratic Republic of the Congo

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## Abstract

**Background:** It is not rare that diabetic patients, motivated by many beliefs, express resistance at the initiation of insulin therapy leading to delays of treatment and subsequent poor control of diabetes. Knowledge of patients' beliefs towards insulin is essential to better orient the education of diabetics.

**Methods:** This is a cross-sectional study aimed at identifying beliefs about insulin therapy in our community using a psychometric test, "the Ch-ASIQ (The Chinese Attitudes to Starting Insulin Questionnaire)" among 213 diabetic patients in three diabetes management health facilities in Kinshasa. Logistic regression was performed to determine significant beliefs among participants with psychological insulin resistance. The statistical significance level is  $p < 0.05$ .

**Results:** Out of 213 patients included in the study, 42.7% had psychological insulin resistance. The psychological insulin resistance was motivated by the worry for patients that other people know they have diabetes through the insulin treatment [ORa: 3.44 (1.15-5.56), p: 0.000], the pain caused by insulin injection [ORa: 4.65 (1.42-7.05), p: 0.003], the worry over the need to perform home blood glucose monitoring (OR: 3.55 (1.35-6.87), p: 0.011) and the lack of family support to support them to inject insulin [ORa: 5.43 (2.92) -10.10), p: 0.000].

**Conclusion:** There is a need for education of both diabetic patients and their entourage in order to successfully remove barriers to insulin adherence. Alleviating financial burden of patients and families will help to face additional obstacles related to cost.

**Keywords:** Beliefs; Diabetes mellitus type 2; Insulin; Psychological insulin resistance

## Background

Worldwide, the prevalence of diabetes mellitus has increased from 4.7% in 1980 to 8.5% in 2014 [1] and it is estimated that in 2040, it will be of 10.4% [2]. Low- and middle-income countries are experiencing the greatest growth of the diabetes epidemic, and their populations are vulnerable to consequences of diabetes, maximized by the non-prioritization of diabetes in health policies with as a consequence, an inadequate response of health systems [1,3].

Lack of glycemic control imposes a risk of developing complications in diabetic patients [4]. Insulin is an important resource in the therapeutic arsenal of diabetes mellitus and becomes unavoidable at a stage in the course of the disease [5,6]. Yet many diabetic patients do not start insulin treatment at the ideal time, partly due to resistance from both providers and patients to start insulin [7,8]. This phenomenon, called psychological insulin resistance is widespread, but unknown and multifactorial [7-11]. Psychological insulin resistance is determined by a number of beliefs and perceptions about diabetes that vary by country [7,11].

Four types factors of psychological insulin resistance are encountered, namely: emotional factors (fears, restriction of

freedom ...), cognitive (lack of knowledge about insulin or disease, technical difficulties, feeling of aggravation of the disease), social or cultural (social stigma and embarrassment) and relational (lack of communication from caregiver to patient) [12]. In the Democratic Republic of the Congo (DRC), no study has evaluated beliefs towards insulin. Awareness of beliefs is essential for providers to develop a diabetes education strategy.

## Methods

### Type of study

Our study was a cross-sectional study. The study was part of a broader study assessing psychological insulin resistance and its determinants in three health facilities in the city of Kinshasa in the Democratic Republic of the Congo. The main objective is to highlight the beliefs underlying psychological insulin resistance through an analysis of the items in a psychometric test, called, "The Chinese Attitudes to Starting Insulin Questionnaire".

### Framework and period of the study

Three diabetes management health facilities served as study sites from 01 November 2017 to 31 March 2018. This is the Diabetic unit of CHME Monkole located in the Mont-Ngafula health zone 1, the Diabetic Clinic of the Tatamena Health Center located in the Bumbu Health Zone and the Diabetes Unit of the DRC SMS Hospital Center located in the Gombe Health Zone. These health facilities organize outpatient consultations of diabetic patients at a weekly rate.

### Target population of the study

Diabetic patients followed in three diabetes management health facilities formed the study population.

### Inclusion criteria

To be included in our study, patients had to meet the following criteria: be a type 2 diabetic (any diabetic patient who had knowledge of the type of diabetes or was diagnosed with diabetes after 40 years of age); be on oral antidiabetic medication; be regularly monitored in one of the clinics retained in the study and having given informed consent.

### Exclusion criteria

Patients who met the following criteria were excluded: diabetic with behavioural disorder; diabetic less than 15 years old; and diabetic patients under insulin therapy.

### Sampling and recruitment method

Sampling was by convenience with a consecutive recruitment pattern.

### Sample size

The sample size was calculated according to the following formula: With  $P = 0.5$  as the proportion of diabetic patients with positive beliefs are unknown,  $Z = 1.96$  and  $d = 0.1$  to 96. Expecting a non-

response rate of 10%, we add it and the minimum size was 106. In total, 213 diabetic patients were included in the study representing as twice of calculated sample.

### Collection of data

The data collection was made during interviews by two investigators, the principal investigator and other trained investigators. As a standardized questionnaire, the Chinese Attitudes to Starting Insulin Questionnaire (CH-ASIQ), was used after a pre-test for data collection [13]. It is a psychometric test comprising 13 items divided into four factors: "self-image and stigma" counts 3 items; "factors favouring self-efficacy" counts 5 items; "fear of pain or needles" counts 3 items; and "time and family support" counts 2 items. Responses to each item are coded according to the 4 point Likert scale (Totally Disagree = 1, Disagree = 2, Agree = 3, Completely Agree = 4). High scores with "time and family support" and "self-efficacy factors" reflect a more positive attitude to insulin therapy; high scores for "self-image and stigma" and "fear of pain or needles" mean a more negative attitude towards insulin initiation [14]. All factors and overall score range from 1 to 4 with a central point of 2.5 [14]. The questionnaire translated from English to French and Lingala was used depending on either of the 2 languages in which the patient was more comfortable speaking.

### Variables of interest in the study

The primary interest variable: beliefs about insulin treatment

### Statistical analyses

The data were encoded in an Excel database after checking and cleaning the database, and was exported to the SPSS software (Statistical Package for Social Sciences, Chicago) version 21. The results are presented in tabular form.

### Ethical considerations

The study was conducted with the approval of the Ethics Committee of the Protestant University in Congo (Ref: CEUPC0031).

## Results

A total of 213 patients with type 2 diabetes took part in the study. Participants had an average age of  $59.8 \pm 11.1$  years with extremes of 30 and 84 years, and 84 were male compared to 129 females. The majority of participants were married (75.1%), with low or average education level (70.9%) and unemployed (70.0%). The mean duration of diabetes was 4 years in 65.7% of patients, including frequent association with other morbidities, the first of which was hypertension (65.7%), and about a third of patients (34.3%) had a diabetes complication. Table 1 summarizes beliefs about the initiation to insulin therapy for all participants. Overall, the majority of participants totally disapproved of the items "If I have to inject insulin, it makes me feel like drug addicts" (68.5%), "I'm worry that people will know I have I have diabetes if I am on insulin treatment" (56.3%) and "Injecting insulin is embarrassing, I worry about being seen when I inject insulin" (54.0%). Just under

half of patients approved the items “I have up-to date knowledge about diabetes management” (46.9%), “I can pay as close attention to my diet as insulin treatment requires” and “I may need to take a snack or reduce eating amount appropriately according” (48.8%). Less than half of the participants completely approved the items “Insulin can help control blood glucose and prevent complications” (43.7%) and “I am afraid of needle injections” (42.3%).

	Completely Disagree	Disagree	Agree	Completely Agree
I'm worry that people will know I have I have diabetes if I am on insulin treatment	120(56,3)	3(1,4)	21(9,9)	69(32,4)
Injecting insulin is embarrassing, I worry about being seen when I inject insulin	115(54,0)	9(4,2)	22(10,3)	67(31,5)
If I have to inject insulin, it makes me feel like drug addicts	146(68,5)	54(25,4)	5(2,3)	8(3,8)
I have up-to date knowledge about diabetes management	26(12,2)	48(22,5)	100(46,9)	39(18,3)
Insulin can help control blood glucose and prevent complications	27(12,7)	14(6,6)	79(37,1)	93(43,7)
I can manage the skill of injecting insulin	47(22,1)	58(27,2)	41(19,2)	67(31,5)
There is social support available if I have to inject insulin	4(19,2)	60(28,2)	41(19,2)	71(33,3)
I can pay as close attention to my diet as insulin treatment requires. For example, I may need to take snack or reduce eating amount appropriately according	27(12,7)	24(11,3)	104(48,8)	58(27,2)
Injecting insulin is painful	54(25,4)	57(26,8)	60(28,2)	42(19,7)
I am afraid of needle injections	55(25,8)	43(20,2)	25(11,7)	9(42,3)
I worry about needing to perform home blood glucose monitoring	78(36,6)	51(23,9)	43(20,2)	41(19,2)
I can spare enough time to perform insulin injection	68(31,9)	52(24,4)	68(31,9)	25(11,7)
My family will support me to inject insulin	16(7,5)	42(19,7)	80(37,6)	75(35,2)

**Table 1:** Distribution of beliefs about insulin therapy among diabetics in Kinshasa sorted out with the Ch-ASIQ, n = 213, 2018.

Globally, 42.7% of patients had psychological insulin resistance. Table 2 summarizes the comparison between diabetics with psychological insulin resistance to those without it, seven of the thirteen components of the psychometric test showed a significant difference between the two groups.

	Resistant N(%)	Accepted N(%)	p
I'm worry that people will know I have I have diabetes if I am on insulin treatment	57(62,6)	12(9,8)	<0,001
Injecting insulin is embarrassing, I worry about being seen when I inject insulin	51(56,0)	16(13,1)	<0,001
If I have to inject insulin, it makes me feel like drug addicts	7(7,7)	1(0,8)	<0,001

I have up-to date knowledge about diabetes management	6(6,6)	20(16,4)	<0,001
Insulin can help control blood glucose and prevent complications	40(44,0)	53(43,4)	0,721
I can manage the skill of injecting insulin	28(30,8)	39(32,0)	0,130
There is social support available if I have to inject insulin	32(35,2)	39(32,0)	0,207
I can pay as close attention to my diet as insulin treatment requires. For example, I may need to take snack or reduce eating amount appropriately according	37(40,7)	21(17,2)	0,002
Injecting insulin is painful	29(31,9)	13(10,7)	<0,001
I am afraid of needle injections	36(39,6)	54(44,3)	0,150
I worry about needing to perform home blood glucose monitoring	13(14,3)	65(53,3)	<0,001
I can spare enough time to perform insulin injection	28(30,8)	40(32,8)	0,146
My family will support me to inject insulin	12(13,2)	68(55,7)	<0,001

**Table 2:** Beliefs associated with psychological insulin resistance in diabetics in Kinshasa, n = 213, 2018.

The multivariate logistic regression analysis retained as items showing a significant difference between diabetics with psychological insulin resistance compared to those without insulin resistance, the following: “I’m worry that people will know I have I have diabetes if I am on insulin treatment” (ORa: 3.44 (1.15-5.56), p: 0.000), “The injection of insulin is painful” (ORa: 4.65 (1.42-7) , 05), p: 0.00 3), “I am concerned about the need to monitor blood glucose at home” (OR: 3.55 (1.35-6.87), p: 0.011) and “My family will support me to inject insulin” (ORa: 5.43 (2.92-10.10), p: 0.000) (Table 3).

	Univariate Analyse		Multivariate Analyses	
	p	OR (IC95%)	p	ORa (IC95%)
I’m worry that people will know I have I have diabetes if I am on insulin treatment	0,000	2,98(1,26-4,43)	0,000	3,44(1,15-5,56)
Injecting insulin is embarrassing, I worry about being seen when I inject insulin	0,000	2,77(1,28-4,46)	0,178	1,17(0,38-1,92)
If I have to inject insulin, it makes me feel like drug addicts	0,000	9,71(3,05-12,20)	0,874	1,37(0,41-2,10)
I can pay as close attention to my diet as insulin treatment requires. For example, I may need to take snack or reduce eating amount appropriately according	0,003	1,61(1,45-2,85)	0,162	1,48(0,85-2,58)
Injecting insulin is painful	0,012	3,51(1,05-5,95)	0,003	4,65(1,42-7,05)
I worry about needing to perform home blood glucose monitoring	0,000	2,21(1,34-3,59)	0,011	3,55(1,35-6,87)
My family will support me to inject insulin	0,000	2,02(1,45-2,78)	0,000	5,43(2,92-10,10)

**Table 3:** Significant beliefs of psychological insulin resistance in diabetics in Kinshasa, n = 213, 2018.

## Discussion

Our study focused on beliefs developed by diabetics about insulin therapy and involved 213 patients followed in three diabetes management health facilities in Kinshasa; a psychometric test and the analyses showed that beliefs presenting a statistically significant difference are “I’m worry that people will know I have I have diabetes if I am on insulin treatment”, “Injecting insulin is painful”, “I worry about needing to perform home blood glucose monitoring” and “My family will support me to inject insulin.”

Sufficiently highlighted in the literature [15] stigmatization appears as an important theme in explaining the reluctance of diabetic patients to start insulin in our environment; participants are afraid that taking insulin will reveal their diabetic status to relatives. Moreover, as pointed out by Shiu, et al. [16] the patient’s entourage may express misunderstanding about the treatment and / or the nature of diabetes as a chronic disease. If elsewhere, the sight of syringes is related to drug addiction, the discovery of the patient’s diabetes can evoke from relatives talks of witchcraft or a bad spell as the basis of diabetes. Moreover, in agreement with Rubin and Peyrot [17] family members and friends consider patients differently; in our environment where diabetes is linked to complications and high mortality, diabetes is sometimes equated with a weak being whose death is near.

The assertion that injecting insulin is painful was linked to a significant difference between accepting and insulin-resistant patients; our data corroborate those of several authors [18-20]. According to Brod, et al. [15] the thought that the injection of insulin is painful is part of a larger framework called “fear of injections” where other components such as technical difficulties, fear to inflict pain, fear of self-injection, rejection of daily injections, and general anxiety or phobia of needles are found.

The treatment of diabetes, in general, requires several adjustments in lifestyle and many restrictions; insulin adds to the burden and stress of managing diabetes on a daily basis, with the corollary that everyday life is not very flexible [8,18,21,22]. This concern is found among participants in our study, with a significant difference between the two patient groups, those accepting insulin compared to those insulin resistant.

Diabetes is a chronic pathology and linked to many connotations in our environment; by its origin, it is discussed and many believe that it comes from a spell on the sick person and few believe that the treatment of insulin is effective; thus many patients will not have the support of their families in the continuation of treatment. Many families will seek to consult the traditional healer who sometimes recommends treatment or an attitude that puts diabetic patients at risk. In addition, the cost of insulin is a factor limiting the use of modern medicine. We must take into account the negative role of traditional medicine in the transmission and interpretation of diabetes information as well as the spiritual movements that sometimes convey opposing messages, thus increasing the negative attitude and the bad perception on insulin therapy [22].

## Conclusion

The fear that insulin treatment will reveal the status of diabetes, of not meeting the requirements of insulin treatment, of injections, and the lack of family support are beliefs that have emerged as underlying psychological insulin resistance in our sample. There is a need for education of both diabetic patients and their entourage in order to successfully remove barriers to insulin adherence. The search for other ways of financing patient care should also be sought so as not to burden the patient and those around him, and thus not raise an additional obstacle related to cost.

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