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Lawan Ahmed Ibrahim AL-Mufti, Omer Q. B. Allela, Hishyar Mohammed Salih & Idris Haji Ahmed

Journal of Public Health
From Theory to Practice

ISSN 2198-1833

J Public Health (Berl.)
DOI 10.1007/s10389-020-01367-z

Springer

Journal of Public Health: From Theory to Practice
https://doi.org/10.1007/s10389-020-01367-z

ORIGINAL ARTICLE

Medication satisfaction in diabetic patients: Kurdish version

Lawan Ahmed Ibrahim AL-Mufti[1] · Omer Q. B. Allela[2] · Hishyar Mohammed Salih[3] · Idris Haji Ahmed[4]

Received: 5 May 2020 / Accepted: 8 July 2020

Abstract

Background Treatment satisfaction has been linked with better glycemic control and lower morbidity. The aims of this study were to translate the TSQM-14 questionnaire into a Kurdish version, to validate the TSQM-14 questionnaire, and to evaluate treatment satisfaction.

Methods This was a cross-sectional survey study. A convenient sample of 307 diabetic patients was studied. The Treatment Satisfaction Questionnaire for Medication (TSQM-14) was utilized to evaluate treatment satisfaction. Statistical Package for Social Sciences (SPSS) version 20 was applied for authentic statistical study.

Results The mean outcomes of satisfaction area were 52.75 ± 13.12, 13 ± 23.59, 54.86 ± 11.77, and 56.91 ± 15.16 for effectiveness (EFF), side effects (SE), convenience (CONV), and global satisfaction (GS) respectively.

Conclusion Developing patients' treatment satisfaction will improve treatment management.

Keywords Satisfaction · Kurdish · TSQM-14 · Iraq

Introduction

National Health and Nutrition Examination Survey (NHANES) statistics show that 43–45% of patients with diabetes do not achieve a glycaemic control (HbA1C) of <7%. Every year, almost 1 million people die as a result of diabetes, with two-thirds of these deaths occurring in developing countries (Lopez et al. 2006).

Treatment satisfaction among diabetic patients is a significant determinant of patients' health-related choices such as adherence (Biderman et al. 2009). Treatment satisfaction has been linked to better glycaemic control and lower morbidity rates (Biderman et al. 2009; Nozaki et al. 2009).

Treatment satisfaction is one of the patient-reported outcomes (PROs) that is potentially useful for understanding patients' views on their current treatment and can distinguish among different treatments. Treatment satisfaction represents a significant result, since it is related to adherence and the desire to continue treatment. PROs include health-related quality of life (HRQoL), self-reported symptoms, functional status, and other endpoints derived from direct reports of patient experience. These PROs are frequently used to assess the impact of disease and treatment on patients' functioning, well-being, and daily life in clinical trials and other studies, including those regarding diabetes. Evaluation of treatment satisfaction in diabetes is compromised by an insufficient conceptual foundation and poorly developed evaluation methods (Redekop et al. 2002).

Treatment satisfaction focuses on one aspect of satisfaction related to medical care (Ware et al. 1983; Pascoe 1983; van Campen et al. 1995) and involves the interaction of preferences, expectations, and satisfaction with medical treatment.

The aims of the present study were to translate the TSQM-14 questionnaire into Kurdish, followed by the validation of this new version, and to evaluate treatment satisfaction.

✉ Omer Q. B. Allela
omarallela2010@gmail.com

Lawan Ahmed Ibrahim AL-Mufti
lawan_coph@yahoo.com

Hishyar Mohammed Salih
garmavy@gmail.com

Idris Haji Ahmed
Idres1975@yahoo.com

[1] Directory of Health, Duhok, Kurdistan Region 42001, Iraq

[2] Department of Pharmacy, Al-Noor College University, Mosul, Iraq

[3] College of Pharmacy, University of Duhok (UOD), Duhok, Kurdistan Region 42001, Iraq

[4] Azadi Teaching Hospital, Duhok, Kurdistan Region 42001, Iraq

Published online: 18 July 2020

Methodology

A cross-sectional survey was chosen, and data were gathered using a self-reported and structured questionnaire.

Most Kurdish-Iraqi patients with diabetes receive their medication from the non-public healthcare system. Subjects were recruited from the Diabetes Outpatient Clinic at Sheelan Private Hospital in Duhok province, Kurdistan-region of Iraq. Non-private sectors, such as government clinics and hospitals, were not included in the present study due to convenience issues and disparity in socioeconomic status.

Inclusion criteria were patients with diabetes who had been treated for at least 6 months prior to enrollment in the study and had new HbA1c scores no older than 3 months. Pregnant females with and without gestational diabetes were excluded from the present study.

A convenience sample of 307 diabetic outpatients was collected from 1 July 2017 to 31 December 2017.

For the collection of data required to validate the study, an analytical questionnaire was used, which consisted of two parts: (1) patient sociodemographics with diabetes-related data, including HbA1C levels; (2) the 14-item TSQM (Sweileh et al. 2011; Jamous et al. 2011). A sociodemographic datasheet was collected from the patients, which encompassed patient age, gender, weight, educational level, marital status, and family history. The datasheet also contained information regarding diabetes duration, medication type, and new HbA1C level.

The most convenient, inexpensive, and easiest method for the evaluation of treatment satisfaction is the self-reporting method. The 14-item TSQM has been widely used to measure treatment satisfaction in diabetic studies, being a psychometrically robust and validated instrument consisting of four scales (Bharmal et al. 2009). The four scales of the TSQM-14 questionnaire include the effectiveness (EFF) scale (questions 1–3), the side effect (SE) scale (questions 4–8), the convenience (CONV) scale (questions 9–11), and the global satisfaction (GS) scale (questions 12–14). The TSQM-14 domain scores were calculated as recommended by the instrument's authors (Atkinson et al. 2004, 2005), and range from 0 to 100, with a high score representing high treatment satisfaction in that domain.

The two sections of the data collection sheet were collectively translated according to international guidelines (Al-Lela et al. 2011, 2014a, b, Wild et al. 2005, Guillemin et al. 1993).

Since the study was performed in the Kurdistan-region of Iraq, the questionnaire had to be translated into the Kurdish language. The questionnaire was translated by two bilingual Kurdish lecturers at the College of Languages, Literacy, and Translations, University of Duhok. This double translation method ensures maximum efficiency of the translation to avoid confusion or misinterpretation (Del Greco et al. 1987). Finally, two versions of the questionnaire were used for data collection (one in Kurdish and the other in English). To test reliability, the internal consistency and corrected item-total correlations were assessed using Cronbach's alpha. Spearman's rank correlation coefficient was used to obtain test–retest reliability values and determine the known-groups validity (Rattray and Jones 2007).

The study proposal was submitted to the College of Pharmacy, University of Duhok, which was approved by the Postgraduate Committee. All patients were informed of their rights to reject taking part in the present study. Verbal patient consent was obtained prior to starting the questionnaire.

Finally, data collected via face-to-face interviews was carefully examined to ensure completeness. Data was analyzed using the computer program SPSS for Windows (Statistical Package for Social Sciences) version 20.0; the level of statistical significance was set at $p < 0.05$ for all analyses (Table 1).

Results

Reliability

Cronbach's alpha of internal consistency was found to be 0.828 for the three items in the effectiveness questions, 0.957 for the five items in the side effect questions, 0.758 for the three items in the convenience questions, and 0.732 for the three items in the global satisfaction questions (Table 2).

Validity

There was a significant negative correlation between the effectiveness and HbA1c scores (−0.560; $p < 0.001$), an insignificant negative correlation between the side effect and HbA1c scores (−0.159; $p = 0.275$), a significant negative correlation between the convenience and HbA1c scores (−0.321; $p = 0.025$), and a significant negative correlation between the global satisfaction and HbA1c scores (−0.329; $p = 0.021$) (Table 1).

Table 1 Correlation of treatment satisfaction with HbA1c score

Parameter	Correlation with HbA1c	*p* value
Treatment satisfaction		
Effectiveness*	−0.560	<0.001
Side effects*	−0.159	0.275
Convenience*	−0.321	0.025
Global satisfaction*	−0.329	0.021

Spearman Rho correlation coefficient test

* Significant, *p* value < 0.05

Table 2 Cronbach's alpha and descriptive statistics

Parameter	Cronbach's alpha	Mean	Standard deviation	Minimum	Maximum
Treatment satisfaction					
Effectiveness	0.828	56.06	13.39	29	95
Side effects	0.957	17	24.75	0	71
Convenience	0.758	57.48	10.17	38	86
Global satisfaction	0.732	64.48	11.15	41	94

Cronbach's alpha of internal consistency test

Table 3 shows the correlation among effectiveness, side effect, convenience, global satisfaction scores, and the HbA1c score. As hypothesized, patients who reported an increase in the effectiveness, side effect, convenience, and global satisfaction scores also reported a decrease in HbA1c score. On the other hand, patients who reported a decrease in effectiveness, side effect, convenience, and global satisfaction scores also reported an increase in HbA1c score.

Demographic characteristics

The mean age of the patients was 51.17 ± 14.53 years old, and the mean weight was 76.21 ± 15.86 kg. The number of male and female diabetic patients was 104 (33.9%) and 203 (66.1%), respectively. Regarding family history, the majority of patients had a positive family history (71%), while the remaining had a negative family history (29%). With respect to marital status, 277 (90.2%) patients were married, while 30 (9.8%) patients were single. As for educational level, 44.3% of patients were uneducated, 33.2% were primary educated, 16.9% were secondary educated, and 5.5% were college educated (Table 4).

Diabetes-related data

The mean HbA1C score was 8.77 ± 1.77 and ranged from 5 to 15. The majority (37.8%) of patients had more than 10 years' duration of diabetes, 37.1% had < 5 years' duration, and 25.1% had 5–10 years' duration. The majority of patients (88.3%) had uncontrolled diabetes (HbA1c > 6.5) and 3.6% had controlled diabetes (HbA1c < 6). Out of the entire cohort of 307 patients, only 86 (28%) were free from complications. The most common complication was neuropathy with retinopathy (33.9%). The majority of patients (221, 72%) were taking

Table 3 Reliability test: 22 questions regarding drug treatment satisfaction

Parameter	Corrected item-total correlation	Cronbach's alpha if item deleted
Treatment satisfaction		
Effectiveness		
Q1	0.755	0.695
Q2	0.75	0.696
Q3	0.582	0.858
Side effects		
Q4	0.941	0.913
Q5	0.785	0.901
Q6	0.876	0.879
Q7	0.823	0.893
Q8	0.914	0.866
Convenience		
Q9	0.524	0.739
Q10	0.675	0.507
Q11	0.552	0.694
Global satisfaction		
Q12	0.493	0.718
Q13	0.588	0.608
Q14	0.594	0.601

Table 4 Demographic characteristics

Variable	Frequency	Percentage
Gender		
Male	104	33.9
Female	203	66.1
Family history		
Negative	89	29
Positive	218	71
Marital status		
Single	30	9.8
Married	277	90.2
Educational level		
None	136	44.3
Primary school	102	33.2
Secondary school	52	16.9
College	17	5.5
Total	307	100

oral medication, while 37 (12%) were taking medication by injection and 49 (16%) were taking combined medication (Table 5).

Association of treatment satisfaction variables with demographic characteristics

The association of treatment satisfaction variables with demographic characteristics were analyzed using the chi-square test. The mean effectiveness, side effect, convenience, and global satisfaction scores were 52.75 (SD = 13.12), 13.03 (SD = 23.59), 54.86 (SD = 11.77), and 56.91 (SD = 15.16), respectively. A significant ($p < 0.05$) relationship between effectiveness and gender, DM duration, and educational level was found (Table 6). In addition, a significant ($p < 0.05$) relationship between convenience and gender, DM duration, and educational level was found. Moreover, a significant ($p < 0.05$) relationship between side effects and gender was found. No significant ($p > 0.05$) association between side effects, DM duration, and educational level was found. A significant ($p < 0.05$) relationship between global satisfaction and gender, DM duration, and educational level was found (Table 6).

Table 5 Diabetes-related data

Variable	Frequency	Percentage
Diabetes mellitus duration (years)		
0–5	114	37.1
5–10	77	25.1
>10	116	37.8
HbA1c group		
Controlled	11	3.6
Pre-diabetic	25	8.1
Diabetic	271	88.3
Complications		
None	86	28
Retinopathy	30	9.8
Neuropathy	69	22.5
Nephropathy	1	0.3
Retinopathy + neuropathy	104	33.9
Retinopathy + nephropathy	1	0.3
Neuropathy + nephropathy	4	1.3
All	12	3.9
Medication type		
Oral	221	72
Injection	37	12
Combined	49	16

Correlations among total HbA1c score and treatment satisfaction

The relationships among the total HbA1c score and treatment satisfaction were examined using Spearman's Rho correlation coefficient (Table 7). Inverse correlations were found among HbA1c and adherence, effectiveness, side effects, convenience, and global satisfaction (Table 7).

Discussion

The present study was the first to use a translated and validated questionnaire instrument to measure drug treatment satisfaction among Iraqi-Kurdish patients.

Although patients' satisfaction regarding their healthcare provider was not evaluated by a valid scale and the results may not be extremely precise, the present study found that the majority of patients (78.8%) were satisfied with the manner by which their physician and healthcare provider controlled their diabetes. In general, there is insufficient knowledge in society regarding diabetes, in addition to poor attention to self-management behavior and low educational levels and social care. It is crucial in diabetes management to obtain

Table 6 Association of treatment satisfaction with demographic characteristics

Variable	Mean ± SD	Gender	DM duration	Education
Effectiveness	52.75 ± 13.12	<0.001*	< 0.001*	<0.001*
Side effects	13.03 ± 23.59	0.005*	0.098	0.74
Convenience	54.86 ± 11.77	0.011*	0.047*	0.001*
Global satisfaction	56.91 ± 15.16	0.01*	0.005*	0.006*

Chi-square test

* Significant, p value <0.05

Fisher's test for cell <5

Table 7 Correlations among total HbA1c score and treatment satisfaction

Variable	HbA1c	Effectiveness	Side effects	Convenience	Global satisfaction
HbA1c	/	−0.760	−0.047	−0.670	−0.682
Effectiveness	−0.760	/	−.058	0.752	0.802
Side effects	−0.047	−0.58	/	−0.122	−0.042
Convenience	−0.670	0.752	−0.122	/	0.722
Global satisfaction	−0.682	0.802	−0.042	0.722	/

Spearman's Rho correlation coefficient test

a good relationship and communication between healthcare providers and patients to insure better self-management.

The study outcomes confirm that gender, diabetes duration, and educational level were significantly associated with effectiveness, convenience, and global satisfaction. The data prove that gender was considerably associated with side effects, while diabetes duration and educational level were not significantly associated with side effects. However, there is an insufficient number of studies evaluating the association between treatment satisfaction and demographic characteristics.

The correlation among the total HbA1c score and treatment satisfaction was assessed, revealing inverse correlations between HbA1c and effectiveness, convenience, side effects, and global satisfaction.

In another study in Palestine, the outcomes confirmed that the majority of patients included in the study had a high satisfaction level with the side effects and effectiveness of their oral hypoglycaemic medication. Furthermore, differences in satisfaction with effectiveness were associated with differences in adherence, where patients with the highest satisfaction concerning effectiveness had the highest adherence level.

Another study conducted in 2499 patients with diabetes using the WHO Diabetes Treatment Satisfaction Questionnaire (DTSQ) determined a negative association between treatment satisfaction and HbA1C levels (Nicolucci et al. 2009). Moreover, in a study conducted to measure the frequency of tolerability problems among type II DM patients and its association with satisfaction, the authors concluded that optimization of oral hypoglycaemic therapy by enhancing tolerability can improve patient satisfaction and health related-quality of life (Pollack et al. 2010). It has also been noted that there exist differences among different types of oral hypoglycaemic medication in terms of tolerability and consequently in terms of treatment satisfaction and medication adherence (Bolen et al. 2007), which may cause changes in medications (Cramer 2004; Asche et al. 2008).

Conclusion

Inverse correlations were found between HbA1c levels and adherence and treatment satisfaction variables, indicating that when patient treatment satisfaction increases, HbA1c levels decrease.

Recommendations

With the rising positive effect of treatment satisfaction on adherence and diabetes consequences, reliable and valid tools for measuring treatment satisfaction are recommended. TSQM-14 was used to evaluate satisfaction, and overall, the majority of patients were satisfied with their healthcare provider; thus, positive physician communication can lead to better medication satisfaction results.

Authors' contributions All authors have made substantial contributions to the conception of the study, drafting the article, and final approval of the version to be submitted. OQ, LA, and HM conceived and designed the study. OQ and LA did the electronic search for the relevant articles and drafted the manuscript. HM and IH analyzed the data OQ and HM revised and edited the manuscript. OQ and IH prepared the manuscript for publication. All authors have read and approved the final submitted manuscript.

Compliance with ethical standards

Competing interest The authors declare that they have no competing interests.

Ethical and informed consent Informed consent was obtained from all individual participants included in the study.

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