

## Construction and validation of an instrument to assess primary care level patient satisfaction

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### Abstract

**Objective:** To develop an instrument to assess the satisfaction of patients using health services at the first care level of the city of Mexico (SSA), adapted to the socio-cultural characteristics of the population, and to examine its reliability and validity. **Methods:** The instrument reagents were designed using the natural semantic networks technique. The dimensions used have been determined from the literature. Participants included 230 adults with type 2 diabetes attending eight SSA health centers. Subsequently, intelligibility was determined by conducting a pilot, then the construct validity of the instrument by means of exploratory factor analysis was evaluated and its internal consistency was determined by calculating Cronbach's alpha. **Results:** The questionnaire is composed of six factors with a Likert-type scale. Its consistency showed a Cronbach's alpha of 0.94. The factor structure included 29 reagents that correlated with the six dimensions with factorial loads > 0.581 that explained 66.8% of the total variance. **Conclusions:** The patient satisfaction questionnaire incorporates the sociocultural characteristics of the target population and has an adequate level of validity and reliability and is quick and easy in application. (Gac Med Mex. 2016;152:36-43)

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### Introduction

Primary health-care postulates demand from health systems to place the individuals at the center of medical attention<sup>1-3</sup>. This way, that what people consider to be desirable forms to face their diseases constitute important parameters to guide the health sector. To meet this end, compromises taking into account the

citizens' expectations on health and healthcare have to be established in order to promote for their opinion to be taken into account in the planning and operation of health services<sup>3</sup>.

To improve both the organization of the system and the strategies for its assessment, the opinions and expectations of people with regard to their satisfaction with health services have to be known<sup>14</sup>. Patient satisfaction with the medical care received has

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been postulated to be essential, as it can indirectly express the results on the quality of care of services<sup>5</sup>, especially those provided in primary care, since its defective functioning directly impacts on the quality of other levels of care<sup>6,7</sup>.

The satisfaction of the users of a health service can be conceptually defined as personal judgments of value and subsequent reactions to the stimuli perceived at the health center by people who use it<sup>8</sup>. These judgments are the result of the difference between what the patient expected to occur and what he claims having obtained ("expectation disconfirmation")<sup>9</sup>. According to this conceptualization, satisfaction will be higher when the expectation on the care to be received is surpassed by what occurs, whereas dissatisfaction will be produced when the care and attention fall below these expectations<sup>10</sup>.

Therefore, satisfaction is a multidimensional concept directly related to the cognitive component of individuals and their relationship with the healthcare system or any of its units (consultations or professional). This concept can be explained by virtue of the disconfirmation of expectation that is expressed through cultural schemes, i.e., they are socialized within a group generating social representations<sup>11</sup>.

Numerous validated instruments have been published, designed to measure patient satisfaction, but the vast majority has been created for other countries and groups of people who use healthcare services from different places and cultures<sup>12-15</sup>. There are other published works on Mexican population user of healthcare services, but they fail to make public the used instrument<sup>16</sup>, or rather they study patients within the social security framework<sup>17</sup>, or hospitalized patients<sup>18,19</sup>. People's expectations are known to differ according to the sociocultural contexts and the type of services being assessed; therefore, it is necessary to generate validated instruments for specific populations, according to local necessities<sup>20</sup>.

The purpose of the present work is to present the construction process of an instrument that evaluates patient satisfaction with healthcare services received in primary care facilities of the SSA, adapted to the sociocultural characteristics of user individuals from Mexico City, and to analyze its reliability and validity. Analyzing the care in adults with type 2 diabetes is proposed, addressing this disease from the perspective of the tracer conditions<sup>21</sup>. The trace condition allows, through a health problem (trace), for the attributes of healthcare services and systems to be identified and, this way, evidence is obtained on the

functioning of the entire organization under evaluation: the instrument will be able to be subsequently used in other diseases<sup>22</sup>.

## Material and methods

It is a mixed-type of study: qualitative, by means of the use of natural semantic networks (NSN), and quantitative, with the design of an instrument through exploratory factor analysis. The NSN technique is employed for the study of the meaning of information contained in the memory of a subject on the concepts, beliefs, moral standards and myths that make up his culture<sup>23</sup>. This is achieved through associations between concepts, whose meaning is organized by the individuals according to important aspects of their social, cultural and personal life<sup>23</sup>. This way, the instrument is considered to have been constructed based on meanings that are specific to the population of interest.

### **Construction of the preliminary instrument: NSN**

The study was carried out at primary care centers, dependent of the SSA of the Distrito Federal, from two public health jurisdictions of the 16 that made up the total of divisions in the city during the year 2011. These two jurisdictions were selected by convenience and because their sociodemographic characteristics represented the individuals that attended Mexico City's healthcare centers.

### **Sample**

The recommended sample size of 10% of the target population was used<sup>24</sup> and, therefore, out of 657 patients with diabetes who attended the selected health centers in a week, 70 were invited to participate and were chosen using a simple random method and according to the selection criteria (at least one year under continuous treatment at the health center, being of either sex, and older than 40 years).

### **Procedure**

Different published works that had identified the main components or dimensions that make up a satisfactory attention from the perspective of the patients were reviewed<sup>10,13,15,25</sup>. From the analysis of these works, 7 dimensions were chosen, which

Table 1. Example of the NSNs result with one of the dimensions/factors

Dimension/factor 1: Interpersonal treatment of the physician							
Definers	Order no.	1	2	3	4	5	Totals
	Weighing	5	4	3	2	1	
Kindness	Frequency	7	6	3	2	1	73
	Weighing	35	24	9	4	1	73
Greeting	Frequency	2	4	2	1	2	36
	Weighing	10	16	6	2	2	
Knowledge	Frequency	4	3	1			35
	Weighing	20	12	3			
Dedicated time	Frequency	3	2		1	1	26
	Weighing	15	8		2	1	
Warmth	Frequency	2	3				22
	Weighing	10	12				
Attentive listening	Frequency			5	3		21
	Weighing			15	6		
Good explanation	Frequency		2	3	1		19
	Weighing		8	9	2		
Good mood	Frequency			4	2		16
	Weighing			12	4		
Good treatment	Frequency	1	1	1	1	1	15
	Weighing	5	4	3	2	1	
Ethical attitude	Frequency	2		1			13
	Weighing	10		3			

allowed for the NSN process to be carried out and this way to elaborate the questions of the questionnaire that, according to health center-user individuals with type 2 diabetes, made up the standards of satisfactory care<sup>26</sup>.

The selected dimensions were the following: medical treatment received; characteristics of the facilities; physician attitude; necessary elements for the care of their condition; characteristics of medical consultations received; explanations received about their disease, and difficulties to obtain medical care.

The participants were asked to generate a list of words (between 5 and 10 nouns, adjectives, verbs and adverbs) defining each one of the dimensions of satisfaction. Then, they were asked to hierarchically order each mentioned word according to the degree of importance it represented for them, so that the number 1 word would be the most important and was assigned the highest weighted value (WV: 5); number 2, the second most important (WV: 4); then, number 3

(WV: 3), and so on. This way, each one of the participant patients' answers became definer and acquired value according to the sum of the WVs. If a definer was repeated by two or more subjects, the WVs provided by all patients were added.

For example, in the "Interpersonal treatment of the physician" dimension (Table 1), one of the selected words was *kindness*, a definer that was repeated by 19 subjects, out of whom 7 placed it at first place of importance (each one was weighted with 5 points = 35); 6, at second place (weighted with 4 = 24); 3, at third place (weighted with 3 = 9); 2, at fourth place (weighted with 2 = 4), and 1, at last place (1 more point was added); altogether, the *kindness* definer obtained a total of 73 points, which placed it at first place on the assessed dimension.

Dimension 1 ended up represented by 10 definers, which were transformed into 10 items to be included in the questionnaire to be validated. The definers are presented in table 2, which shows that not all dimensions

Table 2. NSNs final result: dimensions/factors with their respective definers and items to be incorporated to the preliminary instrument

	Dimensions/factors						
	Medical treatment	Facilities	Physician	Elements of care	Medical appointment characteristics	Explanation	Difficulties
<b>Definers</b>	Knowledge	Doctor's offices	Kind	Organization	Good diagnosis	Treatment	Wait
	Clinical improvement	Specialties	Greeting	Privacy	Personalized treatment	Origin/ causes	Medical file
	Good treatment	Cleaness	Dedication	Referral		Care	Transportation
	Good attention	Equipment	Warmth	Accessibility		Consequences	Schedules
	Correct medications	Waiting room	Listens	Well-trained personnel		Medications	Physician absent
	Good examination	Laboratory	Explains	Studies		The truth	Appointments
	Explanation	Rest-rooms	Good mood			Nutrition	
		Pharmacy	Ethical attitude				
		Basic supplies					
		Emergency department					

were able to have 10 definers, since the subjects did not mention different definers with considerable values.

### Validity and reliability

Once the preliminary instrument was designed by means of the NSNs, its validity and reliability was assessed in subjects resembling the target population.

In the first place, a pilot test was run with 30 randomly-selected individuals in a health center with the purpose to assess intelligibility.

With regard to the sample, the preliminary questionnaire resulting from the use of the NSN technique was applied to 230 randomly-selected subjects with diabetes among the users of eight primary care centers belonging to two public health jurisdictions of the Distrito Federal. There were 162 females (70.4%) and 68 males (29.6%), with a mean age of 56.25 years ( $\pm 12.088$ ) (range: 33-87 years). The sample size was determined by the general agreement of including 5 subjects per item<sup>27</sup>.

The validity of the instrument's construct was assessed by means of an exploratory factor analysis. For this, factor matrices were calculated with the method of main components extraction and orthogonal rotation using the Varimax method. Internal consistency was determined by calculating Cronbach's  $\alpha$ . When the factor analysis is used, dimensions are named factors and, therefore, for the purposes of the present work, these variables are hereinafter presented as dimensions/factors.

### Results

With regard to the NSNs, for the 7 dimensions/factors, the words with the highest scores were taken and transformed into definers for the corresponding dimension/factor. Subsequently, each definer was converted into an item of the instrument. This way, 7 dimensions/factors on satisfaction were obtained with 46 definers that became 46 items (Table 2).

The performance of the pilot test allowed for the wording of 6 items to be modified, thus warranting intelligibility.

Then, with regard to the validity and reliability assessment, the application of the exploratory factor analysis enabled the elimination of one of the dimensions/factors, number 5 ("Characteristics of medical consultations received"), since the highest factor weights of their items attributed other elements that were not consistent with the dimension/factor according

**Table 3. Factor matrix of the CSU-1ND definitive version**

Item	1	2	3	4	5	6
Medical knowledge	0.780					
Clinical improvement	0.757					
Good treatment	0.670					
Good medical care	0.625					
Explanation of the disease	0.641					
Good clinical examination	0.613					
Enough specialists		0.625				
Laboratory		0.731				
Adequate rest-rooms		0.637				
Well-supplied pharmacy		0.785				
Adequate supplies		0.704				
Kindness			0.749			
Greeting			0.768			
Dedicated time			0.793			
Warmth of treatment			0.780			
Attentive listening			0.772			
Explanation by the physician			0.746			
Good organization				0.635		
Privacy				0.698		
Good reference				0.676		
Explanation on the origin of the disease					0.682	
Explanation of the care					0.795	
Explanation of consequences					0.775	
Explanation of drug treatments					0.689	
Medical files area						0.635
Difficulty to access in public transportation						0.581
Difficult schedules						0.686
Physicians' absences						0.677
Getting appointments						0.640

to the theory. On the other hand, some items were also eliminated due to the lack of construct validity. Subsequently, the decision was made to test the final version of the validated instrument in order to know its factor structure. The analysis resulted in the rearrangement of the original items, and it was possible to

obtain 6 dimensions/factors, comprising 29 final items with characteristic values (eigenvalues) higher than 1. The factors' eigenvalues ranged from 4.656 to 2.073 and, in total, all 6 factors accounted for 66.39% of the variance (Table 3). All items showed factor weights higher than 0.581.

**Table 4. Final instrument: questionnaire on the satisfaction of primary care users**

Dimensions	Definers	Items	
Medical treatment	Knowledge	1	The physicians who looked after me at this health center had great knowledge on how to treat my condition
	Clinical improvement	2	Thanks to the treatment given to me in the health center, I have had a noticeable improvement in my condition
	Good treatment	3	One of the things I value from this health center is the good treatment received from all professionals
	Good medical care	4	As for the medical care received, I consider it has been generally good
	Good examination	4	As for the clinical examination, I feel the clinicians have performed it very thoroughly
	Explanation	6	The clinicians clearly explain to me each aspect related to my disease
Facilities	Specialties	7	This health center has all the medical specialties I require for the care of my disease
	Laboratory	8	The laboratory of the health center has everything necessary to perform the tests required by my disease
	Rest-rooms	9	In general terms, the rest-rooms of the health center are sufficient for the use of patients
	Pharmacy	10	The pharmacy of the health center is adequately supplied with the medications required to treat my health problem
	Basic supplies	11	The health center has the supplies needed to care for my health problem
Physician	Kind	12	The physicians who look after me are characterized for treating me very kindly
	Greeting	13	Upon arrival, the physicians who look after me always receive me with a cordial greeting
	Dedication	14	The physicians who have looked after me in this center dedicate the necessary time to my consultations
	Warmth	15	The physicians that have looked after me in this center convey warmth on their way to treat people
	Listening	16	At consultation with the physician, when I lay out my problems, I have felt listened to
	Explain	17	At the moment I bring up my concerns to the physician who looks after me, he has clarified them thoroughly
Elements of care	Organization	18	Good organization characterizes this health center
	Privacy	19	The characteristics of the office warrant the privacy in my medical appointments and those of others
	Referral	20	When my health problem required it, the health center resolved my referral (hospital/specialists)
Explanations	Origin	21	The physician clearly explained to me the causes of my disease
	Care	22	In the health center I have been explained the measures of care I must have for the control of my disease
	Consequences	23	The physician clearly warned me about the possible consequences my disease might bring
	Medications	24	From the first moment I was clearly informed on how to take my medications
Difficulties	Medical file	25	The area that should improve as a priority is the one of medical files
	Distance	26	The zone the health center is located in is difficult to access for me due to the lack of public transportation
	Schedules	27	This health center hours make it difficult for me to get attention for my problem
	Physician absence	28	One constant problem in this health center is the attending physicians' absences
	Appointments	29	One problem that this center has to solve is the system to get appointments

The final version of the Questionnaire on Satisfaction of Primary Care Users for Diabetes (CSU-1ND – *Cuestionario sobre Satisfacción de los Usuarios de Primer Nivel para Diabetes*) is a self-administered instrument that measures the satisfaction of patients with diabetes in primary care. It uses a 5-point Likert-type scale ranging from complete agreement to complete disagreement. The instrument measures 6 dimensions/factors on satisfaction of the user with the medical treatment received, characteristics of the facilities, attitude of the physician, necessary elements for the care of the disease, received explanations and difficulties to obtain medical care. High scores of the instrument translate into higher satisfaction of users.

With regard to reliability, Cronbach's  $\alpha$  was calculated, which obtained an internal consistency with a value of 0.94. The final instrument is shown in table 4.

## Discussion

This work enabled the construction of an acceptably short questionnaire, comprised by 29 items for 6 dimensions/factors, that allows for the satisfaction of adult patients attending medical appointments at primary care services of the Distrito Federal. This number of items turns out to be optimal, since the instrument is completed in less than 22 min and, with the possibility of being self-administered, survey-takers' biases are prevented. The reliability of a measuring instrument is an important aspect of its design. The instrument presented in this work is considered to have been designed meeting this criterion, since a Cronbach's  $\alpha$  coefficient of 0.94 was obtained; there are publications in the literature reporting an  $\alpha$  coefficient of 0.80-0.96<sup>13,15,28</sup> and, therefore, the present questionnaire can be regarded as having an adequate reliability level.

Of the 29 items, 16 assess the relationship with the healthcare professional (55.17%), while the facilities are assessed in the remaining 13 items (44.83%). Therefore, it can be concluded that the questionnaire indicates that the most relevant factor is the subjects' concerns with the treatment they receive from the healthcare professional, above the structure of the facilities, the supplies and the difficulties to get a medical appointment.

When comparing these results with other validated instruments, important differences are observed. For example, the PSQ3 questionnaire<sup>29</sup> and its resumed

version, the PSQ18<sup>25</sup>, both have a proportion of items intended to assess aspects behind the doors of the doctor's office (treatment and interaction with the professional) of 45 and 39%, respectively, well below the 55.2% of the instrument constructed in the present work, whereas other instruments give similar importance to the interaction between patient and physician to that in the present work<sup>30-32</sup>.

This point can be notable, since the instruments may be underestimating these aspects of care, which would lead to the report of elevated results (80-90%) in satisfaction surveys published for the population of health-care services users in Mexico<sup>18,31,33-35</sup>.

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