Development and validation of a questionnaire to evaluate satisfaction of the patient with diabetes at the primary care level

Sarahi Estrella Maldonado-Paredes¹, Teresa Juárez-Cedillo²,³, Jorge Escobedo de la Peña³, Miguel Angel Vaca-Marín⁴, Carolina Quiñones-Villalobos⁵, Osvaldo Garrido-Acosta⁶, Roberto C. González-Meléndez⁶

¹Unidad de Medicina Familiar 11, Instituto Mexicano Del Seguro Social, México City; ²Unidad de Investigación en Epidemiología y servicios de Salud Área Envejecimiento, Instituto Mexicano Del Seguro Social, México City; ³Unidad de Investigación en Epidemiológica Clínica, Hospital General Regional Núm 1 Dr Carlos Mac Gregor Sánchez Navarro, IMSS, Ciudad de México, ⁴Centro Nacional de Programas Preventivos y control de enfermedades CENAPRECE, Secretaria de Salud, México City; ⁵Coordinacion de Enfermeria, Universidad de Estudios Avanzados, Aguascalientes, ⁶Facultad de Estudios Superiores Zaragoza, UNAM, Ciudad de México, México

Abstract

Aims: To develop and validate a new instrument to measure satisfaction with integral care (doctor–nurse) of the patient with type 2 diabetes mellitus, considering expectations-experiences together for the primary level of care. Methods: The instrument was constructed with questions regarding integral care to measure the satisfaction of the diabetes patient and was classified into four domains. The validity of the content was done through a panel of experts, apparent validity through a focus group, the validity of the construct through analysis of the main components and confirmatory factorial analysis, instrument reliability with internal consistency, determined by Cronbach alpha and temporal stability (test-retest). Results: The reliability of the questionnaire was 0.942. The intraclass correlation coefficient was 0.849. Validity of the construct showed acceptable goodness-of-fit and factorial structure with four factors: communication, empathy, technical care, care continuity, and 24 items for each domain, giving a Kayser-Meyer-Olkin index above 0.80 and a total variance above 73%. Conclusions: The instrument is reliable and is also valid in terms of up into construct and content to evaluate satisfaction. Practice Implications: In addition, these results allow to have elements for the design of strategies aimed at improving the relationship of health personnel with the patient.

Keywords: Diabetes, expectative, nursing, primary care level, satisfaction, validation

Introduction

Satisfaction is an important outcome of health care, and its assessment has been encouraged.¹,² Talking about satisfaction is important since it is an essential indicator of the quality of care where users’ perspectives can express their experiences and comfort their expectations.¹,²

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHRPMedknow_reprints@wolterskluwer.com

© 2022 Journal of Family Medicine and Primary Care | Published by Wolters Kluwer - Medknow
With this they can solve many of the deficiencies in care, especially in the first level of care; since the malfunction of this has a direct impact on the quality of the other levels of care and is a key point to obtain positive benefits for the population. Satisfied patients are more likely to follow a plan of care and make better use of health services. Satisfaction in type 2 diabetic patients has been associated with good blood glucose results, mainly due to HbA1c.

A recently proposed instrument that measures satisfaction with health care (i.e., Helping Alliance Questionnaire or HCSQ), with adequate theoretical support, but lacks a qualitative approach that may minimize the gap between real experience and evaluated reality, in spite of being aimed at the elderly, restraining a general approach. The HCQS evaluates just the doctor–patient relationship, from the perspective of the patient in primary care, but does not include the healthcare team approach.

Several assessment tools for patient satisfaction that have been developed, are enriched by their psychometric properties, but they are mainly useful in hospital settings, rather than in primary care units, and few instruments evaluate the satisfaction of patients with type 2 diabetes.

Since most patients with type 2 diabetes are being treated and cared for by primary care providers, the authors have considered that it is important to develop and validate an instrument that allows measuring satisfaction with integral care of the patient with type 2 diabetes in the primary care setting, including evaluation by the health care staff, as primary care physicians and nurses, considering altogether the expectations-experience dimensions.

**Methods**

**Aim**

To develop and validate a new instrument to measure satisfaction with integral care (doctor-nurse) of the patient with type 2 diabetes mellitus, considering expectations-experiences together for the primary level of care.

**Study design**

Cross-sectional psychometric methodology in the construction and validation of a measurement instrument.

**Participants**

At random, 320 patients with type 2 diabetes mellitus were selected, registered at the Family Medical Unit 11, of the Mexican Institute of Social Security in the state of Aguascalientes in Mexico. That they were receiving care with the comprehensive care model (doctor–nurse), at the first level of care.

**Data collection tools**

**Construction of the instrument**

A panel comprising of nine health professional experts developed different items centered on four main dimensions: communication satisfaction, empathy, technical care, and care continuity, taking into account health-care, health-promotion, prevention, rehabilitation, and treatment. All these components are essential for the control of diabetes and independent of medical treatment, they have a major impact on individual quality of life improvement in type 2 diabetes patients, as well as on their family and the community quality of life.

**Validation**

For content validity, the Delphi technique was used in two rounds. Each expert received the objectives of the study, the instrument, through their respective electronic mail, and they were asked to evaluate each item of the questionnaire based on an expert judge template with the indicators for each item ranging from a value of 1 (does not meet the criteria) to 4 (high level of compliance with the criteria). There were four categories to evaluate: sufficiency, coherence, relevance, and clarity. With this procedure, the items of the instrument were reformulated according to the observations of the experts, and they were sent a second round for a new evaluation and to reach a consensus. A focus group was created, consisting of nine experts in the area of satisfaction, who worked with the instrument created by the Delphi technique.

For apparent validity, a focus group was created with 10% of patients with diabetes, randomly selected, trying to have a homogenous sample according to age and gender. They were asked to analyze the elements of each item, reformulating them until a consensus was reached.

For construct validity, 93 patients were selected for each of the domains (total of items plus one), and then an exploratory factorial analysis was carried out for the main components. Items were then reduced (5 n) to conclude with the confirmatory factorial analysis. For criteria validity, concurrent criteria were considered. Finally, reliability was evaluated with the Cronbach alpha coefficient and the test-retest reliability, using a sub-sample of 10% (n = 37) of the patients, who responded to the questionnaire again.

**Questionnaire finalization**

The final questionnaire consisted of 92 items for each domain of satisfaction, based on four dimensions: communication, empathy, technical care, and care continuity. These dimensions were reinforced by the levels of care: promotion, prevention, healing, and rehabilitation, as indicators of the comprehensive care model. Each item was displayed in a Likert Scale either for expectations (Unimportant, Slightly important, Moderately Important, Important, and Very Important) or for experiences (Never, Rarely, Sometimes, Often and Always), both for general practitioner (GP) and family medicine nurse (FMN). Satisfaction was then categorized into three levels: Very satisfied, Satisfied, Unsatisfied.

A questionnaire was applied that included sociodemographic variables, as well as the developed survey to identify expectations and satisfaction [Table 1], which was filled up before and after
Table 1: Sociodemographic and clinical characteristics of the patients (n=320)

| Variable                        | n (n=320) | Percentage |
|--------------------------------|-----------|------------|
| **Sociodemographic characteristics** |           |            |
| Age Mean (ED*)                  | 56.57 (10.70) |            |
| Sex                             |           |            |
| Masculine                       | 116       | 36.3       |
| Feminine                        | 204       | 63.7       |
| **Disease characteristics**     |           |            |
| Time with diagnosis (years)     |           |            |
| <10                             | 288       | 90.0       |
| >10                             | 32        | 10.0       |
| **Comorbidities**               |           |            |
| Hypertension                    | 203       | 64.1       |
| Obesity                         | 16        | 4.3        |
| Dyslipidemia                    | 24        | 7.5        |
| Heart diseases                  | 11        | 3.4        |
| Cerebrovascular diseases        | 2         | 0.6        |
| Others                          | 25        | 7.8        |
| **Clinical actions**            |           |            |
| Visits                          |           |            |
| <10                             | 59        | 18.5       |
| >10                             | 261       | 81.6       |
| Glucose                         |           |            |
| <130 mg/dl                      | 143       | 44.7       |
| >130 mg/dl                      | 177       | 55.3       |
| Glucosylated hemoglobin         |           |            |
| <7%                             | 103       | 32.2       |
| >7                              | 161       | 50.3       |
| Total cholesterol               |           |            |
| <200 mg/dl                      | 177       | 55.3       |
| >200 mg/dl                      | 13        | 42.5       |
| Triglycerides                   |           |            |
| <150 mg/dl                      | 104       | 32.5       |
| >150 mg/dl                      | 208       | 65.0       |
| Glomerular filtration rate      |           |            |
| <60 ml/min                      | 31        | 9.7        |
| >60 ml/min                      | 286       | 89.4       |
| Body mass index                 |           |            |
| 18.50-24.99 (Healthy)           | 49        | 15.3       |
| 25.00-29.99 (Overweight)        | 125       | 39.1       |
| 30.00-34.99 (Obese)             | 130       | 40.6       |
| >40 (Extreme obesity)          | 23        | 7.2        |
| **Satisfaction**                |           |            |
| GP Dissatisfied                 | 126       | 39.4       |
| Satisfied                       | 95        | 29.7       |
| Very satisfied                  | 99        | 30.9       |
| FMN Dissatisfied                | 108       | 33.8       |
| Satisfied                       | 114       | 35.6       |
| Very satisfied                  | 98        | 30.6       |

Characteristics of the disease in the last 12 months. GP=general practitioner; FMN=family medicine nurse.

Results

A total of 320 patients with type 2 diabetes were included in the study. Most of them (60%) were younger than 60 years and included both married and female. Housewives were thus the most frequent occupation (46.3%, n = 148). Less than half had 5 years or less since diagnosis, and 36% had more than 11 years. The most prevalent comorbidities were metabolic syndrome (54%), hypertension, and dyslipidemia, as shown in [Table 1]. Half (50%) of the study population had a glucosylated hemoglobin >7%, and only 32.5% had adequate levels. Nearly two thirds had triglyceride levels above 150 mg/dl, and 42.5% had cholesterol over 200 mg/dl. While renal function was preserved in 89%, 10% had already some kidney impermeant. Factors like overweight and obesity were quite frequent.

Among general practitioners, satisfaction was equally distributed in the three tested categories, dissatisfied (39.4%), satisfied (29.7%), and very satisfied (30.9%), and were very similar for FMN.

While 128 items were evaluated for each of the expectations-experiences domains in the questionnaire, with a significant Kendall W concordance coefficient (0.93), as shown
in [Table 2], following the expert’s consensus, 36 items were eliminated from each domain.

In the exploratory factorial analysis with varimax rotation of the 92 items for both domains, a KMO index >0.860 was obtained for GP and 0.894 for FMN for expectative, while for the experience these values were 0.864 for GP and 0.847 for FMN, with a Bartlett sphericity test < 0.05 (p = 0.001). Therefore, the factorial model was adequate to explain the data, as shown in [Table 3]. There were 11 items eliminated for GP in communication, 7 items in empathy, 11 items in technical care, and 7 items in care continuity, while for FMN there were 8 items in communication, 9 items in empathy, 8 items in technical care, and 7 items in care continuity. Spearman correlation values for expectations were 0.228-0.559 and for experience 0.400-0.629.

Cronbach’ alpha values to assess internal consistency were above 0.7, with a general scale of 0.942 in 48 items. The dimension with the lowest value was technical care, as seen in [Table 4].

The test re-test reliability coefficient was 0.849. The difference of means of the score in the test and the retest was statistically significant, 3 of the 4 factors for the domain of expectations presented reliability coefficients > 0.5 (boundaries from 0.459 to 0.653), indicating an acceptable concordance in the

| Table 2: Concordance between the observations of the experts |
|-------------------------------------------------------------|
| **EXPI** | **EXPII** | **EXPIII** | **Sum of ranges (ΣR)** |
| Sufficiency | 1022 | 1005 | 982 | 3009 |
| Coherency | 1024 | 1024 | 1024 | 3072 |
| Relevance | 1008 | 1018 | 982 | 3008 |
| Clarity | 978 | 977 | 978 | 2933, Σ total=12022 |
| **χ²** | **df** | **P** |
| Kendall W** | 8,379 | 3 | 0,039 |

| Table 3: Confirmatory factorial analysis |
|----------------------------------------|
| **Rotated component array EXPECTATIONS** |
| **ITEM** | **GP** | | | | **FMN** | | | |
| | 1 | 2 | 3 | 4 | | 1 | 2 | 3 | 4 |
| COGP2 | ,864 | | | | COFMN17 | ,800 | | |
| COGP3 | ,870 | | | | COFMN19 | ,811 | | |
| COGP6 | ,734 | | | | COFMN22 | ,761 | | |
| EGP42 | ,851 | | | | EFMN54 | ,740 | | |
| EGP43 | ,896 | | | | EFMN57 | ,789 | | |
| EGP47 | ,806 | | | | EFMN59 | ,788 | | |
| CTGP65 | ,900 | | | | CTMNF89 | ,858 | | |
| CTGP69 | ,913 | | | | CTVMNF92 | ,787 | | |
| CTGP73 | ,913 | | | | CTFMN95 | ,740 | | |
| CAGP98 | ,868 | | | | CAFMN120 | ,759 | | |
| CAGP99 | ,875 | | | | CEFMN122 | ,867 | | |
| CAGPF108 | ,675 | | | | CAFMN123 | ,728 | | |
| Variance (%) | 21,262 | 20,744 | 19,247 | 18,431 | Variance (%) | 19,467 | 18,383 | 17,899 | 17,769 |
| Total Variance (%) | Σ=2313,31 | df=66 | 79,648 | P=0,000 | Total Variance (%) | Σ=1726,58 | df=66 | 73,519 | P=0,000 |
| KMO=0,809 | | | | | KMO=0,837 | | | |

| **Rotated component array EXPERIENCES** |
|----------------------------------------|
| **ITEM** | **GP** | | | | **FMN** | | | |
| | 1 | 2 | 3 | 4 | | 1 | 2 | 3 | 4 |
| EXCOGP10 | ,744 | | | | EXCOFMN22 | ,748 | | |
| EXCOGP14 | ,862 | | | | EXCOFMN27 | ,819 | | |
| EXCOGP15 | ,681 | | | | EXCOFMN31 | ,725 | | |
| EXEGPF34 | ,789 | | | | EXEFMN50 | ,791 | | |
| EXEGPF42 | ,847 | | | | EXEFMN58 | ,709 | | |
| EXEGPF43 | ,838 | | | | EXEFMN64 | ,762 | | |
| EXCTGP75 | ,758 | | | | EXCTFMN83 | ,662 | | |
| EXCTGP76 | ,774 | | | | EXCTFMN84 | ,842 | | |
| EXCTGP79 | ,833 | | | | EXCTFMN89 | ,620 | | |
| EXCAGP98 | ,853 | | | | EXCAFNM122 | ,806 | | |
| EXCAGP99 | ,884 | | | | EXCAFNM124 | ,772 | | |
| EXCAGP100 | ,745 | | | | EXCAFNM125 | ,766 | | |
| Variance (%) | 19,467 | 18,383 | 17,899 | 17,769 | Variance (%) | 19,607 | 18,383 | 17,899 | 17,769 |
| Total Variance (%) | Σ=2313,31 | df=66 | 79,648 | P=0,000 | Total Variance (%) | Σ=1726,58 | df=66 | 73,519 | P=0,000 |
| KMO=0,863 | | | | | KMO=0,877 | | | |

KMO=Kaiser-Meyer-Olkin, BST=Bartlett sphericity test, df=degree of freedom, P=Significance, GP=General practitioner, FMN=Family medicine nurse, CO=Communication, E=Empathy, CT=Technical care; CA=Care continuity.
dimensions of communication, empathy, care continuity, and poor reliability in technical care. In the domain of experience, empathy, technical care, and care continuity had acceptable reliability, while there was poor reliability for the dimension of communication (0.430-0.893). Nevertheless, in the analysis of temporal stability using the Bland Altman method, most of the differences were between the mean of the variable difference and two standard deviations [See Annex 1].

**Discussion**

The developed questionnaire for evaluating type 2 diabetes patient satisfaction in this trial has shown adequate psychometric properties when assessing the health care provided by the general practitioner and the family medicine nurse. Contrary to other satisfaction evaluation tools, this questionnaire is unique since it is aimed to evaluate dual care and simultaneously the domains of satisfaction in expectations-experience.[13]

The use of this instrument in primary care will help experts to reinforcement of all satisfaction parameters in relation to levels of care, as well as the contribution of patients with type 2 diabetes, enriching the interaction physicians, patients and nurse.[15-27]

Content validity based on expert’s judgement was performed as it has been previously suggested.[28-29] Reliability estimation based on agreement allows eliminating subjective issues.[28] A high Kendall W concordance coefficient (0.931) indicates that there was a consensus in the process of classification and scoring, among the evaluators, supporting instruments interchangeability and reproducibility.[30]

One of the advantages of the herein presented questionnaire is that content validity was assessed as part of the psychometric properties of the instrument,[15,31] in opposition to most evaluation tools that only include construct validity,[13] and do not perform a mixed analysis. Another plus of the instrument was the inclusion of type 2 diabetes patients, benefiting from using their words, expressions and accuracy of the items, to properly evaluate satisfaction with different interventions.[32]

The total variability of the instrument was >64% for expectations and 59% for experience considering four factors. Therefore, these factors could only explain a minimal amount of the instrument variability.

In spite of having similar factorial structures with other questionnaires, none of the previously published satisfaction assessment questionnaires have considered all the domains included in this report, nor have they considered the two healthcare staff members included in this trial, general practitioners and family medicine nurses.

Since there is no gold standard to compare the scores from this questionnaire, only criteria items were used for validation.[18] A comparable Cronbach’s alpha coefficient to previously reported.[13] is encouraging, denoting an adequate correlation among included items.

The high observed value of the ICC supports an adequate concordance for the entire scale. The 0.5 cutoff value proposed for the ICC in this research,[24] led to an inadequate score in the mean difference of the test re-test for the technical care dimension in the domain of expectations (0.459), and the communication dimension in the domain of experience (0.430), although there was a good temporal stability of the instrument.[34]

In the present analysis women showed a higher satisfaction score, and so did older subjects, which has also been previously reported.[34]

The degree of satisfaction observed in the studied type 2 diabetes patients with this instrument, may be explained by the social desirability bias, present when participants in a study tend to provide answers that are socially acceptable due to the continuous use of health-care services. Other authors have suggested that fear of reprisal for negative answers may be the cause of the trend towards more favorable scores.

Patient dissatisfaction with care in diabetes is associated with poor self-care behaviors, low quality of life and inadequate blood glucose levels. In the primary care setting, where most type 2 diabetes should be controlled and treated, identifying patient satisfaction may be an important complementary tool to increase treatment adherence and compliance.[35-36]

Nevertheless, the accurate and valid methodology employed in this research, may certainly counteract these limitations on satisfaction assessment. The lack of previous studies in Mexico, prevents comparison of the proposed instrument, and further research will properly validate it.

**Conclusion**

The items included in the development of this instrument provide theoretical support based on the theory and a model of the value of expectation in the setting of satisfaction. They also provide a one-on-one model (general practitioner and family medical nurse) of integral care, aimed to type 2 diabetes patients, considering
four dimensions, communication, empathy, technical care, and care continuity, in the domains of expectations-experience. The main strength of this instrument, in addition to being considered a validated, adaptable instrument for other cultures, is that it can be used by the health care staff as well as in satisfaction evaluation research in the first level of diabetes health-care.

Key points

Primary care physicians play an important role in the control of diseases of the population, por lo que measure the satisfaction with integral care of the patient with type 2 diabetes will allow you to count on other tools to improve your services, optimizing their actions to maintain the health of patients. Knowing the level of satisfaction of patients with the health personnel who is in charge of maintaining control of their disease is essential to understand the effect of treatment on disease control.

In addition, these results allow having elements for the design of strategies aimed at improving the relationship of health personnel with the patient.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Ruiz‑Moral R, Perula de Torres LA, Munoz Alamo M, Jimenez García C, Gonzalez Nebauer V, Alba Dios A, et al. [Patients satisfaction with communication with their family doctors: Comparison of three methods for assessing unmet needs]. Rev Esp Salud Publica 2011;85:315‑22.
2. Abd Manaf NH, Mohd D, Abdullah K. Development and validation of patient satisfaction instrument. Leadership in Health Services 2012;25:27‑38.
3. Tabachnick BG, Linda S. Fidell. Using Multivariate Statistics. 7th ed. Pearson, 2018.
4. Manning ML, Singh H, Stoner K, Habif S. The Development and psychometric validation of the diabetes impact and device satisfaction scale for individuals with type 1 diabetes. J Diabetes Sci Technol 2020;14:309‑17.
5. Sakane N, Murata T, Tone A, Kato K, Kimura M, Kawashima S, et al. Development and validation of the continuous subcutaneous insulin infusion‑related quality‑of‑life (CSI‑QOL) scale. Diabetes Technol Ther 2020;22:216‑21.
6. Lin YJ, Wang CY, Chang EH, Cheng SW, Ko Y. Translation, revision, and validation of the Chinese version of the Satisfaction with Oral Anti‑Diabetic Agent Scale (C‑SOADAS) in patients with type 2 diabetes mellitus. Patient Prefer Adherence 2018;12:607‑72.
7. Galicia Alarcón LA, Balderrama Trápaga JA, Edel Navarro R. Validez de contenido por juicio de expertos: Propuesta de una herramienta virtual. Apertura 2017;9:42‑53.
8. Arabiat D, Whitehead L, Abu Sheikh B, Afrifa‑Yamoah E. Confirmatory factor analysis and reliability of the diabetes treatment satisfaction questionnaire (DTSQ) for Arabic speaking patients with Type II diabetes. J Multidiscip Healthc 2020;13:953‑61.
9. Ijaz S, Muazzam A, Malik S. Development and validation of psychosocial problems scale for type 2 diabetes (PPSTD). J Pak Med Assoc 2020;70:964‑8.
10. Frost R, Donovan C. The development and validation of the sexual and relationship distress scale. J Sex Med 2018;15:1167‑79.
11. Victor Y, Lorgeat V, Coriolan B, Kamal Z, Vincent R, van Oettingen JE, et al. Validation study and outcomes of the diabetes quality of life in youth instrument in haitian youth with type 1 diabetes residing in Haiti. Can J Diabetes 2021. doi: 10.1016/j.jcjd.2021.04.010.
12. Gagnon M, Hebert R, Dube M, Dubois MF. Development and validation of the Health Care Satisfaction Questionnaire (HCSQ) in elders. J Nurs Meas 2006;14:190‑204.
13. Cheng WL, Lai CK. Satisfaction scale for community nursing: Development and validation. J Adv Nurs 2010;66:2331‑40.
14. Erci B, Ciftcioglu S. Psychometric evaluation of the primary health‑care satisfaction scale in Turkish women. Int J Qual Health Care 2010;22:500‑6.
15. Goel S, Sharma D, Singh A. Development and validation of a patient satisfaction questionnaire for outpatients attending health centres in north Indian cities. J Health Serv Res Policy 2014;19:85‑93.
16. Lam WW, Fielding R, Chow L, Chan M, Leung GM, Ho EY. The Chinese Medical Interview Satisfaction Scale revised (C‑MISS‑R): Development and validation. Qual Life Res 2005;14:1187‑92.
17. Verbeek JH, de Boer AG, van der Weide WE, Piirainen H, Anema JR, van Amstel RJ, et al. Patient satisfaction with occupational health physicians, development of a questionnaire. Occup Environ Med 2005;62:119‑23.
18. Kontodimopoulos N, Arvanitaki E, Aletras VH, Niakas D. Psychometric properties of the Greek diabetes treatment satisfaction questionnaire. Health Qual Life Outcomes 2012;10:17.
19. Robin DW, Becker ER, Adams EK, Howard DH, Roberts MH. Patient satisfaction with primary care: Does type of practitioner matter? Med Care 2004;42:579‑90.
20. Campbell SM, Roland MO, Buetow SA. Defining quality of care. Soc Sci Med 2000;51:1611‑25.
21. Varela‑Ruiz Margarita D‑B, García‑Durán Rocío. Descripción y usos del método Delphi en investigaciones del área de la salud. Inv Ed Med 2012;1:90‑5.
22. Tabachnick BG, Fidell LS. Using Multivariate Statistics. 7th ed. Pearson/Allyn & Bacon. 2007.
23. Alicia HS Margarit VR. La técnica de grupos focales. Inv Ed Med educación médica 2013;2:53‑60.
24. IBM Corporation. Manual del usuario del sistema básico de IBM SPSS Statistics 21 2017. Recuperado de: ftp://public.dhe.ibm.com/software/analytics/spss/documentation/statistics/20.0/es/client/Manuals/IBM_SPSS_Statistics_Core_System_Users_Guide.pdf.
25. Valverde M, Isla P, Jansa M, Moncho J. Development of the professional role of diabetes nurses in specialised diabetes and primary care in Catalonia. Endocrinol Diabetes Nutr (Engl Ed) 2021;68:53‑65.
26. Guimond AJ, Kubzansky LD, Boehm JK, Kivimaki M,
Trudel-Fitzgerald C. Does life satisfaction reduce risk of incident hypertension and stroke? Evidence from the Whitehall II cohort. J Psychosom Res 2021;144:110414.

27. Katz LB, Hurrell G, Venugopal U, Cameron H, Shearer DM. Satisfaction of healthcare professionals and people with diabetes with an insulin bolus calculator mobile application. J Diabetes Sci Technol 2021;15:885-90.

28. Jakobsson U, Westergren A. Statistical methods for assessing agreement for ordinal data. Scand J Caring Sci 2005;19:427-31.

29. Ato M, Benavente A, Lopez JJ. [Comparative analysis of three approaches for rater agreement]. Psicothema 2006;18:638-45.

30. Fernández-Castillo A, Vilchez-Lara MJ, Sada-Lázaro E. Satisfaction with hospitalization scale: Adaptation and psychometric properties. Behavioral Psychology/Psicologia Conductual 2012;20:383-400.

31. Carvajal A, Centeno C, Watson R, Martinez M, Rubiales AS. [How is an instrument for measuring health to be validated?] An Sist Sanit Navar 2011;34:63-72.

32. Milutinovic D, Simin D, Brkic N, Brkic S. The patient satisfaction with nursing care quality: The psychometric study of the Serbian version of PSNCQ questionnaire. Scand J Caring Sci 2012;26:598-606.

33. Cicchetti DV. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. Psychol Assess 1994;6:284-90.

34. Kohlmann T, Moock J. [Patient satisfaction in diabetes mellitus—measures and results]. Dtsch Med Wochenschr 2008;133(Suppl 4):S120-3; discussion S4-6.

35. Budreviciute A, Kalediene R, Bagdoniene L, Paukstaitiene R, Valius L. Perceptions of social, emotional, and functional values in patients with type 2 diabetes mellitus and their satisfaction with primary health care services. Prim Health Care Res Dev 2019;20:e122.

36. Suzuki R, Saita S, Nishigaki N, Kisanuki K, Shimasaki Y, Mineyama T, et al. Factors associated with treatment adherence and satisfaction in type 2 diabetes management in Japan: Results from a web-based questionnaire survey. Diabetes Ther 2021;12:2343-58.
Annex 1

Satisfaction of the diabetes patient with the model (GP and/or FMN) with integral care in primary care. (with the items after the elimination)

| EXPECTATIONS                                                                 | 5-Very important | 4-Important | 3-Moderately important | 2-Of little importance | 1-Unimportant |
|------------------------------------------------------------------------------|------------------|-------------|------------------------|------------------------|--------------|

Instructions: Regarding your visit with your General Practitioner and/or the Family Medicine Nurse, I am going to ask you some questions, which you can answer with the options I will give you.

COMMUNICATION

GENERAL PRACTITIONER (GP)
2. How important is it that the General Practitioner explain your disease during the doctor's visit?
3. How important is it that the General Practitioner explain the indications of the prescriptions?
6. How important is it that the General Practitioner explain the complications of diabetes? (The interviewer mentions examples, such as: low sugar, high sugar, eye disease, kidney disease, foot disease).

FAMILY MEDICINE NURSE (FMN)
17. How important is it that the nurse go to your home to orient you about educational programs?
19. How important is it that the nurse explain the activities that would help improve your health?
22. How important is it that the nurse explain hygienic habits you should have?

EMPATHY

GENERAL PRACTITIONER (GP)
42. How important is it that the General Practitioner nicely indicate the general care you should have?
43. How important is it that the General Practitioner nicely invite you to continue treatment with its medications?
47. How important is it that the General Practitioner show interest in your treatment in case of complications?

FAMILY MEDICINE NURSE (FMN)
54. How important is it that the Family Medicine Nurse explain the use of insulin, in case it is necessary?
57. How important is it that the Family Medicine Nurse show interest in going to your home to review your blood pressure?
59. How important is it that the Family Medicine Nurse explain in detail the benefits of being vaccinated against influenza?

TECHNICAL CARE

GENERAL PRACTITIONER (GP)
65. How important is it that the General Practitioner inform you in detail about your disease by telephone?
69. How important is it that the General Practitioner inform you by telephone about support groups to reduce the risk factors of your disease?
73. How important is it that the General Practitioner inform you by telephone about the effects of your medications?

FAMILY MEDICINE NURSE (FMN)
89. How important is it that the nurse teach you how to store, use and apply insulin?
92. How important is it that the nurse sends you to the General Practitioner in case of skin wounds that do not heal?
95. How important is it that the nurse suggest improvement goals in the care of your disease?

CARE CONTINUITY

GENERAL PRACTITIONER (GP)
98. How important is it that the General Practitioner give you an appointment for a visit every month?

Contd...
GENERAL PRACTITIONER (GP)
99. How important is it that the General Practitioner give you monthly treatment?
108. How important is it that the treatments be coordinated between the General Practitioner and the Family Medicine Nurse?

FAMILY MEDICINE NURSE (FMN)
120. How important is it that the nurse send you to the General Practitioner when you are controlled?
122. How important is it that your disease is followed up by the Family Medicine Nurse?
123. How important is it that the nurse perform educational activities each time you come to a doctor’s visit?
**EXPECTATIONS**

Instructions: Regarding the doctor's visit with the General Practitioner and/or the Family Medicine Nurse, I am going to ask you some questions, and you can answer with the options I will give you.

| COMMUNICATION |
|----------------|
| **GENERAL PRACTITIONER (GP)** |
| 10. Did the General Practitioner explain how and when to measure your sugar (dextrostix), before and after ingesting food? |
| 14. Did the General Practitioner explain how you should take care of your skin to avoid complications? |
| 15. Did the General Practitioner explain how medications could avoid complications? |
| **FAMILY MEDICINE NURSE (FMN)** |
| 22. Did the nurse explain the hygienic habits you should have? |
| 27. Did the nurse explain foot care? |
| 31. Did the nurse explain the care you should have in case of presenting complications? |

| EMPATHY |
|----------------|
| **GENERAL PRACTITIONER (GP)** |
| 34. Did the General Practitioner show understanding of your health problems that caused you to go to the doctor's visit? |
| 42. Did the General Practitioner nicely indicate the general care you should have? |
| 43. Did the General Practitioner nicely invite you to continue treatment with medications? |
| **FAMILY MEDICINE NURSE (FMN)** |
| 50. Did the nurse treat you nicely during the doctor's visit? |
| 58. Did the nurse give you clear indications of the use of medications to maintain control? |
| 64. Did the nurse send you in a timely fashion to the various health professionals to avoid complications? |

| TECHNICAL CARE |
|----------------|
| **GENERAL PRACTITIONER (GP)** |
| 75. Did the General Practitioner give you a prescription for treatment based on the indications of the hospital specialist? |
| 76. Did the General Practitioner send you for X-rays for possible complications? |
| 79. Did the General Practitioner indicate applying insulin for uncontrolled sugar (glucose)? |
| **FAMILY MEDICINE NURSE (FMN)** |
| 83. Did the nurse orient you on how to cut your nails? |
| 84. Did the nurse send you to a dentist during these 6 months? |
| 89. Did the nurse teach you how to store, use and apply insulin? |

| CARE CONTINUITY |
|----------------|
| **GENERAL PRACTITIONER (GP)** |
| 98. Did you visit the General Practitioner every month? |
| 99. Did the General Practitioner give you monthly treatment? |
| 100. Did the General Practitioner send you to the health services you required? |
| **FAMILY MEDICINE NURSE (FMN)** |
| 122. Did you receive follow up on your disease from the same Family Medicine Nurse? |
| 124. Did you receive treatments coordinated between the Family Medicine Nurse and the General Practitioner? |
| 125. Did you receive continuity in the follow-up from the nurse to reduce possible complications? |