ORIGINAL ARTICLE

WILEY

Validity and reliability of the Spanish version of the consultation and relational empathy measure in dental students (Sp-Dent-CARE): A cross-sectional study

Alba Sánchez-Torres[1,2] | Octavi Camps-Font[1,2] | Rui Figueiredo[1,2] | Eduard Valmaseda-Castellón[1,2]

[1]Department of Oral Surgery and Implantology, School of Medicine and Health Sciences, University of Barcelona, L'Hospitalet de Llobregat, Barcelona, Spain

[2]IDIBELL Institute, L'Hospitalet de Llobregat, Barcelona, Spain

Correspondence
Rui Figueiredo, School of Medicine and Health Sciences, Campus de Bellvitge. University of Barcelona, C/ Feixa Llarga, s/n; Pavelló Govern, 2ª planta, Despatx 2.9, 08907 - L'Hospitalet de Llobregat, Barcelona, Spain.
Email: ruibarbosa@ub.edu

Abstract

Introduction: An evaluation was made of the psychometric properties of a Spanish version of the Consultation and Relational Empathy Measure (CARE) to assess relational empathy in undergraduate dental students. In addition, the influence of demographic, socio-economic and consultation-related factors upon the degree of perceived empathy and overall satisfaction was studied.

Materials and Methods: A cross-sectional study was carried out in patients seen in the Oral Surgery Unit by fourth year dental students. Dentists, specialized translators and psychologists developed the translation of the questionnaire. After a pilot test, a convenience sample of patients was included. Construct validity was tested by factor analysis using principal component analysis with varimax rotation and Kaiser standardization, and internal consistency was assessed by Cronbach's α.

Results: Two pilot tests were carried out with a panel of experts until the final version of the questionnaire was established. In the validation stage, 191 patients participated (92 men and 99 women), with a mean age of 52.5 ± 17 years. The mean score of the CARE measure was 47.2 ± 4.4, and 57.6% of the patients ($n = 110$) reported the maximum score on the questionnaire. The final version showed a 1-factor solution explaining 68.6% of the total variance, with excellent final internal consistency ($\alpha = 93.4\%$).

Conclusion: The Spanish version of the CARE measure affords high reliability and validity in assessing relational empathy in dental students. Perceived empathy is related to overall satisfaction. Patient demographics and the number of visits do not influence perceived empathy.

KEYWORDS
CARE measure, dental students, psychometric properties, questionnaire, relational empathy

1 | INTRODUCTION

Healthcare professionals must develop skills to relate to their patients which, together with practical skills, seek to provide quality service and improve communication.[1,2] Relational empathy is at the heart of patient-centred healthcare practice and allows trust and good communication between patient and practitioner.[3] Furthermore, empathic care has been linked to high levels of satisfaction, empowerment and improved health outcomes.[2,4] The empathic skills of the dentist are fundamental to achieve good management of patient emotions and behaviours, and also to help reduce anxiety levels, improve compliance with the recommendations given by the professional and adherence to treatments, and secure a better state of health.[1,3,5]

A recent systematic review[6] has examined the current status of different tools for measuring empathy in dental students. The authors noted that the only two tools used were the Jefferson Medical Empathy Scale-health professional version (JSPE-HP) and the Jefferson Medical Empathy Scale-health professional student version (JSPE-HPS). However, these scales are self-reported, and only reflect student empathy orientation and not actual behaviours.

The Consultation and Relational Empathy (CARE) measure was developed by Mercer et al.[7] for patients to assess the empathy of their family doctors in the United Kingdom. Relational empathy is defined as the ability to understand the patient situation, perspectives and feelings; to communicate that understanding; and to act on that understanding with the patient in a therapeutically useful way. The CARE measure includes 10 items which the patient can score with 5 possible responses ranging from "poor" to "excellent", plus a "not applicable" question. These are grouped into different domains such as the ability to connect (items 1–3), appraise (item 4), answer (items 5 and 6) and motivate (items 7–10). The maximum score is the sum of all items, and can range from 10 to 50 points, with a higher score representing a higher degree of empathy.

Subsequently, this tool has been translated into languages such as Japanese,[1] Chinese,[2] Malay Chinese[8] and Croatian,[3] and has been validated for different healthcare professions such as family medicine,[1,3,7,8] nursing[4] and dentistry.[9]

The assessment of relational empathy by patients will provide feedback for further work to improve the skills of dental students. So far, the CARE measure has not been translated into Spanish, and has only been validated for dental students in a study that translated it into Malay Chinese.[9] The study of the psychometric properties and validation of this measure will allow future intervention studies to improve these skills in dental students.

The main objective of the present study was to evaluate the psychometric properties (validity and reliability) of a Spanish version of the CARE measure to assess relational empathy in dental students. Second, an analysis was made of the influence of demographic, socio-economic and practice-related factors, specific to the patient, upon the degree of empathy of the students and the correlation of the latter to the degree of overall satisfaction.

The main hypothesis was that the Spanish translation of the CARE measure has good validity and reliability, similar to the previously published versions, and that all domains measure empathy as a construct.

As a secondary hypothesis, it was postulated that patients who have visited the same student more times would report a higher CARE score, and that this score is positively correlated to overall satisfaction.

2 | MATERIALS AND METHODS

This cross-sectional study included patients over 18 years of age seen in the Clinical Oral Surgery Unit by fourth year dental students as a first visit or a visit for dental extraction (Dental Hospital of the University of Barcelona, Barcelona, Spain) during the academic years 2020–2021 and 2021–2022. Those who were unable to understand the questionnaire written in Spanish, who could not read or who did not wish to participate in the study were excluded. All patients signed the corresponding informed consent form prior to participation in the study.

This study was conducted and reported in accordance with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines.[10] The study protocol was approved by the Ethics Committee of the Dental Hospital of the University of Barcelona (protocol no. 32/2020). The guidelines of the Declaration of Helsinki were followed throughout the study. The latter consisted of different stages to obtain the translated Spanish version of the CARE measure and to perform its validation (Sp-Dent-CARE).

1. Translation: two native English speakers (one of them being a dentist) independently translated the CARE measure into Spanish. These two versions were then combined into a single version resulting in the first draft.
2. Back-translation: two bilingual (Spanish-English) persons not familiar with the original CARE measure carried out the back-translation of the first draft into English. The translation was checked to see if it matched the original tool, and modifications would be made accordingly.
3. Feedback: the first draft in Spanish was to be discussed among all the researchers of the project, who were Spanish speakers and dentists, in order to make the modifications that were considered necessary, leading to the second draft.
4. Pilot test: a preliminary sample of 20 patients would answer the questions of the second draft of the CARE measure, and the need for help in understanding the questions would be assessed, as well as non-applicable answers and missing data, to check the validity of the construct. In the case of finding that the questions were not part of the same construct, modifications would be made and a third draft would be produced and tested again in a preliminary sample. In the case of obtaining adequate validity and reliability

($\alpha > 0.70$), the CARE measure in Spanish would be considered to be completed and validated.

5. Assessment of the CARE measure for validation: a convenience sample of patients attending a visit during the academic years 2020–2021 and 2021–2022 was included. Participants answered the CARE measure at the end of the visit, in the waiting room, and were allowed to ask the researcher any questions.

The main outcome variable was the overall score of the CARE measure, which could range from 10 to 50 points. In addition, information was recorded on the students (age and gender) as well as the patients they visited. Specifically, age, gender, ethnicity (Caucasian/Asian/Sub-Saharan/Latin American/other), level of schooling (primary school/compulsory secondary school/high school or vocational training/university), marital status (living with or without a partner), employment status (active/unemployed/retired), number of visits with the student (1 visit/2 visits/3 or more visits) and type of visit (first visit or surgery) were recorded. Overall satisfaction with the visit was also assessed using a visual analogue scale from 0 to 100 mm.

The data obtained were entered into a Microsoft Excel spreadsheet (Microsoft®, Redmond) and then processed with the Stata/IC 15.1 package (StataCorp LLC). A descriptive analysis was performed and the CARE questionnaire responses were tested for normality using the Shapiro-Wilk test. Non-applicable responses were quantified, and missing values for each of the items were checked to determine the importance given by patients to these items.

In addition, a bivariate analysis of the data was performed by relating the overall CARE score to demographic, socio-economic and consultation characteristics (duration and number of visits made with the same student) related to the patients using the Student's t-test for independent samples. In the event the overall CARE score did not meet normality, nonparametric tests were used. In addition, the Pearson correlation coefficient was calculated to relate the CARE score to patient overall satisfaction with the visit.

To test construct validity, a factor analysis was carried out using principal component analysis with varimax rotation and Kaiser standardization.

Internal consistency was assessed using Cronbach's α. Homogeneity was also tested by correcting for each item of the total correlations, the mean CARE score and Cronbach's α.

Lastly, multiple linear regression analysis was performed with the CARE measure as dependent variable, adjusting for demographic, socio-economic and consultation factors. Statistical significance was considered for $p < .05$.

3 | RESULTS

The first pilot test after translation and back-translation of the original version of the questionnaire was carried out on 20 patients. The descriptive analysis of the responses resulted in only one missing value; no question was answered as "not applicable"; and half of the patients gave the maximum score in their assessment. Validity assessment based on principal component analysis showed the constructs to be divided into 3-factor loadings, different from the published ones, and internal consistency measured by Cronbach's α was 89.4%. A consensus was reached with a panel of experts consisting of two psychologists and a dentist, in which the questionnaire was revised and the wording of two questions was modified for a second pilot test involving 20 patients different from the previous patients. The analysis of the latter test showed an absence of missing values and non-applicable answers, and 60% of the patients gave the maximum score. Validity analysis this time showed a 2-factor solution, with the questionnaire being understood to adequately measure therapeutic skills and empathic listening. In addition, internal consistency improved ($\alpha = 94.2\%$). The final version of the dental CARE questionnaire translated into Spanish was thus confirmed (Figure 1).

A total of 191 patients participated in the validation stage: 92 men (48.2%) and 99 women (51.8%), with a mean age of 52.5 (± 17) years. Twenty-nine patients (15.2%) came for a first visit and 161 (84.3%) for surgery, and visited the trainees an average of 1.9 (± 0.8) times. The mean CARE score was 47.2 (SD = 4.4; range 33–50), and 110 patients (57.6%) reported the highest score on the questionnaire. On average, the overall satisfaction score with the visit was 94.5 (SD = 8.6; range 53–100), and was significantly correlated to the overall CARE score ($r = 0.449$; $p = .000$; Figure 2).

Figure 3 shows the box plot of the overall CARE score, in which positive skewness can be observed, demonstrating the ceiling effect of the questionnaire. The CARE score did not meet normality ($p = .000$), and nonparametric tests were therefore used.

Table 1 shows the characteristics of the variables recorded in the study and the bivariate analysis in relation to the total CARE score. There were no differences for this value across the recorded variables, except for the age of the patients, where the correlation to the total score showed an inverse association (ie the lower the age, the higher the total score).

Table 2 in turn shows the distribution of the CARE responses, with values shifted towards the maximum score. Of the 191 participant responses to the questionnaires, three missing responses were identified (items 3, 6 and 10), as well as 9 non-applicable responses (items 4, 5, 9 and 10) from 10 patients. Only one patient answered three questions as not applicable.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy resulted in an index of 0.916, and Bartlett's test of sphericity showed the correlation matrix to be factorizable (chi-square (45) = 1435.9; $p = .000$).

The principal component analysis showed better results than the second pilot test. After analysis of the sedimentation plot and eigenvalues (greater than 1) a 1-factor solution explaining 68.6% of the total variance was observed. Table 3 showed adequate convergent validity for the CARE questionnaire, as the factor loadings were homogeneous among them, although no robust correlation of item 1 to the remaining items was observed, and reliability improved in the absence of item 1. The final internal consistency proved excellent ($\alpha = 93.4\%$).

El indicador CARE

Rogamos valore las siguientes afirmaciones con respecto a su visita de hoy, marcando la casilla correspondiente a su calificación de cada aspecto.

El/La profesional sanitario/a:	Poco	Algo	Bastante	Mucho	Muchísimo	No procede
1. Le hizo sentirse a gusto *(Fue amable, cordial, le trató con respeto, no fue brusco/a ni frío/a).*						
2. Le permitió contar "lo que le pasa" *(Le dedicó el tiempo que necesitaba para describir detalladamente su enfermedad en sus propias palabras, sin interrumpirle ni distraerle).*						
3. Le escuchó atentamente *(Prestó mucha atención a sus palabras, no leía sus apuntes ni miraba el ordenador mientras usted hablaba.).*						
4. Se interesó por usted como persona *(Preguntó o conocía datos pertinentes sobre su vida y situación personal, no le trató como un número más).*						
5. Entendió perfectamente sus preocupaciones *(Le confirmó que entendía perfectamente sus preocupaciones, sin omitir ni desestimar nada).*						
6. Mostró empatía y compasión *(Parecía que usted le importaba realmente, conectó con usted a nivel humano, no se mostró indiferente ni distante).*						
7. Tuvo una actitud positiva *(Su actitud y planteamiento eran positivos, fue sincero/a pero no negativo/a con respecto a sus problemas).*						
8. Dio explicaciones claras *(Contestó detalladamente a sus preguntas, se lo explicó todo con claridad, le dio la información adecuada, sin ambigüedades).*						
9. Le ayudó a tomar el control *(Animándole y no sermoneándole, exploró con usted lo que puede hacer para mejorar su salud).*						
10. Preparó con usted un plan de acción *(Debatieron las opciones, le tuvo en cuenta a la hora de tomar decisiones, no pasó por alto sus opiniones).*						

FIGURE 1 Final version of the Spanish Dental CARE questionnaire.

Multivariate analysis (Table 4) showed no relationship between the variables assessed and the CARE score. Increasing the number of visits by the student had no influence on the degree of empathy perceived by the patient.

4 | DISCUSSION

The present study aimed to adapt and validate the CARE questionnaire, originally written in English, using a sample of patients who
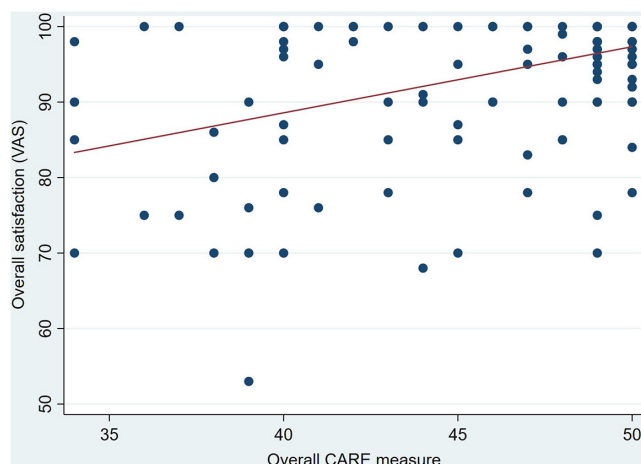
FIGURE 2 Pearson's correlation coefficient for the overall CARE score and overall satisfaction.
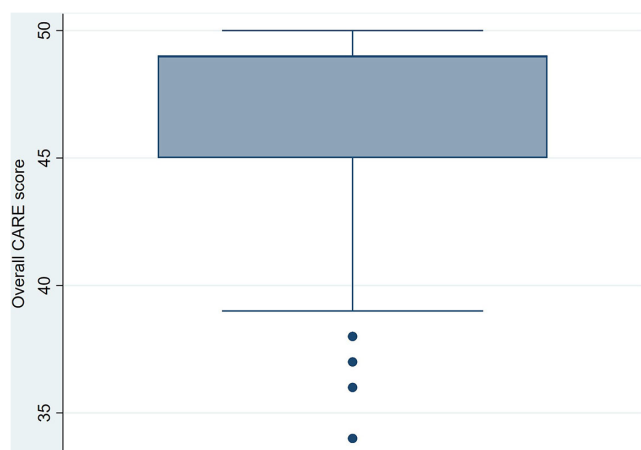

FIGURE 3 Box plot of the overall CARE score.

came for a first visit or for oral surgery carried out by fourth year dental students at the University of Barcelona. The results obtained show that the Spanish version of the CARE questionnaire has adequate validity and reliability for use in the context of a dental visit or treatment.

So far, only one study in the field of dentistry has adapted the CARE measure, translated into Malay Chinese.[9] Our 1-factor solution matches the results of that study, which explained an almost equal percentage of the variance. In their case, reliability measured by Cronbach's alpha was somewhat higher (95%) than ours (93.4%). They included 283 patients visited by students from different academic years, and found the perceived empathy score to be significantly lower the more experienced the students were. Although they observed an inverse relationship between the degree of empathy and the number of visits, the results were not statistically significant. All this evidences probable depersonalization that arises unconsciously and unintentionally. Some of the reasons reported may be stress, work overload or psychological fatigue that also

prevent the professionals from connecting with, or emotionally sustaining, other people.[11]

Previous studies that have translated and validated this questionnaire to the cultural and professional context have been conducted in the field of nursing and family medicine.[1,2,4,7] All of them, with the exception of a study conducted in Croatia,[3] recorded a 1-factor result with high factor loadings (>0.8) for the questionnaire items.

Recently, a Spanish version of the CARE questionnaire validated in family doctors has been published,[12] showing adequate reliability and validity of this tool. These authors likewise corroborated a single-factor solution with high reliability ($\alpha = 95.3\%$), and also found a correlation to the degree of overall satisfaction.

The low number of not applicable/missing responses shows that the tool measures relevant aspects. In the present study, the incidence of "not applicable" responses ranged from 0 to 2.6%, the latter value belonging to item 4, and these percentages are within the range reported by previous authors.[9,12] Likewise, we also documented three non-responses, which agrees with the Spanish authors.[12]

The mean CARE score obtained was higher (47.2 ± 4.4) than that obtained in the validated version in family doctors in Spain (42.2 ± 7.4)[12] and in the validation study in dental students in Malaysia (43.6 ± 6.1).[9] In addition, a ceiling effect of the questionnaire was demonstrated, which could be due to the fact that patients evaluated students and were sympathetic to their actions, as they were aware that the students were in the process of learning.

The differences between the present questionnaire and the published Spanish version validated for primary care physicians[12] are considerable. Only one question was formulated in the same way, and the answers could range from "mediocre" to "excellent" - these being translated as "poor" to "very much" in our case.

The present study was carried out during two academic years marked by the SARS-CoV-2 pandemic; the assessment of student empathy for patients was therefore conducted in a unique context.

The high empathy and satisfaction scores show that despite safety measures such as the permanent use of face masks, protective screens and gowns, the trainees managed to maintain a high standard of quality of care. In fact, a survey conducted in Germany showed that patients attending dental services did not observe any relevant changes in the quality of care received, despite the work overload experienced by both the dentists and the care team with regard to the need to take additional safety measures.[13]

Empathy is an interpersonal skill that depends on sensitivity or recognition of emotional states, and has a positive impact upon the dentist-patient relationship. In fact, the ability to recognize emotion in others enables the professional to be proactive in conveying information both verbally and non-verbally.[14] Thus, assessment by the patient using tools such as the CARE measure allows this ability to be objectified.

Patients with dental anxiety or phobia are at risk of avoiding dental visits and thus of needing more invasive treatments.[11] In fact, the

TABLE 1 Characteristics of the variables recorded in the study and bivariate analysis in relation to the total CARE score.

Students	N (%)	CARE score Mean (SD)	p-value
Age			
<25 years	94 (61.8)	47.5 (4.3)	.624
≥25 years	58 (38.2)	46.8 (4.8)	
Gender			
Female	140 (73.3)	47 (4.6)	.225
Male	44 (23)	48.2 (3.1)	
Missing data	7 (3.7)	–	
Patients	**Mean (SD; range)**	**Mean (SD)**	**p-value**
Age[a]	52.5 (17; 18–85)	−0.001 (0.001)[a]	.007[b]
	N (%)		
Gender			
Female	99 (51.8)	47 (4.2)	.329
Male	92 (48.2)	47.3 (4.6)	
Ethnicity			
Caucasian	142 (74.4)	46.8 (4.6)	.203
Asian	0 (0)	–	
Sub-Saharan	3 (1.6)	50 (0)	
Latin American	34 (17.8)	47.7 (3.8)	
Other	11 (5.7)	48.8 (3)	
Missing data	1 (0.5)	–	
Level of schooling			
Primary school	50 (26.2)	47.4 (3.8)	.419
Compulsory secondary school	37 (19.4)	47.5 (4.6)	
High school or vocational training	75 (39.3)	46.5 (4.6)	
University or higher	28 (14.7)	47.9 (4.5)	
Missing data	1 (0.5)	–	
Marital status			
Living with a partner	109 (57.1)	47.7 (4.2)	.111
Living without a partner	80 (41.9)	46.8 (4.5)	
Missing data	2 (1)	–	
Employment status			
Active	88 (46.1)	47.1 (4.5)	.974
Unemployed	35 (18.3)	47.3 (4.2)	
Retired	67 (35.1)	47.2 (4.3)	
Missing data	1 (0.5)	–	
Number of visits			
1	81 (42.4)	47.9 (3.8)	.569
2	52 (27.2)	46.6 (5)	
3 or more	57 (29.9)	46.8 (4.5)	
Missing data	1 (0.5)	–	
Type of visit			
First visit	29 (15.2)	47.1 (4.4)	.672
Surgery	161 (84.3)	47.2 (4.4)	
Missing data	1 (0.5)	-	

Note: Nonparametric tests were used.

Abbreviations: *N*, number; SD, standard deviation.

[a]Coefficient and standard error.

[b]The variable CARE score has been converted to a logarithmic scale.

TABLE 2 Distribution of the CARE questionnaire responses.

Item	Poor	Little	Enough	Much	Very much	Not applicable	Missing	Mean CARE score (SD)
1	0	0	12 (6.3%)	38 (19.9%)	141 (73.8%)	0	0	4.7 (0.6)
2	0	0	10 (5.2%)	41 (21.5%)	140 (73.3%)	0	0	4.7 (0.6)
3	0	0	3 (1.6%)	43 (22.5%)	144 (75.4%)	0	1 (0.5%)	4.7 (0.5)
4	0	1 (0.5%)	9 (4.7%)	27 (14.1%)	149 (78%)	5 (2.6%)	0	4.7 (0.6)
5	0	0	6 (3.1%)	36 (18.9%)	148 (77.5%)	1 (0.5%)	0	4.7 (0.5)
6	0	0	6 (3.1%)	32 (16.8%)	152 (79.6%)	0	1 (0.5%)	4.8 (0.5)
7	0	0	1 (0.5%)	37 (19.4%)	153 (80.1%)	0	0	4.8 (0.4)
8	0	0	5 (2.6%)	34 (17.8%)	152 (79.6%)	0	0	4.8 (0.5)
9	0	0	5 (2.6%)	39 (20.4%)	146 (76.4%)	1 (0.5%)	0	4.7 (0.5)
10	0	0	7 (3.7%)	34 (17.8%)	147 (77%)	2 (1%)	1 (0.5%)	4.7 (0.5)

Abbreviation: SD, standard deviation.

TABLE 3 Convergent validity of the CARE questionnaire.

Item	Factor loadings	Scale mean if item deleted (SD)	Corrected item-total correlation	Cronbach's alpha if item deleted
1	0.738	42.4 (4.1)	0.401	0.949
2	0.790	42 (3.8)	0.782	0.928
3	0.870	42 (3.8)	0.860	0.923
4	0.827	42.1 (3.7)	0.807	0.927
5	0.883	42 (3.7)	0.885	0.922
6	0.851	41.9 (3.8)	0.850	0.924
7	0.818	41.9 (3.9)	0.819	0.926
8	0.792	41.9 (3.9)	0.797	0.927
9	0.878	42 (3.8)	0.885	0.922
10	0.844	42 (3.7)	0.843	0.924

Abbreviation: SD, standard deviation.

TABLE 4 Multivariate analysis of the CARE score.

CARE score	Coefficient	Standard error	p-value	95%CI
Gender	−0.56	0.67	.412	−1.89 to 0.78
Level of schooling	−0.01	0.34	.996	−0.68 to 0.69
Marital status	−0.88	0.69	.204	−2.25 to 0.48
Employment status	0.38	0.40	.348	−0.41 to 1.17
Number of visits	−0.63	0.43	.138	−1.47 to 0.21
Type of visit	0.76	1.00	.449	−1.22 to 2.74

Abbreviation: CI, confidence interval.

vicious circle of fear of the dentist was described in 1984, showing avoidance of dental visits to worsen oral health status.[15] Thus, ensuring adequate interpersonal skills on the part of the dentist is extremely important in order to establish a better bond of trust and improve communication with the patient and his or her adherence to treatment and to preventive check-ups.

In the present study, the degree of anxiety of the patient prior to consultation was not assessed, which could be a limitation when assessing perceived empathy. However, the students knew at the time that they were participating in the study, so this could

have an impact on unconscious improvement in communication with the patient.

Having a tool such as the CARE measure validated in Spanish and in the context of dentistry is a necessary step to develop new lines of research into the acquisition of interpersonal skills in this field, and to be able to carry out educational interventions aimed at training in relational empathy. This need is justified in view of the high percentages of dental anxiety in the population, as well as the vulnerability that can be generated in patients due to the working position in the dental chair.[16]

5 | CONCLUSIONS

The Spanish version of the CARE measure has high reliability and validity in assessing relational empathy in dental students. Perceived empathy is related to overall satisfaction with the visit. Patient demographics and the number of visits do not influence perceived empathy.

CONFLICT OF INTEREST STATEMENT

Dr. Sánchez-Torres reports grants and personal fees from Inibsa Dental, grants from Mundipharma, grants and personal fees from Mozograu SA, outside the submitted work. Dr. Camps-Font reports personal fees from Grupo Menarini, non-financial support from Nobel Biocare, grants and non-financial support from Inibsa Dental, grants, personal fees and non-financial support from Avinent SA, grants and non-financial support from Dentaid SL, outside the submitted work. Dr. Figueiredo reports grants, personal fees and non-financial support from Inibsa Dental, grants from Mundipharma, grants, personal fees and non-financial support from Mozograu SA, grants and non-financial support from Avinent SA, grants, personal fees and non-financial support from Dentaid SL, grants and personal fees from Geistlich Pharma, grants and personal fees from Menarini Richerche, personal fees from Laboratorios Silanes, personal fees from Araguaney Dental, personal fees from Dentsply Implants, non-financial support from Nobel Biocare, outside the submitted work. Dr. Valmaseda-Castellón reports grants, personal fees and non-financial support from Inibsa Dental, grants from Mundipharma, grants, personal fees and non-financial support from Mozograu SA, grants and non-financial support from Avinent SA, grants, personal fees and non-financial support from Dentaid SL, grants from Geistlich Pharma, grants and personal fees from Menarini Richerche, personal fees from Laboratorios Silanes, non-financial support from Nobel Biocare, outside the submitted work.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the authors, upon reasonable request.

ORCID

Rui Figueiredo ORCID https://orcid.org/0000-0002-2122-6530

REFERENCES

1. Aomatsu M, Abe H, Abe K, et al. Validity and reliability of the Japanese version of the CARE measure in a general medicine outpatient setting. *Fam Pract*. 2014;31(1):118-126.
2. Fung CSC, Hua A, Tam L, Mercer SW. Reliability and validity of the Chinese version of the CARE measure in a primary care setting in Hong Kong. *Fam Pract*. 2009;26(5):398-406.
3. Hanževački M, Jakovina T, Bajić Ž, Tomac A, Mercer S. Reliability and validity of the Croatian version of consultation and relational empathy (CARE) measure in primary care setting. *Croat Med J*. 2015;56(1):50-56.
4. Bikker AP, Fitzpatrick B, Murphy D, Mercer SW. Measuring empathic, person-centred communication in primary care nurses: validity and reliability of the consultation and relational empathy (CARE) measure. *BMC Fam Pract*. 2015;16(1):1-9.
5. Hannah A, Millichamp CJ, Ayers KMS. A communication skills course for undergraduate dental students. *J Dent Educ*. 2004;68(9):970-977.
6. Narang R, Mittal L, Saha S, Aggarwal VP, Sood P, Mehra S. Empathy among dental students: a systematic review of literature. *J Indian Soc Pedod Prev Dent*. 2019;37(4):316-326.
7. Mercer SW, Maxwell M, Heaney D, Watt GCM. The consultation and relational empathy (CARE) measure: development and preliminary validation and reliability of an empathy-based consultation process measure. *Fam Pract*. 2004;21(6):699-705.
8. Park KY, Shin J, Park HK, et al. Validity and reliability of a Korean version of the consultation and relational empathy (CARE) measure. *BMC Med Educ*. 2022;22(1):403.
9. Babar MG, Hasan SS, Yong WM, Mitha S, Al-Waeli HA. Patients perceptions of dental students empathic, person-centered care in a dental school clinic in Malaysia. *J Dent Educ*. 2017;81(4):404-412.
10. von Elm E, Altman DG, Egger M, et al. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol*. 2008;61(4):344-349.
11. Lermen C, Wetzel W, Britz V, Sterz J, Bechstein WO, Schreckenbach T. Empathy, personality traits, and emotional management in 2nd and 4th-year dentistry students: a single-center study. *BMC Med Educ*. 2022;22(1):2.
12. Ruiz de Azua S, Ozamiz-Etxebarria N, Ortiz-Jauregui MA, Gonzalez-Pinto A. Communicative and social skills among medical students in Spain: a descriptive analysis. *Int J Environ Res Public Health*. 2020;17(4):1408.
13. Schlenz MA, Schmidt A, Wöstmann B, et al. Perspectives from dentists, dental assistants, students, and patients on dental care adapted to the COVID-19 pandemic: a cross-sectional survey. *Int J Environ Res Public Health*. 2021;18(8):3940.
14. Schreckenbach T, Ochsendorf F, Sterz J, et al. Emotion recognition and extraversion of medical students interact to predict their empathic communication perceived by simulated patients. *BMC Med Educ*. 2018;18(1):237.
15. Berggren U, Meynert G. Dental fear and avoidance: causes, symptoms, and consequences. *J Am Dent Assoc*. 1984;109:247-251.
16. Moore R. Maximizing student clinical communication skills in dental education-a narrative review. *Dent J (Basel)*. 2022;10(4):57.