NEPALI TRANSLATION AND VALIDATION OF DENTAL SATISFACTION QUESTIONNAIRE

Arbind Rai[1*], Sneha Shrestha[2], Ashok Ayer[3], Navin Agrawal[4], Mannu Vikram[5]

Affiliation

1. Assistant Professor, Department of Conservative Dentistry and Endodontics, B. P. Koirala Institute of Health Sciences, Nepal

2. Assistant Professor, Department of Pediatric and Preventive Dentistry, B. P. Koirala Institute of Health Sciences, Nepal

3. Associate Professor, Department of Conservative Dentistry and Endodontics, B. P. Koirala Institute of Health Sciences, Nepal

4. Additional Professor, Department of Conservative Dentistry and Endodontics, B. P. Koirala Institute of Health Sciences, Nepal

5. Additional Professor and Head of the Department, Department of Conservative Dentistry and Endodontics, B. P. Koirala Institute of Health Sciences, Nepal

ORA 307

* Corresponding Author

Dr. Arbind Rai

Assistant Professor

Department of Conservative Dentistry and Endodontics,

B,P. Koirala Institute of Health Sciences, Nepal

Email:nibra2002@gmail.com

ORCID: https://orcid.org/0000-0003-2757-3127

ABSTRACT

Introduction

Patient satisfaction is regarded as an important outcome of health care that contributes to better patient compliance and consequently offers improved clinical outcomes Dental school clinics must regulate both the clinical and academic classes in balance without hampering the needs of both the patient and students.

Objectives

To develop a reliable and valid Nepali version of Dental Satisfaction Questionnaire (DSQ-N).

Methodology

The English version of the dental satisfaction questionnaire (DSQ) was translated into Nepali following a standard translation process. Content validity followed by pre-testing were evaluated to obtain the final version of DSQ-N. Two hundred patients attending the Department of Conservative Dentistry and Endodontics completed the DSQ-N in the waiting room, at their convenience. Internal consistency of the questionnaire was determined by Cronbach's alpha and Principal component analysis was used to determine the construct of the scale.

Result

Content Validity Index of the scale was 0.9 (S-CVI/ Avg) and alpha (Cronbach's) coefficient for the overall construct of DSQ was ≈0.83. Principal Component Analysis confirmed the internal structure of the scale and four components emerged from it.

Conclusion

The translated nepali version of DSQ is a reliable and valid tool to determine patients' satisfaction of dental care services based on the excellent content validation result together with robust internal reliability.

KEY WORDS

Cross-sectional study; Patient satisfaction; Questionnaire; Reliability; Translation

INTRODUCTION

Patient satisfaction is regarded as an important outcome of health care that contributes to better patient compliance and consequently offers improved clinical outcomes.[1] In these days, transformation of provider-centered approach to patient-centered one has resulted in healthcare facilities that ensures preference, expectation and need of patient.[2,3] Being a teaching institute, dental school clinics must regulate its classes, both academic and clinical, in balance where both the patient as well as student are benefitted. However, precedence must be given for patient's satisfaction which is censorious to the education of students.[4] Studies done on patient satisfaction concluded that satisfaction is a multidimensional concept that addresses many aspects of care, as patients satisfying in some areas may not satisfy with other areas of care.[5,6] Even though, a great degree of similarity was found among these studies, standard survey instrument was not employed. According to Lafront et al., "while there is a vast literature describing patient satisfaction with private providers, we know very little about what satisfies patients and how to attract them to academic health centers."[4] EbnAhmady A et al. in their review concluded that access, interaction, environment, quality, and cost are the dimensions to be included in patient satisfaction survey.[7] Determination of these dimensions for patient satisfaction surveys in dental school clinics, can assist dental academic institutions in providing the highest quality of care.

So, this study was performed with the aim to develop a reliable and valid Nepali version of Dental Satisfaction Questionnaire (DSQ-N). Further, a standard Nepali version of the DSQ is still lacking.

METHODOLOGY

Cross-sectional descriptive study was performed among the dental patients coming to the Department of Conservative Dentistry and Endodontics, College of Dental Surgery, B.P. Koirala Institute of Health Sciences, Dharan, Nepal from March to September 2021. Patients were interviewed by an attending doctor and were included if they had undergone dental treatment in the department within a year. They were also included after their scheduled treatment, if they were visiting for the first time or their previous treatment visit had been more than a year. Medically compromised patients, patients not willing for participation and those who could not adequately respond by themselves were excluded from the study. Sample size calculated was 200 and ethical clearance was obtained from the Institutional Review Committee of the institute (IRC/1231/018)

Standard translation and back translation protocol were followed and a reconciled Nepali version of the questionnaire was obtained. Responses were recorded in 5-point Likert scale from strongly agree, agree, not sure, disagree to strongly disagree. These responses were scored five, four, three, two and one for those with positive (+) directed questions and coded one, two, three, four, and five for items with negative (-) directed ones. This was done to generate a high score and higher score indicates greater satisfaction.

The questionnaire was validated among the six subject experts regarding its content, using Content Validity Index (CVI). Its value can be computed for each item on the scale as well as for the overall scale, referred as I-CVI and S-CVI respectively.

Item Content Validity Index (I-CVI) = n_e/N

Where, n_e = number of SME panelists indicating "essential",

N = total number of SME panelists

Scale Content Validity Index (S-CVI) = Average score of I-CVI

The Nepali version of the questionnaire after content validation was pretested among 20 dental patients for determining the ease and readability of the questionnaire. Following the pretesting, final version of the questionnaire in the target language (Nepali) was obtained and was referred to as DSQ-N. After obtaining informed consent for the study, two hundred patients were enrolled in this study following non probability convenient sampling method. Demographic data of the patients were recorded and the patients were requested to complete the DSQ-N in the waiting area of the department at their convenience.

Data were analyzed using SPSS (version 11) and descriptive statistics were calculated. Missing values on single questions were `plugged' using the mean of the scores of the other questions. More than 20% missing questions would qualify for exclusion from computing a sum-score (but none satisfied this criterion).

Sample adequacy of the study was determined by the Kaiser-Meyer- Olkin (KMO) test. Correlation between the variables was checked with Bartlett's test for Sphericity and Principal component factor analysis was applied to determine the dimensionality of questions in the questionnaire. Internal consistency reliability of DSQ-N was measured using Cronbach's alpha.

RESULT

Content validation testing was done among all thirty-one screening questions and eight questions with an I-CVI score of less than 0.83 were removed from the questionnaire survey (Table 1). After deletion, the Nepali version of the questionnaire consisted of 23 questions and the calculated S-CVI/Avg score for the questionnaire was 0.9.

Response rate of the questionnaire was 100%. Out of the 200 patients who completed the questionnaire, females had more participation than males. Maximum participation was the group that were visiting for the second time within one year and the average age was from 26-40 years range. Table 2 shows the item analysis of individual questions of the questionnaire.

Cronbach's alpha of DSQ-N was 0.73 which shows good internal consistency of the instrument and on deletion of nine questions, Cronbach's alpha increase by ≈ 10% (0.825)

The value of the KMO measure of sampling adequacy was 0.821 which is satisfactory and Bartlett's test showed significant results indicating the questions were correlated and able to proceed for factor analysis. (X^2= 666.573, df =
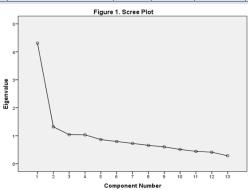
78,p <0.001). Communalities loading of the questions were determined and one question, question 28, was omitted due to low factor loading and the analysis repeated. Remaining thirteen questions were subjected to principal component factor analysis and its result revealed four significant components with an eigen value of one or more, accounting for 59.26% of total variance (Figure 1). There were cross loadings of data after extraction so orthogonal rotation was done using Varimax rotation with Kaiser Normalization. All component loadings were > 0.4. (Table 3).

Table 1: The Dental Satisfaction Sub-scale with item content validity index

Scale	Item	Content (Shortened form)	I-CVI
Dental professional, advice and services received	11.	Preferred dental professional.	0.83
	12.	Same dental professional.	*
	13.	Clearly explained the required treatments.	1
	16.	Answered my questions.	*
	19.	Pleased with care provided	1
	24.	Dental problem solved with treatment	0.83
	28	Assured of good dental care received.	0.83
	30	Provided advise for dental care	0.83
Communication and service results	10.	Impersonal dental professional.	*
	15.	Comprehensive examination #	*
	17.	Additional details regarding treatment. #	0.83
	20.	More dental care provided than required.	*
	21.	Other dental issue not addressed. #	0.83
	23.	Describe the procedure during the treatment.	0.83
	29.	Areas for improvement in the care provided #	*
Facilities/clinic staff	5.	Attractive waiting room	0.83
	7.	Well-resourced dental hospital	1
	8.	Modern dental hospital	*
	9.	Friendly staff	1
Affordability	27.	Unaffordable dental cost. #	1
	31.	Financially secure.	0.83
Clinic location/arrange visits	1.	Distance to clinic. #	0.83
	2.	Difficulty in making appointments	1
	3.	Travel to clinic #	0.83
Service results	22.	Painful dental treatment. #	1
	25.	No improvement with dental treatment #	0.83
	26.	Longer expected improvement. #	*
Unnecessary costs plus conceptually unrelated items	4.	Make prompt visit	1
	6.	Long waiting time	0.83
	14.	Excellent explanation of treatment expenses.	0.83
	18.	Avoided unnecessary treatment cost.	*

* Question omitted due to I-CVI less than 0.83
# Negative directed question

Table 2: Item analysis

Q. No	Content	Mean	Standard Deviation	Corrected Item Total Correlation	Cronbach's Alpha if Item Deleted
1	Distance to hospital made my last visit difficult	3.110	1.5589	.054	.743
2	Difficult to arrange a dental appointment	2.815	1.4565	.225	.726
3	Convenient travel to dental hospital	4.115	1.2608	.303	.719
4	Make prompt visit	4.505	.8624	.401	.715
5	Attractive waiting room	3.980	1.1251	.376	.714
6	Long waiting time	3.790	1.3208	.225	.725
7	Well-resourced dental hospital	4.275	1.0701	.435	.710
9	Friendly staff	4.645	.7759	.543	.709
11	Preferred dental professional.	4.220	1.1171	.426	.710
13	Clearly explained the required treatments.	4.645	.7562	.440	.715
14	Excellent explanation of treatment expenses.	4.210	1.2013	.322	.717
17	Additional details regarding treatment	2.110	1.2146	.096	.734
19	Pleased with care provided	4.460	.8958	.627	.701
21	Other dental issue not addressed	2.990	1.4937	.233	.726
22	Painful dental treatment.	3.030	1.4900	.218	.727
23	Describe the procedure during the treatment.	4.410	.9415	.468	.710
24	Dental problem solved with treatment	4.145	1.0816	.508	.705
25	No improvement with dental treatment	2.925	1.4800	-.066	.752
27	Unaffordable dental cost	2.925	1.4595	-.033	.749
28	Assured of good dental care received.	4.190	.9842	.370	.715
29	Areas for improvement in the care provided	2.490	1.2641	.275	.721
30	Provided advise for dental care	4.410	1.0184	.374	.715
31	Financially secure.	4.160	1.0678	.356	.716

Figure 1. Scree Plot

Table 3: Exploratory factor analysis on the DSQ-N version of questionnaire.

Items	Domain			
	1	2	3	4
Que 3				.860
Que 4				.708
Que 5		.660		
Que 7		.813		
Que 9		.522		
Que 11	.489			
Que 13	.774			
Que 14	.402		.579	
Que 19	.744			
Que 23	.462			.409
Que 24	.698			
Que 30			.615	
Que 31			.759	
Eigen values	2.481	2.096	1.649	1.632
% of Variance	17.720	14.970	11.781	11.654

DISCUSSION

This study was conducted to assess the cross-cultural adaptation and translation of the Dental Satisfaction Questionnaire into Nepali language. Its high completion rate suggests that it is easy to complete with minimal supervision. The employment of self-administered questionnaires eliminated the possibility of interviewer bias.[8] The mean DSQ score of the Nepali samples of this study was similar to that of the community samples of the original study conducted in Australia during 2002[4.31 versus 4.13].[9]

This newly developed DSQ-N is suitable for use among dental patients due to its robust internal consistency reliability (Cronbach's alpha = 0.827). This value is less than that of community samples of the original Australian version (0.9) but similar to the one obtained for Norway (0.81).[9,10] However, is greater than the value of Spanish version (0.56)and is still above accepted CA value of 0.7.[11,12] Further, Nunnally and Bernstein recommended a Cronbach's alpha coefficient equal to 0.60 as a minimum reliability criterion.[13] The Chinese version of the 19-item DSQ used in Hong Kong showed that not all scales reported good internal consistency (Cronbach's alpha: 0.39–0.84).[14]

Excellent Content Validity of the questionnaire is confirmed with I-CVI score of more than 0.78 and S-CVI of 0.9 as suggested by Polit et al.[15] Osborne, Costello, and Kellow suggest that communalities above 0.4 are acceptable and that when the extraction capacity of any Question is less than 0.4, the Question is deemed a weak measure and must be removed from the research instrument.[16] Low extraction capacity of one question led to its exclusion.

The assessment of validity requires a sample size usually around 50 to 200 people in a cross-sectional design, and our study was conducted on 200 samples ensuring sample adequacy for further analysis.[17] Construct validity was measured with principal component analysis and Table 3 represent factor loading of the emerged component on the DSQ-N. Crawford, and Zwick and Velicer suggested that the retained factor should have at least three questions with loading greater than 0.4 for it to be stable.[18,19] Thus, the represented factor loading for the questions propose their contribution to the emergence of four components. The dimensions of the component derived were Dental professional, advice and services received, Facilities/clinic staff, Cost/Affordability and others and Clinic location/arrange visits. Decrease in the domain regarding the internal structure of the questionnaire compared to the original study was noted. Study by Davies and Ware reported an increased components while those with fewer domains were seen in study done by Erik Skaret et al., Imanaka et al. and M. Hakeberg et al.[10, 20-22] This difference in the components after factor analysis can be due to the linguistic problem brought about by the difference in social and culture boundaries of the participants. Direct translation of some questions may become different or meaningless because some of the words and phrases have no direct translation, and questions conceived in the context of one language may not be understood in the same way as in the other language.[23-25] Moreover, this difference may also have been due to the large difference in sample sizes, since the study considers only 200 v/s 1543 respondents.

CONCLUSION

The present study proffers an initial step in formulating a tool in evaluating satisfaction among dental patients in Nepali population. Based on the excellent content validation results together with strong internal consistency, the translated Nepali version of the DSQ is a valid and reliable tool to assess patient satisfaction with dental care services.

RECOMMENDATION

It is advised to do a comparable study to increase the tool's construct and content validity by using a larger sample size and including patient-perspective questions. Patients do, however, voice opposing viewpoints on several areas of satisfaction. When including these topics, the suitable phrase and linguistic flow would be a crucial consideration. Moreover, future studies aimed at validating a shorter and simpler version of the scale should be encouraged and administered in a population study.

LIMITATION OF THE STUDY

This study has several limitations. Perhaps the main concern is that the study did not provide evidence for testing reproducibility of the questionnaire. Further research that considers test-retest reliability is also advised. Secondly, significant variation of sample size in qualitative research exists but larger sample size would have been a better indicator for determining factor structure of the instrument.[26] Further, selection bias of the expert panel may have occurred, especially with the selection of doctors as expert panelists. Since, the raters being service providers and the questions were meant for the patient and their perception towards the service provided, removal of questions that might be essential in patient's perspective, could result in loss of domain during the subsequent analysis. Lastly, low patient awareness and enthusiasm in filling the questionnaire could be the reason for difference in the component during factor analysis.

CONFLICT OF INTREST
None

FINANCIAL DISCLOSURE
None

REFERENCES

1. Donabedian A. The Lichfield Lecture. Quality assurance in health care: consumers' role. Qual Health Care. 1992;1(4):247-51. DOI: 10.1136/qshc.1.4.247

2. Lliffe S, Wilcock J, Manthorpe J, Moriarty J, Cornes M, Clough R, et al. Can clinicians benefit from patient satisfaction surveys? Evaluating the NSF for Older People, 2005-2006. J R Soc Med. 2008;101(12): 598-604. DOI: 10.1258/jrsm.2008.080103

3. Mead N, Bower P. Patient-centeredness: a conceptual framework and review of the empirical literature. SocSci Med. 2000;51(7): 1087-110. DOI: 10.1016/s0277-9536(00)00098-8

4. Lafont BE, Gardiner DM, Hochstedler J. Patient satisfaction in a dental school. Eur J Dent Educ. 1999;3(3):109-16. DOI: 10.1111/j.1600-0579.1999.tb00076.x

5. A SA. Patient satisfaction with care provided by a district dental clinic: University of the Western Cape March 2007. URL: https://core.ac.uk/download/pdf/58913379.pdf

6. Batbaatar E, Dorjdagva J, Luvsannyam A, Amenta P. Conceptualisation of patient satisfaction: a systematic narrative literature review. Perspect Public Health. 2015 Sep;135(5):243-50. DOI: 1757913915594196.

7. EbnAhmady A, Pakkhesal M, Zafarmand AH, Lando HA. Patient satisfaction surveys in dental school clinics: a review and comparison. J Dent Educ. 2015;79(4):388-93. PMID: 25838009

8. Nigel Bruce DP, Debbi Stanistreet. Philosophy of science and introduction to epidemiology. In: Quantitative methods for health research: a practical guide to epidemiology and statistics. . England: Wiley Blackwell; 2009. 1–28 p.

9. Stewart JF & Spencer AJ 2005. Dental Satisfaction Survey 2002. AIHW cat. No. DEN 141. Adelaide: AIHW Dental Statistics and Research Unit. URL: https://www.adelaide.edu.au/arcpoh/downloads/ publications/reports/working-papers/2002-satisfaction.pdf

10. Skaret E, Berg E, Raadal M, Kvale G. Reliability and validity of the Dental Satisfaction Questionnaire in a population of 23-year-olds in Norway. Community Dent Oral Epidemiol. 2004;32(1):25-30. DOI: 10.1111/j.1600-0528.2004.00118.x

11. López-Garví AJ, Montiel-Company JM, Almerich-Silla JM. Cross-cultural adaptation, validity and psychometric properties of the Spanish version of the Dental Satisfaction Questionnaire. Community Dent Health. 2014;31(1):44-9. PMID: 24741893

12. Van Griethuijsen RA, van Eijck MW, Haste H, Den Brok PJ, Skinner NC, Mansour N, et al. Global patterns in students' views of science and interest in science. Research in science education. 2015;45(4):581-603. DOI: 10.1007/s11165-014-9438-6

13. Nunnaly JC BI. Psychometric theory. 3rded. New York: McGraw-Hill; 1994. .

14. Wong M, Schwarz E. Factors determining Hong Kong adults' satisfaction with dental. J Dent Res. 1998;77:5. https://doi.org/10.1177/00220345980770051201

15. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. Res Nurs Health. 2006;29(5):489-97. DOI: 10.1002/nur.20147

16. Osborne J, Costello A, Kellow J. Osborne, JW. Best Practices in Quantitative Methods. 2008. https://dx.doi.org/ 10.4135/9781412995627.d8

17. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. J ClinEpidemiol. 1993;46(12):1417-32. DOI: 10.1016/0895-4356(93)90142-n

18. Crawford CB. Determining the number of interpretable factors. Psychological Bulletin. 1975;82(2): 226–237. https://doi.org/10.1037/h0076374

19. Zwick WR, Velicer WF. Comparison of five rules for determining the number of components to retain. Psychological bulletin. 1986;99(3): 432-442. DOI: 10.1037/0033-2909.99.3.432

20. Davies AR, Ware JE, Jr. Measuring patient satisfaction with dental care. SocSci Med A. 1981;15(6):751-60. DOI: 10.1016/0271-7123(81)90019-5

21. Imanaka M, Nomura Y, Tamaki Y, Akimoto N, Ishikawa C, Takase H, et al. Validity and reliability of patient satisfaction questionnaires in a dental school in Japan. Eur J Dent Educ. 2007;11(1):29-37. DOI: 10.1111/j.1600-0579.2007.00438.x

22. Hakeberg M, Heidari E, Norinder M, Berggren U. A Swedish version of the Dental Visit Satisfaction Scale. ActaOdontol Scand. 2000;58(1):19-24.

23. Harris RV, Ashcroft A, Burnside G, Dancer JM, Smith D, Grieveson B. Facets of job satisfaction of dental practitioners working in different rganizational settings in England. Br Dent J. 2008;204(1):E1; discussion 16-7. DOI: 10.1080/000163500429389

24. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976). 2000;25(24):3186-91. DOI: 10.1097/00007632-200012150-00014

25. Gilmour J, Stewardson DA, Shugars DA, Burke FJ. An assessment of career satisfaction among a group of general dental practitioners in Staffordshire. Br Dent J. 2005;198(11):701-4, discussion 693. DOI: 10.1038/sj.bdj.4812387

26. Baker S, Edwards R. How many qualitative interviews is enough. 2012. URL: http://eprints.ncrm.ac.uk/ 2273/4/how_many_interviews.pdf