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Perceptions of quality and safety among dental patients

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ABSTRACT

Introduction

From the perspective of patients, quality of care can be defined as the ability of healthcare products and services to satisfy their stated or implied needs. Dental professionals have a moral obligation to deliver the best quality care in today's increasingly informed, consumer-driven society.

Aim

To jumpstart the discussion on assessing quality of dental care, using patient perceptions.

Design

A cross-sectional study of South African dental patients.

Methods

Questionnaires were distributed to all non-emergency, adult patients at a teaching dental hospital in South Africa.

The outcome variables were:

a) Access to Care;
b) Technical Quality;
c) Structure and Facilities;
d) Communication;
e) Global Rating of Safety.

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ACRONYMS

ADA:	American Dental Association
CQI:	Consumer Quality Index
DAEs:	Dental Adverse Events
DQA:	Dental Quality Alliance
DQOF:	Dental Quality and Outcomes Framework
IOM:	Institute of Medicine
NIDCR:	National Institute of Dental and Craniofacial Research
NIH:	National Institutes of Health
PES:	Patient Experience Survey
PRR:	Prevalence Rate Ratios
QUOTE:	Quality of care through the patient's eyes

Results

Overall, 58.6% of the participants had a positive view about the quality of dental care in South Africa. Age, race, marital status, child status, employment status, household income and educational status were associated with higher quality ratings.

The question: "The instrument used in treating me appeared clean" (97.6%) was rated highly, while the question "Whenever I was sent to a new dentist, I had to repeat the tests that I did at the previous dentist" rated very low (36.9%).

Conclusions

The findings suggest that the dental profession still has challenges in meeting the expectations of patients.

Keywords

Healthcare quality, patient safety, patient-reported outcome measures, dental care.

INTRODUCTION

From the patient's perspective, quality of care can be defined as the ability of healthcare products and services to satisfy their stated or implied needs.[1] As defined by the Committee on Healthcare Quality in America, Institute of Medicine (IOM), one of the seven aims for healthcare quality is Patient-centered Care ("providing care that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions").[2]

The committee further describes the core dimensions of patient-centered care as: 1) Respect for patient values, attention to patient preferences and expressed needs; 2) Coordination and integration of care; 3) Information, communication and education;

4) Physical comfort; 5) Emotional support: relieving fear and anxiety, 6) Involvement of family and friends, 7) Transition and continuity.[2] The Picker Institute lists similar concepts as the most important priorities for patients in healthcare but adds an eighth dimension, namely: Access to care.[3]

Specifically pertaining to ambulatory care, the following are described as conditions: Access to the location of hospitals, clinics and physician offices; Availability of transportation; Ease of scheduling appointments; Availability of appointments when needed; Accessibility to specialists or specialty services when a referral is made; Clear instructions provided on when and how to be referred.[4]

Most of these dimensions for patient-centered care were first described by Gerteis et al. in 1993 when they identified the key factors in patient-centered care as: Respect for patients views, preferences and expressed needs; Co-ordination and integration of care; Information, communication and education; Physical comfort; Emotional support and alleviation of fear and anxiety; Involvement of family and friends; Transition and continuity.[5]

The concept of patient-centered care often creates a conflict between patients and providers because patients prioritize different aspects of the care[6-8] and these priorities may influence their perceptions of quality of care.[9] Whilst some would argue that patient perceptions are subjective and therefore unreliable,[10,11] others believe in the inherent value of these assessments because the patient is the primary recipient of care and therefore has the most important perspective.[12]

They posit that there is indeed an instrumental value to patient perceptions of quality due to the far-reaching consequences on the choice of providers or health plans, compliance with medical advice, health outcomes and the expression of grievances or seriousness of malpractice claims.[9,12-16] Therein lies the dilemma between the subjective versus normative assessments of quality in healthcare.[9,17] Some researchers have proposed shifting the focus from patient satisfaction, a narrow and relative concept[1,18] to a more substantive and robust evaluation of patient perceptions of quality, using tools that measure the actual experiences of care.[1,9,17,19-23] The development of the appropriate tools is still at its infancy, as is also the concept of patient-centeredness and its applications to quality of dental care.[24-27]

In addition to the above-mentioned reasons, the desire to promote greater transparency and accountability of healthcare systems underscores the importance of quality measurement.[9] As dental professionals, we have a moral obligation to deliver the best quality care that meets both professional standards and patient needs, the latter especially so, in an increasingly informed, consumer-driven society.[10,28]

The American Dental Association (ADA) through the Dental Quality Alliance (DQA)[29,30] and the United Kingdom Department of Public Health through the Dental Quality and Outcomes Framework (DQOF)[31,32] have laid the foundation for the development of quality metrics in dentistry.[27] Efforts are also ongoing by the second and fifth authors of this paper through grant funding from the National Institutes of Health (NIH)/ National Institute of Dental and Craniofacial Research (NIDCR) - R01DE0 24166-01A1, to implement dental quality measures in dental practices across the United States (US).[33]

The goal of this paper is to jumpstart the discussion on patient perceptions of quality as a useful tool for assessing the quality dental care. In the future, this will offer the profession a screening tool for the quick evaluation of dental practices for high performance or for the identification of areas in need of improvement.

Subsequent steps will involve defining key concepts and outcome measures for patient-reported dental quality as well as developing standardized instruments for measuring that quality.

Surveys have typically been used to garner information about patient perceptions of quality.[9,34] A national survey of dental patients in the United Kingdom by Tickle et al. showed that about one fifth of respondents rated the quality of dental care they received as suboptimal.[35]

The factors that were important in their assessment of quality were: “access (40%), technical quality of care (35%), professionalism (30%), hygiene/cleanliness (30%), staff attitude (27%), pain-free treatment (23%), value for money (22%), and staff putting patients at ease (21%)”.[35] Positive responses were associated with “good interpersonal communication, politeness and being put at ease” while negative responses were associated with poor wait times and high cost of care.[35]

This study used a self-reported survey to assess the quality of care experience among South African dental patients.

METHODS

Survey design

The survey was developed by the authors through an iterative process and tested for validity and reliability. A simple convenience sampling method was used to collect information from all non-emergency, adult patients (>18 years) at a teaching dental hospital in South Africa.

Patients gave their informed consent after reading an information leaflet detailing the research objectives and by completing the survey. Necessary approvals were obtained from the Ethics Committees at the University of Pretoria and the Harvard School of Dental Medicine prior to the commencement of data collection.

Definitions and measures

The questionnaire was subdivided into five main sections: 1) Past dental history and oral health, 2) Quality of past dental care, 3) Experience of dental adverse events (DAEs), 4) Sequelae and follow-up events after DAE experience, and 5) Biographic data.

Results from sections 3 and 4 are discussed in another paper. This manuscript primarily focuses on section 2 (Quality of past dental care) but utilizes variables from sections 1 and 5 for explanatory purposes.

Outcome variables

The five primary outcome variables were: a) Access to Care (7 items); b) Technical Quality, Efficiency and Effective Organization of Care (10 items); c) Structure and Facilities (6 items); d) Communication, Information and Courtesy (10 items); e) Global rating of safety. The first four outcome variables were obtained by classifying the questions from section 2 into patient-defined dimensions of quality identified by Sofaer et al. in their extensive review titled "Patient Perceptions of Quality".[9]

The original seven dimensions were: 1) patient-centered care; 2) access; 3) communication and information; 4) courtesy and emotional support; 5) technical quality; 6) efficiency of care/organization; and 7) structure and facilities.[9] Each variable was assessed using items that were measured on a 5-point Likert scale ranging from 1 (Always), 2 (Usually), 3 (Sometimes), 4 (Never), and 5 (Not Applicable).

Table 1. Reliability (Internal consistency)

Dimensions of quality	Cronbach's α coefficient
A) Access to Care	0.62
B) Technical Quality, Efficiency and Effective Organization of Care	0.83
C) Structure and Facilities	0.71
D) Communication, Information and Courtesy	0.92
Overall	**0.77**

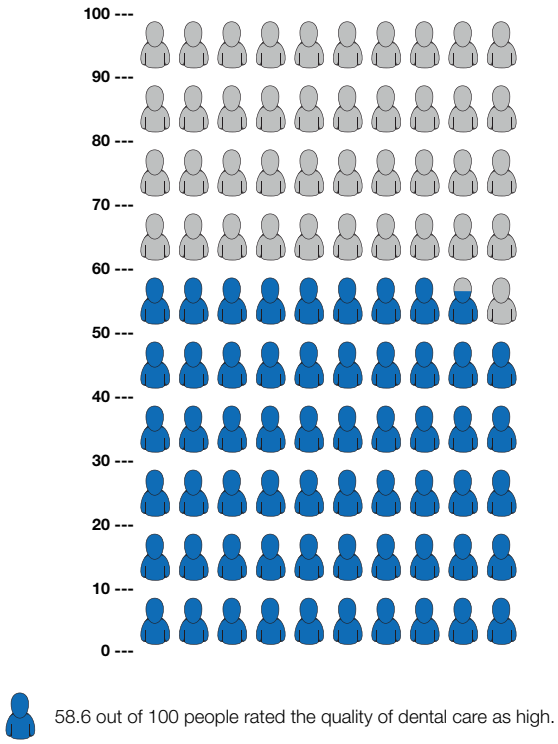

Figure 1. Overall perception of dental quality.

Legend: Pictorial representation of the percentage of patients who rated the quality of dental care received as high (58.6%)

The final responses were collapsed into a 4-point scale and reverse coded to be more intuitive (negative responses were assigned lower values and vice versa). Option 5 (Not applicable) was treated as missing. All four categories had a combined Cronbach's alpha of 0.77 (acceptable) for internal validity (Table 1).

The fifth outcome variable (global rating of safety) was generated from the question "In general, how safe are the dental clinics that you have visited in South Africa?" This question was assessed on a 10-point visual analog scale and collapsed into five categories ranging from 1 (extremely unsafe) to 5 (extremely safe).

Explanatory variables

The past dental history, dental and overall health status, and oral hygiene practices were assessed. We also assessed the relationship between demographic factors such as: gender, age, race, educational level, economic status, employment status, marital status and number of children on each outcome variable.

Statistical analysis

All statistical analyses were performed using STATA 14®. Percent positives were obtained by collapsing the upper two response options for each line item ('Always' and 'Usually' or 'Extremely safe' and 'Safe' for category 5) (Table 2). For inferential analyses, the five categories were converted into binary variables (low vs. high quality) using the mean scores as the cut-off point.

Bivariate analyses using Pearson's chi-squared test were used to identify the explanatory variables with significant relationships with the outcome variables (Table 3).

Further statistical analyses were performed using generalized linear models of the Poisson family with robust variance estimates to generate adjusted prevalence rate ratios (PRR) and identify significantly associated variables with the dimensions of quality and safety.

RESULTS

440 questionnaires were returned (97.8% response rate). The sample characteristics are given as follows: Females (62.7%), 25-44 years (47.8%), whites (64.9%), unemployed (45.8%), high school or vocational school education (52.5%), had children (67.8%), single-never married (36.1%), low income household (57.8%), dental visit within previous 12 months (52.2%), visited a state dental clinic for last dental visit (57.7%), satisfied or extremely satisfied with last dental visit (69.1%), not satisfied with dental health (57.7%), satisfied with overall health (85.1%), clean teeth at least once daily (94.3%) and uses a toothbrush with fluoride or non-fluoride toothpaste (57.3%).

Overall perception of quality and safety

Figure 2 shows the percentage of participants who had positive perceptions of quality and safety by dimension. Access to care received the least favourable rating

Table 2. Detailed Dimensions of Dental Quality and Safety, showing Percentage Positive and Mean scores.

Dimensions of quality	Percent positive (95% CI)	Mean ± SD
A) Access to care		
I was able to get an appointment within 24hrs for a dental emergency.	55.3 (49.8 - 60.7)	2.6 ± 1.1
I was able to get an appointment within one month of my preferred date for routine check-up/cleaning.	59.7 (54.3 - 65.2)	2.7 ± 1.0
I was able to get an appointment within one month of my preferred date to see a dental specialist (e.g. for surgery).	58.4 (52.5 - 64.3)	2.6 ± 1.1
I got turned away when I could not afford to pay for my dental treatment*.	77.8 (72.6 - 83.0)	3.3 ± 1.1
I had to travel more than 45 minutes to get to the dental clinic*.	56.3 (50.8 - 61.8)	2.6 ± 1.2
I was able to see the dental provider within one hour of my appointment.	46.7 (41.1 - 52.2)	2.5 ± 1.0
I found it hard getting into the dental clinic because of my physical disability*.	91.6 (86.9 - 96.2)	3.7 ± 0.8
B) Technical quality, efficiency and effective organization of care		
The clinic staff asked questions to confirm my identity before I was taken into the treatment area.	84.8 (81.1 - 88.5)	3.4 ± 0.9
The dental provider asked questions to confirm my identity before starting treatment.	74.6 (70.1 - 79.2)	3.1 ± 1.1
The dental provider asked about changes to my overall health before starting treatment.	66.6 (61.6 - 71.6)	2.9 ± 1.1
The dental provider asked about changes to the medicines that I take regularly, at every visit.	65.8 (60.6 - 70.9)	2.9 ± 1.2
The dental provider appeared to understand my overall health history well.	74.3 (69.6 - 78.9)	3.1 ± 1.0
The dentist confirmed the location of my dental problem before starting treatment.	93.3 (90.6 - 96.0)	3.6 ± 0.7
Before starting treatment, the dentist confirmed that I didn't feel any pain after giving the injection.	87.9 (84.2 - 91.5)	3.5 ± 0.8
The dentist protected my throat (with gauze or an elastic sheet on a bracket) when there was a potential for something to go down my throat.	78.0 (73.2 - 82.8)	3.2 ± 1.1
The dentist followed up with me after any major treatment to ensure that I did not have any problems.	56.0 (50.1 - 61.8)	2.7 ± 1.2
Whenever I was sent to a new dentist, I had to repeat the tests that I did at the previous dentist*.	36.9 (31.0 - 42.8)	2.1 ± 1.1
C) Structure and facilities		
The clinic was kept clean.	95.9 (93.8 - 98.0)	3.7 ± 0.6
The treatment area was well organized.	91.1 (88.0 - 94.2)	3.6 ± 0.7
The instruments used in treating me appeared clean.	97.6 (95.9 - 99.3)	3.8 ± 0.5
The dental providers washed their hands before starting treatment.	92.5 (89.6 - 95.4)	3.6 ± 0.7
I noticed blood stains in the treatment area*.	93.4 (90.5 - 96.2)	3.8 ± 0.7
The dental staff used a lead cover/apron to protect me when I needed to have an x-ray.	92.0 (89.0 - 95.0)	3.7 ± 0.7
D) Communication, information and courtesy		
The dentist listened to me carefully.	89.0 (85.6 - 92.4)	3.5 ± 0.7
I believe the dentist understood my dental problems.	87.7 (84.2 - 91.3)	3.4 ± 0.8
The dentist explained the treatment that I needed in a way that I could easily understand.	88.9 (85.5 - 92.3)	3.5 ± 0.8
The dentist asked for my permission before starting any major treatment.	87.1 (83.4 - 90.8)	3.4 ± 0.8
The dentist told me what he or she was going to do before he or she did a procedure.	89.1 (85.7 - 92.5)	3.5 ± 0.8
The dentist explained the things I needed to do at home in a way that I could easily understand after every treatment.	85.2 (81.2 - 89.1)	3.4 ± 0.9
The staff spoke to me with respect.	88.6 (85.2 - 91.9)	3.6 ± 0.8
The dentist spoke to the other dental staff with respect.	94.6 (92.3 - 97.0)	3.7 ± 0.6
The dentist explained the results of any tests to me in a way that I could easily understand.	88.6 (85.2 - 92.0)	3.5 ± 0.8
Whenever I was sent to a new dentist, the purpose of the referral was very clear to me.	86.7 (82.8 - 90.6)	3.5 ± 0.8
E) Global rating of safety		
On a scale of 1 to 10, with 1 being 'extremely unsafe' and 10 being 'extremely safe', how safe (harmless) are the dental clinics that you have visited in South Africa?	83.9 (79.3 - 88.5)	8.15 ± 2.07

Percentage positives were obtained by combing the responses from all participants who responded with "always" (4) or "usually"(3) on the Likert scale (1 to 4); the higher the percentage, the more positive the experience; Percent positives for each construct represent the percentage of participants who selected the two highest response options for each line item ('Always' and 'Usually' or 'Extremely safe' and 'Safe' for category 5);
§The mean score represents the average score obtained from all participants for every item on the Likert scale (1 to 4). Higher values represent more positive experiences by participants;
*Original items were reverse-coded for data analysis to mirror the other items, which ranged from the least positive (1) to the most positive (4) experience.

of quality (mean score: 2.8±0.68). Only 48.6% of participants rated this dimension as high quality. The global rating of safety received the highest score (mean score: 4.3±0.98); over 80% of participants had a positive perception of safety.

This rating was not correlated with their past experiences of DAEs (Pearson's rho (r): -0.21). Overall, slightly above half (58.6%) of the participants had a positive view about the quality of dental clinics in South Africa.

The item "Whenever I was sent to a new dentist, I had to repeat the tests that I did at the previous dentist" received the lowest percentage positive score (36.9%; 95% CI: 31.0-42.8), while the item "The instruments used in treating me appeared clean" received the highest score (97.6%; 95% CI: 95.9-99.3) (Table 2).

Table 3. Distribution of Patient-Reported Dimensions of Quality and Safety by Participant Characteristics (Bivariate Analysis; N (%))

Characteristic	Total, *N* (%)	Access to care	Technical quality	Structure & facilities	Communication	Global safety rating
Total, N	440	389	383	376	374	249
Mean ± SD	-	2.8 ± 0.7	3.1 ± 0.7	3.7 ± 0.5	3.5 ± 0.6	4.3 ± 0.98
Percent positive, % range	-	48.6 (43.6 - 53.6)	55.9 (50.9 - 60.9)	62.8 (57.9 - 67.7)	63.9 (59.0 - 68.8)	83.9 (79.3 - 88.5)
Gender						
Male	114 (37.3)	60 (42.3) §	56 (35.2)	66 (37.3)	65 (35.9)	80 (38.6)
Female	192 (62.7)	82 (57.8)	103 (64.8)	111 (62.7)	116 (64.1)	127 (61.3)
Age						
18-24 yrs	39 (13.3)	20 (15.2)	15 (10.1)	21 (12.5)	21 (12.3)	28 (14.0)
25-44 yrs	140 (47.8)	61 (46.2)	75 (50.3)	78 (46.4)	83 (48.5)	97 (48.5)
45-64 yrs	77 (26.3)	28 (21.2)	37 (24.8)	47 (28.0)	46 (26.9)	48 (24.0)
65 yrs+	37 (12.6)	23 (17.4)	22 (14.8)	22 (13.1)	21 (12.3)	27 (13.5)
Race						
Black African	89 (29.2)	39 (27.7)	42 (26.4)	51 (29.1) §	47 (26.1) §	45 (21.7)
White	198 (64.9)	91 (64.5)	103 (64.8)	109 (62.3)	117 (65.0)	145 (70.0)
Colored or Mixed	18 (5.9)	11 (7.8)	14 (8.8)	15 (8.6)	16 (8.9)	17 (8.2)
Employment status						
Employed	115 (39)	53 (38.4)	57 (37.7)	65 (38.9)	68 (39.3)	79 (38.9)
Unemployed	135 (45.8)	59 (42.8)	67 (44.4)	75 (44.9)	79 (45.7)	89 (43.8)
Retired	45 (15.2)	26 (18.8)	27 (17.8)	27 (16.2)	26 (15.0)	35 (17.2)
Educational level						
Less than high school (GR 12)	40 (14.2)	19 (14.5)	19 (13.1)	23 (14.3)	27 (16.6)	26 (13.2)
High school graduate or vocational training	148 (52.5)	70 (53.4)	79 (54.5)	87 (54.0)	83 (50.9)	98 (50.0)
College graduate or higher	94 (33.3)	42 (32.1)	47 (32.4)	51 (31.7)	53 (32.5)	72 (37.7)
Children						
Yes	202 (67.8)	91 (65.5)	104 (67.5)	117 (68.8)	117 (66.1)	134 (65.6)
No	96 (32.2)	48 (34.5)	50 (32.5)	53 (31.2)	60 (33.9)	70 (34.31)
Marital status						
Single-never married	112 (36.1)	41 (28.9)	52 (32.1)	60 (33.7)	59 (32.2)	63 (31.9)
Married or civil partnership	108 (34.9)	58 (40.8)	58 (35.8)	68 (38.2)	69 (37.7)	71 (36.0)
Divorced, separated or widowed	90 (29)	43 (30.3)	52 (32.1)	50 (28.1)	55 (30.1)	63 (31.9)
Annual household income						
Low income (<R50,000)	148 (57.8)	60 (51.7)	80 (59.3)	88 (60.3)	92 (59.7)	99 (576.5
Middle income (R50,000 to 149,999)	61 (23.8)	32 (27.6)	29 (21.4)	30 (20.5)	36 (23.4)	41 (23.8)
High income (R150,000+)	47 (18.4)	24 (20.7)	26 (19.3)	28 (19.2)	26 (16.9)	32 (18.6)
Last dental visit (Time)						
Less than 12 months	228 (52.2)	113 (60.1)	126 (59.2)	137 (58.6)	141 (59.2)	128 (61.2)
More than 12 months	179 (41)	75 (39.9)	87 (40.8)	97 (41.4)	97 (40.8)	81 (38.7)
No previous dental visit	30 (6.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Last dental visit (Location)						
State dental clinic	252 (57.7)	109 (58.3)	134 (63.2)	151 (64.8) §	150 (63.2)	128 (61.8)
Private dental clinic	147 (33.6)	72 (38.5)	70 (33.0)	77 (33.1)	80 (33.8)	73 (35.2)
Other. e.g. non-licensed	38 (8.7)	6 (3.2)	8 (3.8)	5 (2.1)	7 (3.0)	6 (2.9)
Satisfaction with last dental visit						
Extremely satisfied or satisfied	295 (69.1)	149 (80.1) §	157 (74.8) §	185 (79.7) §	186 (79.2) §	162 (77.8) §
Neutral	76 (17.8)	21 (11.3)	37 (17.6)	25 (10.8)	32 (13.6)	30 (14.4)
Dissatisfied and extremely dissatisfied	56 (13.1)	16 (8.6)	16 (7.6)	22 (9.5)	17 (7.2)	16 (7.6)

Characteristic	Total, *N* (%)	Access to care	Technical quality	Structure & facilities	Communication	Global safety rating
Oral health status						
Satisfied with dental health	184 (42.3)	88 (46.8)	97 (45.5)	100 (42.7)	115 (48.5) §	100 (48.0) §
Not satisfied with dental health	251 (57.7)	100 (53.2)	116 (54.5)	134 (57.3)	122 (51.5)	108 (51.9)
General health status						
Satisfied with overall health	369 (85.2)	167 (88.8)	189 (88.3)	202 (86.0)	213 (89.5) §	184 (88.0)
Not satisfied with overall health	64 (14.8)	21 (11.2)	25 (11.7)	33 (14.0)	25 (10.5)	25 (11.96)
Oral hygiene habits						
Clean teeth at least once daily	349 (94.3)	157 (97.5)	173 (94.5)	192 (97.0)	193 (97.0)	189 (95.4)
Clean teeth less than once daily	21 (5.7)	4 (2.5)	10 (5.5)	6 (3.0)	6 (3.0)	9 (4.5)
Cleaning product						
Toothbrush and fluoride toothpaste or non-fluoride toothpaste	212 (57.3)	57 (35.2)	78 (42.4)	80 (40.6)	80 (40.2)	66 (33.6)
Others. e.g. Chew-stick	158 (42.7)	105 (64.8)	106 (57.6)	117 (59.4)	119 (59.8)	130 (66.3)
DAE experience						
Experienced no DAE	240 (54.5)	102 (54.0)	117 (54.7) §	127 (53.8) §	126 (52.7) §	91 (43.5) §
Experienced one or more DAEs	200 (45.5)	87 (46.0)	97 (45.3)	109 (46.2)	113 (47.3)	118 (56.4)

*Binary variables for patient-reported dimensions of quality were obtained by categorizing constructs into "1" High quality (above the mean of collapsed items within that construct) and "0" Low quality (below the mean of collapsed items within that construct); Percentages represent the proportion of participants who rated the dimension of quality and safety as high.
§ Significant p-values ≤ 0.05 for Chi-squared ($\chi 2$) or Fisher's Exact Test.

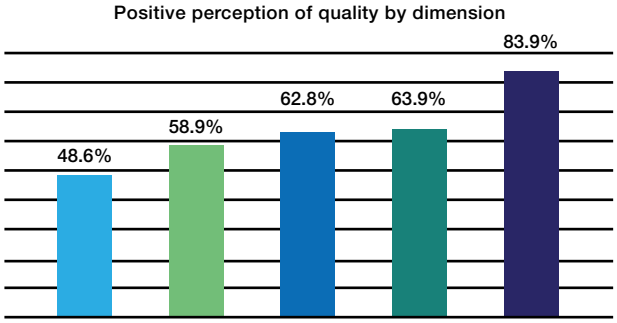

Figure 2. Positive perception of dental quality and safety by dimension.

Legend:
- Access to care
- Technical quality, efficiency and effective organization of care
- Structure and facilities
- Communication information and courtesy
- Global rating of safety

Description: Bar chart illustrating the five dimensions of quality and the percentage of patients who had positive perceptions of each dimension. Access to care had the lowest rating (48.6%); while an overwhelming number of patients rated safety as very high (83.9%).

Dimensions of quality and associated factors

Initial bivariate analysis using Pearson's chi-squared ($\chi 2$) test identified significant associations between:

a) Access to care and gender, satisfaction with last dental visit;
b) Technical quality and satisfaction with last dental visit, past DAE experience;
c) Facilities and race, location of last dental visit, satisfaction with last dental visit, past DAE experience;
d) Communication and race, satisfaction with last dental visit, oral health status, general health status, past DAE experience;
e) Global safety rating and satisfaction with last dental visit, oral health status, past DAE experience.

Satisfaction with last dental visit was significantly associated with all the dimensions of quality and safety; followed by past DAE experience, which was associated with all factors except access to care (Table 3).

The factors that were significantly associated with the dimensions of quality and safety after controlling for other covariates in the generalized linear model.

a) Access to care

Participants who had a high school, vocational (PRR: 0.64; P: 0.04) or college education (PRR: 0.41; P:<0.001), visited the dentist more than 12 months prior (PRR: 0.7; P: 0.03), and experienced one or more DAEs (PRR: 0.7; P: 0.02) were less likely to rate the access to care as high.

On the contrary, high income (Adjusted PRR: 1.65; P: 0.03), married (PRR: 2.63; P: <0.001) or divorced (PRR: 2.3; P: <0.001) participants who had children (PRR: 2.25; P: <0.001) and visited private dental clinics (PRR: 1.45; P: 0.02), were more likely to rate the access to care as high.

b) Technical quality
Similarly, participants who were middle-aged (25-44yrs) (PRR: 2.11; P: 0.02); 45-64 yrs (PRR: 2.18; P: 0.03)) coloured or mixed race (PRR: 2.01; P: 0.01), high school or vocational school graduates (PRR: 1.79; P: 0.04), and cleaned their teeth less than once daily (PRR: 2.05; P: 0.01), were more likely to rate the technical quality as high. Individuals who had at least one dental visit in the preceding 12 months (PRR: 0.69; P: 0.04) were less likely to rate the technical quality as high.

c) Structure and facilities
Participants who were neutral about their last dental visit (PRR: 20.29; P: <0.001), visited a non-licensed dental provider (PRR: <0.01; P: <0.001) and belonged to the middle income (R50, 000 to R149, 000 (PRR: 0.65; P: 0.02)) economic bracket, had negative perceptions of the quality of the structure and facilities at the dental clinic. Retired participants (PRR: 1.62; P: 0.01) had positive perceptions of the quality of the structure and facilities at dental clinics.

d) Communication
Having a dental visit more than 12 months ago (PRR: 0.71; P: 0.02), and being neutral (PRR: 0.58; P: 0.01) or dissatisfied (PRR: 0.46; P: 0.02) with the last dental visit was associated with a decreased likelihood of rating the quality of communication as high.

e) Global safety rating
Participants who were dissatisfied or extremely dissatisfied (PRR: 0.59; P: 0.03)) with their last dental visits had a decreased likelihood of rating the overall safety of dental clinics as high.

DISCUSSION

Our results reveal a sub-optimal perception of dental quality among South African dental patients. 41.4% of participants did not view the services received at dental clinics as high quality. Compared with their counterparts in the United Kingdom (UK), they fared worse, where 20% of UK respondents rated their care as sub-optimal.[35]

When categorized into specific dimensions of quality, access to care received the lowest quality rating from 51.4% of participants. This calls for more attention by dental stakeholders in South Africa, especially as 'access to care' was mentioned as the most important factor affecting a patient's perception of dental quality in the UK as well.[35] Despite this fair overall rating of quality, it is important to note that majority of participants (83.9%) rated the dental clinics as "safe" or "extremely safe".

This high global rating is consistent with expectations because patients tend to be skewed towards the more positive response options when asked about overall healthcare ratings.[9] Their true care experiences are usually highlighted when pressed for the details about specific aspects of care, such as waiting times and medication errors.[9] In this study, there was no correlation between the overall perception of safety and the actual experiences of DAEs by participants, which underscores this theory even further.

Participants who had a previous DAE experience were less likely to rate the quality of access to dental care as high. Duplicate tests, poor wait times and the difficulty in getting emergency appointments received the most negative responses while clinic cleanliness/hygiene and staff courtesy/ respect received the most positive responses. These findings compare with a study about patient-reported measures of quality from five countries (United States, Australia, Canada, New Zealand, and United Kingdom).[36]

The UK (36%) and Canada (37%) ranked lowest on emergency waiting times, while the US ranked last on efficiency because patients had to repeat tests multiple times (22%), or repeat their medical history to multiple providers (57%).[36] Another study in the US identified waits and delays, poor communication, and problems with the environment and amenities as the most commonly reported problems with service quality.[16]

They also found that despite the high incidence of service quality incidents, the patients (two-thirds) still rated the overall quality of care as excellent, which again confirms the theory that global ratings are skewed towards more positive responses.[16]

One explanation given was that patients consider their overall hospital experience when giving global ratings and this may not capture good experiences, such as emotional support or favorable clinical outcomes, that were not covered in the survey questions.[16]

Patient satisfaction emerged as the factor most associated with an increased positive perception of quality across all five dimensions of quality and safety (bivariate analysis). While satisfaction has been intricately linked to the perception of quality,[11,37] it is but one perception of quality that is predominantly affected by one's expectations.[38] The conceptual framework described by Sofaer et al. identified sociocultural norms, previous experiences, personal characteristics, knowledge of what to expect, extent of choice, patient needs, and reputation of provider as the baseline factors influencing patient expectations.[9]

They surmised that patient expectations and patient experiences of care were the primary influencing factors on a patient's perception of care, which ultimately affects their definition and perception of quality.[9] The degree to which one's perception is affected by expectations and/or experiences varies between individuals and over time within-person.[9]

In dealing with this issue, Sixma et al. demonstrated that a more reliable approach was to look at an algorithm of performance, importance and impact scores for the various aspects of healthcare.[1] Sixma's conceptual framework was based on the prior work of Zastowny et al.[39] in the Patient Experience Survey (PES) and has influenced the development of instruments, such as the QUOTE [20-22,40-44] (Quality Of care Through the patient's Eyes) and CQI (Consumer Quality Index),[19,23,45-50] for assessing patient-reported care quality across various disciplines. Dentistry is yet to develop a validated patient-reporting instrument of its own.

In this study, patient characteristics such as age (middle-aged), race (coloured or mixed), marital status (married, divorced), child status (no children), employment status (retired), household income (>R150, 000 or 9200 USD) and educational status (high school or vocational education) were associated with an increased likelihood of having a better experience of care and higher rating of quality.

This is similar to findings from another study where being older, less educated, married and of a high social status was significantly associated with greater patient satisfaction.[51]

One explanation for this finding is that healthcare providers tend to be more respectful and responsive to the needs of middle-aged or older patients compared to younger ones as well as wealthier individuals.[51]

Perhaps, on the contrary, highly educated and single patients have greater expectations of care quality and apply more stringent assessments to their ratings of care quality compared with less educated and married individuals. In a study by Haviland et al., race was also found to be a significant factor affecting one's rating of healthcare services.[52] This was consistent with findings by Tickle et al. among dental patients in the UK.[35]

Although our expectation was that the 'white' population would have higher ratings of care quality due to tenuous racial history of the sub-region[53], it was the 'colored or mixed' race that had significantly higher ratings of care quality (technical quality and effectiveness). This calls for a further exploration of the impact of socio-demographic variables on patients' perceptions of dental quality.

CONCLUSION

Patient perceptions of quality offer an insight into our performance as dental providers. The degree to which the patient's needs and expectations are met often determines their perceptions of quality. Our study findings suggest that the dental profession has huge challenges in meeting these expectations.

Working to develop standardized instruments for dentistry will afford researchers the opportunity to assess patient experiences of dental care quality more reliably rather than just being limited to patient satisfaction measures. In the end, providing care that is patient-centered is an indication of quality and that should be our ultimate goal.

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