

Patient expectations and satisfaction with non-surgical periodontal treatment provided by fourth-year dental students at the University of Otago, Faculty of Dentistry, Dunedin

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Abstract

Evaluation of patient satisfaction is critical to assessing the quality of care. In New Zealand, there are limited studies evaluating the satisfaction of patients receiving treatment by dental students. The aim of this study was to evaluate the current patient satisfaction levels and the factors that influence patient satisfaction with non-surgical periodontal treatment provided by fourth-year dental students at the University of Otago Faculty of Dentistry, along with areas requiring improvement. This study utilised a mixed-methods approach. A 29-item electronic survey was completed by 41 eligible participants. A five-point Likert scale was used to ascertain respondents' level of agreement with a range of statements related to quality of care. Open text fields were used after each group of questions to allow participants to expand on their responses. Quantitative data was analysed using SPSS and qualitative data was coded and content analysed. 100 percent of respondents agreed that they received good periodontal treatment and 81.6 percent agreed that their dental student appeared competent. Participants further elaborated on areas that can be improved such as logistics, standard of care, patient expectation, prior knowledge, communication, physical and emotional care, personnel, technical skills, and physical space. Despite limitations, this study indicated a high level of patient satisfaction with the periodontal treatment provided. Areas of improvement include access to care, informed consent, and communication. The results of this survey reinforce the excellent standard of care provided by students and highlight areas for improvement in future years.

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Introduction

Periodontal disease encompasses a range of inflammatory conditions characterised by the progressive destruction of the periodontium, which includes the gingiva, bone, and periodontal ligament (Gasner, 2024). The disease begins with gingivitis, a localised inflammation of the gingiva caused by the microbial biofilm (Gasner, 2024). If

dysbiosis of the oral microbiota and host immune defences continues, gingivitis can progress to periodontitis (Kinane *et al.*, 2017). The severity of this disease can ultimately lead to alveolar bone loss and tooth loss and contribute to systemic inflammation (Pragati & Neelam, 2020). A comprehensive review revealed that an estimated 10 percent of the global population suffers from severe periodontitis (Frencken *et al.*, 2017).

Non-surgical periodontal therapy (NSPT) is a multi-stage treatment involving professional removal of supragingival and subgingival dental plaque and calculus through scaling and root planning by ultrasonic instruments, hand scalers, and curettes to reduce periodontal inflammation and re-establish periodontal health (Kinane *et al.*, 2017). Professional NSPT and oral hygiene instruction (OHI) can improve patient oral health by a mean 50 percent reduction in plaque indices (Salhi *et al.*, 2020). The success of NSPT depends on modifiable risk factors, such as smoking, localised defects, and the patient's commitment to following OHI to maintain their oral hygiene (Kinane *et al.*, 2017; Salhi *et al.*, 2020). Following the initial therapy, a re-evaluation should take place to assess adequate healing of connective tissue, and the patient placed on periodontal maintenance or receive additional cause-related therapy of a non-surgical or surgical nature (Sanz *et al.*, 2020).

Evaluating patient satisfaction with NSPT is a crucial process for identifying areas for improvement. Satisfaction involves being well attended to and having expectations met (Klaassen *et al.*, 2021). Patients may lack clinical expertise, so non-dental factors may influence their satisfaction. In a dental school setting, patient surveys can pinpoint areas where services can be enhanced, reducing the likelihood of patient complaints and aiding in patient retention, thus providing opportunities for broader clinical experiences for students (Dirham, 2021).

Key themes that commonly arise in the literature assessing patient satisfaction with dental care include communication between the dentist and the patient, cost of treatment, accessibility of dental care, quality of the treatment, pain management, and whether the treatment outcome was as the patient had expected (Luo *et al.*, 2018). Cost is a significant barrier that affects the likelihood of people accessing dental services in New Zealand, resulting in a measurable decline in health status (Jatrana *et al.*, 2009; Stuart, 2011). The University of Otago Faculty of Dentistry Dunedin clinic is attempting to reduce cost as a barrier by offering reduced

fees for dental treatment performed by students under staff supervision. However, patients at the University of Otago Faculty of Dentistry in Dunedin may experience lengthy wait times, with some waiting two years for routine care, negatively impacting patient satisfaction (Miller, 2020; Al Ghanem *et al.*, 2023).

One aspect of care that has not been well documented is patients' satisfaction with their dentists' cultural competency. With the increasing cultural diversity in New Zealand, clinicians must practice in a culturally safe manner to improve patient satisfaction with their treatment (Govere & Govere, 2016). Additional aspects reported to affect patient satisfaction include treatment quality, clinical skills, emotional care, whether expectations were met, and pain management (Luo *et al.*, 2018).

In New Zealand, no published studies have evaluated the satisfaction of patients receiving dental treatment or non-surgical periodontal treatment from fourth-year Bachelor of Dental Surgery (BDS) students at the University of Otago, Faculty of Dentistry, Dunedin. Similar studies undertaken globally have shown proven benefits in conducting such research, as it allows for continuous improvement of the care provided in the area studied (Chang & Chang, 2013).

This study aimed to evaluate the current patient satisfaction levels and the factors influencing patient satisfaction with the non-surgical periodontal treatment provided by fourth-year BDS students at the University of Otago, Faculty of Dentistry, Dunedin, along with areas within the provision requiring improvement.

Materials and Methods

To separate eligible participants from non-eligible participants, all patients who received non-surgical periodontal therapy (NSPT) by fourth-year dental students in 2023 at the Faculty of Dentistry, Dunedin, were screened manually according to the eligibility criteria below (Table 1). The

Global Burden of Disease study estimates that 9.8 percent of the global population suffers from severe periodontitis (Marcenes *et al.*, 2017). Based on an estimated population prevalence of 9.8 percent of individuals having severe periodontitis, a

margin of error of five percent, and a confidence interval of 85 percent, a response from 37 individuals was needed from our sample population of 71. Figure 1. outlines the protocol used in this study to establish the eligible sample population.

Table 1. Inclusion and exclusion criteria.

Eligibility Criteria of Participants	
Inclusion Criteria	<ul style="list-style-type: none"> • Participants >18 years of age who received a full course of non-surgical periodontal treatment in 2023 at the University of Otago, Faculty of Dentistry, Dunedin. • Participants must also be on a recall list for continuation of periodontal treatment and maintenance.
Exclusion Criteria	<ul style="list-style-type: none"> • Patients who did not have their full course of non-surgical periodontal treatment completed during 2023. • Patients whose treatment was completed outside of the BDS4 specialist periodontal clinic. • New periodontal patients assigned to BDS students for 2024. • Patients whose final appointment of their non-surgical periodontal treatment was before 2023. • Treatment that involved any surgical procedures requiring post-graduate periodontal training such as crown lengthening surgery, guided tissue regeneration, bone grafts, etc.

This study utilised a mixed-method approach, collecting qualitative and quantitative data through a 29-item electronic survey based on a survey validated by Mahrous & Hifnawy (2012). Questions 1-4 assessed patient knowledge and expectations before receiving NSPT. Questions 5-10 assessed patient satisfaction with their dentist, the administrative aspects of treatment, and the quality of treatment received, while questions 11-13 assessed satisfaction with the standard of care and cost.

Quantitative data was collected using a series of statements that aimed to target a range of aspects of treatment, from communication to clinical competence. A

five-point Likert scale with the following options: strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5), was used to assess respondents' level of agreement with each statement (Ilioudi *et al.*, 2013). An additional ten open-text questions enabled participants to expand on their answers.

The survey was distributed via Qualtrics XM to all eligible participants and was open for three weeks. Weekly email reminders were sent to complete the survey. The data was stored securely on a university cloud platform, and no identifying participant information was linked to the data collected in this study.

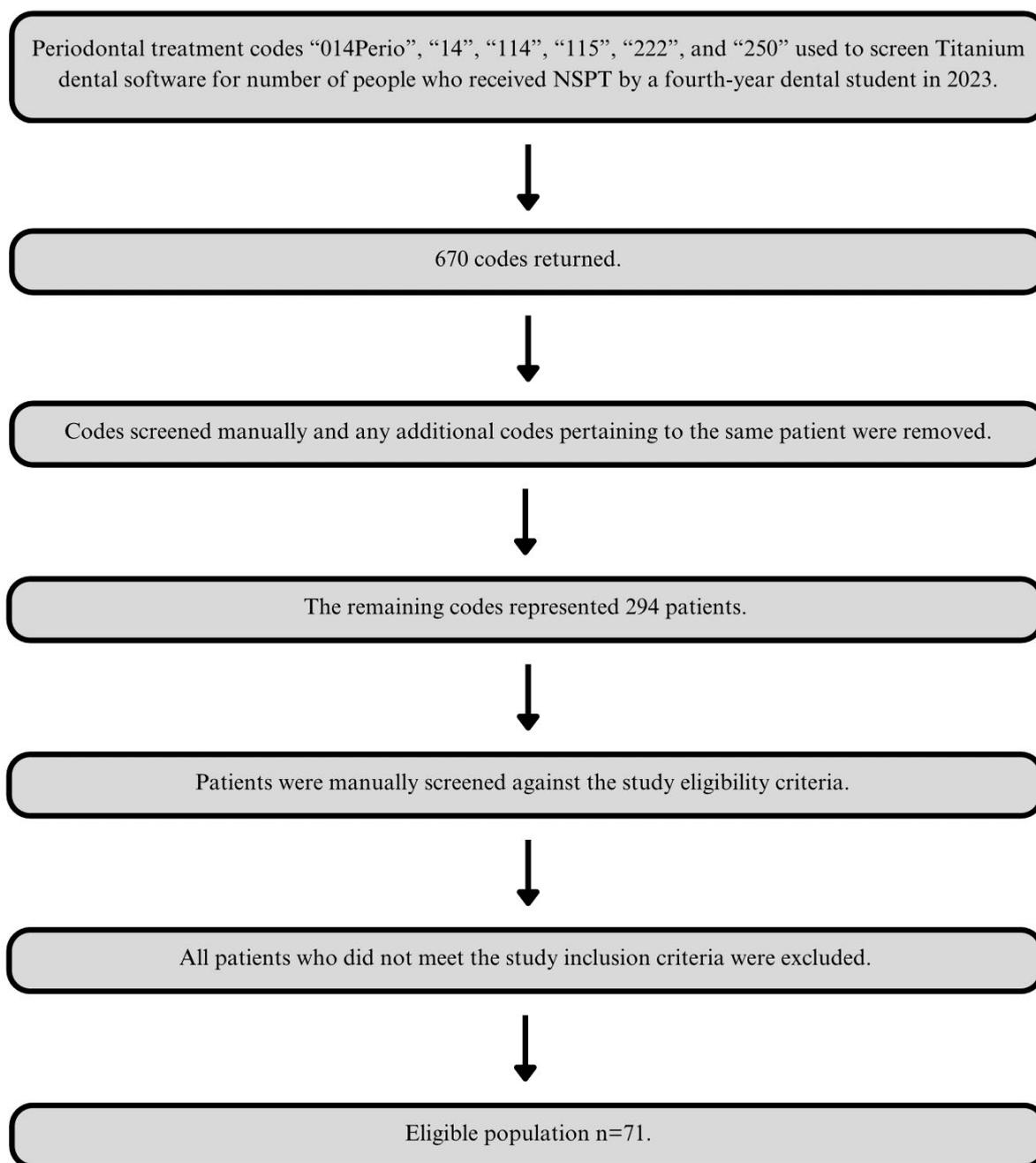


Figure 1. Outline of the process for determining eligible patients to participate in this study.

All qualitative data was coded using the methods from Klaassen *et al.* (2021) by attaching a keyword or phrase to each response. The quantitative data was analysed using IBM SPSS Statistics 2022 version 29.0.0.0 and the mean, median, and standard deviation were calculated for each statement. These figures corresponded to the numerical values attributed to each of the five possible responses provided by the

Likert scale. For example, if the median value for a given statement was 5, it would mean that the middle rating in the dataset was 5, indicating “strongly agree” according to the Likert scale. The data was then further simplified into respondents who agreed or disagreed with each statement, where “agree” encompassed both “strongly agree” and “agree” answers, while “disagree”

encompassed both “strongly disagree” and “disagree” answers.

This project (H24/037) was granted ethics approval by the University of Otago Human Ethics Committee (Health) on 27 May 2024.

Results

Of the 71 eligible study participants, 41 responded to the survey, producing a response rate of 57.7%. An average of 78% of respondents completed the open-ended questions in the patient satisfaction survey.

The sample reflects a diverse age range and ethnic composition. The age distribution shows a predominance of respondents in the 60-69 age group (31.7%), with those aged 50-59 being the second most predominant (29.3%). The mean age of respondents was 65.73 years, with a median age of 67. Most respondents identified as New Zealand European (70.7%), with a smaller proportion of Māori, Pasifika, and Asian (4.9% each), and other ethnicities making up 14.6%. These results indicate that patients at the Faculty of Dentistry requiring periodontal treatment are primarily New Zealand European. Age and ethnicity data are shown below in Table 2.

Table 2. Demographic characteristics of the sample for responses (N=41).

Variable	n	%	Mean	Median	SD
Age					
20-29	1	2.4			
30-39	0	0			
40-49	2	4.8			
50-59	12	29.3	65.73	67.00	13.555
60-69	6	14.5			
70-79	13	31.7			
80-89	7	17.1			
Ethnicity					
NZ European	29	70.7			
Māori	2	4.9			
Pasifika	2	4.9			
Asian	2	4.9			
Other	6	14.6			

Participants’ prior knowledge of periodontal treatment varied widely. Some were familiar with the treatment due to past experiences or regular recalls (33.3%). Others understood that periodontal treatment involved addressing gum disease and preventing its progression, often learning more about it during their appointment (29.2%). However, many patients had limited knowledge, citing they knew “nothing” or “very little” (37.5%).

When asked about the goals they hoped to achieve through NSPT, three participants primarily focused on achieving better

gingival and dental health, preventing further deterioration, and improving their oral hygiene and aesthetics. For example, a patient mentioned “*wanting to keep teeth and gums as healthy as possible and for as long as possible*” [respondent 14]. Three patients with no expectations (8.8%).

When asked about the presence or absence of anxiety before receiving NSPT, most respondents (53.7%) had no degree of anxiety or excitement before treatment. In comparison, 29.3% of respondents felt slightly anxious, as shown below in Table 3.

Table 4 shows that most respondents (90.2%) agreed that their dentist was friendly, and 82.9% agreed that their dentist made them feel comfortable in the chair. 95.4% of respondents agreed that all procedures were explained well before starting. Respondents were generally satisfied when it came to dentist communication. However, 7.3% of respondents neither agreed nor disagreed, and 4.8% disagreed that their dentist communicated effectively. Respondents

(82.9%) agreed that their dentist did not criticise the condition of their teeth or gums, with only one respondent expressing disagreement. Many respondents (87.8%) felt their dentist showed concentration on their work, and 75.6% believed their dentist was competent, with no respondents disagreeing. Additionally, 87.8% of respondents felt they received advice during their appointments, while 80.5% believed the student respected their culture and could express it freely.

Table 3. The frequency, percentage, mean, median, and standard deviation for the responses (N=41).

How did you feel when you were about to receive periodontal treatment?					
Response	n	%	Mean	Median	SD
Severely anxious	1	2.4			
Slightly anxious	12	29.3			
Neither anxious nor excited	22	53.7	2.74	3	0.724
Slightly excited	2	4.9			
Extremely excited	1	2.4			
Missing	3	7.3			

Table 4. The respondents' satisfaction regarding their interaction with the dentist (N=41).

Statement	Responses	n	%	Mean	Median	SD
The dentist was friendly (1)	Strongly disagree	0	0			
	Disagree	1	2.4			
	Neither agree nor disagree	0	0			
	Agree	13	31.7	4.58	5	0.642
	Strongly agree	24	58.5			
	Missing	3	7.3			
The dentist made me feel comfortable in the chair (2)	Strongly disagree	0	0			
	Disagree	1	2.4			
	Neither agree nor disagree	3	7.3			
	Agree	14	34.1	4.39	5	0.755
	Strongly agree	20	48.8			
	Missing	3	7.3			
The dentist explained all procedures before starting (4)	Strongly disagree	0	0			
	Disagree	1	2.4			
	Neither agree nor disagree	1	2.4			
	Agree	12	29.3	4.54	5	0.691
	Strongly agree	23	56.1			
	Missing	4	9.8			
	Strongly disagree	1	2.4			
	Disagree	1	2.4			

The dentist communicated effectively (5)	Neither agree nor disagree	3	7.3	4.30	5	0.939
	Agree	13	31.7			
	Strongly agree	19	46.3			
	Missing	4	9.8			
The dentist did not criticise the condition of my teeth and gums (6)	Strongly disagree	0	0	4.43	5	0.728
	Disagree	1	2.4			
	Neither agree nor disagree	2	4.9			
	Agree	14	34.1			
	Strongly agree	20	48.8			
	Missing	4	9.8			
The dentist was concentrated on their work (3)	Strongly disagree	0	0	4.47	5	0.603
	Disagree	0	0			
	Neither agree nor disagree	2	4.9			
	Agree	16	39.0			
	Strongly agree	20	48.8			
	Missing	3	7.3			
The dentist appeared competent (7)	Strongly disagree	0	0	4.29	5	0.768
	Disagree	0	0			
	Neither agree nor disagree	7	17.1			
	Agree	13	31.7			
	Strongly agree	18	43.9			
	Missing	3	7.3			
The dentist gave me advice following treatment (8)	Strongly disagree	0	0	4.57	5	0.555
	Disagree	0	0			
	Neither agree nor disagree	1	2.4			
	Agree	13	34.1			
	Strongly agree	22	53.7			
	Missing	4	9.8			
The dentist was respectful of my culture and made me feel like I could express my culture freely (9)	Strongly disagree	0	0	4.45	5	0.724
	Disagree	0	0			
	Neither agree nor disagree	5	12.2			
	Agree	11	26.8			
	Strongly agree	22	53.7			
	Missing	3	7.3			

Table 5 shows that wait times at the Faculty of Dentistry were acceptable to most respondents (73.2%). However, 4.8% of respondents felt they had waited too long. 78.1% of respondents thought that their treatment was efficiently completed. While

most respondents thought the clinic was situated in a good location, 9.7% believed it was not, with less than half of respondents thinking it was easy to find a park and access the clinic.

Table 5. The respondents' satisfaction regarding the administrative aspects of treatment.

Statement	Responses	n	%	Mean	Median	SD
I didn't have to wait long to be seen for periodontal treatment (1)	Strongly disagree	1	2.4	4.05	4	0.911
	Disagree	1	2.4			
	Neither agree nor disagree	5	12.2			
	Agree	18	43.9			
	Strongly agree	12	29.3			
	Missing	4	9.8			
The appointment times suited my schedule (2)	Strongly disagree	0	0	4.30	4	0.878
	Disagree	3	7.3			
	Neither agree nor disagree	1	2.4			
	Agree	15	36.6			
	Strongly agree	18	43.9			
	Missing	4	9.8			
Periodontal treatment was completed efficiently (3)	Strongly disagree	0	0	4.27	4	0.693
	Disagree	0	0			
	Neither agree nor disagree	5	12.2			
	Agree	17	41.5			
	Strongly agree	15	36.6			
	Missing	4	9.8			
The clinic is situated in a good location (4)	Strongly disagree	1	2.4	4.14	4	1.058
	Disagree	3	7.3			
	Neither agree nor disagree	3	7.3			
	Agree	13	31.7			
	Strongly agree	17	41.5			
	Missing	4	9.8			
It was easy to find parking and I had no trouble accessing the clinic (5)	Strongly disagree	7	17.1	3.08	3	1.362
	Disagree	5	12.2			
	Neither agree nor disagree	9	22.0			
	Agree	10	24.4			
	Strongly agree	6	14.6			
	Missing	4	9.8			

Table 6 shows that respondents' level of satisfaction regarding the periodontal treatment they received indicated general satisfaction. All respondents strongly agreed or agreed that their initial examination was thorough and that they received good periodontal treatment. Additionally, 82.9% strongly agreed or agreed that their

treatment was painless or well managed with local anaesthetic, though 7.3% neither agreed nor disagreed. All respondents agreed that the dental environment was clean and sterile. Except for two, all respondents felt better about their teeth and gums after treatment.

Table 6. The respondents' satisfaction regarding the periodontal treatment they received (N=41).

Statement	Responses	n	%	Mean	Median	SD
A thorough initial examination was conducted (1)	Strongly disagree	0	0	4.62	5	0.492
	Disagree	0	0			
	Neither agree nor disagree	0	0			
	Agree	14	34.1			
	Strongly agree	23	56.1			
	Missing	4	9.8			
I received good periodontal treatment (2)	Strongly disagree	0	0	4.57	5	0.502
	Disagree	0	0			
	Neither agree nor disagree	0	0			
	Agree	16	39.0			
	Strongly agree	21	51.2			
	Missing	4	9.8			
The treatment offered was not painful or the dentist managed my pain well (using local anaesthetic) (3)	Strongly disagree	0	0	4.35	4	0.633
	Disagree	0	0			
	Neither agree nor disagree	3	7.3			
	Agree	18	43.9			
	Strongly agree	16	39.0			
	Missing	4	9.8			
The dental environment was clean and sterile (chair/bench/tools etc.) (4)	Strongly disagree	0	0	4.67	5	0.435
	Disagree	0	0			
	Neither agree nor disagree	0	0			
	Agree	9	22.0			
	Strongly agree	28	68.3			
	Missing	4	9.8			
I feel better about my teeth and gums now than I did before treatment began (5)	Strongly disagree	0	0	4.62	5	0.594
	Disagree	0	0			
	Neither agree nor disagree	2	4.9			
	Agree	10	24.4			
	Strongly agree	25	61.0			
	Missing	4	9.8			

The remainder of the qualitative data was analysed using content analysis by two researchers (CL and ML). A total of 229 open-ended comments were received. From these comments, 28 codes were generated based on keywords within each comment. To enhance the reliability and validity of the analysis, a clear research aim was established prior to data collection and analysis. An inductive coding system was also used, based on the framework previously implemented by Klassen et al. (2021). Lastly, the analysis was conducted independently by two researchers (CL and

ML), who compared their findings before confirming the final codes.

The codes were then grouped into seven categories to represent the range of data received. The categories, listed from most frequently to least frequently commented on, were logistics (112), standard of care (65), communication (15), physical and emotional care (14), personnel (11), technical skills (7), and physical space (5). Of the 229 comments received, each was also further classified as either satisfied, neutral, or dissatisfied, indicating the tone of the comments in each category (Figure 2). One

hundred sixty-three comments were classified as satisfied (71.2%), with statements such as “*satisfied*”, “*pleased*”, and “*impressed*” supporting this classification. Twenty-eight comments were coded as neutral (12.2%) based on keywords such as “*okay*” and “*fine*”. A final 38 comments were classified as dissatisfied (16.6%), where patients expressed dissatisfaction with aspects of their treatment. Table 7 shows the categories and codes with comment distribution.

Standard of care

The category comments regarding the standard of care encompassed the codes: standard of care, history taking, completeness of care, efficiency, professionalism, and service satisfaction. The periodontal treatment provided by fourth-year students at the Faculty of Dentistry, Dunedin, was generally met with high satisfaction (71.6%). Patients commented that the care they received was thorough, with one respondent citing that “[...] *what I received clinically was what I was expecting. My gums felt healthier, and I was provided with advice for caring for my gums at home. You feel good after these appointments, and it reminds you to preserve your teeth and not go backwards*” [respondent 40]. The care provided often exceeded respondent expectations. Multiple respondents stated that nothing could be improved in the standard of care and highlighted that the students demonstrated professionalism and efficiency in their care. 9.2% of comments received, however, were classified as dissatisfied, with one respondent stating, “*I would like to be treated like a person not a project*”, and another saying, “*I felt like I was being used as a major test case because of the [amount] of work to be done and the students were more interested on how it would look on [their] work experience than what I wanted done*” [respondent 19].

Logistics

The category logistics encompassed the codes: appointment scheduling, notice of

appointments, number of visits, waiting times, parking, cost, tutor numbers, and general administrative satisfaction. The Faculty of Dentistry, being a teaching institution, brings with it a set of inherent qualities such as longer wait times and an increased number of appointments; therefore, this category possessed a broader distribution of satisfied (55.4%), neutral (19.6%), and dissatisfied (25.0%) responses. Patients were mainly dissatisfied with the notice given for appointment scheduling, “*Notice [times] for appointments were very short, sometimes [a] couple of day[s], [was] lucky to have good employer*”. Patients were also dissatisfied with the number of appointments it took to complete their treatment, “*the amount of time to complete treatment from start to finish is slow*” [respondent 28]. Patients also expressed concern regarding a lack of accessible parking, with 100% of responses classed as dissatisfied. Regarding the cost of treatment, the feedback was largely favourable, with 62.5% of responses considered satisfied. There was some dissatisfaction expressed (13.9%), concerning the cost discrepancy between the estimate provided and the invoiced cost following treatment completion. A new fee structure was introduced at the Faculty of Dentistry in 2023, where patients pay per visit rather than per treatment code. Some respondents felt that this could deter patients from completing treatment with the financial burden of multiple visits, “*The new fee structure is clunky and open-ended. Would deter many people from coming back despite really needing dental care. The document on pricing needs rewording at the very least, to indicate time payment [options]*” [respondent 9].

Communication

Communication encompassed the codes: student communication skills, informed consent, and patient education. Feedback received was generally positive, with 93.3% of responses indicating satisfaction. Respondents highlighted the practical and warm communication skills they observed from their students, with one respondent stating that “*everything was explained well*”

[respondent 8]. Others said they felt comfortable asking questions, which were always addressed thoroughly and helped to form rapport and trust throughout the sessions. Regarding cost, many patients appreciated that there were clear explanations around treatment options and the associated costs, which helped to set realistic explanations, with one respondent stating, *"Price was explained at the beginning and was certainly cost-effective"* [respondent 35]. Respondents also praised being able to pay in instalments.

Physical and emotional care

This category encompassed the codes: friendliness, well-mannered, rapport, attentiveness, and comfort, and showed that patients were generally satisfied with their physical and emotional care (92.8%). Patients praised the friendliness and care provided by their students, describing them as *"professional"* [respondent 23] and *"respectful"* [respondent 34]. Many mentioned that their student made them feel at ease during procedures that would typically make them uncomfortable. They felt that their student was attentive and remained calm, providing a positive experience.

Personnel

Personnel referred to the code: student and staff interaction with the patient. Feedback was mainly positive (81.8%), with the remainder being neutral (18.2%). Many noted that the students showed professionalism and care, with the positive influence of tutoring staff members. Although one comment stated the tutor was *"quite abrupt in telling me about the condition of my teeth and gums"* [respondent

40], most responses were positive, with one stating, *"I was completely happy with the treatment I received"* [respondent 38]. Many acknowledged that although the students were still learning, they felt that the quality of care improved with each year; *"the calibre of the student [...] seems to get better as each year goes on"* [respondent 1].

Technical skills

Technical skills encompassed the codes: skills and knowledge, and student competency. Of the comments, 71.4% were satisfied, with patients generally feeling that the fourth-year dental students were willing to learn and improve throughout their treatment. The thoroughness of the examination and the level of informed consent was praised. A significant proportion of patients were dissatisfied (28.6%) with their student's competency, citing that their student was *"[...] confused at what she was doing and had to be told by her assistant"* [respondent 1]. Despite this, most respondents recognised that the Faculty of Dentistry is a training institution for students to learn and develop.

Physical space

The category of physical space represented the code: quality of facilities. There was a 100% satisfaction rate from the respondents who expressed acclaim for the facilities at the Faculty of Dentistry, with the Clinical Services Building opening in 2019. Respondents appreciated the comfort provided, with one respondent saying, *"I like the new building - well really it's the chairs, sooo comfortable"* [respondent 9]. The organisation and cleanliness of the space was commended, contributing to an overall positive experience.

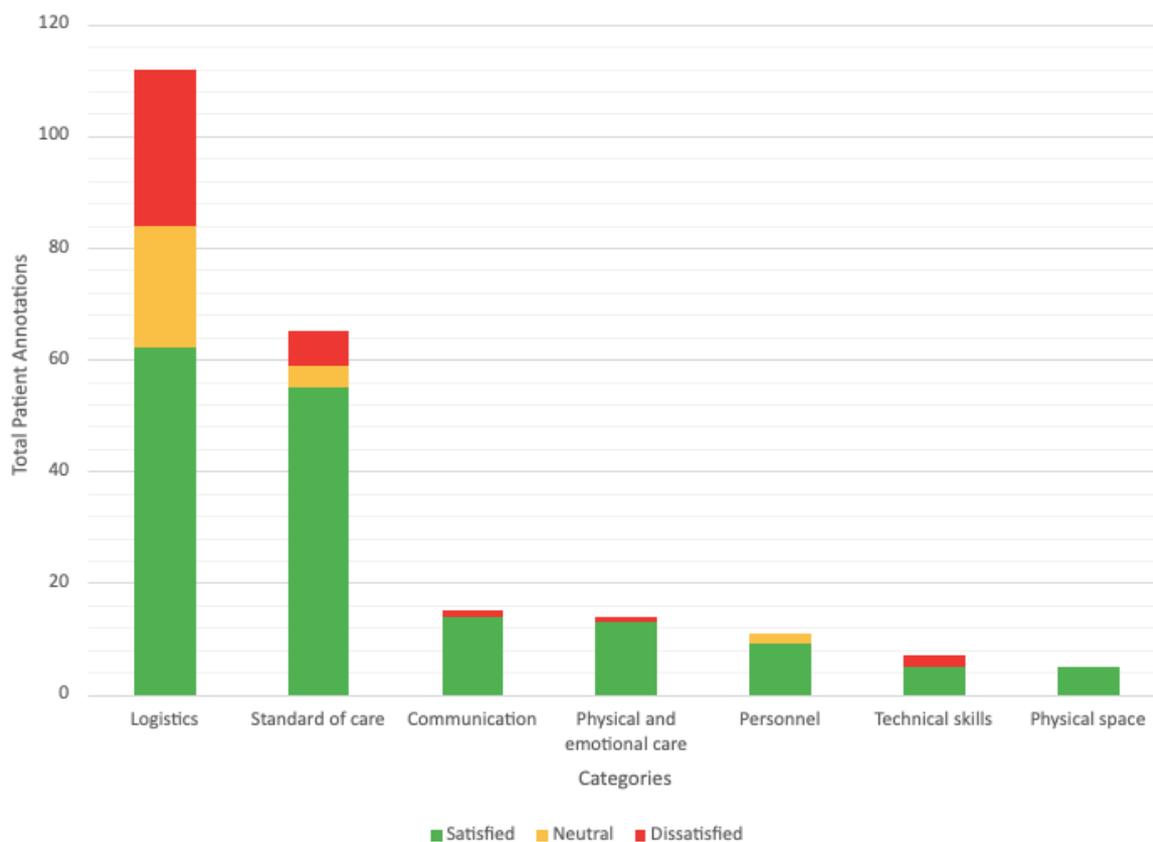


Figure 2. Stacked column graph showing the proportion of satisfied, neutral, and dissatisfied responses within each category.

Table 7. Categories and codes with comment distribution.

Thematic category and codes	Number of times coded from patient responses
Personnel	11
Interaction with dentist	9
Staff interaction	2
Physical and emotional care	14
Friendliness and care	7
Well-mannered	1
Rapport	1
Attentive	1
Comfort	4
Technical skills	7
Skills and knowledge	2
Competency	5
Standard of care	65
Standard of care	32
History taking	1
Completeness of care	1
Efficiency	1
Professionalism	5

Service satisfaction	27
Communication	15
Clinician communication skills	6
Informed consent	6
Patient education	3
Logistics	112
Appointment scheduling	4
Notice of appointment	4
Appointment length	4
Number of visits	4
Parking	8
Wait times	1
Cost	72
Tutor numbers	2
Administration satisfaction	13
Physical space	5
Quality of facilities	5

Discussion

This study examined patient satisfaction with non-surgical periodontal therapy by fourth-year students at the University of Otago, Dunedin, using a mixed-method approach. Given the lack of published data regarding patient satisfaction with NSPT at the University of Otago, Faculty of Dentistry, Dunedin, the primary questions in this study provided insight into patient care, cultural competency, and patient-clinician communication. The comments from respondents in each category of satisfied, neutral, and dissatisfied may help to guide the university in improving aspects of care that relate to each category.

The results indicate a generally positive experience with the NSPT provided by fourth-year dental students. With a response rate of 57.7% from the 71 eligible participants, this study reflects a diverse patient demographic predominantly in the 50-69 age range, including many ethnic backgrounds, with the majority being New Zealand Europeans. The respondents captured in this study were reflective of the overall population in Dunedin, for example, the study had a 70.7% New Zealand European respondent percentage, compared to Dunedin having 85.2% and the Māori population of Dunedin being 9.9%, and we

had a response rate of 4.9% Māori in our study (Stats N.Z, 2024).

Most comments received in this survey expressed satisfaction (71.2%). It was unsurprising to discover that respondents were generally satisfied with the standard of care provided (71.6% of open-ended responses). Quantitative data supported the notion that the standard of care provided by students at the Faculty of Dentistry is satisfactory and meets the standards set by the Dental Council of New Zealand (DCNZ) (Dental Council New Zealand, n.d.).

Patients expressed higher satisfaction in physical space, physical and emotional care, and communication. All respondents were satisfied with the facilities provided by the Faculty of Dentistry. The emotional care provided by the student played an essential role in increasing patient satisfaction, with 92.8% of respondents in their qualitative comments praising the friendliness and care provided by their student, describing them as “professional” and “respectful”. Empathy can decrease dental anxiety and positively impact patient outcomes (Uziel *et al.*, 2019). The results, however, did highlight some areas for improvement, particularly regarding communication and informed consent. While 93.3% of comments relating

to communication were positive, one respondent stated that *“the cost provided by the administrative team did not line up with what the student quoted me”* [respondent 23]. 5.4% of respondents disagreed that their dental student communicated effectively, and 2.7% disagreed that all procedures were explained before starting treatment. These results indicate failure to provide informed consent, as there should be no discrepancy between what is quoted before treatment commences and what the patient pays at the end. Since informed consent is an ongoing process, any changes in cost during treatment should require re-consent. Informed consent is an ethical and legal requirement for all dentists in New Zealand and allows patients to maintain autonomy and make informed choices about the treatment they receive (Nono *et al.*, 2024).

The study showed that 86.8% of respondents found their dental student respectful of their culture which is a positive reflection of cultural safety and suggests that students at the Faculty of Dentistry are operating in alignment with the DCNZ cultural safety domains in both education and regulation (Dental Council New Zealand, n.d.).

Respondents generally thought that their dental student was competent, with 81.6% of respondents either agreeing or strongly agreeing with this statement. Respondents supported this as 71.4% of open-ended responses stated that respondents were satisfied with the technical skills of their dentist; *“They demonstrated good competency”* [respondent 5], *“everything was explained well, and treatment was thorough”* [respondent 28]. However, open-ended comments revealed concerns with students’ technical skills, suggesting a need for further training and evaluation to ensure that students meet professional standards. A recent study of Otago graduates by Loh *et al.* (2022), showed that while new graduates perceive themselves as confident in diagnosing and treating periodontitis, employers thought that new graduates more frequently misdiagnose periodontal diseases, suggesting that despite patients

feeling satisfied with the treatment they receive, their perceptions may not accurately depict the clinical quality of treatment provided.

According to respondents, the logistics of physically accessing the Faculty of Dentistry and finding an appointment time were the most prohibitive factors for accessing care. 8.1% of respondents disagreed that the available appointment times suited their schedules. Fourth-year periodontal clinics were held only on Fridays, acting as a barrier to care for individuals who work or have regular commitments at this time. Fourth-year students are encouraged to see patients with advanced periodontitis in these clinics as they have access to specialist tutors during this time. However, this lack of flexibility may make attendance more difficult for respondents. 10.8% of respondents also disagreed that the clinic was in a good location, and 32.4% disagreed that parking was accessible. Accessibility is a critical aspect to consider for patient satisfaction, however, students and staff at the Faculty of Dentistry have less control over this aspect of care.

This study possessed several strengths. Utilising a mixed-method approach allowed the researchers to analyse the results both statistically and categorically. This enhanced the depth of insights gained, particularly regarding patient expectations, experiences, and the cultural competency of dental care provided by students. Additionally, the response rate for this study (57.7%), was sufficient to ensure a representative sample of participants from diverse ages and ethnic backgrounds. Lastly, the rigorous ethical oversight and systematic data analysis enhanced the credibility of the findings, making this study a valuable contribution to understanding patient satisfaction in dental education settings and the first of its kind in New Zealand.

One limitation of this study was that it was impossible to ensure that respondents were referring solely to the treatment provided in the fourth-year BDS periodontal clinic in 2023. Some participants wrote about treatment provided outside of this clinic,

which was outside the scope of this study. Therefore, it was difficult to be certain which data referred to our population of interest and which did not. Another limitation was the small sample population available after excluding non-eligible participants. Only 71 individuals treated in the fourth-year periodontal clinic in 2023 met the inclusion criteria for this study. Individuals whose treatment was incomplete or was not reviewed, were omitted. Had these groups of individuals been included in the study, the results may be less favourable due to the incompleteness of treatment. This study's smaller sample size also reduces the external validity of the results.

Despite the limitations of this study, we recommend that future research spans several years and includes multiple cohorts of students along with a more significant number of participants. Incorporating focus group interviews with patients could offer deeper insights into the factors that most strongly influence patient satisfaction and provide more precise guidance for future improvements. Additionally, including diverse treatment phases, such as initial NSPT and follow-up care, would help clarify how different stages of treatment impact patient perceptions and satisfaction. A final recommendation is to establish a real-time feedback mechanism that enables patients to share their treatment experiences, facilitating the immediate identification of any issues that may require attention.

Conclusion

This study aimed to provide insight into patient satisfaction with non-surgical periodontal treatment at the University of Otago, Faculty of Dentistry, Dunedin. The results indicated a high level of patient satisfaction and standard of care provided by students. While patients expressed overall satisfaction, they recommended improvement in access to care, informed consent, and communication.

References

- Al Ghanem, E.J., Al Ghanem, N.A., Al Faraj, Z.S., Al Shayib, L.Y., Al Ghanem, D.A., Al Qudaihi, W.S., *et al.* (2023). Patient satisfaction with dental services. *Cureus*, 15(11), e49223.
- Chang, W.J., Chang, Y.H. (2013). Patient satisfaction analysis: Identifying key drivers and enhancing service quality of dental care. *Journal of Dental Sciences*, 8(3), 239-247.
- Dental Council New Zealand (n.d.). Standards Framework. Retrieved 2 September 2024, from <https://dncz.org.nz/i-practise-in-new-zealand/standards-framework/>
- Dirham, A.A. (2021). Patient satisfaction towards non-surgical periodontal therapy. *EC Dental Science*, 20(9), 42-50.
- Frencken, J.E., Sharma, P., Stenhouse, L., Green, D., Laverty, D., Dietrich, T. (2017). Global epidemiology of dental caries and severe periodontitis – a comprehensive review. *Journal of Clinical Periodontology*, 44(S18), S94-105.
- Gasner, N., Schure, R. (2024). Periodontal disease. Treasure Island (FL): StatPearls Publishing. Retrieved 2 September 2024, from <https://pubmed.ncbi.nlm.nih.gov/32119477/>
- Govere, L., Govere, E.M. (2016). How effective is cultural competence training of healthcare providers on improving patient satisfaction of minority groups? A systematic review of literature. *Worldviews on Evidence-Based Nursing*, 13(6), 402-410.
- Ilioudi, S., Lazakidou, A., Tsironi, M. (2013). Importance of patient satisfaction measurement and electronic surveys: Methodology and potential benefits. *International Journal of Health Research and Innovation*, 1(1), 67-87.
- Jatrana, S., Crampton, P., Filoche, S. (2009). The case for integrating oral health into primary health care. *The New Zealand Medical Journal*, 122(1301), 43-52.
- Kinane, D.F., Stathopoulou, P.G., Papapanou, P.N. (2017) Periodontal diseases. *Nature Reviews Disease Primers*, 3(17038). Retrieved 2 September 2024, from <https://pubmed.ncbi.nlm.nih.gov/28805207/>
- Klaassen, H., Dukes, K., Marchini, L. (2021). Patient satisfaction with dental treatment at a university dental clinic: A qualitative analysis. *Journal of Dental Education*, 85(3), 311-321.
- Loh, J.Y., Lim, R., Broadbent, J.M., Duncan, W.J. (2022). Employer and graduate perceptions of the competency of University of Otago dental graduates. *New Zealand Dental Journal*, 118(2), 51-57.
- Luo, J.Y.N., Liu, P.P., Wong, M.C.M. (2018). Patients' satisfaction with dental care: A qualitative study to develop a satisfaction instrument. *BMC Oral Health*, 18(15), 1-10.
- Mahrous, M.S., Hifnawy, T. (2012). Patient satisfaction from dental services provided by the College of Dentistry, Taibah University, Saudi Arabia. *Journal of Taibah University Medical Sciences*, 7(2), 104-109.
- Marcenes, W., Hernandez, C.R., Bailey, J., Abreu, L.G., Alipour, V., Amini, S., *et al.* (2017). Global, regional, and national levels and trends in burden of oral conditions from 1990 to 2017: A systematic

- analysis for the global burden of disease 2017 study. *Journal of Dental Research*, 99(4), 362-373.
- Miller, G. (2020). Wait now two years for dental treatment. Otago Daily Times. Retrieved 8 September 2024, from <https://www.odt.co.nz/news/dunedin/wait-now-two-years-dental-treatment>
- Nono, D., Mwebesa, E., Bagenda, G., Okullo, I., Rwenyonyi, C.M., Williams, S. (2024). Assessment of the knowledge, attitude and practices of the informed consent process in oral healthcare among dental students in Makerere University Dental Hospital, Uganda. *BMC Medical Education*, 24(1), 516.
- Pragati, D., Neelam, M. (2020). Periodontal diseases- a brief review. *International Journal of Oral Health Dentistry*, 6(3), 177-187.
- Salhi, L., Albert, A., Seidel, L., Lambert, F. (2020). Respective effects of oral hygiene instructions and periodontal nonsurgical treatment (debridement) on clinical parameters and patient-reported outcome measures with respect to smoking. *Journal of Clinical Medicine*, 9(8), 1-14.
- Sanz, M., Herrera, D., Kebschull, M., Chapple, I., Jepsen, S., Beglundh, T., *et al.* (2020). Treatment of stage I-III periodontitis-the EFP S3 level clinical practice guideline. *Journal of Clinical Periodontology*, 47(22), 4-60.
- Stats N.Z. (2024). Census population counts (by ethnic group, age, and Māori descent) and dwelling counts. Retrieved 14 September 2024, from <https://www.stats.govt.nz/information-releases/2023-census-population-counts-by-ethnic-group-age-and-maori-descent-and-dwelling-counts/>
- Stuart K., Gilmour, J., Broadbent, J.M. (2011). Oranga waha – oral health research priorities for Māori: literature review. Wellington: Te Rōpū Rangahau Hauora a Eru Pōmare. Retrieved 17 September 2024, from https://www.otago.ac.nz/_data/assets/pdf_file/0019/332218/download-oranga-waha-oral-health-research-priorities-for-maori-a-literature-review-available-in-pdf-format-only-019588.pdf
- Uziel, N., Meyerson, J., Giryas, R., Eli, I. (2019). Empathy in dental care-the role of vicarious trauma. *International Dental Journal*, 69(5), 348–353.