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### RESEARCH PAPER

# Measuring oral health-related quality of life before and after dental treatment in patients in a remote area in Uttarakhand

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**Background and aims:** There is a strong connection between oral health and quality of life, which people often overlook. It is essential to improve the awareness of the importance of oral health among the common public. This study aims to determine the “Oral Health-Related Quality of Life (OHRQoL) of patients before and after dental treatment among service personnel in a remote area in Uttarakhand. It helps to ascertain the responsiveness of patients to developments in oral health after dental treatment and the level of awareness for overall well-being.

**Material and methods:** A structured questionnaire was used with a “5-Point Likert Scale” ranging from 1 to 5 (to determine the severity level of the problem affecting their quality of life). Informed express consent was obtained from the respondents. A sample size of 200 was used who had been through dental treatment with a follow-up for two weeks and interviewed before and after treatment. The study design was descriptive with a progressive element. **Conclusion:** There is an improvement in quality of life after getting dental treatment among patients.

**Keywords:** Oral health; responsiveness; OHRQoL.

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### INTRODUCTION

The World Health Organization (WHO) mentions that the “Quality of Life (QoL)” is a person’s perception of their life in the context of the circumstances and culture where they live and their expectations, goals, concerns, and standards. The QoL has emerged as a multidimensional theory that includes several emotional, physical, and social factors.<sup>1-3</sup> The effect of interventions on perceived oral health conditions and oral disorders and “oral health-related quality of life (OHRQoL)” is a vital health component.<sup>4</sup>

Many researchers<sup>5-10</sup> have already shown the perception of OHRQoL to be associated with oral health issues. The existing questionnaire was used to determine the effect of several dental treatments on Quality of Life, such as OHIP-

49<sup>11</sup> short version OHIP, OHRQoL-UK, OHRQoL,<sup>12</sup> “Oral Impact on Daily Performance (OIDP), and <sup>13</sup> and “Children Perception Questionnaire (CPQ).<sup>13</sup>

Many longitudinal studies have focused on periodontal disease,<sup>14</sup> orthodontics,<sup>15</sup> prosthodontics,<sup>16,17</sup> and oral surgery with OHRQoL. Improvements have been observed in earlier studies, and there was a moderate clinical change in effect size (ES) of OHRQoL.

**Research gap:** There is limited research on the response of “Oral Health-Related Quality of Life (OHRQoL)” “to patients’ overall well-being before and after treatment in the current setting and this specific cohort. The study aims to determine patients’ OHRQoL and their responsiveness to

improvements. The objectives are to determine the “Oral Health-Related Quality of Life (OHRQoL)” of patients before and after treatment and to check the level of responsiveness for changes in oral health quality and awareness of their overall well-being after dental treatment.

So, the research question is whether there are any improvements in “Oral Health-Related Quality of Life (OHRQoL)” among patients after treatment?

**MATERIAL AND METHODS**

We conducted a follow-up study on patients under a specific age group (18 to 65 years old) at Dental Section for service persons deployed in a remote area in Uttarakhand. These patients have self-reported a broad spectrum of oral health pathologies. Two hundred voluntary participants underwent a regular preventive/screening dental check-up. Each patient had signed informed consent before participating in the study. A close-ended “self-explanatory” questionnaire was handed over to each patient having 24 questions categorized into six factors that affect their quality of life by interfering with daily activities and productivity. Treatment was provided after the initial response. After 14 days of treatment, patients were recalled. Patients got the same questionnaire again, and their responses were recorded. The researchers compared the responses before and after treatment. The inclusion criteria are patients with dental morbidity that requires dental intervention; patients in the age group between 18 to 65 years; patients staying in the present geographic area for at least one year; and patients with no co-morbidity that can affect the QoL.

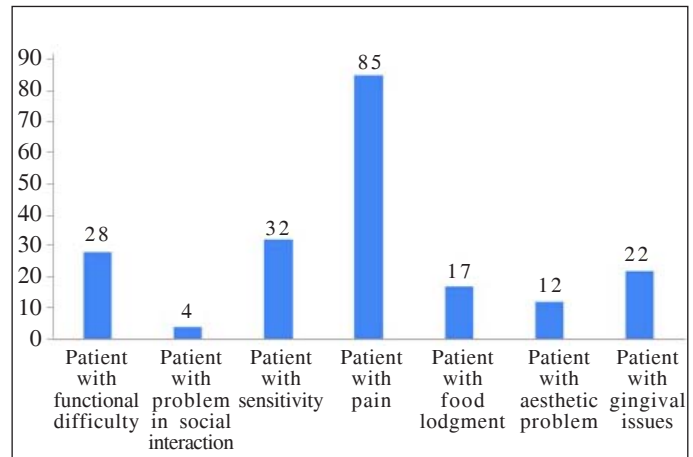
It has excluded the samples based on the exclusion criteria like patients who haven’t completed root canal treatment, patients with root caries, patients with existing co-morbidities and patients who needed emergency dental treatment.

**Study tool:** We obtained demographic information like age group, gender, work status, etc. in the questionnaire and other details by asking 24 questions under six categories, viz., functional difficulties, social interaction, comfort and well-being, food lodgement, aesthetics and gingival tissues.

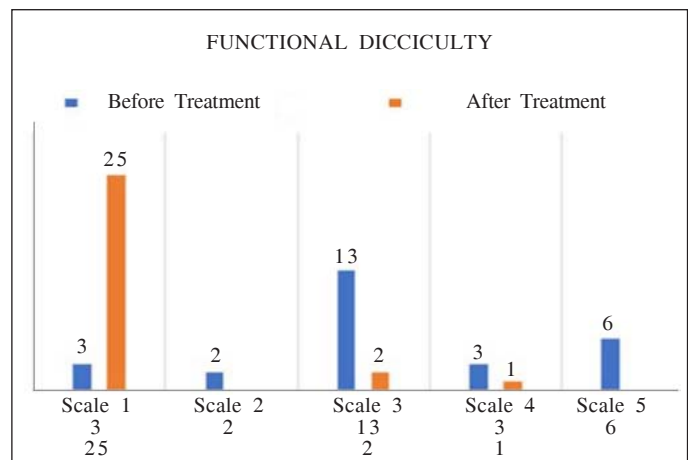
We received responses through a 5-point Likert scale questionnaire which explores the severity of factors affecting the quality of life for patients. For each factor, there were different responses as per the Likert scale. Responses were then turned into a 1 to 5 scale (ranging from least affecting or no effect to most difficulty or effect on the quality of life). Hence, a lower score means a better quality of life and vice versa.

**RESULTS**

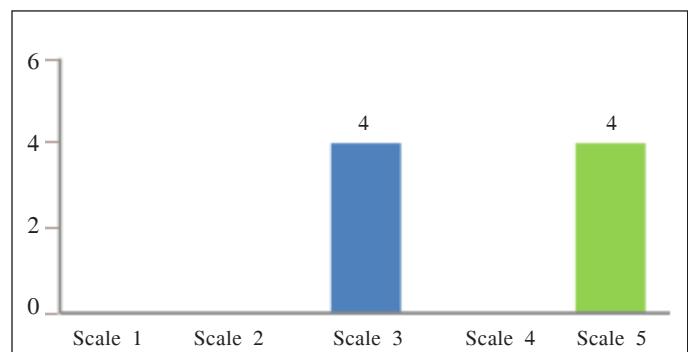
Out of 200 patients who participated in the survey, 62% were males, 38% were females, and 70% of those patients were aged from 20 to 42 years old. The majority of patients (42.5%, n=85) reported pain, 32 patients (16%) reported the problem of sensitivity, 28 patients (14%) had functional difficulty, 17 patients (8.5%) complained of food lodgement, 22 patients (11%) reported gingival issues, 12 patients (6%) reported aesthetic problems, and 4 patients (2%) had a problem with social interaction as shown in **Figure 1**.



**Figure 1** Participants in the survey reported problems



**Figure 2** Functional Difficulty



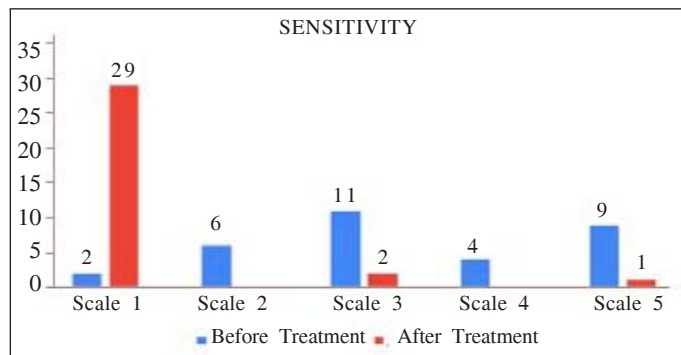


Figure 3 Problem in Social Interaction and Sensitivity

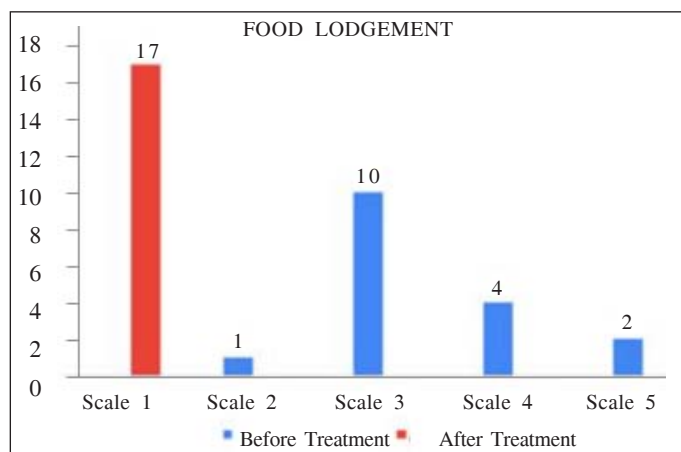
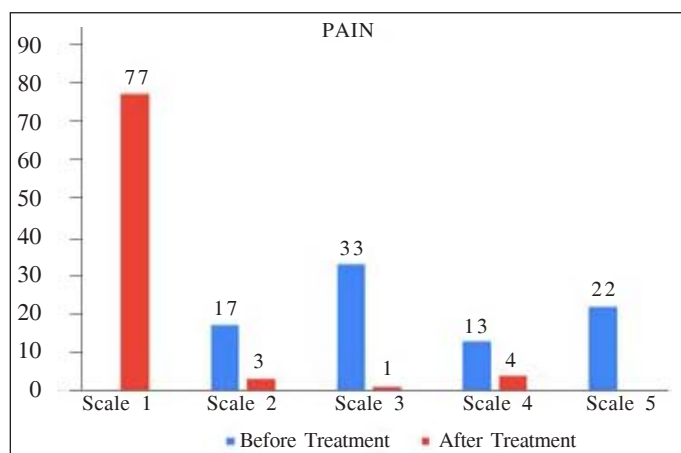


Figure 4 Patients Reported the problem of pain and food lodgement

**Statistical analysis:** Out of 28 people who reported functional difficulty, the mean value before dental treatment was 3.25(SD=1.20), while the Mean value of responses after treatment was 1.17(SD=0.55). Four respondents reported social interaction problems. After treatment, the Mean score was 1, which means they had the least problem with social interaction. The Mean score of 32 people who reported sensitivity before treatment was 3.38(SD=1.26), while only 1.25(SD=0.84) after treatment. The Mean score for 85 patients who reported pain before treatment was

3.47(SD=1.09), while 1.2(SD=0.69) for pain after treatment. Regarding food lodgement issues before treatment, the mean score was 3.4(SD=0.8), which was reduced to 1 after treatment. 12 patients reported aesthetic problems. Before treatment, the mean score for 4.08(SD=0.99) was reduced to 1.5(SD=0.90). Hence, there is a statistically significant difference in results before and after treatment (Table 1).

Table 1 Descriptive statistics

	N	Min	Max	Mean	SD
Functional difficulty before	28	1.00	5.00	3.2500	1.20570
Functional difficulty after	28	1.00	3.00	1.1786	.54796
Social interaction before	4	3.00	3.00	3.0000	.00000
Social interaction after	4	1.00	1.00	1.0000	.00000
Sensitivity before	32	1.00	5.00	3.3750	1.26364
Sensitivity after	32	1.00	5.00	1.2500	.84242
Pain before	85	2.00	5.00	3.4706	1.08659
Pain after	85	1.00	4.00	1.2000	.68661
Food lodgement before	17	2.00	5.00	3.4118	.79521
Food lodgement after	17	1.00	1.00	1.0000	.00000
Aesthetic problem before	12	3.00	5.00	4.0833	.99620
Aesthetic problem after	12	1.00	3.00	1.5000	.90453

**T-Test:** To further analyze improvements in “Oral Health-Related Quality of Life (OHRQoL)” of patients after treatment, we have conducted paired samples T-test. Here, 6 factors are defined as 6 different pairs. Pair 1 consists of social interaction. The T value of Pair 2 - sensitivity is 9.922, while the standard deviation before treatment was 1.26 and after treatment was 0.84. For Pair 3, the Standard Deviation value is 1.08 before and 0.84 after pain treatment. Pair 3 got a T value of 20.596. In Pair 4, the T value stands at 12.505, and the standard deviation is 0.00 for before and after treatment for food lodgement. In Pair 5, the standard deviation for aesthetic problems before treatment was 0.99 and 0.90 after treatment. In Pair 6, the T value stands at 10.42 for functional difficulty, while the standard deviation is 1.2 before and 0.54 after treatment (Table 2).

Table 2 Paired samples statistics

Factors	Attribute	Mean	N	SD	SE Mean	T value	p-value
Pair 1	Social interaction before	3.0000	4	.00000	.00000	-	-
	Social interaction after	1.0000	4	.00000	.00000		
Pair 2	Sensitivity before	3.3750	32	1.26364	.22338		

	Sensitivity after	1.2500	32	.84242	.14892	9.922	.000
Pair 3	Pain before	3.4706	85	1.08659	.11786		
	Pain after	1.2000	85	.68661	.07447	20.596	.000
Pair 4	Food lodgement before	3.4118	17	.79521	.19287		
	Food lodgement after	1.0000	17	.00000	.00000	12.505	.000
Pair 5	Aesthetic problem before	4.0833	12	.99620	.28758		
	Aesthetic problem after	1.5000	12	.90453	.26112	9.940	.000
Pair 6	Functional difficulty before	3.2500	28	1.20570	.22786	10.423	.000
	Functional difficulty after	1.1786	28	.54796	.10356		

Regarding overall value, the Mean score stands at 3.44 before treatment and 1.20 after treatment, and the standard deviation scores are 1.10 before and 0.67 after treatment, with a T value of 29.28. Since the p-value<0.01, there is a statistical difference between before and after treatment (Table 3). All the parameters above have reduced the mean value after treatment; hence, there is a significant decrease in the mean score on the overall scale.

**Table 3** Paired samples statistics

Factors	Attribute	Mean	N	SD	SE Mean	T value	p-value
Pair 1	Overall, before	3.4438	178	1.10453	.08279	29.283	0.000
	Overall, after	1.2022	178	.67531	.05062		

**DISCUSSION**

Vital socio-dental indicator arises with the personal estimation of patients on their oral health condition and their “oral health-related quality of life” with the influence of oral diseases. Strong evidence associates tooth loss with “impairment of OHRQoL”, and distribution and location of tooth loss affect impairment severity. Especially after 12 months of adaptation, most issues go away after dental treatment with expert dentists.

The healthcare sector has seen a significant paradigm change in determining treatment needs and results from a patient’s perspective instead of relying on clinicians’ perspectives alone. Discomfort and pain sourced from dental health issues have been considered in treatment planning and diagnosis

for a long time. However, the outcome and impact of those oral health issues on quality of life or daily life are vital to understanding the stress of diseases and ultimately determining the benefit of the cure for improving patients’ lives.

In this study, we have found significant improvements in patients’ quality of life after a few weeks of dental treatment. Out of 200 survey participants, 28 patients reported problems with functional difficulty. We have asked their difficulty on a scale of 1 to 5 (i.e., 1 being least difficult and 5 being highest difficult). Before treatment, 14 patients scored their difficulty on a scale of 3. Rest 6 patients scored their difficulty to 5, 3 patients voted on a scale of 4, 2 people on a scale of 2 and three patients on a scale of 1. After treatment, 25 patients scored their difficulty on a scale of 1, 2 on a scale of 3 and one patient on a scale of 4. There was a significant improvement after treatment of functional difficulty (Figure 2).

Similarly, four patients reported problems in social interaction before treatment (Figure 3). After treatment, all of the patients successfully resolved this problem.

Some patients also had problems with their sensitive teeth. In total, 32 patients reported this problem. Before treatment, 11 patients rated their problem on a scale of 3, 9 patients rated their problem on a scale of 5, 6 patients on a scale of 2, 4 patients on a scale of 4, and only two patients on a scale of 1, as shown in Figure 1. After treatment, 29 patients rated their problems on a scale of 1, and only 2 and 1 patients rated their problems on scales of 3 and 5, respectively.

As shown in Figure 4, in this study, the majority (n=85) of patients reported having the problem of pain. Before treatment, 33 patients rated their pain on a scale of 3, 22 patients rated their pain on a scale of 5, 17 patients rated their pain on a scale of 2, and 13 patients on a scale of 4. After treatment, the majority (n=77) of patients rated their pain on a scale of 1, 4 patients rated their pain on a scale of 4, 3 patients rated their pain on a scale of 2, and 1 patient rated their pain on a scale of 3.

A total of 17 patients reported problems with food lodging. Before treatment, 10 patients rated their problem on a scale of 3, and four rated their problem on a scale of 4, 2 on a scale of 5, and 1 on a scale of 2. After treatment, all patients rated their problems on a scale of 1. It again shows significant improvement after treatment.

12 patients reported their aesthetic problems, 6 patients reported their problem on a scale of 5, 5 rated their problem on a scale of 3, and 1 rated their problem on a scale of 4. After treatment, 9 patients reported their problem on a scale of 1 and 3 on a scale of 3.

In this study, 22 patients reported their problems with gingival tissue. Here, 15 patients ranked their problem on a scale of, four patients ranked their problem on a scale of 3, and 3 patients ranked their problem on a scale of 5.

After treatment, 17 patients ranked their problem on a scale of 1, and 5 patients ranked their problem on a scale of 2.

However, the results we obtained also have some limitations. They cannot be related to patients with other dental health issues not covered in this study. Hence, further studies are needed. In addition, we cannot record the severity of dental issues as they can be evaluated only with specific treatment approaches. In addition, it was impossible to evaluate the particular pain level due to various problems.

**Future scope of research:** Oral health quality is vital, considering the ever-rise in oral diseases like precancerous conditions and oral cancers. This study attempts to generate awareness about the quality of life among patients who need dental treatment.

## CONCLUSION

Measurement of oral health QoL is an essential subject for research as it not only gives the clinician direction on imparting a specific line of treatment but also makes patients aware of oral health. The study suggests a significant enhancement in the quality of life of service personnel working in a remote area in Uttarakhand after dental treatment. An improvement in awareness among patients about the quality of life was noticed as they could respond to the questionnaire. There was a significant improvement in all the parameters included in the study ranging from a decrease in the mean value of pain, sensitivity, functional disability, social interaction, food lodgment, aesthetics and gingival issues post-treatment as compared to pre-treatment levels. The OHRQoL scale demonstrates significant responsiveness observations as they practice comprehensive patient care.

In addition to treating oral diseases, dental surgeons can help their patients to take care of their psychological, physical and social well-being. In the future, this study can be utilized to decrease the oral health disability among the patients holistically.

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**Conflict of interest:** None declared.

**Authors' contribution:** We declare that Col. Sunil Verma and Capt Naman Chaturvedi did this work, and we will bear all liabilities about claims relating to the content of this article.

**Ethical clearance:** Taken.

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