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Dentistry Section

Oral Health-related Quality of Life after Dental Treatment among Disabled and Non Disabled Individuals in Saudi Arabia: A Cross-sectional Study

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ABSTRACT

Introduction: The quality of life based on oral health has been a vital factor affecting health outcomes. It is an overall factor that influences functional well-being, as disabled individuals may have predisposing factors that could impact their quality of life.

Aim: To assess Oral Health-Related Quality of Life (OHrQoL) in disabled and non-disabled individuals after receiving dental treatment in the Al-Baha region, Kingdom of Saudi Arabia.

Materials and Methods: A cross-sectional study was conducted between September and December 2023. A total of 86 disabled and 129 non-disabled participants underwent clinical examinations, and dental treatments were performed. The Oral Health Impact Profile (OHIP-14) was utilised to evaluate OHrQoL using a validated Arabic version of the questionnaire. Data related to all variables in OHIP-14 were analysed in association with oral diseases using Statistical Package for Social Sciences (SPSS) Software version 20.0.

Results: A total of 215 patients with and without disabilities were included in the study. Among these, 124 (57.5%) were females and 91 (42.3%) were males. Females reported significantly higher OHrQoL scores than males after dental therapy (p-value<0.001). No significant differences in OHrQoL were observed between patients with and without disabilities (p-value 0.389). However, quality of life significantly improved after dental treatment in disabled and non-disabled individuals across all sections or domains (p-value<0.05).

Conclusion: Oral disorders had a negative impact on quality of life, as post-treatment OHrQoL scores were significantly lower than pre-treatment scores.

Keywords: Dental care, Dental public health, Dental service, Disability, Oral health

INTRODUCTION

OHrQoL is a key predictor of overall health. It is a multi-dimensional construct that incorporates an individual's qualitative assessment, with various ways of expressing (subjectively) their oral health. This assessment is based on emotional well-being, functional well-being, expectations, satisfaction with care, and sense of self [1]. It highlights the effects of excellent or poor oral health and assists clinicians and public health advocates in understanding patients' concerns, expectations, and satisfaction with dental care received. Over the last few decades, psychometrically validated measures for assessing OHrQoL have been created [2,3].

The OHIP is an index based on a questionnaire commonly accepted and widely used to assess OHRQoL in children, adults, and the demented elderly [4-9]. The OHIP-14 is a 14-item abbreviated version of the OHIP that is based on Locker's conceptual model for measuring oral health. It provides a complete measure of self-reported oral dysfunction, discomfort, and impairments. These effects were designed to provide indicators based on epidemiological principles of clinical disease, which give information about the impact of illness in the population, as well as the effectiveness of health interventions in lowering the impact of illness [9-11].

Dental care is medically required to prevent and treat orofacial disorders, infections, and pain; restore dentition structure and function; and cure facial disfigurement or dysfunction. However, oral health is one of the most underserved areas of patient care since it is challenging to maintain the best oral and dental health in people, particularly those with disabilities [12]. Moreover, significant dental challenges frequently result in anxiety and cooperation problems, owing to physical restrictions, mental disability, or behavioural management issues [13]. In dental practice, dental professionals face challenges in conventional dental examinations and treatment, which might require general anaesthesia for better ease and quality treatment [14]. The outcome of poor oral health transcends further than the physical implications to severe social and intellectual associations with quality of life linked with foul odour, altered dental appearance, and altered speech, which have an adverse effect on self-confidence and esteem [15-17].

Individuals with disabilities are among the most marginalised and excluded categories of the population, with frequent abuse of their rights. Discrimination originates not from the inherent character of individuals' disabilities, but rather from a lack of knowledge and understanding of causes and implications, phobias of discrimination or difference, phobias of contagion or contamination, or adverse religious or cultural attitudes about disability and its conditions. Economic burden (poverty), social deprivation, humanitarian needs (emergencies), a lack of essential services for needs and assistance, and a hostile and inaccessible environment all contribute to this problem. Individuals with disabilities typically have poorer health, less education, fewer economic opportunities, and higher rates of poverty than people without disabilities [18,19]. Unfortunately, these individuals suffer greatly due to various pharmaceutical drugs' innervation, recommended diet associated with motor function of dysphagia, sucking lips, or tongue positioning, which may create dental issues [20]. Consequently, the lack of dental care affects oral health, and limited access to dental services results in an unnecessary disease burden and can have negative oral health consequences.

Research has been conducted to evaluate OHrQoL in Saudi Arabia and worldwide [9,11,12,21]. However, it can be emphasised that there is no study in the literature that has examined OHrQoL in the Al-Baha region, Saudi Arabia, particularly among both disabled and

non-disabled individuals. Examining this research area may highlight the significance of this study. This study is part of a larger funded project and aims to evaluate OHrQoL among both disabled and non-disabled individuals after dental treatment in the Al-Baha region in the Kingdom of Saudi Arabia.

MATERIALS AND METHODS

A cross-sectional transverse study was conducted between September and December 2023 in the Al-Baha region, Saudi Arabia, among disabled and non-disabled individuals. The present study is part of a project funded by the King Salman Centre for Disability Research (research group number: KSRG-2023-169). The institutional review board of the university observed and reviewed the research code based on the Declaration of Helsinki, with final approval from the Deanship of Innovation and Scientific Research at Al-Baha University, Saudi Arabia (approval number: 1445-45103810), and the Institutional Review Board of the Saudi Ministry of Human Resources and Social Development (approval number: 1444-305040).

Procedure

A total of 215 patients aged 12 years and above of both genders, seeking dental care, were included. Patients were classified into two groups:

- the case group included patients with a disability (n=86, 40%),
- the control group included patients who had no disability (n=129, 60%).

The disabled patients were either physically or mentally disabled. Physical disabilities include those who have lost part of their bodies for different reasons, such as car accidents or disease complications like gangrene. Mental disabilities include cerebral palsy, Down syndrome, autism, and bipolar syndrome. All patients were provided with sufficient details regarding the study before they consented to participate. Physically disabled patients were asked the questions, and their responses were filled in by the healthcare provider, while questionnaires of mentally disabled patients and children under 18 years of age were filled out by either guardians or parents of the patient, as well as the supervising healthcare provider. Subjects who were unwilling to participate or absent on the day of the examination or did not meet the inclusion criteria were excluded.

The center for rehabilitation had 152 residents with disabilities, of which only 86 residents were identified as eligible to be included in the study. The sample size was 44.7% of the total inmates of the institution. A percentage of 55.5% was excluded as they did not meet the inclusion criteria, and a few subjects had serious medical conditions that made them unavailable for the study.

The participants were clinically examined to evaluate various diseases using the World Health Organisation (WHO)-recommended clinical examination format of 2013 [22]. Oral examinations and dental treatments were performed in accordance with the Saudi Dental Guidelines and Protocol. All participants were assigned to the dental center for their first visit before dental treatment. A comprehensive oral treatment plan, based on the oral findings of patients with and without disabilities, was prepared by the treating oral clinician. Participants were asked to complete the questionnaire while waiting at the center. Oral treatment was provided on the same day. The patients were then given basic oral health instructions by the primary investigator and recalled after four weeks. Participants were then asked to complete the questionnaire.

The questionnaire was divided into two parts. The first part comprised demographic details of the patients, including age, sex, social status, smoking habits, health problems, and frequency of dental visits. The second part involved measuring quality of life using the OHIP-14 scale, which incorporates 14 scales to cover seven dimensions in a validated Arabic language format [9]. These seven dimensions of the OHIP-14 scale were physical pain, functional limitations, psychological discomfort, handicap, social impact, physical disabilities, and psychological disabilities. Each dimension was assessed through two questions, with participants asked to report the frequency of adverse experiences related to these dimensions over the previous month. A five-point Likert scale ranging from 0 to 4 was used, where responses were indicated as follows: never=0, hardly ever=1, occasionally=2, fairly often=3, and very often=4. All responses were recorded, and mean scores for each item were evaluated and compared before and four weeks after treatment. Total scores for the 14 items were summed up to provide an overall OHIP-14 score ranging from 0 to 56, with higher scores indicating poorer Oral Health-related Quality of Life (OHrQoL). The Cronbach's alpha coefficient in this study was 0.789, indicating acceptable internal consistency. The questionnaire was distributed digitally using Google Forms.

STATISTICAL ANALYSIS

The collected data were analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0. The analysis aimed to check statistical significance, with a p-value less than 0.05 indicating significance. A two-tailed test was applied to test significance, along with frequency distribution for descriptive analysis. The Wilcoxon signed-rank test, a non-parametric test, was used to compare before and after treatment. The Mann-Whitney U and Kruskal-Wallis tests were used to compare OHIP-14 scores after treatment with respect to demographic variables.

RESULTS

In total, 215 patients with and without disabilities were included in this study. Of those, 57.5% were females and 42.3% were males. The majority were single, with no history of smoking, and undergoing regular dental check-ups. The OHIP-14 scores after treatment were comparable across age, social status, smoking status, health problems, and visits to dentists (p-value=0.473, p-value =0.471, p-value=0.277, p-value=0.311, and p-value=0.793, respectively). Based on gender, females reported significantly higher scores than males after treatment (p-value=0.021). [Table/Fig-1] describes the patients' demographic characteristics and OHIP-14 scores after treatment.

Variable	n (%)	Mean±SD	p-value
Age			
10-20 years	54 (25.1)	7.35±5.20	473
21-30 years	76 (35.3)	6.78±4.28	
31-40 years	51 (23.7)	7.41±5.33	
41-50 years	27 (12.6)	6.25±4.81	
Above 51 years	7 (3.3)	9.85±7.92	
Disability			
Yes	86 (40)	7.09±4.98	0.389
No	129 (60)	9.21±4.99	
Gender			
Female	124 (57.7)	7.78±5.47	**0.021***
Male	91 (42.3)	6.19±4.05	
Social status			
Single	113 (52.6)	7.34±4.67	0.471
Married	102 (47.4)	6.85±5.30	
Smoking			
Yes	18 (8.4)	5.88±3.98	0.277
No	197 (91.6)	7.22±5.05	
Health problem			
Yes	34 (15.8)	5.97±4.21	0.311
No	181 (84.2)	6.39±4.87	

When to see dentist			
Regular	85 (39.5)	8.65±5.82	793
Irregular	52 (24.2)	7.83±5.63	
Pain	78 (36.3)	7.11±4.81	

[Table/Fig-1]: Participants demographic characteristics and OHIP-14 score after treatment provided.
*The level of significance was set at p<0.05

The mean OHIP-14 score of the studied population before treatment for disabled and non-disabled individuals was found to be 16.74±10.34 and 19.98±9.56, respectively. While the mean OHIP-14 score after treatment for disabled and non-disabled individuals was found to be 7.09±4.98 and 9.21±4.99, respectively, indicating a significant reduction in the mean OHIP-14 scores across all the 14 items after dental treatment. [Table/Fig-2] describes the average mean OHIP scores based on pre and post-treatment in disabled and non-disabled individuals. Moreover, a significant reduction in the mean OHIP-14 scores across all the seven domains (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap) after dental treatment was noticed and described in [Table/Fig-3].

OHIP item	Individuals with disabilities			Non-disabled individuals		
	Mean±SD before treatment	Mean±SD after treatment	p-value	Mean±SD before treatment	Mean±SD after treatment	p-value
Q1	0.47±0.91	0.22±0.59	**0.001***	0.53±0.83	0.28±0.48	**0.001***
Q2	0.36±0.80	0.21±0.54	**0.022***	0.61±0.91	0.36±0.56	**0.001***
Q3	1.70±1.18	0.60±0.96	**0.0001***	1.31±1.01	0.29±0.78	**0.0001***
Q4	1.50±1.08	0.53±0.89	**0.0001***	1.82±1.31	0.73±0.89	**0.0001***
Q5	2.53±1.26	1.47±1.35	**0.0001***	1.39±1.22	0.42±0.83	**0.0001***
Q6	1.83±1.47	0.67±1.13	**0.0001***	2.39±1.05	1.33±1.15	**0.0001***
Q7	0.80±1.24	0.18±0.57	**0.0001***	0.92±0.87	0.68±0.53	**0.001***
Q8	1.42±1.25	0.45±0.88	**0.0001***	1.87±1.39	0.79±0.98	**0.0001***
Q9	1.53±1.22	0.88±1.09	**0.0001***	1.86±1.44	0.71±1.12	**0.0001***
Q10	1.05±1.35	0.39±0.81	**0.0001***	2.61±1.34	1.56±1.44	**0.0001***
Q11	1.04±1.29	0.55±0.99	**0.0001***	1.61±1.18	0.64±0.97	**0.0001***
Q12	0.93±1.19	0.37±0.80	**0.0001***	0.56±0.87	0.31±0.52	**0.001***
Q13	0.84±1.18	0.35±0.78	**0.0001***	0.71±0.98	0.47±0.64	**0.001***
Q14	0.74±1.14	0.22±0.54	**0.0001***	1.79±1.38	0.63±1.04	**0.0001***
OHIP Total	16.74±10.34	7.09±4.98	**0.0001***	19.98±9.56	9.21±4.99	**0.0001***

[Table/Fig-2]: Mean±SD of OHIP Scores before and after treatment.
*The level of significance was set at p<0.05

OHIP domain	Individuals with disabilities			Non-disabled individuals		
	Mean± SD before treat-ment	Mean± SD after treat-ment	p-value	Mean± SD before treat-ment	Mean± SD after treat-ment	p-value
Functional limitation	0.83± 1.29	0.43± 0.84	**0.001***	1.66±1.91	0.64±1.04	**0.0001***
Physical pain	3.21± 1.93	1.13± 1.24	**0.023***	4.52±2.33	2.32±2.01	**0.0001***
Psychological discomfort	4.36± 2.15	2.14± 1.84	**0.0001***	1.79±2.25	1.41±1.79	**0.001***
Physical disability	2.23± 2.16	0.62± 1.04	**0.0001***	2.03±2.24	0.98±1.42	**0.0001***
Psychological disability	2.57± 2.14	1.27± 1.33	**0.0001***	4.14±1.93	1.92±1.63	**0.0001***
Social disability	1.97± 2.19	0.92± 1.31	**0.0001***	0.87±1.33	0.49±0.87	**0.001***
Handicap	1.58± 2.03	0.57± 1.02	**0.0001***	0.91±1.37	0.51±0.92	**0.001***

[Table/Fig-3]: OHIP domains score before and after treatment.
*The level of significance was set at p<0.05

The mean OHIP-14 scores after treatment were found to be statistically significantly different between the various treatments. The OHIP-14 scores were significantly higher in patients undergoing restoration, and the lowest scores were observed in patients undergoing endodontic treatment (p-value=0.005). [Table/Fig-4] shows a comparison of the mean OHIP-14 scores after treatment.

Treatment	N	Mean± SD OHIP-14 Score	95% Confidence Interval		Mini-mum	Max-imum	p-value
			Lower Bound	Upper Bound			
Conservative treatment	65	11.52± 9.94	9.0580	13.9882	-6.00	44.00	0.005
Extraction treatment	11	9.81± 14.52	0.0604	19.5759	-11.00	30.00	
Endodontic treatment	18	6.05± 7.46	2.3441	9.7670	-4.00	16.00	
Prosthodontic treatment	84	9.40± 11.79	6.8461	11.9634	-16.00	48.00	
Periodontal treatment	37	8.70± 9.68	5.4741	11.9313	-10.00	35.00	

[Table/Fig-4]: Comparison of mean OHIP-14 score after treatment provided.
*The level of significance was set at p<0.05

DISCUSSION

The current study was a cross-sectional study that aimed to evaluate the oral health-associated quality of life of individuals pre- and post-dental treatment. The age group studied ranged from 10 to 60 years old, and a shorter version of the OHIP-14 was used, which supports characteristic variables. The study showed a clinically and statistically significant reduction in OHIP-14 scores after treatment. The improved OHrQoL is with in agreement with similar findings reported by Rollon-Ugalde V et al., who reported an improvement of OHrQoL after dental treatment in oral symptoms (p-value=0.001 significant), daily life problems (p-value=0.018), parents' perceptions (p-value=0.013), and the overall score of the Franciscan Hospital for Children OHrQoL questionnaire (FHCOHRQOL-Q´s) (p-value=0.001) [23]. [Table/Fig-5] tabulates similar studies from the literature [23-28]. Jiménez-Lobo J et al., stated that the mean child OHIP-Short Form (COHIP-SF)-19 total score decreased from 53.7±7.8 pre-dental treatment to 31.4±4.2 post-treatment with overall improvements in all subdomains [25].

The present study showed that the physical pain and psychological discomfort domains were the most affected before treatment. Additionally, the disability status showed no statistically significant difference in OHIP-14 scores between disabled and non-disabled patients (p-value=0.389). However, a significant reduction in scores was observed for all domains after treatment. These findings summarize the impact on Health-Related Quality of Life (HRQoL), which is associated with both biological and psychological aspects as one dimension of health (Bio-psychological). This dimension includes symptoms related to physical, cognitive functioning, emotional reasoning, and social well-being[12]. During this period, subjects experience challenges to their physical and psychological well-being due to their internal and external environments. They are conscious of their appearance, emotions, and perceptions of the inside and outside world. Patients may have experienced positive feelings about themselves after treatment in terms of pain relief, improved function, and enhanced social interactions [28].

Quality of life is a dynamic construct that evolves with age [29,30]. The OHIP-14 ratings after therapy were shown to be equivalent across age, social status, education, and smoking in the current study. Females, on the other hand, reported considerably higher scores following treatment than males. Patients who had undergone conservative treatment showed higher scores compared to other treatment modalities. There was a significant result in all subscales, including oral symptoms and functional problems, both statistically and clinically.

S. No.	Author's name and year	Place of study	Number of subjects	Parameters assessed	Conclusion
1.	Baens-Ferrer C et al., 2005 [28]	United States of America(USA)	107 children	QOL in children with special needs after dental treatment under general anaesthesia	Oral rehabilitation under general anaesthesia was effective at improving QOL for special health care needs children and their families.
2.	Chang J et al., 2014 [24]	Seoul, South Korea	102 patients	OHrQoL in adults and adolescents with special needs after dental treatment under general anaesthesia	The postoperative improvement in OHrQoL was significant in the patients who were older than 30 year of age, originally eating soft meals, displaying no or very low levels of cooperation, or receiving endodontic treatment. Based on the primary caregiver perceptions, the OHrQoL of adolescents and adults with intellectual and developmental disabilities and neurocognitive disorders was improved by dental treatment under GA.
3.	Song JS et al., 2018 [27]	Seoul, South Korea	93 paediatric patients	QOL in children after dental treatment	Dental treatment improved the OHrQoL in Korean paediatric patients.
4.	Hillebrecht AL et al., 2019 [25]	Germany	52 adult patients	QOL in children with special needs after dental treatment under general anaesthesia	Self- and proxy-ratings revealed a significant improvement of OHrQoL in patients with intellectual disabilities after dental treatment in general anaesthesia.
5.	Rollon-Ugalde V 2020 [23]	Spain.	85	QOL in children after dental treatment in patients with intellectual disabilit	At 12-months of follow-up, the improvement of oral symptoms was significantly associated with DMFT index, decayed teeth, dental extractions and number of treatments
6.	Jiménez-Lobo J et al., 2023 [26]	Costa Rica	80	OHrQoL before and after dental treatment in 8-12-year-old children	This study affirms that dental caries, hypomineralisations, and dental malocclusions have a negative impact on the quality of life of 8-12-year-old schoolchildren
7.	Present study	Al-Baha region, Saudi Arabia	215	OHrQoL among both disabled and non-disabled individuals after dental treatment	No significant differences were seen in OHrQoL between disabled and non-disabled groups. Post-treatment OHrQoL scores were significantly lower. Oral disorders have a negative impact on the quality of life

[Table/Fig-5]: Comparison of similar studies from the literature [23-28].

Despite the requirements and obligations to guarantee that children with disabilities have equal access to quality healthcare, their access and services to dental health services have barriers, resulting in health disparities unrelated to their impairments. Preventive procedures with prompt early treatment will prevent the development of new oral diseases and stabilise the deterioration of existing ones, leading to better health outcomes in children and young people with disabilities. Education of patients and their parents or carers about oral disease prevention and treatment must begin early. This will reduce disease and operative intervention, as extractions and surgical operations, in particular, frequently cause substantial issues. Dental healthcare workers frequently need to work in this direction.

Limitation(s)

The limitation of the study could have been that further analysis on the association between socio-demographic factors and OHIP-14 responses was not conducted. Additionally, the time for reassessment of the questionnaire was insufficient.

CONCLUSION(S)

The study revealed no significant differences in OHrQoL between disabled and non-disabled groups. The OHrQoL scores after the treatment were lower, which could be attributed to the elimination of symptoms and challenges before the treatment. It confirmed that oral disorders have a negative impact on the quality of life. Thus, dental treatment may improve self-perception and quality of life in the short-term. Further clinical research focusing on evidence-based practices is necessary for the betterment of disabled individuals. Strategic planning is recommended in institutional homes for further day-to-day oral care.

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