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Factors associated with the impact of oral health-related quality of life in employees of a Peruvian university

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ABSTRACT

Objective: To identify factors associated with the impact of oral health-related quality of life in the staff of a Peruvian university during 2023. **Materials and methods:** Cross-sectional and analytical study with 319 employees. The OHIP-14sp questionnaire was applied to evaluate oral health-related quality of life, and data were collected on different sociodemographic variables, healthy habits and use of odontological services. Bivariate and multivariate analysis was performed by means of the chi-square test and Poisson log-linear regression with robust variance, respectively. **Results:** A total of 56.74% (n = 181) of the employees presented a lower impact on oral health-related quality of life. In addition, significant associations (p < 0.05) were found with sex, education level and reason for consulting a dentist. Multivariate analysis showed that participants with higher university education had a greater negative impact compared to those with a PhD (aPR = 1.16; 95% CI: 1.04-1.28; p = 0.006). In addition, those who consulted for pain had a greater negative impact, in contrast to those who sought dental care for other reasons (aPR = 1.11; 95% CI: 1.02-1.22; p = 0.023). **Conclusion:** The level of education and the reason for consulting a dentist are associated with the impact on oral health-related quality of life in employees of a Peruvian university in 2023.

Keywords: quality of life; healthy lifestyle; dental care; oral health; sociodemographic factors.

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INTRODUCTION

Oral health plays an essential role in people's quality of life and is influenced by various social and health factors (1, 2). In the Peruvian context, this issue has been traditionally neglected, starting, for example, from a deficient use of dental services and the lack of resources that hinders access to the required care, in addition to a resistance to opt for good oral habits (3). The COVID-19 pandemic has exacerbated this situation by further decreasing the availability of health services. In addition, sociodemographic factors, such as educational level, gender and age, have a significant impact on oral health and associated quality of life (4, 5).

The term "oral health-related quality of life" (OHRQoL) refers to the assessment of the impact of oral health conditions on the overall well-being and satisfaction of individuals, encompassing functional, psychological and social aspects, and experiences of discomfort or pain associated with oral diseases and conditions. To assess this relationship, various instruments are used to understand how oral health affects people's ability to lead full and satisfying lives (6). Evidence based on the conduct of these studies is essential to guide public health policies that address the needs of the population and promote better access to dental care (7, 8). Ultimately, the contribution of this type of research would enable policy makers to improve the oral health and quality of life of the Peruvian population, ensuring that everyone can access the services necessary to maintain optimal oral health (9).

Findings related to this issue are expected not only to serve as a reference for future research, but also to inform public health policies and practices that address underlying social determinants and reduce disparities in oral health. In this sense, the main objective of this research was to identify the factors that were found to be associated with the impact on OHRQoL in employees of a Peruvian university in 2023.

MATERIALS AND METHODS

The study was a cross-sectional, analytical design. The target population consisted of 1886 employees of Universidad Nacional de Trujillo (UNT) in Peru, of whom 1034 were professors and 852 were part of the administrative staff. A sample of 319 workers was calculated using the method of estimating proportions in finite populations, with a maximum prevalence of 50%, a confidence interval of 95%, and a margin of

error of 5%. The sample was proportionally stratified according to the occupational group of the target population (professors or administrative staff). The sampling was non-probabilistic, for which the first 175 professors and 144 administrative staff who agreed to participate in this research and who met the criteria for the selection of the sample were selected: that they could understand and complete the survey and that they gave their consent to participate.

The dependent variable in this research was the OHRQoL, evaluated by means of the OHIP-14sp survey, validated nationally and internationally and that in Peru presents a significant construct validity and discriminant validity, in addition to a global internal consistency by means of Cronbach's alpha coefficient of 0.95 and values ranging from 0.66 to 0.88. This tool is organized in 7 dimensions with 2 questions each (10, 11). The answers could be "never", "almost never", "occasionally", "frequently", and "very frequently". The independent variables included sex (male or female), age (18-29 years, 30-59 years, 60 and over), occupational group (professors or administrative staff), type of contract (appointed or contracted), level of education (high school, higher technical, higher university, master's, doctor's degree), monthly remuneration (less than 1,025 soles, between 1,025 and 2,000 soles, more than 2,000 soles), frequency of dental visits (less than once a year, once a year, more than once a year), service visited when going to the dentist (public or private), reason for consulting the dentist (routine, pain, other causes other than pain and/or routine) and frequency of daily brushing (once a day, twice a day, three or more times a day).

The OHIP-14sp questionnaire was adapted to a virtual format using Google Forms, which allows data collection automatically once it is answered by participants. This questionnaire was sent through the institutional e-mails of all teaching and administrative workers, which were provided by the Human Resources unit of the university, which, in turn, gave authorization for the study to be carried out. To find the impact of OHRQoL, questionnaire responses were dichotomized, assigning a score of 0 to those who indicated having no oral health-related problems ("never") and a score of 1 to those who reported having some problem ("almost never", "occasionally", "frequently" or "very frequently"). The scores were then summed by dimension and overall, and categorized by quartiles. Those with scores below the last quartile were considered "low impact", which means having a lower negative impact on OHRQoL.

On the other hand, scores within the last quartile or higher were classified as “high impact”, which means having a higher negative impact on OHRQoL. The data were processed, and descriptive and inferential statistics were performed, including bivariate chi-square analysis and Poisson regression with robust variance to determine the adjusted prevalence ratio (aPR) of significant variables ($p < 0.05$). This research had a 95% confidence level, and the IBM SPSS v. 25.0 software was used to perform the respective analyses.

The privacy of the participants was protected by means of a virtual informed consent, developed in accordance with international guidelines (12). In addition, the research was approved by the Ethics Committee of Universidad Peruana Cayetano Heredia under code SIDISI 210005, and permission was obtained from the Human Resources area of the UNT to carry out the research. It is important to emphasize that all procedures were carried out following ethical standards and guaranteeing the confidentiality of the data according to the guidelines of the Helsinki declaration (13).

RESULTS

The results showed that 52.35% ($n = 167$) of participants were women and 67.71% ($n = 216$) were in the age range of 30 to 59 years. The majority were professors, with 54.86% ($n = 175$), being mostly staff appointed with 71.16% ($n = 227$). A high educational level stood out, with 31.66% ($n = 101$) having reached the master's degree level; and 61.44% ($n = 196$) had a monthly remuneration higher than 2000 soles. Regarding oral health habits, 45.14% ($n = 144$) visited the dentist at least once a year; 88.09% ($n = 281$) visited a private dentist; and “other causes” was the main reason for consultation, with 41.07% ($n = 131$). Regarding brushing, 42.63% ($n = 136$) brushed twice a day, while 46.08% ($n = 147$) brushed three or more times a day (Table 1).

Regarding the OHIP-14sp questionnaire, we should mention that the dimension “psychological discomfort” was the one with the most “frequent” responses, with 30.72% ($n = 98$) of participants expressing concern about oral problems. Overall, the dimensions showed a high frequency of responses in the “never” and “almost never” categories; however, a significant percentage of “occasionally” responses was observed, ranging from 10.97% ($n = 35$) to 40.75% ($n = 130$). Dimensions such as physical pain, physical disability and psychological discomfort were notable for having a significant number of occasionally” responses (Table 2).

Table 1. Sociodemographic characteristics of workers of the Universidad Nacional de Trujillo.

Variable	n	%
Sex		
Female	167	52.35
Male	152	47.65
Age		
18 to 29 years	10	3.13
30 to 59 years	216	67.71
60 to more years	93	29.15
Occupational group		
Administrative Staff	144	45.14
Professor	175	54.86
Type of contract		
Contracted	92	28.84
Appointed	227	71.16
Level of education		
High school	8	2.51
Higher technical	46	14.42
Higher university	64	20.06
Master's degree	101	31.66
Doctor's degree	100	31.35
Monthly remuneration		
Less than 1025 soles	24	7.52
Between 1025 and 2000 soles	99	31.03
Greater than 2000 soles	196	61.44
Frequency of visits to the dentist		
Less than once a year	103	32.29
Once a year	144	45.14
More than once a year	72	22.57
Type of service you visit when you visit the dentist		
Private	281	88.09
Public	38	11.91
Reason for going to the dentist		
Routine	106	33.23
Pain	82	25.71
Other causes	131	41.07
Daily brushing frequency		
Once a day	36	11.29
Twice a day	136	42.63
Three or more times a day	147	46.08

Table 2. Oral health impact profile of workers of Universidad Nacional de Trujillo.

OHIP-14sp	Never		Almost never		Occasionally		Frequently		Very frequently	
	n	%	n	%	n	%	n	%	n	%
Functional limitation										
Have you had difficulty pronouncing words?	148	46.39	98	30.72	69	21.63	3	0.94	1	0.31
Do you feel that the taste of food has varied?	157	49.22	87	27.27	64	20.06	6	1.88	5	1.57
Physical pain										
Have you felt pain in your mouth?	89	27.90	120	37.62	104	32.60	5	1.57	1	0.31
Have you had discomfort when eating?	86	26.96	107	33.54	117	36.68	7	2.19	2	0.63
Psychological distress										
Are you worried about the problems in your mouth?	21	6.58	43	13.48	130	40.75	98	30.72	27	8.46
Have you felt stressed because of problems in your mouth?	69	21.63	101	31.66	110	34.48	28	8.78	11	3.45
Physical disability										
Have you had to change your food because of problems with your mouth?	117	36.68	107	33.54	81	25.39	9	2.82	5	1.57
Have you had to interrupt your food due to problems with your mouth?	123	38.56	104	32.60	80	25.08	8	2.51	4	1.25
Psychological disability										
Have you had problems sleeping because of problems in your mouth?	136	42.63	117	36.68	57	17.87	6	1.88	3	0.94
Have you been embarrassed for problems in your mouth?	122	38.24	96	30.09	74	23.20	19	5.96	8	2.51
Social disability										
Have you been irritable due to problems with your mouth?	133	41.69	98	30.72	79	24.76	6	1.88	3	0.94
Have you had difficulty to do your daily activities due to problems in your mouth?	151	47.34	103	32.29	57	17.87	6	1.88	2	0.63
Handicap										
Have you felt that life in general has been less pleasant because of problems in your mouth?	147	46.08	96	30.09	60	18.81	10	3.13	6	1.88
Have you been totally unable to do your daily activities due to problems in your mouth?	194	60.82	86	26.96	35	10.97	3	0.94	1	0.31

Regarding the impact on OHRQoL, it was observed that the areas of functional limitation, psychological disability, social disability and handicap showed mainly a lower negative impact (low impact), while physical pain, psychological discomfort and physical

limitation mostly showed a higher negative impact (high impact). Despite this, in general terms, most of the participants perceived a lower negative impact on their OHRQoL, with a prevalence of 56.74% (n = 181) (Table 3).

Table 3. Impact of the OHRQoL of workers at Universidad Nacional de Trujillo.

	Low impact		High impact	
	n	%	n	%
Dimension				
Functional limitation	197	61.76	122	38.24
Physical pain	119	37.30	200	62.70
Psychological distress	69	21.63	250	78.37
Physical disability	145	45.45	174	54.55
Psychological disability	177	55.49	142	44.51
Social disability	169	52.98	150	47.02
Handicap	200	62.70	119	37.30
OHIP-14sp (total)	181	56.74	138	43.26

Through inferential analysis, significant associations were found between some of the factors included and the impact on OHRQoL. Regarding sex, women reported a lower negative impact than men (PR = 0.92; 95% CI: 0.86-0.99; $p = 0.035$). Regarding the level of education, workers at the higher university level (PR = 1.17; 95% CI: 1.06-1.30; $p = 0.003$) or master's degree (PR = 1.10; 95% CI: 1.01-1.21; $p = 0.047$) reported a greater negative impact than those with a PhD. Those who visited the dentist for pain reported a greater negative impact compared to those who visited the dentist for other causes (PR = 1.13; 95% CI: 1.04-1.24; $p = 0.007$). No significant associations were found with the other variables included in this study (Table 4).

Table 4. Bivariate analysis between sociodemographic characteristics and the impact of OHRQoL of workers at Universidad Nacional de Trujillo.

Variable	Low impact		High impact		PR	CI (95 %)	p*
	n	%	n	%			
Sex							
Female	104	57.46	63	45.65	0.92	0.86-0.99	0.035
Male	77	42.54	75	54.35	1		
Age							
18 to 29 years	4	2.21	6	4.35	1.17	0.96-1.44	0.126
30 to 59 years	118	65.19	98	71.01	1.07	0.98-1.16	0.149
60 to more years	59	32.60	34	24.64	1		
Occupational group							
Administrative Staff	80	44.20	64	46.38	1.02	0.94-1.10	0.698
Professor	101	55.80	74	53.62	1		
Type of contract							
Contracted	47	25.97	45	32.61	1.06	0.97-1.15	0.191
Appointed	134	74.03	93	67.39	1		
Level of education							
High school	3	1.66	5	3.62	1.23	0.99-1.53	0.061
Higher technical	26	14.36	20	14.49	1.09	0.96-1.23	0.179
Higher university	29	16.02	35	25.36	1.17	1.06-1.30	0.003
Master's degree	55	30.39	46	33.33	1.10	1.01-1.21	0.047
Doctor's degree	68	37.57	32	23.19	1		

Table 4. (Continuation).

Variable	Low impact		High impact		PR	CI (95 %)	p*
	n	%	n	%			
Monthly remuneration							
Less than 1025 soles	12	6.63	12	8.70	1.05	0.91-1.21	0.5
Between 1025 and 2000 soles	57	31.49	42	30.43	0.99	0.92-1.08	0.943
Greater than 2000 soles	112	61.88	84	60.87	1		
Frequency of visits to the dentist							
Less than once a year	59	32.60	44	31.88	0.94	0.85-1.04	0.255
Once a year	87	48.07	57	41.30	0.92	0.84-1.01	0.095
More than once a year	35	19.34	37	26.81	1		
Type of service you visit when you visit the dentist							
Private	164	90.61	117	84.78	0.91	0.82-1.02	0.101
Public	17	9.39	21	15.22	1		
Reason for going to the dentist							
Routine	71	39.23	35	25.36	0.94	0.86-1.03	0.192
Pain	33	18.23	49	35.51	1.13	1.04-1.24	0.007
Other causes	77	42.54	54	39.13	1		
Daily brushing frequency							
Once a day	18	9.94	18	13.04	1.09	0.97-1.23	0.162
Twice a day	71	39.23	65	47.10	1.08	0.99-1.17	0.076
Three or more times a day	92	50.83	55	39.86	1		
Total	181	56.74	138	43.26			

PR: prevalence ratio; CI: 95% confidence interval; p: statistical significance.

* chi-square test.

After adjusting the variables with statistical significance, through the regression models used, significant aPR were found for OHRQoL in participants with a higher university level who presented a greater negative impact with respect to those with a PhD (APR = 1.16; 95% CI: 1.04-1.28;

p = 0,006). At the same time, a greater negative impact was obtained in those who went to the dentist for pain compared to those who went to the dentist for other causes (APR = 1.11; 95% CI: 1.02-1.22; p = 0.023) (Table 5).

Table 5. Poisson regression model with robust variance to evaluate the impact of OHRQoL in workers of the Universidad Nacional de Trujillo, according to sex, level of education and reason for visiting the dentist.

Variable	aPR	CI (95%)	p
Sex			
Female	0.93	0.86-1.01	0.054
Male	1		
Level of education			
High school	1.11	0.90-1.37	0.320
Higher technical	1.09	0.96-1.23	0.175
Higher university	1.16	1.04-1.28	0.006
Master's degree	1.10	0.99-1.21	0.052
Doctor's degree	1		
Reason for going to the dentist			
Routine	0.96	0.87-1.04	0.315
Pain	1.11	1.02-1.22	0.023
Other causes	1		

aPR: adjusted prevalence ratio, each variable was adjusted for the other two variables (sex, level of education, reason for dental visit); CI: 95% confidence interval; p: statistical significance.

DISCUSSION

Quality of life is a crucial indicator of health and well-being. Therefore, in the field of oral health, it refers to the way a person perceives his or her ability to do their daily activities without pain (11). Dental conditions, such as caries, periodontitis or tooth loss, have an adverse impact on quality of life (10, 13). These problems can also restrict food choice and affect overall health. Therefore, it is essential to maintain good oral hygiene to improve the level of well-being and quality of life (7, 14).

This study highlights the fact that the majority of workers were women (30-59 years old), who indicated their high concern for oral health and their related quality of life. On the other hand, professors and appointed personnel were the groups that represented a high educational level, suggesting a possible educational influence on their mouth care practices. Domínguez-Crespo et al. (5) found that many workers visit the dentist annually, preferring private services for various reasons. In this study, 45.1% visited a dentist at least once a year, while 88.1% chose private dentists. The main reason for consultation is due to

other causes, indicating concern for prevention. In fact, most of them brush at least twice a day, showing an acceptable concern for their oral hygiene.

Regarding the OHIP-14sp questionnaire, psychological distress showed a greater negative impact on OHRQoL, like that observed by authors such as Domínguez-Crespo et al. (5) and Drachev et al. (15), who suggest that oral problems may derive from poor mental health. Physical pain also had a greater negative impact on OHRQoL, as mentioned by researchers such as Batista et al. (10) and Drachev et al. (15), indicating that the perception of pain may negatively influence the feeling of having good oral hygiene. In contrast, physical disability showed a greater negative impact than what was reported by Domínguez-Crespo et al. (5), Batista et al. (10) and Drachev et al. (15), who report a low influence of this dimension on the OHRQoL, which could be due to differences in the participants' appreciation of their functional capacity, possibly influenced by cultural factors and variations in the perception of pain between studies.

Bivariate analysis revealed significant associations for the variables gender, level of education and reason for consultation. However, after adjusting for these variables in the regression model, the level of education and reason for consultation showed significant associations. This is interesting because several studies have highlighted gender, especially in women, as a significant factor in OHRQoL, attributing these differences to perceptions of beauty and esthetic standards influenced by sociocultural factors. Results vary among studies and may differ from the present findings (10, 15, 16).

The level of education showed an association with the impact on their OHRQoL, suggesting that workers with higher education experienced a lower negative impact on OHRQoL. Statistical significance was observed when contrasting workers who have a PhD with workers who only have a higher level of education without having completed any postgraduate studies. Although the relationship for workers with a master's degree did not reach statistical significance, they demonstrated a predisposition to have a greater negative impact on their OHRQoL, in contrast to workers with a PhD. In this regard, Quintanilla-Cohello et al. (16) mentioned that the level of education was associated with psychological distress in Venezuelan migrants, highlighting that a high level of education can improve knowledge and perceptions about oral health prevention, thus reducing the negative impact on OHRQoL. However, the differences evidenced in

these results, in contrast to other studies, should be considered, since the sociocultural reality and the study population are different.

In the case of the reason for consultation, it is also associated with the impact on the OHRQoL, presenting a greater negative impact for those who visit the dental service because of pain, in contrast to those who visit it for other causes, which can be interpreted as reasons related to oral esthetics or discomfort with the stomatognathic system. This finding coincides with previous studies (10, 17), which also found an association between the reasons for visiting the dentist and the OHRQoL, highlighting a greater negative impact on those who visit the dentist because of pain. It is crucial to understand that tooth disease can have a significant effect on life quality and overall well-being, as one of the main reasons for seeking dental care (18).

The study has limitations, such as the following: its implementation in a single workplace could affect the generalization of results. The majority sample of appointed personnel may have generated a selection bias; data collected through a self-administered questionnaire may contain response bias; and unmeasured factors, such as previous oral health or the quality of dental services could influence the results. Nevertheless, and considering these limitations, the present research offers important and relevant information regarding the appreciation of oral health through its OHRQoL, which is useful because it could boost the design of oral health intervention proposals aimed at improving access to preventive dental care and the promotion of healthy oral hygiene habits in university workers, to reduce the gap in quality of life and promote a more equitable well-being among all workers. In the case of UNT workers, these actions could help reduce disparities in OHRQoL and improve their perception of OHRQoL. In addition, it would be beneficial to provide education and awareness about the importance of oral health and how it can affect overall well-being. Therefore, we recommend the investigation of these limitations in future studies to obtain a broader understanding of the association between factors influencing oral health and the impact on quality of life in different population groups.

CONCLUSIONS

The level of education and the reason for visiting the dentist were found to be associated with the impact of the OHRQoL of UNT workers. Workers who had a higher level of university education and who visited

the dentist for pain had a greater negative impact on their OHRQoL, compared with those who had a PhD and went to the dentist for other reasons, respectively. In addition, although the overall impact is mostly low, which makes it have less of a negative effect on workers, psychological distress, physical pain and disability are dimensions that impact workers more negatively.

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