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Influence of oral health on the quality of life of institutionalized and noninstitutionalized elderly people

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ABSTRACT

Background: This study aimed to determine the perception of institutionalized (G1) and noninstitutionalized (G2) elderly people on oral health and quality of life (QOL).

Materials and Methods: This cross-sectional, exploratory study applied two instruments – the Geriatric Oral Health Assessment Index (GOHAI) and the World Health Organization QOL-Bref (WHOQOL-BREF) – in two cities of the state of Sao Paulo, Brazil. Among the institutionalized elderly, G1 (n = 150), 50% were not mentally able to answer the questions correctly, 12% did not answer all the questions, and 7.34% refused to take part in the research or were too frail or dependent, resulting in 31 institutionalized participants. In the noninstitutionalized group, G2 (n = 80), 52.50% refused to take part in the research, resulting in 38 noninstitutionalized participants. The elderly individuals (i) who did not respond to three or more questions of the GOHAI, (ii) those who did not answer all the questions of the WHOQOL-Bref, and (iii) those who did not consent to participate in the research study were excluded from the study population ($P < 0.05$ consider significant).

Results: The oral health of both groups minimally affected the QOL of the elderly. The WHOQOL-Bref score varied between the two study groups mainly in terms of physical domain and self-perception of QOL. The study groups showed differences in some variables: self-perception of QOL ($P = 0.0209$), mobility ($P = 0.0057$), and access to health services ($P = 0.0252$). G2 presented the best conditions.

Conclusion: The oral health condition of both groups minimally affected the QOL of the participants; however, differences in the self-perception of QOL were significant, mainly in the physical domain.

Key Words: Ageing, eldery, oral health, people, quality of life

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INTRODUCTION

According to the World Health Organization, the global population is rapidly aging. Between the years 2000–2050, the proportion of the world population older than 60 years will double; from about 11%–22%. The number of people aged 60 years and over will expectedly increase from 605 million to 2 billion over the same period.[1-3]

Pathophysiological disorders generally arise by the third decade of life, and they can affect the QOL of the elderly, particularly when they decrease an

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individual's capacity to function. The deterioration of the functional capacity is often caused by psychiatric disorders or absence of physical exercise, which can result in changes in an individual's personality and oral condition, such as xerostomia and periodontium. However, aging can be filled with contentment, happiness, and good QOL depending on one's personal view of life, particular lifestyle and habits, coping strategies for major losses, disappointments, and unexpected changes in life.[4-6]

As a consequence of the recent increase in the elderly population, oral health is a general health condition that should be monitored in this phase of life. It entails the need for subsidies to develop health policies, prevention programs, treatment, and rehabilitation. Poor oral health conditions among the elderly can limit feeding (i.e., chewing, digestion, and taste) and cause nutritional deficits, geriatric diseases, and dissatisfaction. Then, this limitation can decrease the amusement of meals with family and friends and inhibit social life by affecting pronunciation and esthetics. In Brazil, the rate of edentulism incidence is high, as demonstrated in the epidemiological survey by SB Brazil in 2010 with 65–74-year-old participants: 76.5% of older adults used some type of prosthesis in the upper arch (n = 7.502), and 53.9% used some type of prosthesis in the lower jaw (n = 7.503).[7-9]

The most used questionnaires to measure the effect of oral health on the quality of life (QOL) are the Oral Health Impact Profile and its derivatives and the Geriatric Oral Health Assessment Index (GOHAI). For older communities, the compact version of the GOHAI questionnaire seems to be more practical because of the weak ability of the elderly to concentrate and their reduced physical endurance. GOHAI has presented better results to detect small changes in oral health.[10]

Homes for the aged are currently one of the alternatives for families who are unable for some reason to take care of their elderly relatives. However, the environment offered by homes for the aged can favor or hinder the development of physical and psychological autonomy and social relations, affecting the QOL of those living in that environment. In contrast, the noninstitutionalized elderly has greater physical and psychological autonomy, as well as better social relationships. Their environment offers tranquillity, comfort, privacy, opportunity for social relationships, varied activities during the day, and outdoor activities, which improves QOL.[11] Considering that these factors affect QOL, we evaluated if there are differences in the self-perception of oral health between the two groups.

The present study aimed to identify the self-perception of institutionalized and noninstitutionalized elderly participants regarding oral health status and QOL and verify associations among various parameters.

MATERIALS AND METHODS

This quantitative, exploratory, and cross-sectional study used the Portuguese versions of two validated instruments: GOHAI,[12] which assesses self-perception on oral health, and the World Health Organization QOL-Bref (WHOQOL-Bref), which assesses health-related QOL.[13]

We invited elderly people living in homes for the aged (n = 150) and two groups for senior citizens (n = 80) from two cities of the state of Sao Paulo, Brazil, to participate in the research. These senior groups have been organized by neighboring councils of aged people and have engaged in daily activities, such as sports, dancing, parties, and field trips. The total sample consisted of 68 individuals. With a margin of error of 10%, we calculated the sample sizes so that the number of institutionalized and noninstitutionalized elderly was almost equivalent. After that, the elderly were randomly selected according to the group.

The inclusion criteria were age over 60 years, written consent to participate in the research, living in selected homes for the aged or participating in one of the two senior groups during the third decade of life, healthy mental status determined by a responsible institutional geriatric doctor, and attendance at the application of questionnaires. Among the institutionalized elderly participants (n = 150), 50% were not mentally capable of answering the questions correctly, 12% did not answer all the questions, and 7.34% refused to take part in the research or were too frail or dependent, resulting in 31 participants (G1). In the noninstitutionalized group (n = 80), 52.50% refused to take part in the research, resulting in 38 participants (G2). Hence, the final sample totalized 69 participants.

The elderly individuals (I) who did not respond three or more questions in the GOHAI, (II) those who did not answer all the questions in the WHOQOL-Bref,[12-14] and (III) those who did not

consent to participate in the research study were excluded from the study population.

The first instrument, GOHAI, was chosen because it facilitates the identification of functional and psychological impacts of oral health on QOL.[14] It measures an individual's perception of oral functional problems and estimates the level of psychological impact associated with oral disease. GOHAI consists of 12 questions that encompass three dimensions: Physical function (chewing, pronunciation, and swallowing); psychological function (preoccupation or interest in oral health, dissatisfaction with one's appearance, self-perception in terms of oral health, and avoidance of social interactions due to oral problems); and pain or discomfort (use of medications to relieve pain or discomfort in the oral cavity). All questions were measured using a 5-level Likert scale (always 5; often 4; sometimes 3; seldom 2; never 1).[12]

The second instrument, WHOQOL-Bref, consisted of 26 questions concerning four domains: Physical aspect, psychological aspect, social relationships, and environment. It also included two questions regarding the individual's perception of QOL and general health. All questions were measured using a 5-level Likert scale (never/not at all/very dissatisfied/very poor: 1; seldom/a little/dissatisfied/poor: 2; quite often/a moderate amount/neither satisfied nor dissatisfied/neither poor nor good: 3; very often/mostly/satisfied/good: 4; and always/completely/very satisfied/very good: 5). The WHOQOL was selected because it is the most appropriate instrument to study populations, and its application takes little time.[14,15]

Information regarding gender, age, and dependence level (independent, partially dependent, and totally dependent) was collected from medical records of the responsible geriatric doctor of the corresponding institution.

The members of G1 completed the questions at their home for the aged, while G2 participants answered the questions where the meetings and recreational activities were conducted. Each participant answered the questions individually, with the assistance of a researcher, and positioned far from other participants to prevent them to share answers. The two groups only matched by age.

The final sum of GOHAI scores varied from 0 to 60. Scores between 57 and 60 represented an oral health condition with a "high" impact on QOL; scores between 51 and 56 designated a "moderate" impact on QOL; scores lower than 50 indicated an oral health condition with a "low" impact on QOL. Thus, these categories indicate that higher GOHAI scores reflect poor oral health status, which in turn may result in negative psychological and social consequences.[12]

The WHOQOL-Bref scores for each question varied from 1 to 5 points: The higher the score, the better the QOL, except for pain or discomfort, negative feelings, and medicine dependency, which had reverse scoring for QOL. The physical domain consisted of seven questions; the psychological domain comprised six questions; social relationships included three questions; the environmental domain consisted of eight questions; and QOL and general health presented two questions. The total score of each study participant using each instrument and the scores per domain were calculated to conduct comparative analyses. To determine the relationship between various domains and QOL, we applied the Mann–Whitney's test.

Three researchers collected all the data, which were processed in the Epi Info Program, version 7, and in the BioEstat software, version 5.3. Fisher's and Mann–Whitney's tests were used to perform a bivariate analysis to determine the statistical significance between dependent variables and outcomes. A simple regression model was used to analyze pair variables. A confidence interval of 95% was adopted for all statistical tests. The interexaminer reproducibility was checked and agreed by researchers.

This research was approved by the Ethics Committee of Araçatuba Dental School, UNESP, Brazil (process number FOA-01916/2011).

RESULTS

The results showed that women were the majority in both study groups and more independent [Table 1]. In G1, 23.80% of women and 40% of men showed some level of dependence to perform daily routine activities. In G2, all participants were independent. There was not any significant statistical association between gender and physical dependence level in both groups G1 and G2(G1- =0.4174; G2P = 0.9999) according

Table 1: Distribution of old people according to group and gender (Araçatuba/SP)

Gender	Group 1, *n* (%)	Group 2, *n* (%)	Total, *n* (%)
Female	21 (67.7)	28 (73.7)	49 (71.0)
Male	10 (32.3)	10 (26.3)	20 (29.0)
Total	31 (100.0)	38 (100.0)	69 (100.0)

to Fisher's test, nor between individual's oral health perception and gender (P = 0.8162; P = 0.8037, respectively), according to Mann–Whitney's test.

According to fisher's test, there was no statistically significant association between sex and the level of physical dependence in either G1 or G2 (P = 0.4174; P = 0.9999, respectively), nor between the individual's oral health perception and gender (P = 0.8162; P = 0, 8037, respectively) according to the Mann-Whitney test.

In relation to the total score of GOHAI, a descriptive statistical analysis showed that G1 and G2 were similar (median = 28 and 27; standard deviation = 6.6 and 6.8; variance = 43.3 and 45.6, respectively). Only one G1 member presented a "moderate" impact of oral health status on QOL; the other participants presented a "low" level. According to this instrument, oral health in the two groups analyzed had a "low" impact on the QOL of older adults (GOHAI average score was 28.1 for G1 and 26 for G2), and there was no difference between the scores of both groups (P = 0.4955) according to Mann–Whitney's test.

Regarding WHOQOL-Bref, the total score only presented a significant difference in the physical domain [Table 2] between G1 and G2 ($P < 0.05$).

The groups studied presented no significant difference in relation to annoyance and worries due to their oral health status ($P < 0.05$), and the institutionalized elderly showed these feelings more frequently than the other group [Table 3]. As a possible contributing factor to this annoyance among the institutionalized elderly participants, we observed a dissatisfaction with the access to health-care services (P = 0.0347) according to a simple regression model, but probably, there are other contributing factors to be verified in the future studies.

The scores of G1 and G2 for QOL presented significant differences concerning individuals' perception of their dependence on medical treatment to live and enjoy life; the importance and meaning of one's own life; availability of information for routine leisure opportunities; mobility; satisfaction with social relationships; and access to health-care services. For these variables, G2 showed the best conditions [Table 4]. Satisfaction with sexual life could not be compared between the groups because half of G1 participants did not answer the question on that matter.

DISCUSSION

This research about QOL and individual perception of oral health identified differences between institutionalized and noninstitutionalized elderly groups in the physical domain.

Some studies[7,15] have observed the predominance of the female gender in both groups, and this can be explained by multifactorial causes for female longevity. However, the aging process equally affects both sexes; it damages cognitive functions and affects functional skills of the elderly, which can become worse with the use of many medications and the absence of a partner, particularly for the female gender.[16,17]

The oral health impact on the QOL of both groups was considered "low," and there was no difference between institutionalized and noninstitutionalized elderly people, similarly to the findings of other studies. It means that the elderly had a positive self-perception of their oral health despite their precarious clinical status, which they consider a normal clinical condition due to their advanced age. Haikal *et al*. demonstrated this fact in their study; they reported justifications given by the elderly for positively perceiving their oral conditions.[18,19]

However, many of the participants presented edentulism, which is a serious problem for the elderly. As dental problems are barely perceived by the population, people believe that having no teeth is the solution to stop pain, or even that removing them is natural and inevitable. A study on the use and need of dental prosthesis in the elderly identified that, in relation to the institutionalized elderly, a low number of elderly people used dental prosthesis, whereas most noninstitutionalized elderly participants used dental prosthesis, most frequently a total prosthesis. Another study also observed that a high percentage of institutionalized elderly people needed dental prostheses, but little more than half of noninstitutionalized elderly people needed a prosthesis.[20,21]

As oral health status becomes worse with aging, people feel chewing discomfort, pain, and damages to social life. In general, this aspect of life seems to be related to education, but sometimes even people with good education can present the same problems as less educated ones. Besides, some psychological factors can influence oral health self-perception between real oral health status and self-report. As a consequence,

Table 2: Statistical data of World Health Organization Quality of Life-Bref score according to domains (Araçatuba/SP)

Domains	Average scores		SD		Variation coefficient		Minimum value		Maximum value		Amplitude		Mann-Whitney's test (*P*)
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	
Physical	14.47	15.90	2.02	2.06	13.93	12.92	10.86	9.71	10.86	9.71	8.00	9.14	0.0083[a]
Psychological	15.33	16.02	1.96	1.67	12.75	10.43	10.00	12.67	10.00	12.67	8.00	7.33	0.1806
Social relationships	14.97	15.30	1.92	3.05	12.85	19.96	12.00	4.00	12.00	4.00	8.00	16.00	0.3080
Environment	15.23	15.50	1.63	2.24	10.72	14.46	12.50	10.86	12.50	10.86	6.00	9.14	0.6040
Self-perception	14.65	15.89	3.36	2.46	22.96	15.47	4.00	10.00	4.00	10.00	16.00	10.00	0.0984
Total	14.97	15.69	1.39	1.74	9.28	11.07	11.84	11.38	11.84	11.38	5.60	7.85	0.4955

[a]Significant statistically difference between Group 1 and Group 2. SD: Standard deviation

the institutionalized elderly, mainly those totally dependent, need assistance with their oral hygiene. However, many professionals who work in long-term care are not able to do this job, and they do not like it, although the Statute of the Elderly in Brazil considers this act a punishable crime: "*to refuse*, *delay or hamper care or not to provide health assistance to the elderly without just cause*." Therefore, to promote health, regular and specific dental treatment for the elderly is necessary.[18,22-25]

In relation to WHOQOL-Bref, the score was analyzed based on domains similar to those found in other studies that also showed the physical domain as the most expressive aspect for institutionalized elderly participants. However, a study showed that the psychological and social relationships domains had higher scores among senior participants living in the community of the state of Rio Grande do Sul than institutionalized participants from the countryside of Minas Gerais, Brazil.[22]

As mentioned previously, schooling levels, chronic diseases and functional capacity are factors that interfere in individuals' perception of QOL, mainly for the institutionalized elderly, and the worsening of physical performance is more significant between the ages of 60–70 years, and it should stabilize after 70 years of age.[16,26] However, the practice of exercise for the aged can improve their health status, promote well-being, improve social life, and reduce mortality risks. Takata *et al*.'s[27] study corroborated the difference found in the present study between the institutionalized and noninstitutionalized elderly in relation to mobility; the noninstitutionalized participants played volleyball three times a week and danced once a week, while the institutionalized participants did not practice any kind of physical activity. In addition, a study conducted in the United Kingdom[28] verified that the elderly people spend a lot of their time sleeping or resting, doing only household chores or watching television. These are not healthy habits, so the occupational therapist must help and assist daily practices of some kind of physical activity.

Social life strongly affects the QOL and general health of the elderly too. This becomes clear when one compares those who have social life and those who do not. In this context, their appearance has a strong role because being dissatisfied with one's own oral health status can cause inconvenience, discomfort, and embarrassment, which in turn can lead to isolation from other people.[7,29]

Table 3: Distribution of Geriatric Oral Health Assessment Index average score according to questions and statistical results (Araçatuba/SP)

GOHAI items in the past 3 months…	Average GOHAI score (SD)		Mann-Whitney's test (*P*)
	Group 1	Group 2	
1. How often did you limit the kinds or amounts of food you eat because of problems with your teeth or dentures?	2.2 (1.49)	1.8 (1.14)	0.3884
2. How often did you have trouble biting or chewing any kinds of food, such as firm meat or apples?	3.0 (1.59)	2.4 (1.62)	0.1154
3. How often were you able to swallow comfortably?	3.9 (1.41)	3.9 (1.60)	0.6950
4. How often have your teeth or dentures prevented you from speaking the way you wanted?	1.9 (1.31)	2.0 (1.53)	0.9279
5. How often were you able to eat anything without feeling discomfort?	3.5 (1.52)	3.5 (1.60)	0.9856
6. How often did you limit contacts with people because of the condition of your teeth or denture?	1.6 (1.20)	1.4 (1.10)	0.5344
7. How often were you pleased or happy with the looks of your teeth and gum or dentures?	4.2 (1.11)	4.2 (1.42)	0.3720
8. How often did you use medication to relieve pain or discomfort from around your mouth?	1.4 (0.92)	1.5 (0.92)	0.7027
9. How often were you worried or concerned about the problem with your teeth, gums, or dentures?	2.5 (1.29)	1.8 (1.03)	0.0203[a]
10. How often did you feel nervous or self-conscious because of problems with your teeth, gums, or dentures?	1.5 (0.89)	1.8 (1.31)	0.5998
11. How often did you feel uncomfortable eating in front of people because of problems with your teeth or dentures?	1.8 (1.41)	1.8 (1.30)	0.9088
12. How often were your teeth or gums sensitive to hot, cold, or sweets?	1.7 (1.36)	1.8 (1.30)	0.8611

[a]Significant difference. GOHAI: Geriatric Oral Health Assessment Index; SD: Standard deviation

Table 4: Distribution of medians from World Health Organization Quality of Life-Bref instrument according to items and statistical data (Araçatuba/SP)

WHOQOL Bref items	Average WHOQOL score (SD)		Mann-Whitney's test (*P*)
	Group 1	Group 2	
1. How would you rate your life?	3.52 (0.96)	4.08 (0.71)	0.0209[a]
2. How satisfied are you with your health?	3.81 (0.95)	3.87 (0.70)	0.8140
3. To what extent do you feel that physical pain prevents you from doing what you need to do?	2.42 (1.76)	2.13 (1.17)	0.4001
4. How much do you need any medical treatment to function in your daily life?	2.90 (0.91)	2.16 (1.98)	0.0080[a]
5. How much do you enjoy life?	3.26 (1.12)	4.18 (0.61)	0.0008[a]
6. To what extent do you feel your life to be meaningful?	3.48 (0.81)	3.92 (0.54)	0.0256[a]
7. How well are you able to concentrate?	3.71 (0.74)	3.50 (1.13)	0.9663
8. How safe do you feel in your daily life?	3.68 (0.70)	3.87 (0.84)	0.1786
9. How healthy is your physical environment?	4.19 (0.65)	3.68 (1.16)	0.1154
10. Do you have enough energy for everyday life?	3.65 (0.13)	3.95 (0.87)	0.0713
11. Are you able to accept your bodily appearance?	4.19 (0.91)	4.16 (0.55)	0.3951
12. Have you enough money to meet your needs?	3.16 (0.93)	3.58 (0.90)	0.1034
13. How available to you is the information that you need in your day-to-day life?	3.16 (0.86)	3.58 (1.18)	0.0237[a]
14. To what extent do you have the opportunity for leisure activities?	3.29 (0.97)	4.05 (0.69)	0.0012[a]
15. How well are you able to get around (mobility)?	3.48 (1.13)	4.37 (0.59)	0.0057[a]
16. How satisfied are you with your sleep?	3.97 (0.98)	3.87 (1.09)	0.8187
17. How satisfied are you with your ability to perform your daily living activities?	3.84 (0.69)	3.97 (0.85)	0.2749
18. How satisfied are you with your capacity for work?	3.16 (1.12)	3.63 (1.26)	0.0615
19. How satisfied are you with yourself?	4.13 (0.62)	3.89 (1.03)	0.6209
20. How satisfied are you with your personal relationships?	3.68 (0.79)	4.08 (0.78)	0.0241[a]
21. How satisfied are you with your sex life?	0.10 (0.54)	2.71 (1.69)	<0.0001[b]
22. How satisfied are you with the support you get from your friends?	3.84 (0.64)	3.92 (0.91)	0.4879
23. How satisfied are you with the conditions of your living place?	4.29 (0.69)	4.13 (0.81)	0.5187
24. How satisfied are you with your access to health services?	4.42 (0.56)	4.00 (0.70)	0.0252[a]
25. How satisfied are you with your transport?	4.26 (0.63)	4.03 (0.68)	0.2419
26. How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1.77 (1.17)	1.81 (1.13)	0.6729

[a]Significant difference; bItem answered with wrongs. WHOQOL: World Health Organization Quality of Life; SD: Standard deviation

The environment is another domain that should be carefully explored because it has direct results on the QOL of the elderly. A healthy environment, where the elderly can express themselves in their own way and where they are respected, contributes to human longevity.[30]

When the environment and social life are deficient during the old age of life, the elderly has a strong tendency to express some depressive symptoms that damage their health, well-being, happiness, and satisfaction in their lives. This situation can get worse after the beginning of psychological and psychiatric disorders because some discord can result in severe stress and somatic impact. This is a good explanation for the differences found between the two groups studied regarding satisfaction with social relationships and ability to enjoy life.[31]

As corroborated in this study, research studies conducted with institutionalized elderly participants have presented some difficulties due to the low cognitive, psychological, and mental capacities of respondents. Besides, the low number of homes for the aged limits the sample size. Thus, qualitative research can be carried out to broaden understanding on the topic and implement improvements in homes for the aged to enhance the elderly's QOL.[11]

CONCLUSION

This study found out that the perception of oral health was not different in institutionalized and noninstitutionalized elderly groups, showing a general good status and low impact on their QOL. The main difference in this perception between the two groups appeared in the physical domain since the noninstitutionalized elderly participants, who practiced physical activities, showed a better QOL than the other group.

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Conflicts of interest
The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

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