

# Relationship between Gerotranscendence and Oral Health-Related Quality of Life among Elderly Population in Tertiary Care Hospital, Wardha, Maharashtra: A Cross-sectional Study

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## ABSTRACT

**Introduction:** Gerotranscendence represents a shift in meta-perspective, transitioning from a materialistic and rational outlook to a more cosmic and transcendent one. This phase fosters resilience in older individuals, enabling them to overcome the challenges and despondency associated with ageing, thereby promoting a positive embrace of the ageing process. Remarkably, individuals with high levels of gerotranscendence, even in the presence of poor oral health, demonstrate the capacity to cope and adapt to their circumstances. This adaptive capability may contribute to an enhancement in their self-reported Oral Health-Related Quality of Life (OHRQoL).

**Aim:** To evaluate the relationship between gerotranscendence and OHRQoL among the elderly population in the Vidarbha region.

**Materials and Methods:** This cross-sectional study was conducted over a 6-month period from March 2023 to August 2023 in collaboration with the Department of Prosthodontics and the Department of Public Health Dentistry at the Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra on 350 participants. The study included volunteers aged  $\geq 70$  years, residing in homes or old age homes, and those visiting tertiary healthcare centers. Methodologically, data collection employed a self-made organised proforma. Oral examinations were conducted using Type III inspections with a mouth mirror. Gerotranscendence was

assessed using the Gerotranscendence Scale Type 2 (GST2), which was validated and translated into Marathi. The Geriatric OHRQoL was evaluated using the Geriatric Oral Health Assessment Index (GOHAI), also translated into Marathi. The study used Chi-square tests for categorical variables and Pearson's and Spearman's tests for correlation analyses.

**Results:** The average gerotranscendence score was 23.45 (95% confidence interval [CI]: 22.96, 23.94), reflecting a mid-level of gerotranscendence, indicating that the gerotranscendence score was neither low nor high. According to Pearson's and Spearman's correlation tests, the gerotranscendence score was significantly positively correlated with age and self-perceived need for treatment. The mean GOHAI score was 40.16 (95% CI: 39.55, 40.76). A substantial positive association between the GOHAI and self-perceived need for treatment was found using Pearson's and Spearman's correlation tests. When comparing gerotranscendence and GOHAI, Pearson and Spearman correlation tests revealed a significant positive association ( $p < 0.001$ ).

**Conclusion:** Gerotranscendence was significantly positively correlated with OHRQoL, independent of objective oral status. Despite having poor oral health, elderly individuals with high levels of gerotranscendence may be better able to handle and adapt to their circumstances, which could result in an improvement in self-reported OHRQoL.

**Keywords:** Geriatrics, Gerotranscendence, Geriatric oral health assessment index, Oral health related quality, Public health of life

## INTRODUCTION

The World Health Organisation (WHO) forecasts a significant demographic shift by 2050, with the proportion of individuals aged over 60 expected to nearly double, rising from 12% to 22% globally [1,2]. This demographic transition is particularly pronounced in India, driven by an ageing population and increased life expectancy, prompting heightened interest among researchers in the health needs of the elderly [3,4].

Over the past decade, there has been a notable transition away from hospital-based and institutionalised care for the elderly in many nations, in favour of in-Home Comprehensive Health and Care Services (HHCS) [5]. This shift, attributed to both economic considerations and patient preferences, has led to increased demands on HHCS providers, given the complex healthcare needs of elderly individuals living at home [1-3,6].

Recognising the pivotal role of oral health in overall well-being, the WHO's Global Oral Health Programme emphasises the importance of

maintaining good oral hygiene to sustain overall health and wellness [7,8]. OHRQoL has emerged as a critical measure in assessing the subjective well-being of the elderly, encompassing functional, psychological, social, and orofacial pain/discomfort aspects [9,10].

One significant factor influencing OHRQoL is gerotranscendence, as highlighted by Mihara Y et al., [10]. Gerotranscendence, introduced by Tornstam in 1989, represents a philosophical shift towards a more cosmic and transcendental understanding of life in old age. Individuals experiencing gerotranscendence often report increased life satisfaction and a broader perspective on their existence [11,12].

Furthermore, Erikson's psychosocial development theory has been expanded to include a ninth stage specific to ageing individuals aged 80 and older, emphasising the psychological aspects of ageing [13]. This ninth stage, introduced by Erikson's wife, facilitates coping with and overcoming the grief experienced in the preceding stage and is closely linked to the psychological transformations associated with gerotranscendence [13,14].

Recent research suggests that despite experiencing poor oral health, elderly individuals with high levels of gerotranscendence may exhibit better coping mechanisms, leading to increased self-reported OHRQoL [10,15,16]. This highlights a potential relationship between gerotranscendence and OHRQoL, underscoring the importance of considering psychological factors in assessing the oral health outcomes of the elderly.

The aim of this study was to investigate the correlation between gerotranscendence and OHRQoL within the elderly population residing in the Vidarbha region. This research seeks to understand the intricate connection between gerotranscendence—a concept encompassing personal growth, wisdom, and a shift in the perception of time and self—and OHRQoL, which pertains to the impact of oral health on an individual's overall quality of life. The objective of the study was to evaluate the association between gerotranscendence and OHRQoL among the elderly in Vidarbha, examining how the psychological and existential aspects of ageing may influence oral health experiences. Through these objectives, the research aims to contribute valuable insights into the complex interplay of gerotranscendence and OHRQoL, ultimately aiding in the development of holistic approaches to enhance the well-being of the elderly population.

## MATERIALS AND METHODS

This cross-sectional study was conducted in collaboration between the Department of Prosthodontics and the Department of Public Health Dentistry at the Datta Meghe Institute of Higher Education & Research (Deemed to be University) from March 2023 to August 2023. Ethical clearance for the study was granted by the Institutional Ethical Committee (IEC) of the university, with the approval number DMIHER(DU)/IEC/2023/1150. Informed consent was obtained from all participants before their inclusion in the study.

**Sample size calculation:** The sample size of 350 participants was determined using the formula:

$$n = Z^2 p (1-p) / E^2$$

where Z for a 95% confidence level is approximately 1.96,  $p=0.5$  (maximum variability), and E (margin of error) is approximately 5.24% or 0.0524.

Thus,  $n \approx 349.971024$ .

Rounding upto the nearest whole number, the corrected sample size is approximately 350 [10,15].

**Inclusion criteria:** Volunteers aged  $\geq 70$  years residing in their homes or in old age homes, as well as those visiting a tertiary healthcare center during the study were included.

**Exclusion criteria:** Those individuals with mental disorders such as Alzheimer's disease, which affect communication, reasoning, social behaviour, and memory functions were excluded from the study.

## Study Procedure

A self-made organised proforma was used to collect the data (Annexure 1). The proforma was designed to facilitate the gathering of information on socio-demographic characteristics, medical issues, medications, habits, dental service usage, self-perceived oral health, and self-perceived need for dental treatment.

Type III oral examinations (inspections) were carried out by four trained investigators. Before commencing the Type III oral examinations to evaluate participants' dentition status, the four investigators underwent a meticulous and comprehensive training program aimed at ensuring consistency and reliability in their assessment methodologies.

**Gerotranscendence level assessment:** The gerotranscendence level assessment was conducted by investigators who administered the GST2 questionnaire to participants. Developed by Tornstam, the GST2 questionnaire comprises 10 items designed to measure aspects of gerotranscendence, including cosmic understanding, coherence, and solitude [17]. Participants responded to each item

using a Likert scale, ranging from 1 to 4, which indicated their level of agreement from "strongly disagree" to "strongly agree." After completing the questionnaire, individual responses were scored by summing the numerical values assigned to each item. The total score, typically ranging from 10 to 40, served as an indicator of the participant's level of gerotranscendence, with higher scores reflecting a greater degree of gerotranscendence. This systematic approach facilitated the evaluation of participants' perspectives on ageing and life transitions, providing valuable insights into their overall outlook on late adulthood [13].

The validity of the GST2 questionnaire for the Indian population had been assessed by previous research; however, it had not been translated into the Marathi language [14]. Therefore, it was translated into the local language (Marathi), and the language validity was checked through the back-translation method. Ensuring cultural and linguistic validity during the translation process of questionnaires into Marathi was pivotal for accurately assessing gerotranscendence and OHRQoL. A team of bilingual experts, well-versed in both English and Marathi, meticulously translated the questionnaire to capture the essence of the original text while considering local cultural nuances. Rather than a literal translation, emphasis was placed on conveying concepts in Marathi that resonated with the cultural context and norms of the target population. The back-translation method was employed to validate linguistic accuracy, where an independent translator translated the Marathi version back into English for comparison with the original text. Any discrepancies were carefully reviewed and addressed through iterative revisions, ensuring that the final Marathi version maintained both linguistic accuracy and cultural relevance.

The importance of linguistic accuracy in assessing gerotranscendence and OHRQoL cannot be overstated. Inaccuracies in translation could lead to misinterpretations or biases in the collected data. By prioritising cultural and linguistic validity throughout the translation process, researchers can confidently utilise the Marathi version of the questionnaire to assess these critical aspects of health and well-being among Marathi-speaking individuals, thereby enhancing the validity and reliability of their research findings.

OHRQoL assessment in geriatrics is associated with several variables, including demographics, socio-economic status, self-perceived oral health, prosthesis status, overall health, and nutritional status. The self-perceived levels of OHRQoL were measured using the GOHAI. The 12-item GOHAI questionnaire examined oral health issues along three theoretical axes: physical functioning, psychosocial functioning, and pain or discomfort. On a Likert scale with a maximum score of 5, the following responses were scored: 1 for "always," 2 for "often," 3 for "sometimes," 4 for "seldom," and 5 for "never." The final GOHAI score ranged from 12 to 60 and was determined by summing the results of all the questions. The validity of the GOHAI in Hindi (the national language) had already been evaluated in earlier studies; however, it had not been translated into Marathi (the local language) [18]. Therefore, it was translated into Marathi using a back-translation technique. A higher GOHAI score indicates better OHRQoL, as it reflects fewer problems and less frequent negative impacts on physical functioning, psychosocial functioning, and pain or discomfort.

## STATISTICAL ANALYSIS

In the study, data analysis was conducted using IBM Statistical Package for Social Sciences (SPSS) software version 20.0 Statistics for Windows, version 20, with a pre-determined significance level set at  $p$ -value  $< 0.05$ . The process began with meticulous data cleaning and preparation, ensuring the removal of any errors or inconsistencies while reading the dataset for analysis. Subsequently, the appropriate statistical tests were selected based on the nature of the variables and the research objectives. For comparisons involving categorical variables, the Chi-square test was employed to assess

the presence of significant associations between two categorical variables. In addition, correlation analyses were conducted using both Pearson's and Spearman's tests. Pearson's correlation assessed the strength and direction of linear relationships between continuous variables, assuming normal distribution and linear association, while Spearman's correlation examined monotonic relationships, which are more robust to non normally distributed data and outliers. Following the execution of these tests within the Statistical Package for Social Sciences (SPSS) software, the results were interpreted within the context of the research objectives, considering the significance levels, effect sizes, and practical implications of the findings. Finally, conclusions were drawn and communicated through various channels, ensuring the clear and accurate dissemination of the study's outcomes.

RESULTS

The study comprised predominantly male participants (n=255, 72.85%), aged between 70 and 88, with the average age of male participants being 75.31 years. Additionally, there were female participants (n=95, 27.1%), with an average age of 74.88 years. For a detailed clinical and demographic profile of the study participants, please refer to [Table/Fig-1].

Demographic variable	n (%)
<b>Gender</b>	
Male	255 (72.9%)
Female	95 (27.1%)
<b>Occupation</b>	
Employed	27 (7.7%)
Unemployed	323 (92.3%)
<b>Socioeconomic status</b>	
Lower	82 (23.4%)
Middle	243 (69.4%)
Upper	25 (7.1%)
<b>Source of income</b>	
Pension	41 (11.7%)
Depend on child	290 (82.9%)
Other	19 (5.4%)
<b>Living with</b>	
Family	287 (82%)
Spouse	30 (8.6%)
Alone	25 (7.1%)
Old age home	8 (2.3%)
<b>Education</b>	
Illiterate	217 (62%)
Primary school	64 (18.3%)
Secondary school	44 (12.6%)
Graduation and above	25 (7.1%)
<b>Medical problem</b>	
Yes	295 (84.3%)
No	55 (15.7%)
<b>On medication</b>	
Yes	273 (78%)
No	77 (22%)
<b>Smoking</b>	
Yes	11 (3.1%)
No	339 (96.9%)
<b>Alcohol</b>	
Yes	26 (7.4%)
No	324 (92.6%)

<b>Tobacco chewing</b>	
Yes	70 (20%)
No	280 (80%)
<b>Pan chewing</b>	
Yes	21 (6.0%)
No	329 (94%)
<b>Status dentition</b>	
Partially edentulous	64 (18.3%)
Completely edentulous	286 (81.7%)
<b>Prosthetic status</b>	
Removable prosthesis	129 (36.9%)
Fixed prosthesis	69 (19.7%)
None	152 (43.4%)
<b>Last dental visit</b>	
<1 year	230
>1 year	120
<b>Self-perceived oral health</b>	
Good	159 (45.4%)
Fair	144 (41.1%)
Poor	47 (13.4%)
<b>Self-perceived need for treatment</b>	
Yes	164 (46.9%)
No	186 (53.1)

[Table/Fig-1]: Demographic and clinical profile.

The mean GOHAI score was 40.16, with a 95% confidence interval of (39.55, 40.76), as illustrated in [Table/Fig-2]. Notably, a substantial positive correlation between GOHAI and the self-perceived need for treatment was observed through Pearson's and Spearman's correlation tests, with a Pearson correlation value (r) of 0.197 and a p-value of <0.001.

GOHAI	Details
Mean	40.1571
Mode	39.00
Standard deviation	5.76183
Minimum	19.00
Maximum	51.00

[Table/Fig-2]: Distribution of mean GOHAI scores among the study population.

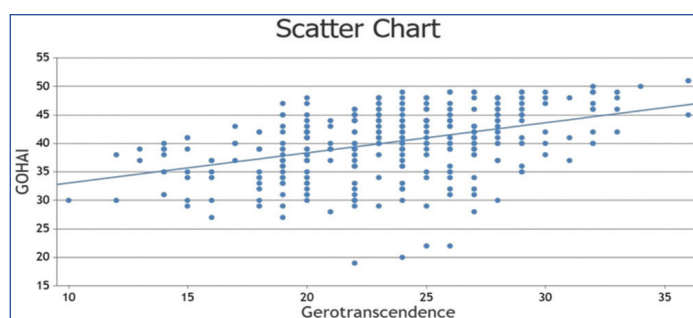
Concerning the average Gerotranscendence score, it was found to be 23.45, with a 95% confidence interval of (22.96, 23.94). This score fell within the mid-range of Gerotranscendence, indicating that the Gerotranscendence scores were neither skewed toward the lower end nor the higher end of the scale, as depicted in [Table/Fig-3]. Furthermore, a significant positive correlation was observed between the Gerotranscendence score and age (r=0.211, p<0.001) and between the Gerotranscendence score and self-perceived need for treatment (r=0.520, p<0.001).

Gerotranscendence	Details
Mean	23.4486
Mode	20.00 <sup>a</sup>
Standard deviation	4.64887
Minimum	10.00
Maximum	36.00

[Table/Fig-3]: Distribution of mean Gerotranscendence Scale Type 2 (GST2) scores among the study population.

To assess the relationship between Gerotranscendence and GOHAI, both Pearson and Spearman correlation tests were employed, with a significance level of p<0.001, as illustrated in [Table/Fig-4].





**[Table/Fig-4]:** Pearson correlation between Gerotranscendence and GOHAI showing significant  $p < 0.001$  positive correlation ( $r = 0.427$ ).

## DISCUSSION

The process of gerotranscendence is described as a natural developmental progression that leads to a fundamentally new perspective, allowing older individuals to embrace ageing positively and mitigate ageing-related despondency. Recently, gerotranscendence has been investigated as a potential predictor of OHRQoL [10,19]. A positive correlation between gerotranscendence and OHRQoL was observed in a previous study [10]. This correlation may stem from the fact that older individuals exhibiting high levels of gerotranscendence tend to adopt a more cosmic and transcendental understanding of the universe, often resulting in increased life satisfaction [20]. Numerous studies exploring the relationship between gerotranscendence and Health-Related Quality of Life (HR-QoL) have found that it can enhance HR-QoL among older individuals, particularly those facing declining health [10,15,21].

According to Wadensten B, the theory of gerotranscendence may facilitate the development of care systems for the elderly, such as those within gerontological nursing [18]. Wang JJ et al., discovered that participation in a gerotranscendence support group led to decreased levels of gerotranscendence, life satisfaction, and increased despair among institutionalised elders [22]. Additionally, Read S et al., conducted a longitudinal study examining the influence of age, gender, and negative life events on the development of cosmic transcendence [23]. Their results suggested that undergoing challenging life experiences may facilitate the attainment of cosmic transcendence, even after adjusting for age and gender. However, in the absence of traumatic life events, cosmic transcendence was found to decline with age [23-25].

Hosseiny RS et al., conducted a study in 2021 investigating the relationship between gerotranscendence and quality of life among 200 elderly cancer patients in Tehran, Iran. Their research revealed significant associations between gerotranscendence and demographic factors, including marital status, education, employment, housing, type of cancer, and treatment type. Notably, age exhibited a negative correlation with quality of life, while gerotranscendence showed positive correlations with dimensions such as depression and anxiety, mental and social performance, and overall life satisfaction. These factors impact overall oral health, as geriatric patients often neglect oral health compared to general systemic health [16]. Thus, Hanson A in 2023 and Aleo G et al., suggested that nurturing gerotranscendence may enhance the quality of life for elderly individuals facing cancer, emphasising the importance of integrating spiritual health considerations into comprehensive care strategies for this vulnerable population [26,27].

Mihara Y et al., were the first to investigate the relationship between gerotranscendence and OHRQoL among the Japanese population. Their study revealed a strong relationship between the degree of gerotranscendence and OHRQoL, irrespective of the subjects' objective oral health status [10]. According to their findings, there exists a negative relationship between the Japanese Gerotranscendence Scale Revised (JGS-R) score and the number of teeth and occlusal force [10]. A similar study conducted by Das A et al., on the Indian population residing in Davangere showed

contrasting results, where the level of gerotranscendence was negatively correlated with OHRQoL [15]. The results were consistent with the present study. Hence, it can be concluded that cultural or geographical factors also influence the correlation.

As the authors transit from bench science to applied science and adopt person-centered methodologies to assess treatment needs and care effectiveness, OHRQoL presents various critical applications in dentistry, healthcare, and dental research. Despite experiencing poor oral health, elderly individuals with high gerotranscendence may demonstrate resilience and adaptability, potentially leading to improvements in self-reported OHRQoL [28,29].

The objective of this research was to examine the relationship between gerotranscendence and OHRQoL among elderly individuals in the Vidarbha region of Maharashtra. Geriatric oral health is essential for providing high-quality care to elderly individuals. The study measured self-perceived OHRQoL levels using the Geriatric Oral Health Assessment Index (GOHAI). The GOHAI, originally developed for use among older North Americans, is a self-assessment oral health questionnaire. Its validity has been previously established in various studies. The questionnaire was translated into Marathi using the back-translation method. GOHAI comprises 12 items assessing oral health concerns across three theoretical dimensions: pain or discomfort, psychosocial functioning, and physical functioning. It has been used since the 1900s to date [30,31].

## Limitation(s)

A limitation of the study was the small sample size, as well as the lack of hygiene routines among the study participants, which could have served as valuable indicators of OHRQoL. The exclusion of individuals with mental disorders, such as Alzheimer's disease, might have biased the sample toward individuals with better cognitive function, potentially limiting the generalisability of the findings. Additionally, the use of self-reported measures, such as the GOHAI questionnaire and self-perceived need for dental treatment, may have introduced information bias, as participants may have provided inaccurate or socially desirable responses. Furthermore, variability in the skills and subjective interpretations of the investigators during oral examinations may have introduced observer bias, impacting the consistency and accuracy of the findings. These limitations highlight the need for caution when interpreting the results and underscore the importance of conducting larger-scale studies with more comprehensive assessments of oral health conditions and hygiene routines. Further research on the relationship between gerotranscendence and OHRQoL among the elderly may provide valuable insights for patient-centered clinical decision-making.

## CONCLUSION(S)

The mid-range Gerotranscendence scores indicate a balanced outlook among the elderly in Vidarbha, with a notable positive correlation between Gerotranscendence scores, age, and the self-perceived need for treatment. This underscores the influential role of psychological factors, particularly Gerotranscendence, in shaping oral health experiences. The positive correlation between GOHAI scores and the self-perceived need for treatment highlights the significance of addressing oral health concerns to enhance the overall well-being of the elderly. The study advocates for a comprehensive approach to elderly care, emphasising the integration of psychological and oral health dimensions to achieve holistic health outcomes.

Gerotranscendence profoundly shapes the oral health experiences of the elderly, and acknowledging this interplay is essential for designing effective healthcare interventions that cater to the unique needs of the ageing population.

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#### PLAGIARISM CHECKING METHODS:

- Plagiarism X-checker: Oct 02, 2023
- Manual Googling: Dec 20, 2023
- iThenticate Software: Jun 28, 2024 (11%)

#### ETYMOLOGY: Author Origin

EMENDATIONS: 8

#### AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

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## [ANNEXURE 1]

<b>Name:</b>			
<b>Age:</b>			
<b>Gender:</b>	Male ( )	Female ( )	Other ( )
<b>Occupation:</b>	Employed ( )	Unemployed ( )	
<b>Socioeconomic status:</b>	Upper class ( )	Middle class ( )	Lower class ( )
<b>Source of income:</b>	Pension ( )	Depend on child ( )	Other ( )
<b>Living with:</b>	Family ( )	Spouse ( )	Alone ( ) Old age home ( )
<b>Education:</b>	Illiterate ( )	Primary school ( )	Secondary School ( ) Graduation and above ( )
<b>Medical problem:</b>	Yes ( )	No ( )	
<b>On medication:</b>	Yes ( )	No ( )	
<b>Smoking:</b>	Yes ( )	No ( )	
<b>Alcohol:</b>	Yes ( )	No ( )	
<b>Tobacco chewing:</b>	Yes ( )	No ( )	
<b>Pan:</b>	Yes ( )	No ( )	
<b>Status of dentition:</b>	All Teeth Present ( )	Partially Edentulous ( )	Completely Edentulous ( )
<b>Prosthetic status:</b>	Removable Prosthesis( )	Fixed Prosthesis ( )	None ( )
<b>Last dental visit (year):</b>	<1year ( )	>1year ( )	
<b>Self-perceived oral health:</b>	Good ( )	Fair ( )	Poor ( )
<b>Self-perceived need for treatment:</b>	Yes ( )	No ( )	