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Oral Health Related Quality Of Life Among Children, Adults, And Elderly Population In Southern Part Of India- A Systematic Review

Hariprasath Nagarajan[1], I. Meignana Arumugham Indiran[2*], Sri Sakthi D[3]

[1]Post graduate student, Department of Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Management and Technical Sciences, Saveetha University, No. 162, Poonamallee High Road, Chennai – 600077, Tamil Nadu, India.

[2]Professor and head of department (Academics), Department of Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Management and Technical Sciences, Saveetha University, No. 162, Poonamallee High Road, Chennai – 600077, Tamil Nadu, India.

[3]Professor, Department of Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Management and Technical Sciences, Saveetha University, No. 162, Poonamallee High Road, Chennai – 600077, Tamil Nadu, India.

***Corresponding author:** I. Meignana Arumugham Indiran, Professor and head of department (Academics), Department of Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Management and Technical Sciences, Saveetha University, No. 162, Poonamallee High Road, Chennai – 600077, Tamil Nadu, India.

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ABSTRACT

Background/Introduction: Dental diseases especially the ones like dental caries, malocclusion and traumatic dental injuries affect not only the functional ability and aesthetic appearance of the person but also the psychological aspect of the individual which in turn may influence the self-esteem, socializing and inter-personal relationship of the individual, thus disturbing Oral Health Related Quality of Life (OHRQoL)

Aim: The aim of the review is to assess the impact of oral health related quality of life among children, adolescents and elderly population in the southern part of India.

Materials and methods: An extensive literature search in PubMed, Cochrane, science direct, Google Scholar and TRIP were performed to identify the oral health related quality of life among children, adolescents and elderly population. We include 26 observational studies in this review. Newcastle Ottawa risk of bias assessment tool for observational studies was used to assess the risk of bias across the included studies.

Results: The oral health related quality of life was found to be better among children, adolescents in comparison to elderly population. Similarly, males have better oral health related quality of life than females. Also, rural populations have compromised quality of life than the urban population in South India. The risk of bias across the included studies was found to be moderate.

Conclusion: The OHRQOL can provide the basis for any oral health-care program and it has to be considered one of the important elements of the Global oral health program. Educating these patients about promoting good oral health and preventive care will be crucial. Dental education has to make a contribution if this situation is to change.

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INTRODUCTION

The component of oral well-being has been extended by adding the idea of prosperity after WHO widened the meaning of well-being by the incorporation of social prosperity (1). From that point forward oral well-being as well is considered to add to general prosperity and not simple nonappearance of infection. Day by day exercises like eating, talking, grinning and innovative commitments to society are determinants of a people's prosperity(1,2). Hence, it is perceived that oral well-being is vital to general wellbeing and prosperity.

A change in perspective has happened concerning the idea of well-being, infection causation and medical care conveyance in medication and dentistry (3). The clinical model has been supplanted by the socio natural model of wellbeing which accepts the condition of wellbeing as capacity for ideal working and social and mental prosperity. Subsequently, Yewe–Dyer M characterized oral wellbeing as the condition of the mouth and related constructions where infection is contained, future illness is hindered, the impediment is adequate to chew food and the teeth are of a socially adequate appearance. Despite the fact that this definition is an endeavor to join the socio natural model, a superior definition given by Dolan T all the more intently reflects the new idea. She characterized oral wellbeing as an agreeable and useful dentition which permits people to proceed in their wanted social job.

Wellbeing, wellbeing status, wellbeing related personal satisfaction and personal satisfaction have been utilized reciprocally in writing. David Locker after getting motivation from WHO ICIDH (International Classification of Impairment, Disability and Handicap) built up a reasonable model interestingly to clarify the pathways by which oral sicknesses furthermore, conditions influence personal satisfaction (4). As per him, ideas of wellbeing and personal satisfaction are: 1) hard to characterize; 2) multidimensional and complex; 3) overwhelmingly emotional; 4) continually developing; and 5) shift as indicated by friendly, social, political and pragmatic settings. He additionally added that overall wellbeing and oral wellbeing are indistinguishable (4).

Quality of life in the wellbeing situation (Health related Quality of life): The term ' Quality of life' (QoL) was first utilized by the British market analyst Pigou AC in 1920. The most broadly utilized OHRQoL instrument, the Oral Health Impact Profile (OHIP) depends on the Locker's reasonable model (5). Since the WHO ICIDH model appeared, numerous models have been proposed by various scientists, The Wilson and Cleary (1995) (6) model is by all accounts a basic yet exhaustive one. It is a consolidation between the predominant biomedical idea and the arising social idea. Wilson and Cleary model depends on five conceptual ideas in particular, natural/physiological, indication status, utilitarian status, general wellbeing and personal satisfaction in addition to referencing individual and ecological components. Storage D and Quinonez C set forward a few motivations to validate the extensiveness of Wilson and Cleary model (7), as follows: 1) it recognizes the fundamental causal pathway connecting natural elements and their practical and mental results; 2) it makes unequivocal reference to the personal satisfaction and the factors that have a direct or then again circuitous effect on life quality; and 3) it demonstrates that quality of life is dictated by both clinical and. Wilson and Cleary model is the most generally tried and applied calculated model in HRQoL. The other two usually examined HRQoL models are Ferrans FE et al., alteration of Wilson and Cleary model and WHO International Classification of Functioning also, Disability (WHO ICF) nonmedical factors and recommends that individual and ecological qualities likewise play a job (7,8). Now, it is generally perceived that personal satisfaction measures are not a substitute for evaluating illness or treatment results yet are crucial aides to it. In dental writing apparatuses that action patient's viewpoint was initially alluded to as socio-dental markers or proportions of oral wellbeing status or social effects of oral infections (9). In the last part of the 1990s these

terms were supplanted by the term OHRQoL. The accompanying words are utilized to indicate personal satisfaction gauges reciprocally - scale, profile, instrument, stock and poll. These actions change generally as far as: 1) the arrangement of the things, regardless of whether question or articulation; 2) configuration of reaction, VAS score or on the other hand likert type; 3) number of things; 4) setting of its utilization; and 5) the populace in which it is applied.

Oral wellbeing related personal satisfaction apparatuses might be:

1) Socio dental markers;

2) Global self-evaluations of oral wellbeing;

3) Multiple thing surveys. Social pointers evaluate the impact of oral conditions at the local area level (10). The Social Impacts of Dental Diseases (SIDD) created by Sheiham An et al., (11) was one of the first socio dental markers. This sort of evaluation by and large includes doing broad populace reviews to discover the weight of oral conditions on the entire populace regarding certain social pointers like days of leave from work or work, nonattendance from school, loss of working days because of oral sicknesses. They are significant for organizers and strategy creators as for social or financial viewpoints. Worldwide self-evaluations are a solitary measure which asks a general question in regards to the person's view of their general wellbeing status or personal satisfaction at that specific period. The reactions will be in an unmitigated way going from great to poor (12).

MATERIALS AND METHOD

Structured Question

Does oral health related quality of life have an impact on daily performance of children, young adults and elderly in the Indian population?

PICO Analysis

P – Children, adults and elderly people of Indian population
I – Oral health related quality of life structured questionnaire
C – NA
O – Oral health related Quality of life

Eligibility criteria

Articles published for the last 10 years were considered

Inclusion Criteria

Criteria for considering studies for the Review:

- Cross sectional studies evaluating the oral health related quality of life among children, adults, and elderly in Indian population
- Cross sectional evaluating influence of oral health related quality of life among children, adults, and elderly in Indian population

Exclusion Criteria

- Literature that cannot be translated by the reviewer was not included in this review.
- Studies conducted other than the Indian population.
- Animal studies
- In vitro studies

Search strategy and Sources

The PubMed Central, Cochrane, Google Scholar were searched using search strategy to find relevant article (elaborate full process of selection of studies as per PRISMA chart)

To identify the studies to be included for detailed evaluation in systematic review, following search strategy were developed for each database searched:

1. PubMed Central (Cross sectional study design published till February 2021)
2. The Cochrane Central Register of Clinical Trials (Cross sectional study design published till February 2021)
3. Google Scholar (Cross sectional study design published till February 2021)
4. Trip (Cross sectional study design published till February 2021)
5. Science direct (Cross sectional study design published till February 2021)

Risk of bias quality assessment

A version of the Newcastle-Ottawa Scale, modified for cross-sectional studies, was used for

quality assessment. The methodological quality of a study was measured by the number of points the study received. The Newcastle-Ottawa Scale uses a star rating system by which stars are allocated across three categories, including five stars for participant selection, two stars for comparability.

Newcastle - Ottawa Quality Assessment Scale

(Adapted for cross sectional studies)

Selection: (Maximum 5 stars)
Selection: (Maximum 5 stars)
1) Representativeness of the sample:
a) Truly representative of the average in the target population. * (all subjects or random sampling)
b) Somewhat representative of the average in the target population. * (non-random sampling)
c) Selected group of users.
d) No description of the sampling strategy.
2) Sample size:
a) Justified and satisfactory. *
b) Not justified.
3) Non-respondents:
a) Comparability between respondents and non-respondents' characteristics is established, and the response rate is satisfactory. *
b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory.
c) No description of the response rate or the characteristics of the responders and the non-responders.
4) Ascertainment of the exposure (risk factor):
a) Validated measurement tool. **
b) Non-validated measurement tool, but the tool is available or described. *
c) No description of the measurement tool.
Comparability: (Maximum 2 stars)
1) The subjects in different outcome groups are comparable, based on the study design
or analysis. Confounding factors are controlled.
a) The study controls for the most important factor (select one). *
b) The study control for any additional factor. *
Outcome: (Maximum 3 stars)
1) Assessment of the outcome:
a) Independent blind assessment. **
b) Record linkage. **
c) Self report. *
d) No description.
2) Statistical test:
a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). *

Search Strategy

FIGURE 1A: Screenshot of PubMed Search

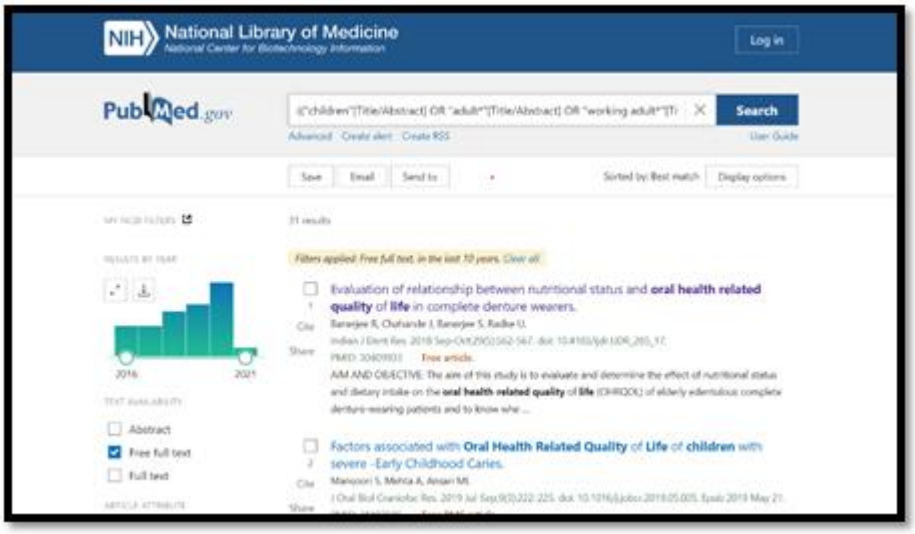

FIGURE 1B: Screenshot of PubMed search

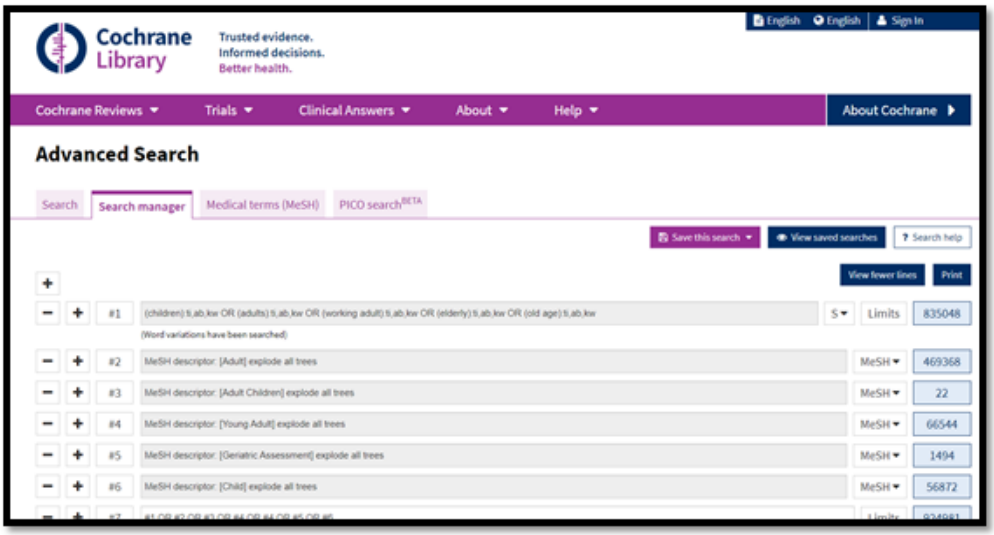

FIGURE 2A: Screenshot of Cochrane search

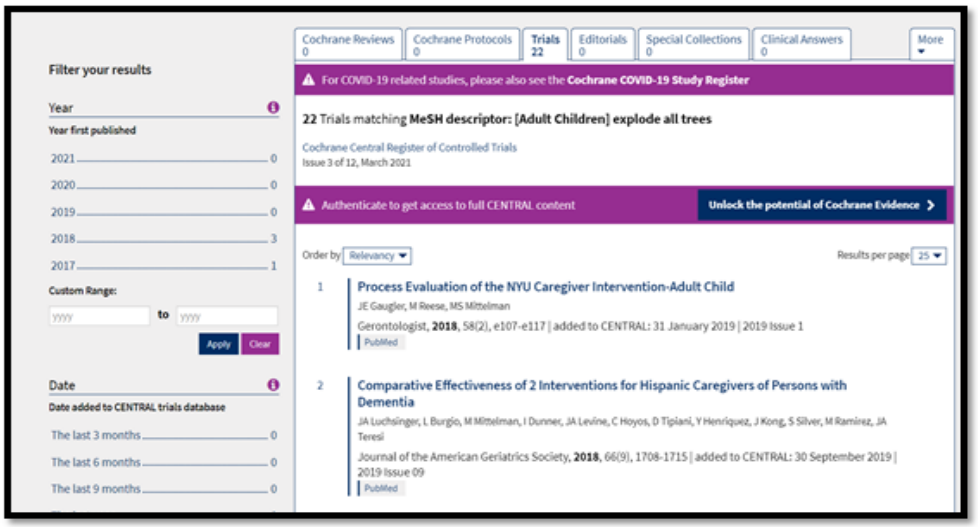

FIGURE 2B: Screenshot of Cochrane search

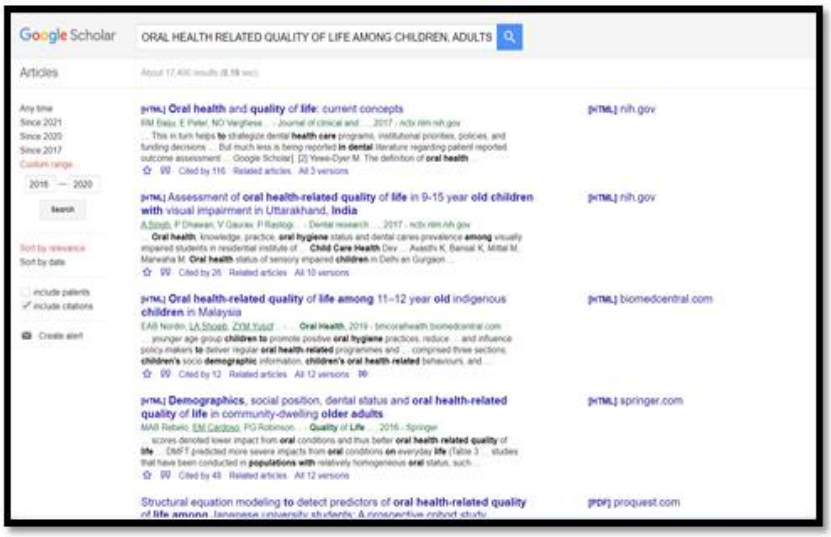

FIGURE 3: Screenshot of Google Scholar search

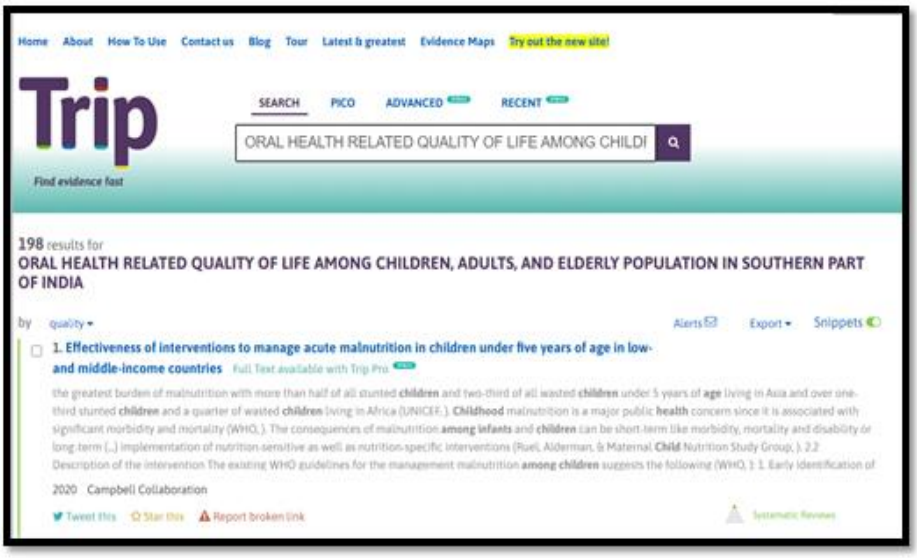

FIGURE 4: Screenshot of Trip

Data Collection and Analysis

Screening and Selection

Electronic pursuit was completed utilizing the watchwords in the Search motors PubMed, Cochrane, science direct and Google Scholar which yielded a sum of 196 articles. In light of present incorporation and avoidance measures, the titles of the studies were assessed independently by two review authors (Hariprasath Nagarajan, Meignana Arumugham I) Conflicts concerning consideration of the investigations were settled by conversation. The reference list of the full text articles was reviewed for identifying additional studies. Titles of articles relevant to the review were selected by discussion. Abstracts of the two selected articles were reviewed. Difference of opinion concerning inclusion of a study was resolved by discussion and all two articles eliminated after reviewing abstracts. Quality Assessment criteria to evaluate the studies were decided by two review authors in accordance with STROBE guidelines. The risk of bias for each study was independently assessed by the review authors and conflicts concerning risk of bias were sorted by discussion.

Data Extraction

Data extraction for general characteristics of studies and variables of outcome was done

For each trial the following data were recorded:

- Author and Journal
- Study Design
- Sample Size
- Participants and Group
- Methodology
- Parameters
- Statistical Analysis
- Results

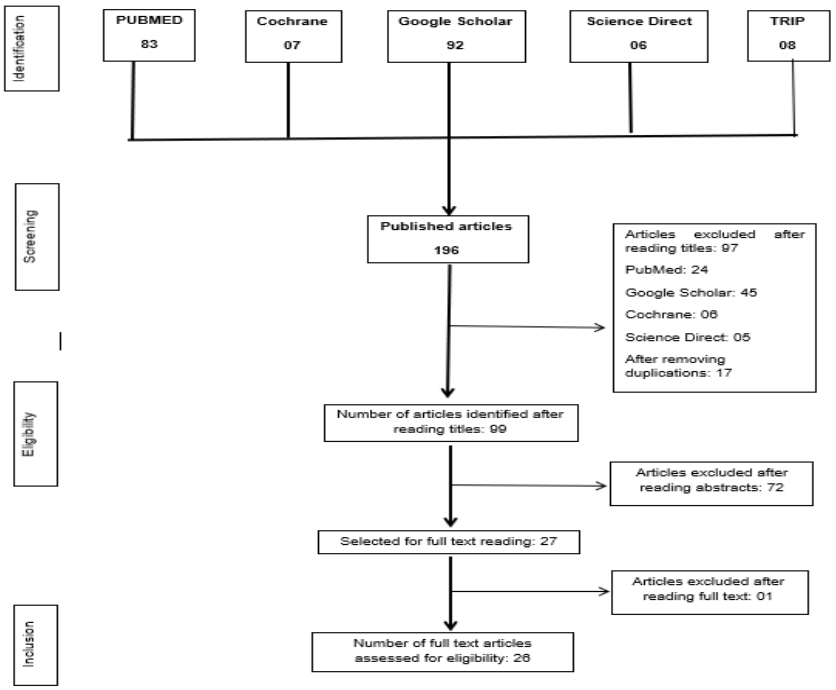

Chart 1: PRISMA flowchart for included studies

The variable of interests is given in Table.1. Data extraction (qualitative synthesis) from the articles selected is described in Table 2. 26 articles belonged to the Indian population. Since the aim of this review was to assess the oral health related quality of life and its impact on children, adults, and elderly population in India, studies done in other countries were excluded from the review, studies where only the oral health was assessed were also excluded. Risk of bias is shown in Table 3. Table 4 shows the level of evidence of the included studies.

TABLE 1: Variable of interests

Sl. no	Variables of interest
1	OHIP-14 (Oral health impact profile-14) GOHAI (Geriatric oral health assessment index) E-COHIS, (Early childhood oral health impact scale) C-OIDP (Child oral impacts on daily performances) OPHDQoL, (Older people quality of life) C-OHIP, (Child Oral health impact profile) GOHAI-Tml, (Geriatric oral health assessment index-tamil) OHIP-49, (Oral health impact profile-49) CPQ, (Child perception questionnaire) P-CPQ (parental caregivers perception questionnaire)

J Popul Ther Clin Pharmacol Vol 30(10):e211–e237; 06 May 2023.

TABLE 2: Data extraction table

Author;Year	State	Sample size	Age (years)	Methods of evaluation	Oral health status	Statistics used	Results	Inference
A.vinita mary et al, 2017 (13)	Tamil Nadu	342	14-19	OHIP-14`	Orthodontic treatment need	Pearson's Chi square test and Mann Whitney U test	The comparison of OHIP-14 scores between treatment needed and treatment not needed was highly significant ($p<0.001$)	Malocclusion affected some aspects of OHIP14 significantly namely functional limitation, psychological discomfort and psychological disability.
Rajani A.Dable et la, 2013 (14)	Maharashtra	63	>60 years	GOHAI	Completely edentulous patients	Mc Nemer-Bowkers test and wilcoxon signed rank test	GOHAI score increased from 28.90+7.28 to 42.19+7.60	A thorough investigation is necessary to assess the psychological effect of tooth loss on their quality of life
Ravikumar thatekala et al, 2018 (15)	Karnataka	212	18-80	OHIP-14	Bruxism	Chi square test, t test and linear regression model	Mean OHIP score was higher $p<0.001$ among active sleep bruxism inmates	The active sleep bruxism has the negative impact on OHRQoL
Sonawane Madhuri et al, 2014 (16)	Maharashtra	42	>50	GOHAI	Complete denture patients	Chi square and repeated measure ANOVA	Statistically significant improvement from baseline to 6th month but no statistically significant improvement was observed from 6th month to 12th month	Denture insertion was effective in increasing the chewing ability, body weight, food-intake, and oral health

								related quality of life.
Srinivasan R Samuel et al, 2020 (17)	Tamil Nadu	3799	3-6	ECOHIS-13	child's dental pain, caregiver's fear of SARS-CoV2 and parental distress	Bivariate, multivariate regression analysis	Children reporting higher pain scores (OR=1.9) due to decayed teeth and having dmft >5 (OR=4.25); followed by greater parental distress (OR=4.13) and fear of SARS-CoV2 (OR=3.84) were significantly associated with poor OHRQOL during the COVID-19 pandemic.	Greater parental distress and fear of COVID-19 among caregivers, higher self-perceived dental pain among children and caries experience is associated with poor OHRQOL of preschool children during the COVID-19 pandemic.
Akshaya vekatesan et al, 2020 (18)	Tamil Nadu	219	65-75	GOHAI	Oral health status	Chi-square test	GOHAI differed significantly among these three groups, with overall OHRQoL decreasing with age.	Several physical, physiological, and psychological aspects of the GOHAI differed significantly among these three groups, with overall OHRQoL decreasing with age.

S Acharya et al, 2008 (19)	Karnataka	259	24-30	OHIP-14	Pregnant women	Mann–Whitney test, anova, Tukey's post hoc test, and Spearman's correlation analysis	OHIP-14 scores were significantly higher among those who reported various oral problems than those who did not	Gingival index scores, community periodontal index of treatment needs scores and previous pregnancies was associated with poorer OHRQoL
Seebu Dhingra et al, 2016 (20)	Karnataka	300	9-12	OHIP-14	occlusal support using Eichner index	Binary logistic regression analysis	The mean total OHIP score was 9.23 ± 8.9. EI showed a significant relation with perceived chewing ability	Occlusal support was significantly associated with perceived chewing ability, OHRQoL, and perceived general health status.
Varsha K Pavithran et al, 2020 (21)	Karnataka	420	12-15	C-OIDP	Oral health status	Pearsons, chi square test and mann whitney test	C-OIPD scores are higher in orphans	Age, dental fluorosis and decayed teeth are the factors determining the C-OIDP

J Popul Ther Clin Pharmacol Vol 30(10):e211–e237; 06 May 2023.

Jyothi thadakamadla et al, 2015 (22)	Telangana	150	-	OPHDQoL	Oral potentially malignant disorders	One way analysis of variance (ANOVA) and Post hoc analysis using Tukey HSD	OLP and OSF have a significant impact on the QoL of affected individuals: OL less so. Increasing stage of the disease is associated with worsening QoL	OL patients reported fewer problems for the dimension, 'physical impairment and functional limitations' than the OLP and OSF patients. A significant trend was observed with the overall OPMDQoL and MCS, deterioratin g as the disease stage increased.
Sybil siluvai et al, 2015 (23)	Karnataka	900	13-19	OHIP-14	dental caries	Logistic regression	Those with malocclusion showed higher impact on quality of life	Malocclusion has impact on oral health related quality of life among 13 -19 years student
Rubinder Bhatia et al, 2016 (24)	Maharashtra	604	12-14	CPQ-14, IOTN	malocclusion	Spearman's correlation coefficient	There is significant correlation between IOTN and CPQ	OHQRoL focused more on emotional and social well-being.
Nagappan et al, 2019 (25)	Tamil Nadu	160	8-16	C-OHIP	Dental caries status	Independent t test	The mean DMFT/deft was higher in cleft patient	Cleft children have negative impact on OHQRoL

Kalyana Chakravarthy penapati et al, 2012 (26)	Karnataka	359	13-15	C-OIDP	Dental caries and oral health behavior	ANOVA and independent sample t test	The most prevalent impact was difficulty in eating (37%)	Caries experience and past dental visits were associated with oral health-related quality of life among this study population.
Priya Subramanian et al, 2020 (27)	Karnataka	1545	3-5	OHRQoL	Dental caries	The Mann Whitney U test, Independent Student t test, Kruskal Wallis test, Mann Whitney's post hoc analysis	The mean OHRQoL of urban preschool children was 17.86 and was significantly different from 20.42 of rural preschool children	OHRQoL was significantly associated with the 'decayed' component
Deva Priya Appukuttan et al, 2016 (28)	Tamil Nadu	199	20-70	GOHAI-Tml	teeth/denture	Independent t test and one way ANOVA	The mean score with standard deviation for physical dimension was 4.34±0.96, psychological dimension was 4.03±1.13 and pain was 4.05±1.09 on GOHAI	Factors like age, education, employment status, income, self-reported oral health, self-perceived general health, satisfaction with oral health, perceived need for treatment and denture wearing status influenced perceived OHRQoL

Santhiya K.Neelamana et al, 2020 (29)	Karnataka	270	-	GOHAI	Oral health status	Chi square test, ANOVA and Bonferroni	Male population the GOHAI score is 26.44 and female population the GOHAI score is 19.72	The prevalence of tobacco use is more of concern. Education and motivation of laity is needed
S.Acharya et al, 2008 (30)	Karnataka	325	17-23	OHIP-14	Oral health status	Kruskal–Wallis ANOVA followed by Mann–Whitney test	The OHIP-14 scores were significantly higher among those with self-reported oral problems.	Sharp increase in Self-reported dental problems, in particular, Malocclusion, Tooth decay, Calculus among the third year and final year students respectively
Nandita kshetrimayum et al, 2012 (31)	Karnataka	141	23-28	GOHAI	Nutritional status	Student's t-test, Pearson chi-square test of independence, Multiple logistic regression model	Mean GOHAI score was 47.03 ± 9.2, with 69.5% had low perception of oral health	Oral health–related quality of life was associated with nutritional deficit, and it requires a greater integration between dentistry and nutrition in the health promotion of older adults

Amrita geevarghese et al, 2017 (32)	Kerala	300	-	OHIP-49	Periodontal status of pregnant women	Chi square test and ANOVA	The overall OHIP score for pregnant women (47.33±8.56) was significantly (p=0.03) higher, when compared to nonpregnant women (37.87±9.61).	The periodontal health and OHRQoL of pregnant women were poorer than non-pregnant women
K. Indira Priyadarshini et al, 2017 (33)	Tamil Nadu	60	35-54	OHIP-14	Oral malignancy	Chi square and one way ANOVA	No significant difference between 3 groups	Patients surgically treated showed better quality of life
M.Bhat et al, 2020 (34)	Karnataka	873	35-54	OHIP-14	Prevalence, extent and severity of oral health status	Univariate, bivariate and multivariate analysis	Prevalence, extent, and severity of OHIP-14 were 13.4%, 0.5 (0.4-0.7), and 11.8 (11.2-12.5)	Low socioeconomic conditions, dental visits, and FT ≤19 were positively associated with prevalence, extent, and severity of oral health impacts.
Albin Geo Joseph et al, 2016 (35)	Kerala	539	>60	OHIP-14	Prosthetic status and needs	ANOVA	The prosthetic status was found to have no impact on the OHRQOL.	Of all the domains in OHRQOL, physical pain was the most affected in this population.

K. P. Chakravarthy et al, 2012 (36)	Karnataka	456	13-15	OIDP	Body mass index and dental caries	Chi square test, simple and multiple linear regression analysis	The prevalence of impacts ranged from 7.4–32.8 % in low normal and 12.9–49.7 % in overweight/obese adolescents	Adolescents with caries and increased BMI had poor OHRQoL
S. Kumar et al, 2017 (37)	Telangana	1130	11-14	CPQ	Parental rearing practice and family demography	Chi square	Parents with higher positive (β=−0.106) and lower power assertion rearing practices (β=0.103) had children with better OHRQoL	Parental rearing practices had direct effects on OHRQoL
Sashidar Acharya et al, 2012 (38)	Karnataka	215	25-30	OIDP	Work stress	Student's test and the Mann–Whitney U-test	Mean DMFT and CPITN scores were significantly greater among those who reported oral impact on their daily performance	work stress and periodontal disease were significant predictors for poor OHRQoL in the sample population

TABLE 3: Summation table of the included study

Author;Year	Year	outcomes	Inference	Level of evidence	Limitations
A.vinita mary et al,	2017	The comparison of OHIP-14 scores between treatment needed and treatment not needed was highly significant ($p<0.001$)	Malocclusion affected some aspects of OHIP14 significantly namely functional limitation, psychological discomfort and psychological disability.	IV	Sample was not intended to represent the entire adolescent population in Chennai but to give an overview of children's orthodontic treatment needs

Rajani A.Dable et la,	2013	GOHAI score increased from 28.90+7.28 to 42.19+7.60	A thorough investigation is necessary to assess the psychological effect of tooth loss on their quality of life	IV	More attention to elderly people was not given
Ravikumar thatekala et al,	2018	Mean OHIP score was higher p<0.001 among active sleep bruxism inmates	The active sleep bruxism has the negative impact on OHRQoL	IV	Danger of bias was introduced by the samples selected
Sonawane Madhuri et al,	2014	Statistically significant improvement from baseline to 6th month but no statistically significant improvement was observed from 6th month to 12th month	Denture insertion was effective in increasing the chewing ability, body weight, food-intake, and oral health related quality of life.	IV	Investigator was not blinded during recording the data, it could have introduced bias
Srinivasan R Samuel et al,	2020	Children reporting higher pain scores (OR=1.9) due to decayed teeth and having dmft >5 (OR=4.25); followed by greater parental distress (OR=4.13) and fear of SARS-CoV2 (OR=3.84) were significantly associated with poor OHRQOL during the COVID-19 pandemic.	Greater parental distress and fear of COVID-19 among caregivers, higher self-perceived dental pain among children and caries experience is associated with poor OHRQOL of preschool children during the COVID-19 pandemic.	IV	Caregivers who expressed greater fear towards COVID-19 could have delayed the care required for their child thus negatively impacting their OHRQOL
Akshaya vekatesan et al,	2020	GOHAI differed significantly among these three groups, with overall OHRQoL decreasing with age.	Several physical, physiological, and psychological aspects of the GOHAI differed significantly among these three groups, with overall OHRQoL decreasing with age.	IV	The sample consisted mainly of women, preventing comparisons between men and women.
S Acharya et al,	2008	OHIP-14 scores were significantly higher among those who reported various oral problems than those who did not	Gingival index scores, community periodontal index of treatment needs scores and previous pregnancies was associated with poorer OHRQoL	IV	weak correlation scores between clinical indices (e.g. caries, periodontal pockets) and summary scores derived from Geriatic Oral Health Assessment Index (GOHAI) and OHIP

Seebu Dhingra et al,	2016	The mean total OHIP score was 9.23 ± 8.9. EI showed a significant relation with perceived chewing ability	Occlusal support was significantly associated with perceived chewing ability, OHRQoL, and perceived general health status.	IV	Difficult to recognize the causes for the change in chewing function among the elderly
Varsha K Pavithran et al,	2020	C-OIPD scores are higher in orphans	Age, dental fluorosis and decayed teeth are the factors determining the C-OIDP	IV	Simple random sampling was used to select subjects which could not be matched accurately
Jyothi thadakamadla et al,	2015	OLP and OSF have a significant impact on the QoL of affected individuals: OL less so. Increasing stage of the disease is associated with worsening QoL	OL patients reported fewer problems for the dimension, 'physical impairment and functional limitations' than the OLP and OSF patients. A significant trend was observed with the overall OPMDQoL and MCS, deteriorating as the disease stage increased.	IV	The subjects attending only one teaching hospital in India, and the results might not be generalizable to all OPMD patients of India, nor to other populations or ethnic groups
Sybil siluvai et al,	2015	Those with malocclusion showed higher impact on quality of life	Malocclusion has impact on oral health related quality of life among 13 -19 years student	IV	Some subjects with severe malocclusion are satisfied with the appearance
Rubinder Bhatia et al,	2016	There is significant correlation between IOTN and CPQ	OHQRoL focused more on emotional and social well-being.	IV	Simple random sampling was used to select subjects which could not be matched accurately
Nagappan et al,	2019	The mean DMFT/deft was higher in cleft patient	Cleft children have negative impact on OHQRoL	IV	There is difference in study size and sample population
Kalyana Chakravarthy penapati et al,	2012	The most prevalent impact was difficulty in eating (37%)	Caries experience and past dental visits were associated with oral health-related quality of life among this study population.	IV	Oral and other chronic diseases have determinants in common, so greater emphasis should be on the common risk factor approach
Priya Subramanian et al,	2020	The mean OHRQoL of urban preschool children was 17.86 and was significantly different from 20.42 of rural preschool children	OHRQoL was significantly associated with the 'decayed' component	IV	Elaborate periodontal charting was not done for each patient; instead, PSR was used for defining the periodontal status.

J Popul Ther Clin Pharmacol Vol 30(10):e211–e237; 06 May 2023.

Deva Priya Appukuttan et al,	2016	The mean score with standard deviation for physical dimension was 4.34±0.96, psychological dimension was 4.03±1.13 and pain was 4.05±1.09 on GOHAI	Factors like age, education, employment status, income, self-reported oral health, self-perceived general health, satisfaction with oral health, perceived need for treatment and denture wearing status influenced perceived OHRQoL	IV	Risk of Bias in selecting sample
Santhiya K.Neelamana et al,	2020	Male population the GOHAI score is 26.44 and female population the GOHAI score is 19.72	The prevalence of tobacco use is more of concern. Education and motivation of laity is needed	IV	Validity of studies investigating the relationship between locus of control and health-related behaviors have been questioned due to the fact that an individual may have a tendency to be internal in many life areas, but have an external belief with regard to the particular health-related behavior in question
S.Acharya et al,	2008	The OHIP-14 scores were significantly higher among those with self-reported oral problems.	Sharp increase in Self-reported dental problems, in particular, Malocclusion, Tooth decay, Calculus among the third year and final year students respectively	IV	Despite including almost all the subjects of the elderly institutions in Mysore, the sample size was not large enough
Nandita kshetrimayum et al,	2012	Mean GOHAI score was 47.03 ± 9.2, with 69.5% had low perception of oral health	Oral health–related quality of life was associated with nutritional deficit, and it requires a greater integration between dentistry and nutrition in the health promotion of older adults	IV	Health-related behaviors have been questioned due to the fact that an individual may have a tendency to be internal in many life areas, but have an external belief with regard to the particular health-related behavior in question
Amrita geevarghese et al,	2017	The overall OHIP score for pregnant women (47.33±8.56) was significantly (p=0.03) higher, when compared to nonpregnant women (37.87±9.61).	The periodontal health and OHRQoL of pregnant women were poorer than non-pregnant women	IV	The full mouth periodontal disease assessment based on the PD and CAL was preferred over CPITN

K. Indira Priyadarshini et al, 2017	2017	No significant difference between 3 groups	Patients surgically treated showed better quality of life	IV	Complication including pain mucositis dryness and reduced taste was not interpreted between groups
M.Bhat et al,	2020	Prevalence, extent, and severity of OHIP-14 were 13.4%, 0.5 (0.4-0.7), and 11.8 (11.2-12.5)	Low socioeconomic conditions, dental visits, and FT ≤19 were positively associated with prevalence, extent, and severity of oral health impacts.	IV	Some individuals become accustomed to accepting less than ideal health status as norma
Albin Geo Joseph et al,	2016	The prosthetic status was found to have no impact on the OHRQOL.	Of all the domains in OHRQOL, physical pain was the most affected in this population.	IV	The aspect of socio-economic status was not considered in this study
K. P. Chakravarthy et al, 2012	2012	The prevalence of impacts ranged from 7.4–32.8 % in low normal and 12.9–49.7 % in overweight/obese adolescents	Adolescents with caries and increased BMI had poor OHRQoL	IV	Lack of diet histories, physical activity, use of BMI as a measure for overweight/obesity and only caries as a factor for influencing OHRQoL
S. Kumar et al, 2017	2017	Parents with higher positive (β=−0.106) and lower power assertion rearing practices (β=0.103) had children with better OHRQoL	Parental rearing practices had direct effects on OHRQoL	IV	No consensus between the seven studies that have evaluated the effect of a composite SES scale on OHRQo
Sashidar Acharya et al,	2012	Mean DMFT and CPITN scores were significantly greater among those who reported oral impact on their daily performance	work stress and periodontal disease were significant predictors for poor OHRQoL in the sample population	IV	A key limitation of this study concerns its design (i.e., cross-sectional), which precludes any discussion of causality

TABLE 4: Risk of bias Quality Assessment based on Newcastle Ottawa Scale - 1999

Author;Year	Representative of sample	Sample size	Ascertainment of exposure	Non respondents	Comparability	Assessment of outcome	Statistical test	Summary Score
A.vinita mary et al, 2017	**	*	*	*	*	*	*	8
Rajani A.Dable et la, 2013	**	*	*	*	*	*	*	8

Ravikumar thatekala et al, 2018	*	*	*	NR	*	*	*	6
Sonawane Madhuri et al, 2014	*	*	**	NR	*	**	*	8
Srinivasan R Samuel et al, 2020	*	*	*	*	*	**	*	8
Akshaya vekatesan et al, 2020	*	*	*	*	NR	*	*	6
S Acharya et al, 2008	*	*	*	*	*	**	*	8
Seebu Dhingra et al, 2016	**	*	*	*	*	**	*	9
Varsha K Pavithran et al, 2020	**	*	*	NR	*	*	*	7
Jyothi thadakamadla et al, 2015	**	*	*	NR	*	*	*	7
Sybil siluvai et al, 2015	*	*	*	NR	*	*	*	6
Rubinder Bhatia et al, 2016	*	*	*	NR	NR	**	*	6
Nagappan et al, 2019	**	*	*	NR	*	*	*	7
Kalyana Chakravarthy penapati et al, 2012	*	*	*	*	*	*	*	7
Priya Subramanian et al, 2020	*	*	*	*	*	*	*	7
Deva Priya Appukuttan et al, 2016	**	*	*	*	*	*	*	8
Santhiya K.Neelamana et al, 2020	**	*	*	*	*	*	*	8
S.Acharya et al, 2008	*	*	*	NR	*	*	*	6
Nandita kshetrimayum et al, 2012	*	*	*	*	*	*	*	7
Amrita geevarghese et al, 2017	**	*	*	*	*	*	*	8

J Popul Ther Clin Pharmacol Vol 30(10):e211–e237; 06 May 2023.

K. Indira Priyadarshini et al, 2017	*	*	*	*	*	*	*	7
M.Bhat et al, 2020	**	*	*	*	*	*	*	8
Albin Geo Joseph et al, 2016	*	*	*	*	*	*	*	7
K. P. Chakravarthy et al, 2012	*	*	*	NR	*	*	*	6
S. Kumar et al, 2017	*	*	*	NR	*	*	*	6
Sashidar Acharya et al, 2012	*	*	*	NR	*	*	*	6

TABLE 5: Evidence level of selected articles (AHRQ; 2016)

Sl. no	Study	Study design	Level of evidence
1	A.vinita mary et al, 2017	Cross sectional	VI
2	Rajani A.Dable et la, 2013	Cross sectional	VI
3	Ravikumar thatekala et al, 2018	Cross sectional	VI
4	Sonawane Madhuri et al, 2014	Cross sectional	IV
5	Srinivasan R Samuel et al, 2020	Cross sectional	IV
6	Akshaya vekatesan et al, 2020	Cross sectional	IV
7	S Acharya et al, 2008	Cross sectional	IV
8	Seebu Dhingra et al, 2016	Cross sectional	IV
9	Varsha K Pavithran et al, 2020]	Cross sectional	IV
10	Jyothi thadakamadla et al, 2015	Cross sectional	IV
11	Sybil siluvai et al, 2015	Cross sectional	IV
12	Rubinder Bhatia et al, 2016	Cross sectional	IV
13	Nagappan et al, 2019Denture Wearers [Indira Priyadarshini et al]	Cross sectional	IV
14	Kalyana Chakravarthy penapati et al, 2012	Cross sectional	IV
15	Priya Subramanian et al, 2020	Cross sectional	IV
16	Deva Priya Appukuttan et al, 2016	Cross sectional	IV
17	Santhiya K.Neelamana et al, 2020	Cross sectional	IV
18	S.Acharya et al, 2008	Cross sectional	IV
19	Nandita kshetrimayum et al, 2012	Cross sectional	IV
20	Amrita geevarghese et al, 2017	Cross sectional	IV
21	K. Indira Priyadarshini et al, 2017	Cross sectional	IV
22	M.Bhat et al, 2020	Cross sectional	IV
23	Albin Geo Joseph et al, 2016	Cross sectional	IV

24	K. P. Chakravarthy et al, 2012	Cross sectional	IV
25	S. Kumar et al, 2017	Cross sectional	IV
26	Sashidar Acharya et al, 2012	Cross sectional	IV

DISCUSSION

Oral health is essential for general health and well-being. Traditional indicators for dental diseases measure only the physical components of the disease and are short of measuring the psychological components. Studies that have shown over the last decade, the differences in the oral health status and the oral health related quality of life have markedly increased. 26 articles were retrieved after extensive search on the database of PubMed, Cochrane, Google Scholar, Science Direct, TRIP. All the 26 articles belonged to the southern part of the Indian population. The quality assessment of the included studies was done according to the Newcastle-Ottawa scale. Since the aim of this review was to assess the influence of oral health related quality of life among the southern part of the Indian population, studies from other parts of Indian populations were excluded from the review; studies from other countries were also excluded. In this study, we show that oral health related quality of life among children, adolescents and elderly between the age of 3 and 75 years are associated with lowered OHRQOL. We clearly see an impact of oral disease on OHRQOL, albeit this impact seems small. There was high heterogeneity among the studies included in the present study, which was partly explained by different factors.

OHRQOL 'reflects people's comfort while eating, sleeping and engaging in social interaction, their self-esteem and their satisfaction with respect to their oral health' (39). Thus, it encompasses the physical, social and psychological aspects of oral health. OHRQoL can play an important role in understanding subjective evaluations. The subjective evaluation of an individual in health care decision-making process, leads to a change in dynamics of clinical practice as they reflect a better understanding of treatment needs and outcomes from the patient's perspective. The effect of oral disease on OHRQOL might depend on how prevalent other oral diseases are and how important dental aesthetics are seen in certain sociocultural structures, which could explain the big difference in the association of oral disease with OHRQOL (40). OHRQOL is suggested to be a multidimensional concept, influenced by individual factors and not stable but dynamic over time.

This idea is supported by our subgroup analyses, as we show significant differences in the association of malocclusions and OHRQOL among several subgroups. Firstly, we have shown that the age of the children had a major influence on the association between malocclusions and OHRQOL. Children between the ages of 11 and 14, the age when they undergo major life changes, were most likely to have any impact of malocclusions on OHRQOL, but children older than 14 years showed the biggest impact of malocclusions on OHRQOL. According to Zhou et al., most of the patients with malocclusion had a nickname related to their dentofacial problems, which made them to feel embarrassed or angry.(40) Furthermore, the psychological status (embarrassment, fatigue, anger, peer pressure, and so on) of patients with skeletal malocclusion was closely related to the severity of the malocclusion. According to Seehra et al., bullying has a significant relationship with certain occlusal traits, self-esteem, and OHRQoL.(41) Patients with malocclusion may encounter feelings of self-consciousness and sad reflection about their dental condition, as well as lack of self confidence in social situations may suffer as a result of their facial appearance. It has been established that the most common cause of seeking orthodontic treatment is to correct dental esthetics and improve self-esteem.

A traumatic dental injury (TDI) is an irreversible disease that is attracting more consideration from health practitioners at the moment. A TDI, especially in children, is considered a severe health issue. Maxillary anterior teeth are the most

affected teeth that cause physical, aesthetic, and psychological problems for children and their parents. Many the studies expressed that the child perception of TDI impact on the OHRQoL does not change with age. Children between the age group of 8–10 years have criteria similar to those of children between 11–14 years regarding the self-perception of body image. To evaluate their appearance, children compare themselves to others of their age, and the judgment of peers exerts an influence on the development of self-esteem where the QoL is affected.

On other hand major influence on the association of Dental caries and OHRQOL was well established. The study conducted by Subramaniam P et al., showed that Preschool children in rural areas showed higher OHRQoL score compared to those in the urban areas of Bangalore.(42) This indicated that the Quality of Life related to oral health was significantly better in urban preschool children. The mean OHRQoL of urban preschool children was 17.86, which was significantly different from 20.42 in rural preschool children. The difference was also evident at each age. Concerning age there was a significant impact as age increases, which was associated with poor quality of life (p=0.025).

Changes in the dental health status of elderly individuals affect the nutritional requirements, food intake patterns, and ultimately physical conditions. On the other hand, it can influence one individual's appearance, self-esteem, and psychological-social functions and the quality of life in elderly people. Therefore, the quality of life in this age group is of paramount importance the study also shows older females had poor OHRQoL with respective of behaviour, psychological, pain and discomfort, and functional limitation. Also, edentulous patients had poorer OHRQoL. According to Shivakumar KL et, Aesthetic, psychosocial, and cultural issues that may have influenced the self-perception of the elderly are the factors related with poor OHRQoL(43). Our team has done extensive research in various fields (44-58). Regarding the impact of poor OHRQoL, like in other studies, it was determined that the elderly people needed upper dentures and self-reported poor opinion about their teeth/gums/dentures. Thus, early diagnosis and management can aid in improving QoL in children, adult and elderly patients. The findings of the study concluded that the children, adult and elderly populations have an impact on oral health related quality of life.

CONCLUSION

The OHRQOL can provide the basis for any oral health-care program and it has to be considered one of the important elements of the Global oral health program. Research on trends in dentistry and dental education shows that in future, fewer dentists will take care of the increasing number of patients. Therefore, educating these patients about promoting good oral health and preventive care will be crucial. Research also shows that certain population segments are drastically underserved. Dental education has to make a contribution if this situation is to change. Finally, with a rapidly changing knowledge base and technology in all health-care fields, interdisciplinary considerations and collaborations become increasingly important. QOL measures are not only being used in population surveys, but also in randomized clinical trials, technology assessment in health-care and evaluation of health-care delivery systems. The perception of QOL has a subjective component and therefore varies from one culture to another. Therefore, research at the conceptual level is needed in countries where the OHRQOL has not been described, like India. This is a necessary step because adapting models developed and validated in other cultures could lead to inaccurate measurement of OHRQOL and may not address the important issues pertaining to Indian culture.

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