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# Assessment of Oral Healthcare Utility among Young Adults of Chennai, India, using Standard Gamble Method, and Evaluating its Association with Self-perceived Oral Health Status

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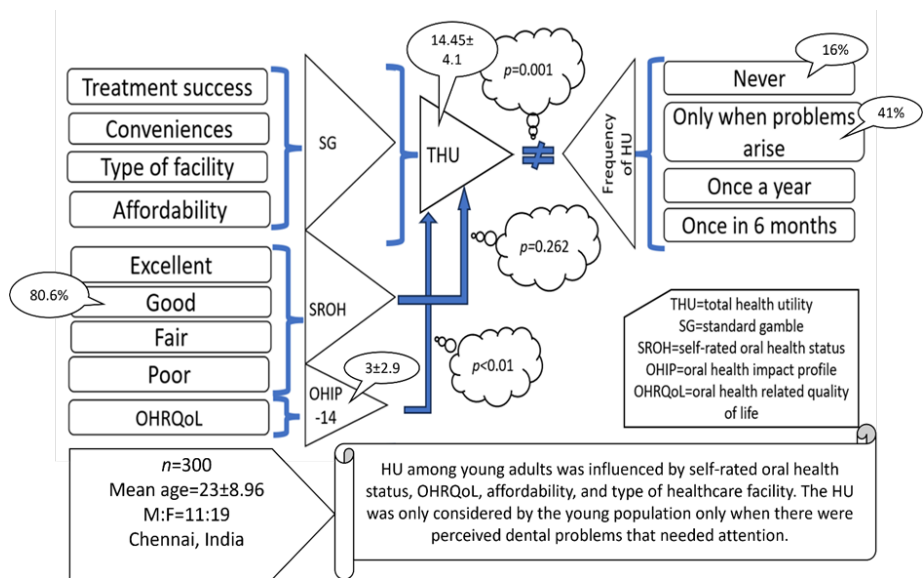
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## Abstract

**Background:** Oral diseases pose a great burden across the world, especially among low to middle-income countries, owing to changes in dietary habits, urbanization, and individual economic constraints. Healthcare utilization (HU) plays an important role in lessening such burden. Individual perception of health status can provide insights to understand the problems with HU. **Aim:** The present study aims at understanding healthcare utility in individuals' perspective among young adults of Chennai. **Methods:** 310 young adults were assessed Self-rated oral health status (SROH) and oral health related quality of life (OHRQoL) using oral health impact profile (OHIP-14). Total Healthcare utility (THU) was evaluated using standard gamble method. The association of gender, OHIP scores, and SROH with HU was assessed using Pearson's Chi-square. Kruskal Wallis test was employed to compare the THU among participants grouped based on their frequency of dental visits. **Results:** Participants of mean age  $23 \pm 8.96$  reported good (80.6%), fair (12.6%), and poor (6.66%) oral health statuses. The mean HU score was  $14.45 \pm 4.15$ . Significant associations were observed between OHIP and THU ( $P < 0.01$ ), OHIP and HU based on convenience ( $P = 0.002$ ), SROH and HU based on type of facility ( $P = 0.004$ ), SROH and HU based on affordability ( $P = 0.041$ ). A significant difference was found in THU scores among participants with different frequencies of dental visits ( $P = 0.001$ ). **Conclusion:** The HU among young adults was

influenced by self-rated oral health status, OHRQoL, affordability, and type of healthcare facility. Consideration to HU was only given when there were perceived dental problems.

**Graphic abstract**



**Keywords:** Oral health impact profile; Self-rated oral health status; Affordability to healthcare; Dental visits; Health related quality of life

**1 Introduction**

The Global Burden of Disease report (2019) states that over 3.5 billion people suffer from some kind of dental condition. Low levels of personal knowledge, a lack of suitable infrastructure and resources, and insufficient pertinent dental research continue to tarnish oral health. In addition to the prevalence of disease and the accessibility of dental care across socioeconomic classes, little attention has been paid to how these services are used. Healthcare utilization is defined as using healthcare to diagnose, treat, promote healthy living, and learn about one’s health (Gellman).<sup>1</sup>Dental care utilization can be defined as the percentage of the population who access dental services over a specified period. In most cases, patients visit the dentist only when

in cases of persistent pain. Many barriers remain to properly utilizing dental services in private and public sectors due to a wide gap between actual dental needs and the demand for dental care.<sup>2</sup>The perception of people about their dental problems, perception of their oral health status, and the impact of oral health on their quality of life can be studied to understand the psychological hindrances to healthcare utilization.<sup>3</sup>This aids in the proper planning of health services and the development of relevant policies. A significant factor in healthcare use is the discrepancy between the perceived and actual requirements for dental services. However, a number of variables, including living conditions, income, and education, may make it difficult to use the services, even if the needs are acknowledged.

The dental profession (inadequate resources, uneven distribution, inadequate training, and inadequate consideration of patient attitudes), society (lack of public support, limited facilities, inadequate planning, and insufficient research provision), and individual factors (lack of perceived need, anxiety or fear, financial considerations, and restricted access) are the three main categories into which the World Dental Federation groups barriers to accessing dental services.<sup>4</sup> To assess people's attitudes regarding oral health, self-rated oral health (SROH), can give an insight into perceived needs based on acceptance of oral health status and provide a cost-effective approach for large-scale population studies.<sup>5</sup> In the same way, the oral health impact profile (OHIP-14) can indicate the individual perception of oral health and its effect on quality of life. Many studies proved OHIP-14 to be relevant to be used in different scenarios.<sup>6</sup> So, the association of self-perceived oral health and its effect on QoL with healthcare utility can provide a ground to understand the psychological barriers in healthcare utilization. The assessment of healthcare utility is a critical component in health economics, giving valuable insights into the effectiveness and efficiency of various medical interventions. The most widely used methods for evaluating these utilities are time trade-off, rating scale, and standard gamble method. Here, utility implies an individual's assessment of different health states according to their interest values assigned to various outcomes and their readiness to exchange risk for improved health.<sup>7</sup> The present study aims at finding the association of healthcare utilization with self-perceived oral health status. It explores the difference, if any, between the self-perceived need for dental services and the actual frequency of dental visits.

### 1.1 Key contribution

- The present research provides a way to understand the barriers of utilization of dental care from patients' perspective. It also helps in understanding patients' perspectives on symptoms and signs that impact the quality of life propelling them to utilize dental care. This contributes to design strategies that impact patients' perspectives and improve overall utilization of dental care.

### 1.2 Highlights

- The study findings indicated a difference between participants' willingness to utilize dental care and the actual utilization of the same.
- The participants' self-perception of dental problems was not correlated with and underplayed the actual existing problem.
- Significant association between OHIP-14 scores and total healthcare utility scores indicated that impact on health-related quality of life propels the people to

undergo treatment.

## 2 Materials and Methods

The present analytical cross-sectional study was conducted to observe the attitude of young adults regarding dental healthcare utility in Chennai, Tamil Nadu, India. The study as a protocol was conceived on 05/02/2024 and was executed for 6 months. The selection of study participants was done using a simple random sampling method. The sample size was estimated based on the prevalence of dental healthcare utility in India<sup>1</sup> by applying the formula  $4 * p * q / L^2$  ( $p$ =prevalence: 23.96%;  $q$ =100- $p$ ;  $L$ =error: 5%) to be 291. The patients visiting SRM Dental College and primary health centers (PHCs) from Ramapuram and Porur areas were accessed to include as a sampling frame after applying eligibility criteria. Inclusion criteria were (i) Individuals of 18 to 35 years of age, (ii) Individuals willing to participate in the study (iii) Individuals who were residents of Chennai for at least 4 years. Exclusion criteria: (i) individuals who had systemic diseases (ii) individuals who are mentally challenged or who are unable to comprehend or respond to the questions. A total of 300 participants were selected randomly from the sampling frame. Informed consent was collected from all participants. The institutional review board of SRM Dental College Ramapuram, Chennai, ethically approved the study. The dental health of the patients was assessed using self-rated oral health status (SROH) on a 4-point scale: 4. Excellent, 3. Good, 2. Fair, 1. Poor.<sup>8</sup> Also, self-reported Oral Health Impact Profile (OHIP-14) was assessed. Each point was assigned to each question if the respondent selected the option as present. The maximum and the minimum scores for OHIP-14 were 14 and 0, respectively. The dental healthcare utility ratings were assessed using the directly measured Standard gamble utility scoring method.<sup>9</sup> Four questions were framed based on the important considerations for dental healthcare utilization and participants' perceptions of dental healthcare available in the private and public sectors. The four important aspects of healthcare utility considered were (i) expectation for cure or success from dental treatment, (ii) cost of the treatment, (iii) conveniences like hygiene, ambiance, behaviors of clinicians and staff, proximity of dental facility and (iv) type healthcare facility (private/government) [Figure 1].<sup>10</sup> Five options were given for each component: a percentage gamble (90%, 80%, 70%, 60%, and 50%). The responses of willingness were given a score of 1, and the reactions of non-willingness were given a score of 0. Maximum and minimum scores for total HU were 20 and 0, respectively. The maximum and minimum scores for each of the four individual components were 5 and 0. The frequency of visits to dental offices to avail health services was assessed, and responses were collected and scored as 0 (never), 1 (only when there is a problem), 2 (once in a year), and 3 (once in 6 months). Higher scores were considered as better utilization of healthcare. The questions

were circulated to the selected participants using Google Forms, and responses were collected. The data obtained from the reactions was segregated and tabulated.

### 2.1 Statistical analysis

Descriptive statistics for portraying the distribution of healthcare utility among all the participants were conducted. Shapiro Wilk's test was conducted to test the normality of data. Pearson's Chi-square was performed to test if there is a significant association between self-assessed oral health status, gender, and oral health impact profile with oral healthcare utility among the participants. Kruskal Walli's test was conducted to assess if there was a significant difference between perceived healthcare needs and the actual frequency of utilization of healthcare. The statistical analysis was conducted using the JASP 17.3 version.<sup>11</sup>

### 3 Results

A total of 300 participants were included in the study, among which 110 (36.6%) were males and 190 (63.3%) were females [Figure 2]. The mean age of the participants was  $23 \pm 8.96$ . When a self-rated oral health state was assessed, none of the participants reported a poor oral health state. Two hundred forty-two participants reported good oral health (80.6%), 38 reported fair status (12.6%), and 20 participants reported excellent oral health (6.66%). Data was not found to be normally distributed (Shapiro Wilk's  $p < 0.01$ ). The median oral health impact score measured by OHIP-14 was  $3 \pm 2.90$ . The oral healthcare utility score was calculated by four major components [Figure 2]. The mean score for health utility (HU) based on treatment success was 5, based on conveniences was  $3 \pm 1.24$ , based on type of facility was  $3 \pm 1.39$ , and based on cost/affordability was  $3 \pm 1.42$ . The mean health utility score for all the participants was  $14.45 \pm 4.15$  [Table 1, Figure 3]. Chi square was done to test the associations between the variables with healthcare utility. Significant associations were observed between the OHIP-14 score and total healthcare utility ( $P < 0.01$ ) OHIP-14 score, and healthcare utility based on convenience ( $P = 0.002$ ). Significant associations were found between self-rated oral health status and healthcare utility based on type of facility ( $P = 0.004$ ) and self-rated oral health status and healthcare utility based on affordability of the participants ( $P = 0.041$ ). Regarding the frequency of visits, 122 participants (41%) visited the dentist only when there was a problem, 70 (23%) participants visited the dentist once in 6 months, 60 (20%) participants once a year, and 48 (16%) participants never visited a dentist. We found a significant difference in total oral healthcare utility scores among participants with different frequencies of visiting dentists ( $P = 0.001$ ) [Tables 3 and 4, Figure 4].

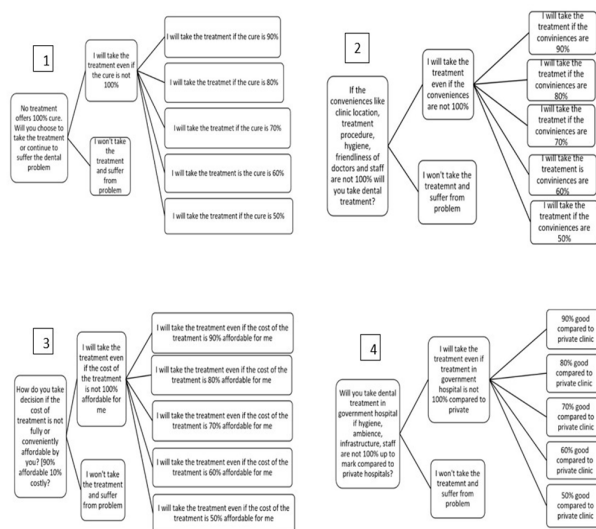


Fig 1. The 4 questions framed in SG method to assess perspective of study participants on healthcare utility

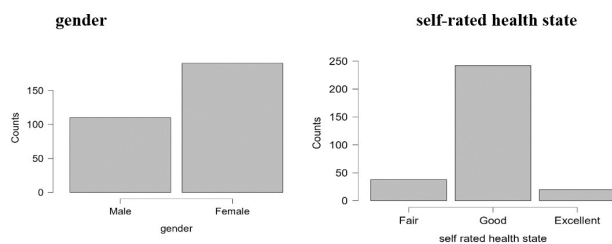


Fig 2. Simple bar diagrams representing the distribution of age and self-rated health states

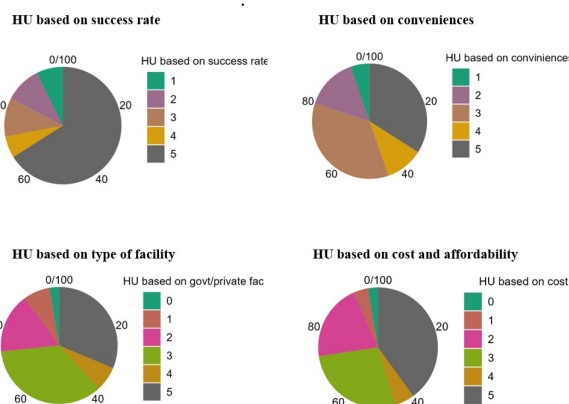


Fig 3. Pie charts describing the healthcare utility based on factors of success rate of treatment, convenience, type of facility and affordability

**Table 1. Healthcare utility and self-reported healthcare status and associated factors**

|                                   | N   | Median | Mean   | SD    | Percentage         | Max score | Min score |
|-----------------------------------|-----|--------|--------|-------|--------------------|-----------|-----------|
| Age                               | 300 | 21     | 23.86  | 8.961 |                    |           |           |
| gender                            | 300 | 2      | 1.633  | 0.483 | 63% F, 37% M       |           |           |
| OHIP score                        | 300 | 3      | 3.753  | 2.905 |                    | 14        | 0         |
| HU total score                    | 300 | 14     | 14.453 | 4.152 |                    | 20        | 0         |
| Self-rated oral health state      | 300 | 3      | 2.94   | 0.436 | 81% G, 13% F, 7% E | 4         | 0         |
| HU based on success rate          | 300 | 5      | 4.133  | 1.347 |                    | 5         | 0         |
| HU based on convenience           | 300 | 3      | 3.533  | 1.244 |                    | 5         | 0         |
| HU based on govt/private facility | 300 | 3      | 3.3    | 1.392 |                    | 5         | 0         |
| HU based on cost/affordability    | 300 | 3      | 3.487  | 1.425 |                    | 5         | 0         |

N=number of samples; OHIP=oral health impact profile; HU=healthcare utility; Max=maximum; Min=minimum; F=female; M=male; G=good; F=fair; E=excellent

**Table 2. Chi square analysis (two sided) testing the association of factors with healthcare utility**

| Factor       | X <sup>2</sup> | N   | df  | P value |
|--------------|----------------|-----|-----|---------|
| Gender*THU   | 4.918          | 300 | 16  | 0.996   |
| Gender*HU-S  | 1.057          | 300 | 4   | 0.901   |
| Gender*HU-C  | 4.255          | 300 | 4   | 0.373   |
| Gender*HU-F  | 2.61           | 300 | 5   | 0.760   |
| Gender*HU-A  | 4.61           | 300 | 5   | 0.464   |
| OHIP-14*THU  | 473.76         | 300 | 176 | <0.001* |
| OHIP-14*HU-S | 36.70          | 300 | 44  | 0.774   |
| OHIP-14*HU-C | 23.94          | 300 | 8   | 0.002*  |
| OHIP-14*HU-F | 47.54          | 300 | 55  | 0.752   |
| OHIP-14*HU-A | 47.98          | 300 | 55  | 0.737   |
| SROH*THU     | 36.63          | 300 | 32  | 0.262   |
| SROH*HU-S    | 13.02          | 300 | 8   | 0.111   |
| SROH*HU-C    | 48.82          | 300 | 44  | 0.285   |
| SROH*HU-F    | 25.85          | 300 | 10  | 0.004*  |
| SROH*HU-A    | 18.90          | 300 | 10  | 0.041*  |

THU=total healthcare utility; HU-S=healthcare utility based on success of treatment; HU-C=healthcare utility based on convenience; HU-F=healthcare utility based on type of facility (government/private); HU-A=healthcare utility based on affordability; OHIP=oral health impact profile; SROHS=self-rated oral health status. \*\* =significant.

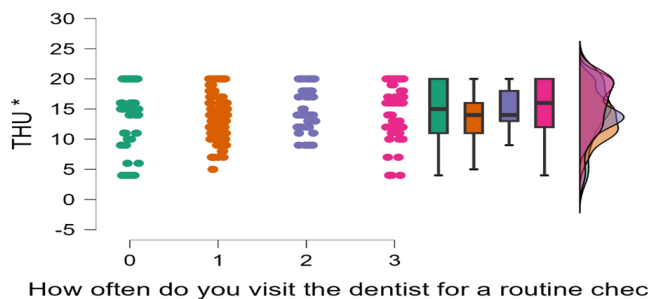
**Table 3. Description of healthcare utility frequency among participants and their mean total healthcare utility scores**

| How often do you visit the dentist for a routine check-up? | Descriptives - THU |        |       |       |       |
|--|--------------------|--------|-------|-------|-------|
|  | N                  | Mean   | SD    | SE    | COV   |
| Never  | 48                 | 14.417 | 5.001 | 0.722 | 0.347 |
| Only when there is a problem                               | 122                | 13.492 | 3.648 | 0.33  | 0.27  |
| Once in a year   | 60                 | 15.467 | 3.412 | 0.441 | 0.221 |
| Once in 6 months   | 70                 | 15.286 | 4.597 | 0.549 | 0.301 |

THU=total healthcare utility; N=number of samples; COV=coefficient of variation

**Table 4. Results from Kruskal Walli’s test to understand the willingness for health utility and actual frequency of visiting dentists**

| Kruskal-Wallis Test  | df | Statistic | P value |
|--|----|-----------|---------|
| How often do you visit the dentist for a routine check-up? | 3  | 15.831    | 0.001   |



**Fig 4. Rain cloud plots to depict total healthcare utility scores and frequency of dental visits among participants (frequency of visits on x-axis (0=never; 1=only when problem is there; 2=once in a year; 3= once in 6 months) and total healthcare utility (THU) score on y-axis)**

## 4 Discussion

In the present study, the participants, when assessed their oral health state, most of them reported good oral health and none reported poor oral health. Some of them reported that they have problems like bleeding gums, sensitivity, bad breath, and occasional pain. Since the study population was young adults, they did not report problems associated with tooth loss, gingival recession, or chronic periodontitis, resulting in null scores for some components of OHIP associated with tooth loss and functional limitation. When it comes to healthcare utilization, most of them showed positive opinions about healthcare utilization, indicated by HU scores. Participants especially showed interest in choosing health utilization over suffering from problems, irrespective of the amount of success that the treatment offered. The oral health-related quality of life was associated significantly with total healthcare utility and healthcare utility based on convenience. The conveniences mentioned were the location of the dental facility, the friendliness of doctors and staff, and hygiene. The self-rated oral health status was significantly associated with healthcare utility based on the type of facility and affordability. Most participants preferred a private dental care facility to a government facility. When enquired about the frequency of dental visits, most participants responded that they visited the dentist only when there was a problem, and 16% of them mentioned that they never visited the dentist. The study found differences between participants’ willingness to utilize healthcare and the frequency of dental

visits. The self-perceived good oral health status and lack of disturbing symptoms might be one of the reasons why the young population never visit a dentist or visit only when there is a significant and painful symptomology. In a study by Kumar A. *et al.* (2022) among government school children in Bangalore, India, the authors indicated that gum problems were among the most frequently reported symptoms. The parent’s unawareness of the oral healthcare facilities nearby and their financial constraints were found to be major barriers to healthcare utilization. According to the authors, Pain relief was the only reason for visiting the dentist.<sup>12</sup> A similar study was conducted in Kerala by Ramanarayanan V *et al.* (2023) among the adult population. The study found that participants’ age and education were significantly associated with healthcare utility. The study also found a gap between perceived need and actual utilization of dental healthcare.<sup>13</sup> Oral health utilization has been investigated in other countries recently. A study in South China by Cai Y *et al.* (2024) indicated that dental HU was remarkably low among college students due to negligence and limited awareness of their oral health problems.<sup>14</sup> A similar cross-sectional study conducted in Hadler-Olsen E *et al.* (2021) suggested that most participants rated their oral health as good. The main reason for the underutilization of healthcare services was found to be financial barriers. Lack of awareness about preventive care offered at dental facilities and its importance in oral disease prevention could be a barrier to healthcare utilization.<sup>15</sup> Kellie Murph *et al.* conducted another study among the Canadian population in 2024. The major reasons for the underutilization of health services among the young population were low income and low socio-economic status.<sup>16</sup> Assessment of healthcare needs based on which, designing and incorporating novel approaches like teledentistry may encourage people to utilize healthcare services better.<sup>17-19</sup> Regular dental visits and taking expert opinions of the actual oral health status play an important role in reducing the overall burden of dental disease among people. The importance of oral health and its impact on general quality of life and the significance of preventive care in disease prevention should be instilled in the minds of the young population to help them lead a healthy life ahead.<sup>20-22</sup> The current study had limitations like low sample size and inclusion of a lesser number of factors that influence oral healthcare utility.

## 5 Conclusion

In conclusion, the study findings suggested that there exists a gap between the wish for healthcare utilization and the actual utilization of healthcare. The participants were interested in availing dental care, but the practical utilization frequency was quite limited. The young populations’ self-rated oral health status and self-assessed oral health-related quality of life as good on average might be a factor that affected availing

dental health utility along with other influencing factors like affordability and lack of awareness on services offered by government dental health centers. Dental health education interventions focusing on preventive dental care might help improve the utilization of health services among young adults.

## References

- 1) Talukdar R, Barman D, Thakkar V, Kanungo S. Utilization of dental care services among adult Indian population: A meta-analysis of evidence from 2011–2022. *Health Promotion Perspectives*. 2022;12(4):325–335. Available from: <https://dx.doi.org/10.34172/hpp.2022.42>.
- 2) Gambhir R, Brar P, Singh G, Sofat A, Kakar H. Utilization of dental care: An Indian outlook. *Journal of Natural Science, Biology and Medicine*. 2013;4(2):292. Available from: <https://dx.doi.org/10.4103/0976-9668.116972>.
- 3) John HA, Reche A, Paul P. Overcoming Barriers to Dental Care in India by the Use of Mobile Dental Vans. *Cureus*. 2023. Available from: <https://dx.doi.org/10.7759/cureus.47786>.
- 4) Sidharthan S, Ramanarayanan V, Karuveetil V, Ravindran GC. Utilization of dental health services and its associated factors among adult population in Ernakulam district, Kerala, India: A mixed-method analysis. *Journal of Oral Biology and Craniofacial Research*. 2024;14(2):133–142. Available from: <https://dx.doi.org/10.1016/j.jobcr.2024.01.010>.
- 5) Atala-Acevedo C, McGrath R, Glenister K, Capurro D, Bourke L, Simmons D, et al. Self-Rated Oral Health as a Valid Measure of Oral Health Status in Adults Living in Rural Australia. *Healthcare*. 2023;11(12):1721. Available from: <https://dx.doi.org/10.3390/healthcare11121721>.
- 6) Campos LA, Peltomäki T, Marôco J, Campos JADB. Use of Oral Health Impact Profile-14 (OHIP-14) in Different Contexts. What Is Being Measured? *International Journal of Environmental Research and Public Health*. 2021;18:13412. Available from: <https://dx.doi.org/10.3390/ijerph182413412>.
- 7) Alex GMJ, Wyrwich KW. Health Utility Measures and the Standard Gamble. *Academic Emergency Medicine*. 2003;10:360–363. Available from: <https://dx.doi.org/10.1111/j.1553-2712.2003.tb01349.x>.
- 8) Liu H, Maida CA, Spolsky VW, Shen J, Li H, Zhou X, et al. Calibration of self-reported oral health to clinically determined standards. *Community Dentistry and Oral Epidemiology*. 2010;38:527–539. Available from: <https://dx.doi.org/10.1111/j.1600-0528.2010.00562.x>.
- 9) Gafni A. The standard gamble method: what is being measured and how it is interpreted. *Health Services Research*. 1994;29(2):207–224. Available from: <https://pubmed.ncbi.nlm.nih.gov/8005790/>.
- 10) Horsman J, Furlong W, Feeny D, Torrance G. The Health Utilities Index (HUI): concepts, measurement properties and applications. *Health and Quality of Life Outcomes*. 2003;1:54. Available from: <https://dx.doi.org/10.1186/1477-7525-1-54>.
- 11) JASP - a fresh way to do statistics. JASP - Free and User-Friendly Statistical Software. 2025. Available from: <https://jasp-stats.org/>.
- 12) Raina R, Kumar AV, Narayanaswamy R, Pavithran VK. Access and dental health service utilization by children of government schools in Bangalore, India: A parent perspective. *Journal of Indian Association of Public Health Dentistry*. 2020;18(4):302. Available from: [https://dx.doi.org/10.4103/jiaphd.jiaphd\\_9\\_20](https://dx.doi.org/10.4103/jiaphd.jiaphd_9_20).
- 13) Ramanarayanan V, Sidharthan S, Karuveetil V. Utilization of dental health services and its associated factors among adult population in Ernakulam district, Kerala, India: a mixed-method analysis. *Population Medicine*. 2023;5(Supplement):A1438. Available from: <https://dx.doi.org/10.18332/popmed/165021>.
- 14) Cai Y, Zeng S, Hu Y, Xiao L, Liao Y, Yan Z, et al. Factors associated with oral health service utilization among young people in southern China. *BMC Oral Health*. 2024;24(1):289. Available from: <https://dx.doi.org/10.1186/s12903-024-03994-4>.
- 15) Hadler-Olsen E, Jönsson B. Oral health and use of dental services in different stages of adulthood in Norway: a cross sectional study. *BMC Oral Health*. 2021;21(1):57. Available from: <https://dx.doi.org/10.1186/s12903-021-01626-9>.
- 16) Murphy K, Gondro JV, Moharrami M. Factors associated with the use of oral health care services among Canadian children and youth. 2024;35(4):15–26. Available from: <https://pubmed.ncbi.nlm.nih.gov/38630920>.
- 17) Sindhu R, Rajmohan M, Bharathwaj VV, Sathiyapriya S, Prabu D, Gousalya V, et al. Need Analysis of Indian Critical Health Care Delivery in Government Sectors and Its Impact on the General Public: A Time to Revamp Public Health Care Infrastructure. *Indian Journal of Critical Care Medicine*. 2023;27(4):237–245. Available from: <https://dx.doi.org/10.5005/jp-journals-10071-24442>.
- 18) Bansal A, Dinesh D, Sindhu R, Sathiyapriya S, Prabu D, Rajmohan M. Teledentistry versus Manual Community Dentistry- A Systematic review. *Journal of Advanced Medical and Dental Sciences Research*. 2023;11(7):44–50. Available from: <https://jamdsr.com/uploadfiles/12vol11issue7pp51-6120230729101127.pdf>.
- 19) Northridge ME, Kumar A, Kaur R. Disparities in Access to Oral Health Care. *Annual Review of Public Health*. 2020;41(1):513–535. Available from: <https://dx.doi.org/10.1146/annurev-publhealth-040119-094318>.
- 20) Chavan S, Rahavi SL, Umesh K, Karuppaiah M, Pandian P. Knowledge, attitude, and practice regarding preventive dentistry among dental students in Tamil Nadu, India. *Education in the Health Professions*. 2019;2(2):103. Available from: [https://dx.doi.org/10.4103/ehp.ehp\\_13\\_19](https://dx.doi.org/10.4103/ehp.ehp_13_19).
- 21) Haresaku S, Umezaki Y, Egashira R, Naito T, Kubota K, Iino H, et al. Comparison of attitudes, awareness, and perceptions regarding oral healthcare between dental and nursing students before and after oral healthcare education. *BMC Oral Health*. 2021;21(1):188. Available from: <https://dx.doi.org/10.1186/s12903-021-01554-8>.
- 22) Rana BK, Kiyani A, Hassan S, Masood R, Javed MQ, Abulhamael AM, et al. Assessment of treatment needs, barriers, and self-perception regarding oral health among female university students: a cross-sectional study. *BMC Oral Health*. 2024;24(1):883. Available from: <https://doi.org/10.1186/s12903-024-04658-z>.