

Oral Health Among School Children in India: A Meta-Analysis

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Abstract

Background: Good oral health is essential for overall well-being, and its foundation starts from a young age. Majority of people, especially school-aged children, suffer from dental conditions, such as gingivitis, periodontitis, and tooth decay. The Unani System of Medicine (USM) put a lot of emphasis on good oral health. According to the wisdom of USM, the entire health of an individual depends on their oral condition. Oral health is more than just having healthy teeth; it is crucial for overall well-being as well. **Aim:** To conduct a meta-analysis of different observational studies to assess School children's knowledge and awareness regarding oral health & to highlight the possible management and preventive measures of oral diseases through school health programs, education and health policies. **Materials and Methods:** Multiple cross-sectional studies were included that were serviceable to the analysis of oral health knowledge and awareness among school children. Ten out of the thirty-two studies were finally elected after searching both electronically and manually through scientific databases like Pub-med, MEDLINE, and EMBASE. **Discussion:** Many studies show that oral health and knowledge among children was low, oral health practices are poor that can lead to many oral health problems like tooth decay, gingivitis, and dental caries. Study shows 5.33% children use tooth powder, 7.33% children use coal, ash, neem, etc., only one study of A. Harikaran shows 23.70% children use toothpick. Overall, about average 60% of students think oral health has an impact on general health, and mostly studies show children not aware of oral health & hygiene and routine dental checkup.

Keywords: Oral health practices, oral health knowledge, Unani medicine, preventive measure

INTRODUCTION

Oral diseases, among others, account for majority of the diseases in humans. On top of that, they receive negligible attention in many of the countries, and are still not appropriately acknowledged by international health, despite having a significant negative impact on both social and economic well-being [1]. Healthy oral cavities are of great cruciality for an individual's general health and well-being. Additionally, a rather superficial implication of oral health is that it enables an individual to chew, speak and socialize without any active discomfort or embarrassment [2]. Oral health is now regarded as crucial as general health with mounting evidence that suggests a link between Oro-systemic health and major illnesses like respiratory and cardiovascular disease, diabetes, obesity, arthritis, mild cognitive impairment, and even cancer [3].

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The result of poor oral hygiene can cause multitudes of problems, a relatively significant and common one of them being tooth loss. Tooth loss is

a bane that impacts not only appearance, but the quality of life, nutritional impact and consequently growth itself [4]. In certain countries, dental caries and periodontal disease affect as many as 80% of school-age children, making them two of the most common oral conditions in the human population [4].

It has been shown that there is a direct relationship between increased knowledge and maintenance of oral health for better knowledge which leads to increased awareness that, in turn, alters an individual's sense of control over their health [5]. Traditional behavior change model suggests that if we transmit knowledge into communal environment, there will be a certain enhancement in positive attitude towards the propelled subject [6]. But the relationship between knowledge and oral health is not as linear as it might seem because a lot of other factors play an important role too [3].

The Unani system of Medicine has put a lot of emphasis on oral health. Unani physician Ibn Sina believed that good dental hygiene was essential for overall health since the mouth is the first organ in the digestive system that is responsible for mixing food before it goes to the stomach [7]. Poor oral hygiene can lead to Qulā' and Qarḥa Khabīthā, among other disorders, as Hakim Kābiruddin explained in his book Bayāḍ-i-Kabīr [8].

The importance of the educational approach in the prevention and management of health issues has grown in recent years all over the world. However, it is challenging to spread information through health promotion initiatives in developing countries, like India, which has the world's biggest population and limited financial and medical resources to support its continually growing population. Additionally, the lower literacy rates taper off the efficacy of the efforts. In such a case, a group target tactic would be more appropriate and given that many risk-inducing behaviors emerge during schooling, school children are of the quintessential groups for this approach. Another reason for school students being ideal for intervention is that healthy habits and lifestyles developed at a younger age are relatively unfaltering. It has been observed that children of many developing nations do not know much about oral well-being and diseases. The amount of knowledge about oral health as well as the attitudes and practices of children in India has not yet been extensively studied [9, 10].

MATERIALS AND METHODS

The following was the eligibility criteria for study selection.

- The study must be on school children.
- The study must be published in the English language.
- The study must be evaluating the knowledge and awareness as outcome measures.
- Observational cross-sectional studies.

The research that had been excluded from the existing evaluation had been both reviews, intervention research or unpublished fabric and abstracts.

Identification of Suitable Studies

The strategy used in this review was carried out through multiple scientific sources, like MEDLINE, EMBASE, Pub-med, research gate, and google scholar, irrespective of their date of publication. Google scholar was harnessed using MESH terms (like "school children", "oral health", knowledge, awareness, etc.). Inclusion of every term in the result was prioritized. A total of thirty-two papers were identified with these methods. Ten articles were finally selected for the review.

Selection of Studies

The outcome of the electric and manual search was further analyzed, and full text articles were recovered that met the inclusion criteria. Selected studies were then screened using STROBE checklist for observational cross-sectional studies.

Quality Assessment and Control of Bias Assessment

The paramount aim of the quality assessment is to establish the potential for selection bias (eligibility criteria, sampling strategy, sample size, etc.). This is a chief concern for a cross-sectional research study that reflects knowledge and awareness levels. A total of eight domains were evaluated. A total of eight domains were assessed. A score of 1 is given for fulfilling conditions in each domain, 0.5 for partial fulfilment and zero otherwise (Table 1). The maximum possible score was 8 and a study scoring 8 was classified as a high-quality study, 1 study as average-quality and 1 study as low-quality otherwise. The satisfactory evaluation of the research has emerged as finished on the idea of guidelines set forth using preferred reporting items for systematic reviews and meta analyses and STROBE checklist.

Seven authors independently used a predetermined data collection form to extract information on the following eight domains: (1) Title of the study (2) clear objectives (3) study setting (4) sample size adequacy (5) study design (6) eligibility criteria (7) sampling strategy and (8) completeness of reporting information regarding oral health. Any kind of conflict regarding article screening and extraction was sorted out by the author.

Table 1. Quality assessment of studies included in the systemic review.

Author	Title of the Study	Clear Objectives	Study Setting	Sample Size Adequacy	Study Design	Eligibility Criteria	Sampling Strategy	Completeness of Information	Quality
Blaggana A. et al. [3]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
H.Sakir et al. [9]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
A. Harikaran et.al [10]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	High
Gazi Ikhtiar et al. [2]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
G.Akila et al. [11]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Kangavelu A. [12]	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	High
M. Abhishek [13]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Avg.
Vishwanat haia H. [14]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Kamath A et al. [15]	Yes	Yes	Yes	Yes	No	Yes	No	No	Low
Tomar S. [16]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High

Table 2. Summary of studies reviewed for knowledge, awareness and practices regarding oral health among school children.

Author	Year of Publication	Sample Size	Study Population	Study Area	Outcome Measure	Result
Gazi Ikhtiar et al. [2]	2023	325	Private school	Shahzadpur, U. P. Zillain Sirajganj district.	KAB on oral Health	oral health knowledge and awareness among the children was low.

H. Sakir et al. [9]	2019	500	Govt. and Private school	Jammu and Kashmir	KAP on oral health	oral health knowledge among the surveyed children was low.
A. Harikaran [10]	2008	212	Government-aided missionary school.	Bangalore city. Karnataka	KAP health-education programme	oral health KAP of study participants are poor and need to be improved.
G. Akila [11]	2019	1600	Various schools	Chennai Tamil Nadu	Awareness & Oral Hygiene Status	Oral hygiene practices were positively correlated with the level of oral hygiene.
Kangavelu A. [12]	2020	210	Private School	Chennai Tamil Nadu	KAP on oral health	Majority of the students i.e. 58.6% brushed twice a day & their parents have good knowledge for oral health.
M Abhishek [13]		440	school students, Rural area	Panchkula Haryana	KAP on oral health	45.5% of children have poor knowledge of oral health and suffer from oral problem.
Vishwanathaiah S. [14]	2016	700	School children	Devangere Karnataka	KAP towards oral health	shows that 70.42% of the children showed poor oral hygiene prior to the study.
Blaggana A., et al. [3]	2016	1027	Govt. School student, Chandigarh.	Chandigarh	KAP towards oral health	approximately 54% of the population studied brushed their teeth once daily, while 40% respondents brushed twice a day.

Kamath A. [15]	2014	2636	Rural School	Mangalore, Karnataka	KAP towards oral health	oral hygiene awareness and practices are poor and need to be improved.
Tomar S. [16]	2016	150	School Near Medical area in Jabalpur	Faridabad City, Punjab	KAP on oral health	Oral hygienic practices were poor, needs educational motivation regarding duration of brushing, appropriate way to brush the teeth, and use of mouthwash.

RESULT

Description of Selected Studies

The preliminary search yielded thirty-two studies, out of which, only ten studies were found to be eligible for the present systematic review after the exclusion [11–16]. The target group in all the studies comprised exclusively of school children. They may reside in both urban and rural areas. Various studies features are summarized in Table 2. Three studies were conducted in Karnataka, two in Tamil Nadu, whereas one was conducted in Jammu & Kashmir, Haryana, Chandigarh, Bengal and Punjab. All studies were cross-sectional in nature and used a self-structured questionnaire (close-ended) for gathering the relevant data on the topic (Table 3).

Table 3. Cleaning aid and material used by subjects in different studies.

Studies	Cleansing Aid and Material	Percentage of Subjects
Tomar S. [16]	Toothpaste + brush	86.70%
	Tooth powder + brush	5.33%
	Others (coal, ash neem twang)	7.33%
	Both indigenous material and toothpaste	4.70%
Kamath A. et al. [15]	Toothpaste	97.60%
	Tooth Powder	2.30%
Blaggana A. et al. [3]	Toothbrush + paste	96.80%
	only past	1.50%
	Tooth powder	1.10%
Vishwanathaiah S. [14]	Toothpaste + brush	100%
M. Abhishek [13]	Toothpaste + brush	100%
Kangavelu A [12]	Toothpaste + brush	98.67%
	Tooth powder	3.67%
H. Sakir et al. [9]	Toothpaste + brush	88.20%
	Dental Floss	2%
	Toothpick	9%
A. Harikaran et al. [10]	Toothpaste + brush	58.40%
	Toothpick	23.70%

	Chewstick	10%
	Charcoal	1.70%
	Dental Floss	4.60%

Table 4. Response to questions on the relation of oral health to general health in different studies.

Questions Asked In Different Studies	Study	Yes (%)
Tooth decay can make me look bad	A. G. Harikaran [10]	37
Do you think dental health impacts body health?	A. Biradar [1]	61.3
Not cleaning your teeth can cause oral health	Kangavelu A. [12]	85
Impact of health of mouth and dentition on health of body.	Kamath A. [15]	50.20
Has oral health got any role in general health?	Vishwanathaiah S. [14]	100

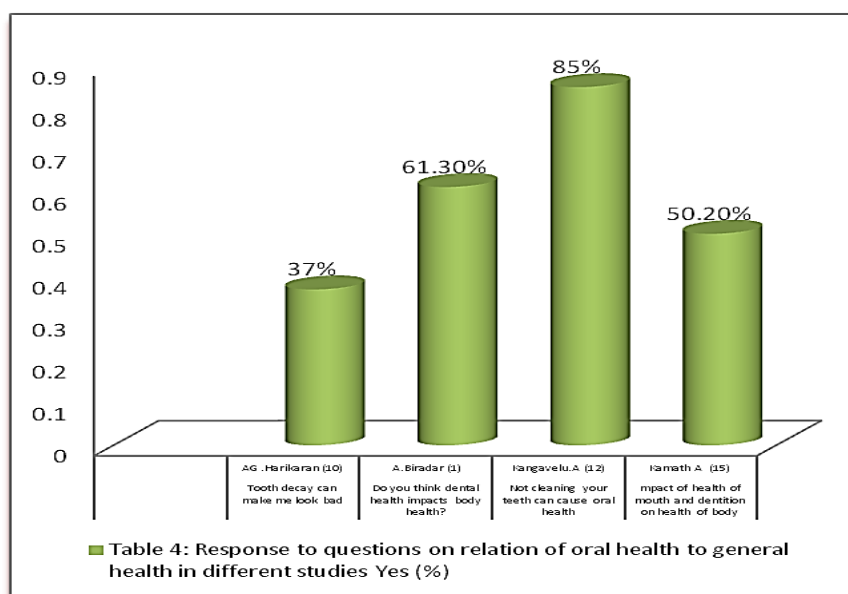
**Figure 1.** Histogram responses to oral health questions.

Table 4 findings of Vishwanathaiah S. [14] revealed that majority of subjects (100%) know the association between oral health and general health. Moreover, A. Biradar et al. [1] shows that 61.3% of subjects think dental health impacts body health; 38.7% subjects are not aware of dental health. 37% of subjects believed tooth decay can make me look bad as per the study by A. Harikaran et al. [9].

DISCUSSION

It was noticed in many studies by Blaggana A., H. Shakir, A. Harikaran, M. Abhishek, S. Vishwanathan, and Kamath that oral health and knowledge among children were low, oral health practices are poor that can lead to many oral health problems like tooth decay, gingivitis, and dental caries. Most studies show children use toothpaste and brush in higher percentages. Tomar S. [16] study shows 5.33% children use tooth powder, 7.33% children use coal, ash, neem etc. Only one study A. Harikaran [10] shows 23.70% children use toothpick. Overall, about average 60% of students think oral health impacts general health, and most studies show children not being aware of oral health & hygiene and routine dental checkup. Only a few studies show that the children brush twice a day in an appropriate way.

CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The chief purpose of this study was to emphasize the sheer importance of oral health education amongst school children aiming to improve overall oral health and implementation of programs to promote it. As school age is the optimal time when behavior can still be molded, secondary level students would still be more appropriate of a group to receive the first intervention. This would ensure that they lead towards a path of healthy habits and correct knowledge that, in turn, will significantly impact their overall oral well-being.

Conflict of Interest

The authors declare no conflict of interest.

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