

Original Research Article

## Validity of Oral Hygiene Behaviour Index Kannada Version among Young Adolescents in Bangalore, India- A Cross Sectional Study

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### ABSTRACT

**Objective:** To translate the original English version of oral hygiene behaviour Index (OHB) into Kannada and to assess its validity and reliability.

**Methods:** After translation into Kannada, a total of 200 students aged 14-15 years established acceptable validity and reliability. The questionnaire was used to record about socio-demographic information and oral hygiene behaviour. Clinical examination included assessment of oral hygiene by using Oral Hygiene Index- Simplified.

**Results:** Its respective psychometric properties were assessed by using Content validity, face validity. Internal consistency and homogeneity between the OHB items were assessed by using Cronbach's alpha (0.77). OHB index was found to correlate with OHI-S index score, the correlation coefficient value was 0.83.

**Conclusion:** OHB index can be used as a valuable instrument to measure oral hygiene behaviour among Kannada speaking population.

**Key words:** India, Oral health, Oral hygiene behavior.

### INTRODUCTION

The state of oral health can offer lots of clues about overall health. Oral health may be defined as a standard of health of the oral and related tissues which enables an individual to eat, speak and socialize without active disease, discomfort or embarrassment and which contributes to general well being. [1] It is the primary concern of oral health educators to impart a positive oral health knowledge and behavior in the society. This knowledge is usually derived from information and the information when believed translates into an action. Behavior is the outcome when that action is sustained. However, only a weak relation

exists between knowledge and behaviour. [2,3] Nonetheless, there are reports that there is an association between increased knowledge and better oral health. [4,5] Students play a vital role in health promotion and preventive information diffusion among the family and their society. It is therefore important that their own oral health knowledge is good and their oral health behavior conforms to expectation of the population. [6]

Nowadays, the WHO calls for a reorientation of oral health systems towards prevention and health promotion. The Oral Health Programme (ORH) of the WHO emphasizes the application of evidence-based strategies in oral health

promotion and prevention as well as in the treatment of oral diseases worldwide. [7]

The available methods measuring oral health behaviour have been used and validated on the Western population. There is a need to adapt these measures to Indian population to assess their oral hygiene behaviour. This should be done in regional languages to ensure better understanding. The outcome of such studies can be used to increase the awareness and hence the perceived need by the patient and to plan oral health promotion programs. They will also help motivate the patients to improve their oral health and thus their quality of life. Hence the present study was undertaken to translate the original English version of oral hygiene behaviour Index (OHB) into Kannada and to assess its validity and reliability.

## **MATERIALS AND METHODS**

The present study was cross sectional study conducted in North zone of Bangalore city; involving 200 children aged 14-15 years, from high schools. Two schools were randomly selected from the lists of high schools in North zone of Bangalore which was obtained from Deputy Directorate of Public Instructions (DDPI). Permission was obtained from the Institutional Ethical Committee of M.R. Ambedkar Dental College and Hospital, Bangalore and the head of the respective schools were taken. All the children present on the day of data collection were included in the study. Consent was also obtained from subjects after explaining the objectives of the study. Subjects who were physically disabled and not able to take care of their oral hygiene were excluded. The sample size was estimated based on the pilot study, in which 80% of study population was having high score of oral hygiene behavior. Assuming design effect of 2 based on the cluster random sampling method, the sample size was 200.

### **Description of the proforma used for data collection**

A proforma was used to record the data. It had three sections.

- Section one consisted of informed consent and socio-demographic information such as age, sex and socio-economic status based on Kuppaswamy's scale updated for 2012 [8] consisting of education, occupation and income of parents.
- Section two consisted OHB index- 8 item questionnaire.

The OHB index is a measure of the extent to which people engage in optimal oral care, as defined by professional standards. [9,10] OHB index included eight items with respect to tooth brushing, interdental cleaning and tongue cleaning. [11] The OHB sum score of this index was in the range 0–16. A higher sum score indicated a higher level of oral self-care.

The OHB index was translated into Kannada by a dentist who was fluent in both English and Kannada. The Kannada draft was then back-translated into English by another dentist who was fluent in both Kannada and English. The back-translated version was compared with the original English version to confirm that the questions were properly translated. All of the back-translated items were sounded similarly the original ones and also in their meaning. Before establishing the final questionnaire, it was pretested in a pilot study on 30 school children to evaluate the children's ability to understand. The questionnaire appeared to be easily understood and was finalized with no modification.

Its respective psychometric properties (validity and reliability) were assessed. Content validity was assessed by a panel of ten experts made up of staff members of all the departments of M.R. Ambedkar dental college and hospital, Bangalore. The purpose was to portray those items with a high degree of agreement among experts; Aiken's V was used to measure the concordance between experts for each item and the values higher than 0.85 were always obtained. Test-retest

reliability was assessed by using the data from 30 subjects who were re-interviewed one week after the first visit. The test-retest correlation coefficient for add-OHB scores was 0.76, indicating good stability. Cronbach's alpha was 0.77 indicating good reliability.

– Section three included provision to record Oral Hygiene Index-Simplified (OHI-S). [12] The examiner underwent intensive training in the usage of Oral Hygiene Index-Simplified (OHI-S). In order to ensure intra-examiner consistency, a randomly selected ten subjects were examined for OHI-S and were re-examined. Using Kappa statistics, intra examiner reliability was 0.84. The score imply high degree of reproducibility.

### Clinical examination

The subjects were made to sit comfortably on a chair and the oral cavity was examined under natural light. The type III clinical examination as recommended by American dental Association was followed throughout the study.

**Statistical analysis:** The responses were coded and data were transferred to the computer for analysis using SPSS version 18.0 statistical software. Following the computation of the initial descriptive statistics, correlation between OHB index scores and OHI-S scores were measured using Pearson's correlation coefficient.

## RESULTS

The study comprised of 200 subjects. Out of them 48% were male and 52% were female. All the subjects in the study group were belonged to 14-15years. 31%, 45.5% and 23.5% of subjects belonged to upper middle class, lower middle class and upper lower class respectively.

### Oral Hygiene Behavior (OHB) Index

The findings of the OHB index showed that 65% of the subjects brushed their teeth as recommended, twice a day. Out of 65%, 9% of the subjects brushed

their teeth in the morning after breakfast and in the night before going to sleep and 56% of the subjects brushed their teeth in the morning before breakfast and in the night before going to sleep. 35% of the subjects brushed their teeth once a day in the morning before breakfast. 47%, 37.5% and 16% of the subjects brushed their teeth with soft and forcefully, softly and forcefully respectively. 77% of the subjects brushed their teeth for 2 to 3 minutes and 23% brushed for more than 3 minutes.

68% of the subjects used up & down & circular method of brushing and 14%, 10% and 8% used horizontal, up & down and circular accordingly.

86% of the subjects used fluoridated toothpaste where as rest of the subjects used non fluoridated toothpaste. Majority of the subjects reported the use of interdental cleaning methods. 20% of the subjects never used any kind of interdental cleaning aids. 72% and 26% of the study subjects cleaned their tongue every day and sometimes respectively. 2% of the subjects never cleaned their tongue. The overall mean OHB index score was  $10.69 \pm 2.41$  (mean $\pm$ sd) and the range was 7 to 16 (Table 1).

**Table 1: Distribution of the study subjects according to mean OHB index**

OHB-I	Mean	Standard deviation
Q1 Frequency of tooth brushing	1.35	0.58
Q2 Moments of tooth brushing	1.36	0.62
Q3 Measure of force	1.22	0.7
Q4 Duration	1.77	0.42
Q5 Method	1.58	0.8
Q6 Fluoride tooth paste	0.86	0.35
Q7 Interdental cleaning	0.86	0.91
Q8 Tongue cleaning	1.7	0.50
OVERALL	10.69	2.41
RANGE	7-16	

### Oral Hygiene Index- Simplified

The mean DI-S and CI-S score was  $0.18 \pm 0.3$  and  $0.24 \pm 0.2$  respectively. The mean OHI-S was  $0.42 \pm 0.40$ . The distribution of the OHI-S values showed that 91% of subjects had good evaluation of the oral hygiene. 9% of the subjects

were evaluated as having fair hygiene (Table 2).

**Table 2: Distribution of the study subjects according to OHI-S**

OHI-S	study group n (%)
Good	182(91)
Fair	18(9)
Poor	0(0)
Total	200(100)

### Correlation between OHB Index and OHI-S

A correlation analysis was done to establish the direction and magnitude of the association between OHB Index and OHI-S score. OHB index was found to correlate with OHI-S index score, the correlation coefficient value was 0.

### DISCUSSION

The OHB index is a useful method for assessing and evaluating oral hygiene self-care practices of individuals. OHB index included all brushing details and other potential components of personal oral hygiene regimens, such as the use of tooth sticks, interdental brushes, toothpaste with fluoride, and tongue cleaning. [11] In this study oral health status was assessed by using Oral Hygiene Index-Simplified [12] and also assessed its correlation with Oral Hygiene Behavior index.

In the present study majority of the study subjects were females, this is line with the study done by Gomes et al [13] and were belonged to lower middle class. More than 50% of the subjects were brushed their teeth twice a day i.e., morning before breakfast and in the night before going to sleep using fluoridated tooth paste. The probable reason could be that, in urban area people are more concerned about their oral hygiene. The findings of this study are consistent with evidence from previous studies done by Ajzen et al [14] and Godin G et al [15] in which comparable percentage of tooth brushing behaviour was found. Contrast result was found in the study done by Sharma et al. [16] Majority of them brushed their teeth for two to three minutes with soft/forceful pressure. This is in

accordance with the study done by Buunk-werkhoven YAB et al. [9,17] More number of subjects used both up & down and circular motion to clean their teeth and cleaned their tongue every day. This is in line with the study done by Buunk-werkhoven YAB et al. [17] Less than 50% of the subjects used interdental cleaning aids. This is in accordance with the study done by Buunk-werkhoven YAB et al. [9,17]

The distribution of the OHI-S values showed that more than 50% of subjects had good evaluation of the oral hygiene. Rests of the subjects were evaluated as having fair oral hygiene. Pearson correlation of coefficient showed positive correlation between the OHB index scores and OHI-simplified scores. No similar studies have been done in relation to check correlation between OHB index scores and OHI-Simplified scores. This is the pioneering study providing data about Oral Hygiene Behavior Index in Kannada version and correlating with that of the Oral Hygiene Index simplified.

This study has some limitations that need to be addressed in future studies. First, the large proportion of female students may have biased the results. For instance, female brush their teeth more often than men and people with a healthy lifestyle use more extra cleaning aids. [18,19] Secondly, there may be social desirability bias as self-administration method was used.

Oral Hygiene Behavior index is simple and cost effective preventive approaches in public health systems. This index can be used to measure oral self care behavior among Kannada speaking population. Nowadays dentists are at times less primarily focused on the education of patients and on the promotion of adequate oral health, preferring to treat rather than prevent oral disease. Therefore, this short 8 item OHB index can be used to assess their OHB before treating the patients and modify their OHB accordingly. Further studies are recommended with different

age groups to check its reliability and validity.

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