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Original Research Article

Comparative assessment of knowledge, attitude and practice regarding tobacco and areca nut use among visually impaired and normally sighted individuals: a questionnaire study

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ABSTRACT

Background: Aim was to compare the knowledge, attitude, and practice (KAP) regarding tobacco and areca nut use among visually impaired (VI) and normally sighted (NS) individuals across three age groups.
Methods: A cross-sectional study was conducted among 90 participants (45 VI and 45 NS) divided into three age groups. A modified KAP questionnaire was used in Braille and print. Data were analyzed using SPSS; t-tests and ANOVA were applied.
Results: VI participants showed significantly lower KAP scores than NS individuals (Knowledge: 4.2 vs 6.9, attitude: 2.6 vs 5.3, practice: 1.8 vs 4.8; $p<0.001$). A gradual improvement with age was noted in both groups but VI scores remained consistently lower.
Conclusions: VI individuals have poorer awareness and practices regarding tobacco and areca nut use. Accessible health education tools like Braille and audio aids are essential for improving outcomes.

Keywords: Tobacco, Areca nut, Visually impaired, KAP study, Braille, Oral health education

INTRODUCTION

India is home to 7.8 million blind individuals, representing 20% of the 39 million blind people worldwide. The prevalence of childhood blindness in India is estimated to be 0.8 per 1000 children under the age of 16, amounting to a total of 300,000 blind children in the country. The World Health Organization's (WHO) VISION 2020: The right to sight program prioritizes the control of blindness in children.[1]

The WHO defines blindness as having a visual acuity of less than 3/60 meters, or an equivalent visual field loss, in the better eye with the best possible correction. This means that a person who is blind can see at 3 meters what someone with normal vision can see at 60 meters. Visual impairment refers to eyesight that cannot be corrected to achieve normal vision (WHO, 2013).[2]

Oral health is crucial for overall well-being, impacting physical, social, and mental health, as well as appearance and interpersonal relationships. Patients with special medical needs present distinct challenges for dentists, requiring specialized skills and knowledge. With sufficient training and understanding of diverse medical complexities and disabilities, effective management of these patients is achievable.[3]

The areca nut, a substance with a long and ancient history of use, is widely accepted in certain segments of society, including among children, adults and women. The

reasons for its popularity include addiction, social acceptance, religious beliefs, and perceived health benefits. People chew areca nut for reasons such as pain relief, euphoria, refreshment, and increased saliva production. However, habitual chewing of areca nut can be harmful to human health.

The WHO classifies areca nut as a psychoactive substance and a group 1 human carcinogen. The mortality rate associated with habitual areca nut chewing is significant, as it can lead to oral squamous cell carcinoma (OSCC) with a prevalence rate of 2.3% to 7.6%.[4]

Tobacco use, whether smoked or chewed, is a leading cause of severe oral health problems worldwide. It contributes to periodontal disease, tooth decay, and significantly increases the risk of oral cancers. Similarly, areca nut, often chewed with various additives like khaini, pan masala, mawa, paan, and gutkha, is the fourth most commonly used psychotropic substance globally after caffeine, alcohol, and nicotine.[5]

This widespread habit is linked to several adverse oral health outcomes, including submucous fibrosis, periodontal disease, and OSCC. Both tobacco and areca nut contain carcinogenic compounds that damage the oral mucosa and other tissues, leading to a heightened risk of developing serious oral health conditions.[6]

Understanding the relationship between these substances and oral health is essential, and it is crucial for children, including those who are VI, to also be aware of how harmful these habits are to oral health. Educating VI individuals about the dangers of tobacco and areca nut use can be challenging due to accessibility barriers such as limited access to educational materials in accessible formats like Braille.[7]

Additionally, VI individual may face difficulties in accessing mainstream educational programs that provide information on oral health and substance use prevention.[8] Assessing the KAP regarding tobacco and areca nut use among VI individuals is vital for developing effective public health policies and interventions. Ensuring that educational materials and interventions are accessible and inclusive for VI children, adults are essential for reducing the prevalence of these harmful habits and improving oral health outcomes globally.

Braille stands as sole tactile reading and writing system available for individuals who are blind/VI, providing them with access to printed materials they cannot perceive. Through Braille, they gain ability to conceptualize and comprehend nearly everything in their environment.[9-11]

Objectives

Objectives were to assess KAP of tobacco and areca nut use in VI using Braille, evaluate KAP in NS using printed questionnaire and compare KAP findings between VI and NS individuals.

METHODS

This cross-sectional observational study included 90 participants from RDDC, RC Nagpur and selected centers for VI individuals in Nagpur. The study was approved by the institutional ethics committee (IEC) of Ranjeet Deshmukh Dental College and Research Centre, Nagpur (IEC Approval No.: IEC/RDDC&RC/Dean/11/2024), duration of the study was 2 months. Participants were divided into 3 age groups: 6-12 years, 13-18 years, and ≥19 years, with 15 VI and 15 NS individuals in each group.

Inclusion criteria comprised VI individuals aged ≥6 years who could read Braille or access Braille interpretation, and those enrolled in specialized institutions. Exclusion criteria included individuals <6 years, not VI, cognitively impaired, or previously exposed to tobacco-awareness programs.

A modified KAP questionnaire, translated into Braille for VI participants and printed for NS participants, was used.[12]

Statistical analysis

Statistical analysis was performed using the statistical package for the social sciences (SPSS) software (version 21.0, IBM Corp., Chicago, IL, USA). Descriptive statistics were expressed as mean and standard deviation. Independent t test was used to compare VI and NS groups, while one-way analysis of variance (ANOVA) was applied for age-wise comparisons among groups, followed by Tukey's post hoc test for pairwise intergroup comparisons. A $p<0.05$ was considered statistically significant.

RESULTS

The present study assessed and compared the KAP related to tobacco and areca nut use among VI and NS individuals across three age groups. A total of 90 participants were enrolled, comprising 45 VI and 45 NS individuals. Each group was further stratified into three age categories: 6-12 years, 13-18 years, and ≥19 years, with the 15 participants from each visual category per group.

Overall group comparison

The mean KAP scores between VI and NS participants demonstrated statistically significant differences across all three domains. The mean knowledge score among VI individuals was 4.2±1.3, considerably lower than the 6.9±0.9 observed among NS individuals ($p<0.001$). Similarly, attitude scores were significantly lower in the VI group (2.6±1.2) compared to NS group (5.3±0.8), with

a p<0.001. In practice domain, the VI group again exhibited a much lower score (1.8±1.0) as opposed to 4.8±0.6 in the sighted group, which was also statistically significant (p<0.001). These results suggest that VI individuals have a significantly lower level of awareness, more passive or permissive attitudes, and poorer health-related practices regarding tobacco and areca nut use compared to their sighted counterparts (Table 1).

Age-wise comparison within VI group

When analyzed within the VI population, KAP scores showed a progressive improvement with age. The knowledge score increased from 3.6±1.1 in the 6-12 years group to 4.2±1.3 in the 13-18 years group, and further to 4.8±1.5 among participants aged ≥19 years. A similar trend was observed in attitude scores (2.1±1.0 → 2.6±1.2 → 3.0±1.4) and practice scores (1.5±0.9 → 1.8±1.0 → 2.2±1.3) across the same age groups. The differences in all three domains were found to be statistically significant using one-way ANOVA, with p-values of 0.01, 0.03, and 0.04 for knowledge, attitude, and practice respectively.

These findings indicate that, although VI individuals gain some improvement in awareness and behavior as they age, their scores remain consistently lower compared to those of NS individuals in similar age brackets (Table 2).

Age-wise comparison within NS group

Among NS participants, a clear age-related enhancement in all three KAP domains was observed. The knowledge score rose from 6.5±0.9 in the youngest age group (6-12 years) to 6.9±1.0 in adolescents (13-18 years), and reached 7.3±0.8 in adults (≥19 years). Attitude scores similarly increased from 4.9±0.8 to 5.3±0.9 and 5.7±0.7 respectively. Practice scores improved from 4.6±0.7 in the youngest group to 4.8±0.6 in adolescents and 5.1±0.5 in adults. The differences were statistically significant in all three domains, with p=0.02 (knowledge), 0.01 (attitude), and 0.03 (practice). These results highlight the positive impact of age, education, and possible social exposure on knowledge and preventive behaviors related to tobacco and areca nut use among NS individuals (Table 3).

Table 1: Overall comparison: VI versus NS.

KAP domain	VI (Mean±SD)	NS (Mean±SD)	P value
Knowledge	4.2±1.3	6.9±0.9	<0.001
Attitude	2.6±1.2	5.3±0.8	<0.001
Practice	1.8±1.0	4.8±0.6	<0.001

Table 2: Age-wise comparison within VI group, (n=45).

Age group (in years)	Knowledge (Mean±SD)	Attitude (Mean±SD)	Practice (Mean±SD)
6-12	3.6±1.1	2.1±1.0	1.5±0.9
13-18	4.2±1.3	2.6±1.2	1.8±1.0
≥19	4.8±1.5	3.0±1.4	2.2±1.3

Table 3: Age-wise comparison within NS group, (n=45).

Age group (in years)	Knowledge (Mean±SD)	Attitude (Mean±SD)	Practice (Mean±SD)
6-12	6.5±0.9	4.9±0.8	4.6±0.7
13-18	6.9±1.0	5.3±0.9	4.8±0.6
≥19	7.3±0.8	5.7±0.7	5.1±0.5

DISCUSSION

This study aimed to explore and compare the KAP regarding tobacco and areca nut use among VI and NS individuals across three age groups. The findings revealed that VI participants had consistently and significantly lower KAP scores compared to their sighted counterparts. These results are in agreement with previous studies that have highlighted the disparity in health knowledge and preventive behavior between VI and NS populations.

Sujatha et al emphasized that children with sensory impairments, particularly visual disabilities, have limited exposure to general health education, which leads to reduced awareness and poor oral health practices.[13] Our findings mirror this observation, as VI individuals in the present study scored significantly lower in the knowledge domain (mean: 4.2±1.3) compared to NS participants (mean: 6.9±0.9).

Similarly, Pani et al reported that VI individuals face challenges in acquiring health-related knowledge due to the absence of customized communication tools.[14] This knowledge gap often results in a more tolerant or indifferent attitude toward harmful habits. The attitude scores in the present study support this, with the VI group showing a mean of 2.6±1.2 compared to 5.3±0.8 in the NS group, indicating a less informed perception of the risk.

The practice domain also revealed alarming trends, with VI participants exhibiting more frequent use or passive behavior toward tobacco and areca nut, as reflected in their significantly lower practice scores (1.8±1.0 vs. 4.8±0.6). Shetty et al emphasized that without regular reinforcement of preventive messages in accessible formats such as Braille or audio, the likelihood of behavior modification among the VI remains low.[15]

Another interesting aspect of our study was the age-wise evaluation within each group. A gradual improvement in KAP scores with increasing age was observed among VI individuals. However, even in the ≥19 years age group, the scores remained below those of the youngest NS group (6-12 years), reinforcing the idea that simply growing older does not compensate for the lack of accessible health education.

This finding aligns with the observations of Rao et al who stated that VI individuals, regardless of age, require tailored interventions and sustained engagement through formats that suit their learning styles-primarily tactile or auditory.[16] In the absence of these, the disparity in awareness and preventive behavior is likely to persist.

Moreover, the high percentage of "Don't know" responses in the VI group in individual questionnaire items indicates a serious knowledge deficit. This supports the need for government and institutional health promotion programs to adopt more inclusive strategies that accommodate individuals with visual impairments.

Thus, the study highlights a significant public health gap and calls for urgent policy action. Introducing health education materials in Braille, training teachers and caregivers in accessible oral health education, and conducting regular awareness programs in schools for the blind are necessary steps toward addressing this issue.

CONCLUSION

VI individuals demonstrated significantly lower knowledge, attitude, and practice regarding tobacco and areca nut use compared to NS individuals. Despite slight improvement with age, their scores remained consistently lower, highlighting the need for accessible, inclusive health education through formats like Braille and audio tools.

Limitations

Small sample size limits generalizability to the broader VI population. Geographical limitation to Nagpur city may not reflect national trends. The study relied on self-reported responses, which may be affected by social desirability bias. Participants who could not access Braille or an interpreter were excluded, potentially omitting a vulnerable subgroup. No follow-up was conducted to evaluate long-term retention or behavioral change post-survey.

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