International Journal of Community Medicine and Public Health
Yavagal PC et al. Int J Community Med Public Health. 2022 Nov;9(11):4118-4123
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20222906

Original Research Article

Knowledge and behaviour towards second hand smoke exposure among high school teachers in Davanagere city: a cross sectional survey

Puja C. Yavagal[1]*, Mahalaxmi H. Susheelamma[1], Sumukh Shivashankar[2], Vinitha D. Nagabhushanaiah[2], Sonia R. Pawaskar[2], Sushma G. Maruthi[2]

[1]Department of Public Health Dentistry, [1,2]Bapuji Dental College and Hospital, Davanagere, Karnataka, India

Received: 22 August 2022
Revised: 05 October 2022
Accepted: 06 October 2022

***Correspondence:**
Dr. Puja C. Yavagal,
E-mail: pujacyavagal@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: School teachers may influence the avoidance of smoking and second-hand smoke (SHS) exposure behaviour in their students. Objective was to assess the knowledge and behaviour of high school teachers towards SHS in Davanagere city.
Methods: A cross sectional questionnaire survey was conducted in the school setting involving a stratified random sample of 160 high school teachers in Davanagere city. A pre validated 18 item questionnaire was used to collect data with responses on 5-point Likert scale. The questionnaire was tested for face validity, language validity and content validity (content validity index score for relevance clarity, simplicity and ambiguity was 0.87, 0.84, 0.92, and 0.94, respectively). The significant level was fixed at $p<0.05$. Descriptive data was expressed in frequencies. Statistical analysis was done using Student's unpaired 't' test, one-way analysis of variance (ANOVA) and Pearson's/Spearman's correlation tests.
Results: The mean age of teachers was 37.59±9.56 years with average teaching experience of 10.72±8.02 years. The mean knowledge and behaviour scores of participants were 29.65±4.94 and 31.56±4.28 respectively which reflected good knowledge and behaviour towards SHS. Knowledge and behaviour scores of participants were significantly ($p<0.05$) correlated with age (r=-0.19, -0.26), sex (r=0.21, 0.27) and teaching experience (r=-0.17, -0.23). Knowledge scores were positively correlated with behaviour scores (r=0.52, p=0.00).
Conclusions: High school teachers in Davanagere city had good knowledge about and behaviour towards SHS.

Keywords: Second hand smoke, Knowledge, Behaviour, High school, Teachers

INTRODUCTION

Non-smokers are exposed to an estimated 4000 harmful compounds in second-hand smoke, which poses a major health risk. Every year, over 600,000 people are projected to die as a result of second-hand smoke (SHS) exposure.[1] Children's health is severely harmed by SHS exposure, which increases their risk of lower respiratory tract and middle ear infections, meningococcal disease, tuberculosis and asthma severity.[1] Parental smoking has also been linked to their children's hospitalizations.[1] SHS exposure in children and adolescents leads to poor cognitive functions and academic achievements.[2] Children exposed to smoking behaviours by their family members have an increased chance of taking up smoking.[3] Unfortunately, 40% of children could be exposed to SHS worldwide amounting to a major public health threat.[1] According to global youth tobacco survey (GYTS-4), conducted in 2019 by the international institute for population sciences (IIPS) under the Ministry of Health and Family Welfare (MoHFW) the median age of initiation to cigarette and bidi-smoking, and smokeless tobacco use were 11.5 years,

10.5 years and 9.9 years respectively. More than 29% of school students aged 13-15 years in India are exposed to second-hand smoke.[4]

A study by Rao et al done in Mangalore to assess the exposure to second hand tobacco smoke among 12-year-old adolescents reported that 28.6% of children were exposed to SHS.[5] Aswathy et al reported second hand smoke exposure among 20.3% of high school students in Ernakulam district of Kerala.[6] A cross sectional study done by Rustagi et al among class 7 and class 8 school students pointed out that though children reported smoking from other people was harmful (89%) and discussion about harmful effects of smoking was carried out by school authorities (73.2%) and families (75.9%) of adolescents yet attitude towards SHS among adolescents was favourable and was considered helpful in enhancing socialization among boys (73.10%) and making personality attractive among girls.[7] Teachers are an essential target population for tobacco control activities because they serve as role models for students, disseminators of tobacco prevention knowledge, and significant opinion leaders in terms of creating school tobacco control attitudes. A study conducted by Bhat et al among school teachers in Bangalore revealed that majority of school children did not use any forms of tobacco and though they were aware of the addictive effect of tobacco, they did not perceive second hand smoke as harmful.[8] This calls for understanding the knowledge and behaviour of high school teachers towards second hand smoke exposure so that proper educational programs can be designed to raise awareness among school teachers thereby helping them to create a favourable attitude among their adolescent students towards avoidance of second-hand smoke exposure and tobacco cessation. Since there is lack of literature determining the knowledge and behaviour of school teachers towards second hand smoke exposure, a cross sectional survey is planned to assess the knowledge and behaviour of high school teachers towards second hand smoke exposure in Davanagere city.

METHODS

Study design was descriptive, cross sectional questionnaire survey conducted in school setting.

The study was carried out from April 2022 to September 2022. The objective of the study was to assess the knowledge and behaviour about harmful effects of second-hand smoke exposure among high school teachers in Davanagere city, using a questionnaire. Sample size was calculated using the formula.

$$n = (z_{1-\alpha/2})^2 \times (p)(q)/d^2$$

Where, n=sample size, $z_{1-\alpha/2}$=1.96 (type-I error), p=87% (prevalence of participants who had good knowledge about harmful effects of second-hand smoke exposure, based on previous research; and d=0.05 which is the margin of error or precision.[8]

$$q = 0.12\ (1-p)\ d = 0.05$$

Substituting the values, the sample size was estimated to be 160. Multistage random sampling was followed to select sample. After obtaining the list of high schools in Davanagere city, three groups of schools were identified viz. government schools (15), government aided (18) and private unaided (104). Two schools each under the list of government schools and government aided schools and 4 schools from list of private unaided schools were randomly selected. Further 80 teachers from four private unaided schools and 40 teachers each from two government and two government aided schools were randomly selected to participate in the study. Systematic random sampling technique was used to selected the teachers from the registries of selected schools (sampling frame). High school teachers of Davanagere city who consented to participate and present at the site during data collected were included in the study. Ethical approval was obtained from the institutional review board of college where study was conducted. (Ref No.ECR/1652/Inst/KA/2022/08-012). Voluntary written informed consent was obtained from the study participants after explaining them about the purpose of conducting the study and procedure of collecting the data through participant information letter.

Data collection

Data was collected using self -designed structured proforma containing both open and closed ended questions. The proforma had provision to record demographic characteristics like name, age, sex, place of work, contact number, educational qualification, years of service, teaching subject and to record the knowledge and behaviour related to exposure of second-hand smoke.

Data was collected using questionnaire which was designed and validated by Sun et al and pre-tested by Nuzooa et al.[9] An 18-item questionnaire was used to assess knowledge and behaviour of teachers towards SHS with responses on a 5-point Likert scale. The responses to the knowledge/behaviour items in the questionnaire was given the scores: strongly agree: 4, agree: 3, don't know: 2, disagree: 1, and strongly disagree: 0. The addition of the scores of all the responses to the knowledge/behaviour items was summarised as knowledge/behaviour score, which had a range from 0 to 36. For both measures, higher the score the better the knowledge/behaviour. Cut-off points were based on the grading system used by El Sherbiny et al to categorize knowledge as follows: good knowledge/behaviour (score >27), satisfactory knowledge (score 18–27) or poor knowledge (score <18).[10]

Validation of the questionnaire

Language validity of the questionnaire was ascertained. As majority of the participants preferred Kannada questionnaire, for easier understanding and unbiased answers, Kannada questionnaire was prepared by translating all the questions in the English to Kannada by a

Kannada scholar. It was later retranslated into English by translation experts well versed in both Kannada and English by back translation method. This was done to check the translation validity. Both English and Kannada questionnaires were tested for content validity by four validators (Two public health dentists, one oral medicine and radiologist and a high school teacher). Items in the Questionnaire were assessed for relevance, simplicity, clarity and ambiguity. The content validity index (CVI) of questionnaire was computed and validity was tested. The CVI score for relevance clarity, simplicity and ambiguity was 0.87, 0.84, 0.92, and 0.94, respectively. These CVI values suggested that the questionnaire had a good content validity. Necessary modifications were done based on comments of the validators. Face validity of the questionnaire was determined by distributing the questionnaires to high school teachers.

A satisfactory level of agreement was found among teachers regarding the clarity and understandability of the questions and language of the questionnaire.

Details of pilot study

A pilot study was conducted to check the feasibility, reliability and internal consistency of questionnaire. The questionnaire was administered to 20 participants for pilot testing. After a period of 10 days the questionnaire was again re – administered to the same participants to check the reliability by test - retest method. Inter and Intra examiner reliability score were 0.84 and 0.92 which reflected good reliability of questionnaire.

Method of data collection

Data was collected from high school teachers by distributing questionnaires to them at their respective school premises. Either Kannada or English questionnaire was self-administered based on participants language preference. Sufficient time was given to participants to answer the questionnaire. Maximum time of 20 minutes per participant was allowed to answer the questionnaire. Participants were not allowed to discuss among themselves during answering of questionnaires.

Statistical analyses

The data obtained was compiled systematically in Microsoft excel sheet and subjected to statistical analyses using IBM statistical package for the social sciences (SPSS) statistics for Windows, version 21 (IBM Corp., Armonk, N.Y., USA). The significant level was fixed at $p<0.05$. Descriptive statistics of the responses was generated in terms of frequencies or percentages. Knowledge and behaviour scores were compared across various groups using student's unpaired 't' test and one way ANOVA test. Correlation between knowledge and behaviour scores was assessed using Pearson's/ Spearman's correlation test.

RESULTS

A total of 160 high school teachers participated in the study. The mean age of teachers was 37.59±9.56 years. The average teaching experience of participants was 10.72±8.02 years. Majority of participants were females (68%) and had a master's degree in education (62%). Around 50% of teachers were from private school and rest 25% each from private aided and government schools. Majority of them taught language (42%), followed by science (17%), Maths (16%), Social (14%), arts and physical education (11%) (Table 1).

Table 1: Demographic details of study participants.

Demographic variables	N (%)
Gender	
Male	51 (32)
Female	109 (68)
Age (years)	Mean age: 37.39±9.56
Years of service	Mean: 10.72±8
Type of school	
Private	80 (50)
Private aided	40 (25)
Government	40 (25)
Subjects taught by teachers	
Language	67 (41.9)
Maths	26 (16.3)
Science	28 (17.5)
Social studies	22 (13.8)
Arts/Physical education	17 (10.6)
Highest educational qualification	
Bachelor of education (B. Ed)	61 (38.1)
Master of education (M. Ed)	99 (61.9)
Mean knowledge score	29.65±4.94
Mean behaviour score	31.56±4.28

Knowledge scores

The mean knowledge score of participants was 29.65±4.94 which reflected good knowledge about harmful effects of SHS. There was no significant difference in mean knowledge scores across different groups of participants based on gender, type of school, highest educational qualification of participants and type of subjects taught by teachers (Table 2).

Knowledge scores of participants were significantly correlated with age ($r=-0.19$, $p=0.01$), sex ($r=0.21$, $p=0.00$), teaching experience ($r = 0.17$, $p=0.03$) and behaviour related to SHS ($r=0.52$, $p=0.00$) (Table 3)

Behaviour scores

The mean behaviour score of participants was 31.56±4.28 which reflected good behaviour towards avoidance of SHS. On comparison, mean behaviour scores were

significantly higher among females (mean=32.35±3.92, p=0.00) and teachers from private aided schools (mean=32.52±3.48, p=0.03) (Table 2). Behaviour scores of participants were significantly correlated with age (r=-0.26, p=0.00), sex (r=0.27, p=0.00), teaching experience (r=-0.23, p=0.00) and knowledge related to SHS (r=0.52, p=0.00) (Table 3).

Table 2: Comparison of mean knowledge and behaviour scores across various groups.

Demographic variables	Mean knowledge score		Mean behaviour score	
Gender				
Male	28.23±5.28	t =-2.53 (p=0.9)	29.86±4.55	t =-3.55 (p=0.00)
Female	30.32±4.64		32.35±3.92	
Type of school				
Private	29.60±5.44	F=0.78, df=2 (p=0.45)	31.81±4.05[A]	F=3.5, df=2 (p=0.03)
Private aided	30.40±4.41		32.52±3.48[B]	
Government	29.02±5.40		30.10±5.09[AB]	
Subjects taught by teachers				
Language	29.64±5.44	F=0.88, df= 4 (p=0.47)	31.28±4.48	F=1.11, df= 4 (p=0.35)
Maths	28.57±60		30.34±4.53	
Science	29.60±3.54		32.35±4.17	
Social studies	29.63±3.17		32.29±3.88	
Arts/physical education	31.47±4.93		31.56±4.28	
Highest educational qualification				
Bachelor of education (B. Ed)	29.86±5.23	t=0.42, df=1 (p=0.67)	32.00±4.37	t=1.01, df=158 (p=0.31)
Master of education (M. Ed)	29.52±4.77		31.29±4.22	

Same letter indicates significant difference between groups with post hoc LSD test; A-p=0.03, B-p=0.01

Table 3: Correlation of knowledge and behaviour scores of participants with various variables.

Variables	Knowledge score	Behaviour score
	Pearson's/Spearman's correlation value (r) and p value	
Age	r=-0.19, p=0.01	r=-0.26, p=0.00
Sex	r=0.21, p=0.00	r=0.27, p=0.00
Type of school	r=-0.01, p=0.86	r=-0.10, p=0.17
Years of experience	r=-0.17, p=0.03	r=-0.23, p=0.00
Highest educational qualification	r=-0.06, p=0.44	r=-0.09, p=0.23
Behaviour/knowledge	r=0.52, p=0.00	r=0.52, p=0.00

DISCUSSION

The present study was done to assess the knowledge and behaviour of high school teachers towards second hand smoke exposure in Davanagere city. The participants had good knowledge and behaviour towards SHS. Similar result was observed in a study by Sun et al where school teachers had good knowledge about harmful effects of SHS.[9] There was a positive correlation between knowledge scores and behaviour scores of the participants in the present study. Similar result was seen in study by Sun et al where a mild positive correlation was found between knowledge and behaviour scores related to SHS among school teachers.[9] Study by Bhat et al showed that majority (88.2%) of school staff were aware of harmful effects of SHS.[8] Female participants in the study reported more avoidance to SHS compared to male teachers. A study by Nagler et al revealed more prevalence of smoking among male teachers compared to female teachers in India.[11] Perhaps this might be the possible reason for less avoidance to SHS mong male teachers. Cigarette smoking among females is socially unacceptable in some parts of India. Thus, habit of smoking is less prevalent and avoidance to SHS is more among female population. Young teachers with less teaching experience reported more avoidance to SHS compared to elder teachers with more teaching experience. According to a study by Nagler et al, older teachers engaged more in smoking habit compared to younger teachers perhaps this might be the reason for less avoidance to SHS among older teachers.[11] Increased awareness about harmful effects of SHS over the years may be one of the reasons of increased avoidance to SHS among younger generation teachers. A study by Desai et al showed that almost 100% of school teachers were aware of harmful effects of tobacco.[12] Literature review revealed no Indian studies done to assess the knowledge and behaviour about SHS among school teachers hence valid comparison of present study results with other Indian studies could not be done.

Schools are pivotal sites for health promotion because they offer a potential opportunity to foster a healthy learning

environment. School-based interventions that aim to reduce smoking and exposure to second hand smoke often concentrate on deterring children from starting to smoke or lowering their smoking behaviour and exposure to cigarette smoke. A study by Hoferichter et al showed that teacher support was associated with higher psychological wellbeing and physical wellbeing among adolescents.[13] Majority of time is spent in school by adolescents where they are supported and influenced by teachers. Supportive teachers are like mentors and act as major socialization unit and influence how students feel and think about themselves. Hence, they can influence the smoking behaviour and avoidance to SHS in their students. Based on a Cochrane review, despite numerous studies focussing on parental education and counselling programmes, it was found that these programmes' efficacy in lowering children's exposure to tobacco smoke was not firmly established study by Rao et al showed that only 46% of school children in Mangalore city, India was aware that SHS was produced by cigarette smoke exhaled by smokers or by the side stream of a cigarette.[5] Based on these findings, it is pivotal to design school-based prevention programmes using a multi-stakeholder approach, with high school teachers serving as a crucial stakeholder. This study fills a gap in the literature regarding the lack of similar studies among high school teachers by focusing on their knowledge and behaviour towards SHS. The main obstacle to comparing and contrasting our results with earlier research on related topics is the dearth of earlier studies on high school teachers' knowledge about and behaviour towards SHS. Our study reveals the potential contribution high school teachers can make to educating students about the importance of avoiding SHS exposure.

In light of the methodologies employed in this survey, the questionnaire was a pre validated standard questionnaire which was revalidated in kannada language. The questionnaire demonstrated good internal consistency and reliability. Furthermore, participants were selected at random from each of Davanagere's three categories of schools, making the study sample a representative of Davanagere high school teachers.

This survey's limitation is that it did not provide a comprehensive understanding of teachers' knowledge and behaviour. Also, the study did not assess the prevalence of smoking habit among teachers. It is therefore advised to do a qualitative study to solve this constraint and learn more about how teachers view their role in improving health of their students. The present study emphasises the importance of teachers as possible agents of SHS awareness and SHS protection.

CONCLUSION

High school teachers in Davanagere city had good knowledge about and behaviour towards SHS. Knowledge and Behaviour scores of teachers were significantly correlated with age, sex and teaching experience. Teachers with good knowledge reported more avoidance to SHS exposure.

ACKNOWLEDGEMENTS

Authors would like to acknowledge the support of all the high school teacher participants of the study and the III BDS, 2022 Clinical Batch of Bapuji Dental College for their support.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Siddiqi K, Huque R, Kanaan M, Ahmed F, Ferdous T, Shah S, et al. Children Learning About Secondhand Smoke (CLASS II): A Pilot Cluster Randomized Controlled Trial. Nicotine Tob Res. 2019;21(5):670-7.
2. Chen R, Clifford A, Lang L, Anstey KJ. Is exposure to second hand smoke associated with cognitive parameters of children and adolescents? –A systematic literature review. Ann Epidemiol. 2013;23(10):652-61.
3. Leonardi-Bee J, Jere ML, Britton J. Exposure to parental and sibling smoking and the risk of smoking uptake in childhood and adolescence: A systematic review and meta-analysis. Thorax. 2011;66(10):847-55.
4. Ghosal S, Sinha A, Kanungo S, Pati S. Declining trends in smokeless tobacco use among Indian women: findings from global adult tobacco survey I and II. BMC Public Health. 2021;21(1):1.
5. Rao A, B U, Rungta N, M N, Shenoy R, Rao A, Shetty MK. Exposure to Second Hand Tobacco Smoke among 12 year old Adolescents in Mangalore, Karnataka - A Descriptive Study. Asian Pac J Cancer Prev. 2021;22(3):827-35.
6. Aswathy S, Syama S, Georgy S, Mathew MM, Mohandas S, Menon VB, et al. Tobacco use and exposure to second-hand smoke among high school students in Ernakulum district, Kerala: A cross-sectional study. Public Health in Practice. 2021;2:100213-7.
7. Rustagi N, Verma M, Kumar A, Norbu L. Second hand smoke: awareness and acceptability among school going adolescents In India. Tobacco Induced Dis. 2018;16(1):953.
8. Bhat PK, Sushma SG, Jayachandra MY. Knowledge and attitude about tobacco use among school personnel in Bangalore South-a Cross Sectional Study. RGUHS J Dent Sci. 2019;11(1):14-20.
9. Sun MC, Frédéric JDS. Knowledge of second-hand smoke and behaviour towards its exposure among teachers in Mauritius. Tob Prev Cessat. 2020;6:32.

10. El Sherbiny, El Essawy, Abdel K. Knowledge and attitude towards smoking among Fayoum university students. J High Inst Pub Health. 2010;40(3):573-85.
11. Nagler EM, Sinha DN, Pednekar MS, Stoddard AM, Gupta PC, Mathur N, Lando H, Aghi M, Cordeira LS, Viswanath K, Sorensen G. Social contextual factors and tobacco use among Indian teachers: insights from the Bihar School Teachers' Study. Prev Med. 2015;74:24-30.
12. Desai D, Desai D. Knowledge attitude and practice of school personnel on COTPA. Int J Prev Clin Dent Res. 2020;7:104-6.
13. Hoferichter F, Kulakow S, Hufenbach MC. Support From Parents, Peers, and Teachers Is Differently Associated With Middle School Students' Well-Being. Front Psychol. 2021;12:758226.
14. Behbod B, Sharma M, Baxi R, Roseby R, Webster P. Family and carer smoking control programmes for reducing children's exposure to environmental tobacco smoke. Cochrane Database Syst Rev. 2018;1(1):CD001746.

Cite this article as: Yavagal PC, Susheelamma MH, Shivashankar S, Nagabhushanaiah VD, Pawaskar SR, Maruthi SG. Knowledge and behaviour towards second hand smoke exposure among high school teachers in Davanagere city: a cross sectional survey. Int J Community Med Public Health 2022;9:4118-23.