RESEARCH ARTICLE

Effect of peer education on knowledge and frequency of smoking among high school students in disadvantaged districts: A quasi-experimental study

Gulengul Mermer[1], Nurcan Bilgic[2], Salih Keskin[3], Turkan Gunay[4]

Abstract

Objective: To evaluate the effectiveness of peer education on changing the knowledge and frequency of smoking of high school students.

Method: The quasi-experimental study was conducted at the Vocational and Technical Anatolian High School, Turkey, during the 2021-22 academic year, and comprised students of either gender from the 9th to the 11th grade. After baseline assessment, training that blended peer education with the photovoice technique was administered between March 2021 and January 2022. Post-intervention assessment included smoking frequency, cigarette exposure and health literacy. Data was analysed using R version 4.0.5.

Results: Of the 465 students available, 395(84.95%) were part of the baseline assessment, while 434(93.3%) took the post-intervention assessment. At the baseline, 365(93.8%) participants were males and 24(6.2%) were femaes. The overall median age was 15 years (interquartile range: 15-16 years). Post-training, smoking rate and indoor exposure to cigarette smoke among the students were statistically lower than the baseline values ($p<0.05$). The mean health literacy score post-intervention was significantly higher than the baseline score ($p<0.05$).

Conclusion: Photovoice combined with peer education seemed beneficial in terms of positive effect on smoking behaviour among youths.

Keywords: Peer education, Smoking cessation, Peer influence, Smoking prevention, Adolescent, Health literacy.

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Introduction

Tobacco consumption is a serious global problem and an important health hazard that can damage almost every organ in the body, and ultimately result in death.[1,2] The most common form of tobacco consumption is smoking. According to the 2017 Global Youth Tobacco Survey (GYTS), the frequency of tobacco smoking in young boys is 23.2% and it is 12.1% in girls.[3]

In adolescence, while the search for identity and the effort to be accepted are experienced intensely,[1] many behaviours that determine the lifestyle are also acquired. The vast majority of people using tobacco today began doing so when they were adolescents. Globally in 2018, at least 1 in 10 adolescents aged 13-15 years used tobacco, although there were areas where the figure was much higher.[4] E-cigarettes are particularly risky when used by children and adolescents. Nicotine is highly addictive and young people's brains develop up to their mid-20s.[3,5,6]

[1]Department of Public Health Nursing, Ege University, Izmir, Turkiye; [2]Department of Nursing, World Peace University,Nicosia, Schoolof Health Sciences,Cyprus; [3,4]Department Public Health, Dokuz Eylul University, Izmir, Turkiye.

Correspondence: Nurcan Bilgic. e-mail: nurcan.bilgic@gmail.com

ORCID ID. 0000-0001-7368-6144

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Peer education is one of the methods that can be used in health education and counselling services on prevention of smoking among young people. Peer education includes educational activities that aim at developing young people in terms of knowledge, attitudes, beliefs and skills, and to at increasing awareness about protecting their own health. This is carried out together with their peers after they have been made aware of it through interactive methods by experts.[7] Peer education programmes are planned systematically, and it has been determined that not only knowledge, but also behavioural change intervention can be provided in this way.[6,8]

In recent years, health literacy across all age groups have been under focus for reducing and quitting tobacco use. Initial definitions were generally based on being able to read and understand medical care-related written and printed documents, which is now called functional health literacy. Over time, the scope of this definition has changed and expanded, and the cognitive and social aspects of the issue have been emphasised by the World Health Organisation (WHO).[9] Health literacy can be defined as the ability to access, understand, use and evaluate the information that a person will need in order to protect and improve his/her health.[9-11]

Photovoice is a new method used within the scope of peer education. Tanjasiri et al. defined the photovoice method as the use of a qualitative needs assessment technique.[12]

This method aims at enabling researchers to better understand the structure, emotions and thoughts of their respective societies to realise the weak and strong aspects of both society and individuals with a critical point of view, and to improve individuals in this regard.[13,14]

The current study was planned to evaluate the effectiveness of peer education on changing knowledge and frequency of smoking among high-school students.

Subjects and Methods

The quasi-experimental study was conducted at the Vocational and Technical Anatolian High School, Turkey, during the 2021-22 academic year after approval from the ethics review committee of Ege University, Izmir, Turkey, and comprised students of either gender from the 9th to the 11th grade. All the enrolled students were included after taking informed consent from each of them and their families for filling up survey forms under the observation of researchers in their classes. Students who were absent on the day and those who did not volunteer to participate were excluded.

A group of students was selected to act as the voluntary peer educator group.

The study had 5 stages (Figure). Stage 1 was about determining the situation. The Global Youth Tobacco Survey-Turkey (GYTS-T) questionnaire was used to determine the use of tobacco and its products by the students, and the Turkey Health Literacy Scale-32 (THLS-32) was used to determine the health literacy levels of the students.

GYTS, one of the largest public health surveillance systems, is currently conducted in more than 185 countries. Turkey was included in this system after signing the WHO Framework Convention on Tobacco Control in 2004. The survey form consists of 79 questions.[8]

The THLS-32 is a self-report scale developed to assess health literacy in literate people aged >15 years, and is based on the conceptual framework developed by the European Health Literacy Research Consortium. The level of health literacy was evaluated in 4 categories according to the score obtained: poor health literacy (0-25), problematic/limited health literacy (>25-33), adequate health literacy (>33-42), and excellent health literacy (>42-50). The overall Cronbach alpha coefficient of the scale was 0.927.[15] In the current study, the Cronbach Alpha coefficient was 0.895. Both the scales were used after permission from their respective authors.[8,15]

Stage 2 was about identifying and training peer educator students. To identify the peer educator students, their voluntary participation was first ensured. Students recommended by their friends and teachers were also added to the group. The selected peer educators were interviewed in small groups, and divided into 5 groups. The selected students were academically successful, had social status and a large group of friends, constantly felt the urge to strive, valued individuality, creativity and art, thought that they were different from their peers owing to their physical appearance, valued their families, and enjoyed outdoor activities.

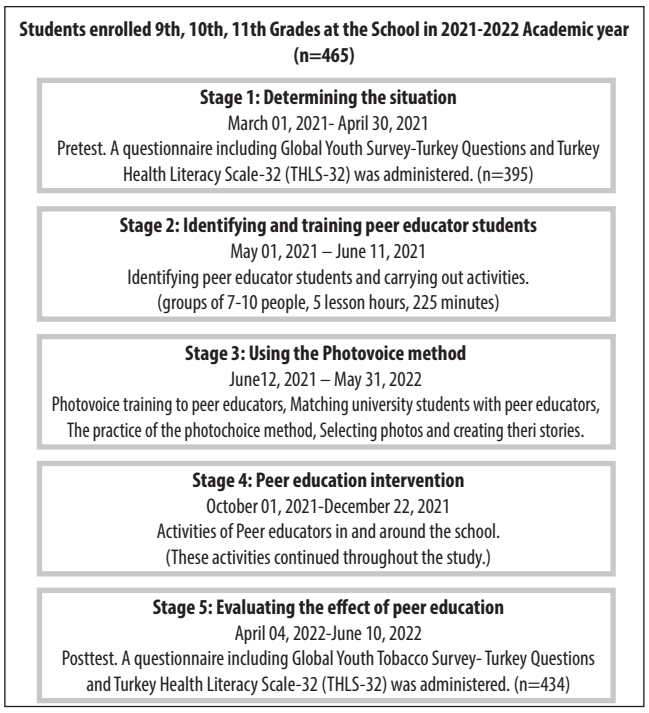

Figure: Study flowchart.

The peer educator training sessions were held in the meeting room and classrooms of the school where the data was collected. After the completion of the training, the students were given a participation certificate and a peer educator identification card. To increase visibility, the sticker, "*There is a Peer Educator in This School within the Scope of Fight Against Tobacco*", was affixed to the door of the school.

Stage 3 Was about using the photovoice method. The peer educators were trained by an expert on photography and the photovoice method. At the end, photographs were taken by the students for 4 months about the risks of tobacco and tobacco use. After the photoshoot, materials were discussed by the peer educators and the researchers, and a story was created for each picture. The selected photographs were exhibited at the events held during the health week and the World No Tobacco Day. Students, administrators and non-governmental organisations (NGOs) working on the subject were invited to the exhibitions.

Stage 4 was about peer education intervention. Each of the peer educators gave information to 7-10 students about the harms of tobacco use in the school canteen, in the garden, in classrooms, and in their conversations inside and outside the school. By preparing posters and brochures, they shared their experiences on the school website, on socialmedia and on school/classboards that all students could see, and effort was made to find out what they thought. The researchers and the peer educators held regular meetings to identify and share the topics and messages to be delivered to the students. The peer educators created suggestions for changes that could be made to increase the risk perception against tobacco in the school, and presented them to the school administration.

In line with these suggestions, live music events were added to the activities that were held for the students at regular intervals. Interventions, including presentations, posters, brochures and suggestions, were made to increase the level of health literacy in school activities. The students were supported by the peer educators and the researchers whenever they were needed during the project.

Stage 5 was about evaluating the effect of peer education. To determine the effect of peer education, the GYTS-T questionnaire and the THLS-32 were applied again 3 months after the completion of the intervention.

The dependent variables were cigarette smoking, passive smoking, and the level of health literacy, whereas the independent variable was peer education for tobacco consumption.

To maintain minors' privacy and to avoid stigmatisation with respect to a sensitive issue like smoking, and also to reduce response bias and aligning with the focus on group-level educational policy and intervention, the current study did not collect individual identifiers. This methodological choice led to the presentation of aggregate data based on the number of responses against each item of GYTS-T and THLS-32, reflecting the intervention's overall impact.

Data was analysed using R version 4.0.5. Descriptive statistics were generated to summarise the general characteristics of the participants. Data was presented as frequenceis and percentages, as well as mean and standard deviation, or median with interquartile range (IQR), as appropriate. Chi-square and Mann-Whitney U tests were used to compare the groups. Type 1 error was accepted as 0.05. P<0.05 was considered statistically significant.

Results

Of the 465 students available, 395(84.95%) were part of the baseline assessment, while 434(93.3%) took the post-intervention assessment. At the baseline, 365 (93.8%) participants were males and 24(6.2%) were femaes (Table 1). The overall median age was 15 years (IQR: 1 5-16 years).

Table-1: Characteristics of the participants.

Characteristics (n=395)	**n (%)**
Gender (n=389)	
Male	365 (93.8)
Female	24 (6.2)
Mother'sEducation Level (n=390)	
Not graduated	17 (4.4)
Primaryschool	166 (42.6)
Secondaryschool	138 (35.4)
High school	60 (15.4)
University	9 (2.3)
Mother'sEmploymentStatus (n=389)	
Housewife	246 (63.2)
Working	138 (35.5)
Retired, not working	5 (1.29)
Father'sEducation Level (n=390)	
Not graduated	8 (2.1)
Primaryschool	120 (30.8)
Secondaryschool	141 (36.2)
High school	108 (27.7)
University	13 (3.3)
Father'sEmploymentStatus (n=385)	
Working	336 (87.3)
Retired, not working	17 (4.4)
Not working	32 (8.3)
FamilyIncomeStatus (n=383)	
Income equal to expenses	244 (63.7)
Income less than expenses	79 (20.6)
Income more than expenses	60 (15.7)

Table-2: Tobacco use characteristics of the participants.

Variables	**Pre-intervention** n (%)	**Post-intervention** n (%)	***p*-value***
Smoking			<0.001
Yes	127 (33.0)	88 (20.3)	
No	258 (67.0)	346 (79.7)	
Attempting to quit smoking			1.000
Yes	44 (49.4)	44 (50.0)	
No	45 (50.6)	44 (50.0)	
Smoking at home			0.113
Yes	151 (40.7)	152 (35.0)	
No	220 (59.3)	282 (65.0)	
Smoking indoors near the student			0.01
Yes	204 (54.5)	196 (45.2)	
No	170 (45.5)	238 (54.8)	
Getting information about smoking and its harms			<0.001
Not sure /No	198 (50.1)	129 (29.7)	
Yes	197 (49.9)	305 (70.3)	
HealthLiteracy			<0.001
Poor	63 (21.7)	103 (32.3)	
Problematic – limited	78 (26.9)	57 (17.9)	
Adequate	96 (33.1)	135 (42.3)	
Excellent	53 (18.3)	24 (7.5)	
Health Literacy score †	33.6 (27.3 – 41.1)	34.9 (32.8 - 45.4)	<0.001**

Getting information about smoking and its harms power=0.9999782

As part of the photovoice component, 148 photographs were taken during the photoshoot phase, and at least 1 photograph taken by each peer educator was used in activities at the school, while 20 photographs were selected for the 2 exhibitions.

Post-training, smoking rate and indoor exposure to cigarette smoke among the students were statistically lower than the baseline values ($p<0.05$). The mean health literacy score post-intervention was significantly higher than the baseline score ($p<0.05$) (Table 2).

Discussion

In the current study, which had an almost all–male sample, one-third of the students never smoked. The rate of smoking among young people aged 13-15 in Turkey is 9.9% in men, and 5.3% in women.[3] The smoking rate in the study group, as such, was higher than the overall rate in Turkey. These rates are similar with 41.3% for men aged 15 and over, and 14.9% for women aged 15 and over.[16] In addition, nearly half of the students (40.7%) were exposed to cigarette smoke at home, which was similar to the GYTS (46.1%).[16,17] In the current study, the rate of the students exposed to cigarette smoke indoors outside the home was 54.5% compared to 51.8% reported by GYTS-2017.[6]

Smoking initiation is a multidimensional factor that can include curiosity to try new and different things and to take risks, aggressive temperament, extroversion, low self-confidence, stress, low social and academic achievement, limited opportunities for self-development, family structure and peer attitudes.[18,19]

The rate of getting information from the school was 21.5%, which was quite low compared to GYTS-2017 (51.7%).[3] Distance education, because of the coronavirus disease-2019 (COVID-190 pandemic during the study period may have led to such a low finding.

The rate of smoking in the current group decreased significantly after the intervention. It is known that education and interventions conducted with peers have promising results.[18-20] Peer education is an effective method that encourages positive decision-making and changes risk-taking behaviours.[21,22]

Smoking indoors post-intervention (45.2%) was significantly lower than at the baseline (54.5%) ($p=0.01$). It has been recommended that intervention programmes should be implemented to limit tobacco use, and to prevent passive smoking in areas where young people are present.[23,24]

The rate of getting information about smoking and its harms was significantly higher in the post-intervention group (70.3%) than in the pre-intervention group (49.9%) ($p<0.001$). Literature suggests that about 50% students learn about tobacco and its harms from social media, family, mass media, and the school they attend.[25] Messages to be given by family, media and educational institutions are of great importance for youths so that they may never start smoking, or to quit smoking if they have started already.[24]

After the intervention, the health literacy of the current group increased significantly ($p<0.001$). Working with peer groups contributed to the students' protection of their own and others' health.

The current study used the photovoice method as a part of the educational intervention. In a study using the photovoice method, young people were asked to determine whether the family and social characteristics they lived in positively or negatively affected their tobacco use, and whether there was a relationship between tobacco use and cancer.[26] In addition, to determine how students perceive the relationship between the environment they live in and alcohol use, photovoice method was used to determine whether the sales conditions and environments of tobacco products increased tobacco use.[26-28]

Limitations: The current study has limitations. Since data was collected anonymously, therefore, individual change could not be evaluated before and after the intervention. This may make it difficult to establish a causal relationship between intervention and outcomes. Behaviour change in any case is a complex process which depends on many factors. Thus, the results cannot be attributed to the intervention alone.

Using the photovoice method in peer education studies on tobacco use is a new field, and the current study, despite its limitations, contributed to overall literature by using the novel method. To observe behaviour change, however, long-term observations are recommended.

Conclusion

Photovoice combined with peer education seemed beneficial in terms of positive effect on smoking behaviour among youths.

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References

1. Özcebe H, Guciz Dogan B, İnal E, Haznedaroglu D, Bertan M. Smoking Habits and the Related Sociodemographic Characteristics in University Students. Turk Thorac JournalTürk Toraks Derg. 2014; 15:42–8. DOI: 10.5152/ttd.2013.29

2. Bassiony MA, Aqil M, Khalili M, Radosevich JA, Elsabaa HM. Tobacco Consumption and Oral, Pharyngeal and Lung Cancers. Open Cancer J. 2015; 6; 8:1–11. DOI: 10.2174/1874079001508010001
3. World Health Organization. 2017 GYTS Fact Sheet Turkey. [Online] [Cited 2023 September 7]. Available from: URL: https://www.who.int/publications/m/item/2017-gyts-fact-sheet-turkey
4. Ma C, Xi B, Li Z, Wu H, Zhao M, Liang Y, et al. Prevalence and trends in tobacco use among adolescents aged 13–15 years in 143 countries, 1999–2018: findings from the Global Youth Tobacco Surveys. Lancet Child Adolesc Health. 2021; 5:245–55. doi: 10.1016/S2352-4642(20)30390-4.
5. Çalışkan Ş. The Factors Affecting Smoking of Undergraduates: An Econometric Approach. SOS Bilim Derg [Online] [Cited 2022 September 22]. Available from: URL: http://dergipark.gov.tr/doi/10.12780/uusbd.19233
6. World Health Organization. Adolescent health. [Online] [Cited 2022 March 15]. Available from: URL: https://www.who.int/health-topics/adolescent-health
7. Bilgiç N, Günay T. Evaluation of Effectiveness of Peer Education on Smoking Behaviour. Smoking Prevention and Cessatio. Intech Open. [Online] [Cited 2022 September 22]. Available from: URL: https://www.intechopen.com/books/smoking-prevention-and-cessation/evaluation-of-effectiveness-of-peer-education-on-smoking-behaviour
8. Erguder T, Cakir B, Aslan D, Warren CW, Jones NR, Asma S. Evaluation of the use of Global Youth Tobacco Survey (GYTS) data for developing evidence-based tobacco control policies in Turkey. BMC Public Health. 2008; 8:S4. doi: 10.1186/1471-2458-8-S1-S4.
9. Brandt L, Schultes MT, Yanagida T, Maier G, Kollmayer M, Spiel C. Differential associations of health literacy with Austrian adolescents' tobacco and alcohol use. Public Health. 2019; 174:74–82. doi: 10.1016/j.puhe.2019.05.033.
10. Lee YO, Jordan JW, Djakaria M, Ling PM. Using Peer Crowds to Segment Black Youth for Smoking Intervention. Health Promot Pract. 2014; 15:530–7. doi: 10.1177/1524839913484470.
11. Woodgate RL, Busolo DS. A qualitative study on Canadian youth's perspectives of peers who smoke: an opportunity for health promotion. BMC Public Health. 2015; 15:1301. doi: 10.1186/s12889-015-2683-4.
12. Tanjasiri SP, Lew R, Kuratani DG, Wong M, Fu L. Using Photo voice to assess and promote environmental approaches to tobacco control in AAPI communities. Health Promot Pract. 2011; 12:654–65. doi: 10.1177/1524839910369987.
13. Ames A, Evans M, Fox L, Milam AJ, Petteway RJ, Rutledge R. 2011 Neighborhood Health Profile: Baltimore City. Baltimore City Health Department [Online] [Cited 2022 Sep 22]. Available from: URL: https://health.baltimorecity.gov/sites/default/files/2011%20Summary%20Baltimore%20City%20NHP.pdf.
14. Petteway RJ, Sheikhattari P, Wagner F. Toward an Intergenerational Model for Tobacco-Focused CBPR: Integrating Youth Perspectives via Photovoice. Health Promot Pract. 2019; 20:67–77. DOI:10.4103/2319-5932.159057
15. Okyay P, Abacıgil FTC. Sağlık Bakanlığı Türkiye Sağlık Okuryazarlığı Ölçekleri Güvenirlik ve Geçerlilik Çalışması [Internet]. T.C. Sağlık Bakanlığı; [Online] [Cited 2022 Jan 1]. Available from: URL: https://toad.halileksi.net/sites/default/files/pdf/avrupa-saglik-okuryazarligi-olcegi-toad.pdf
16. Khude S, Pawar R, Shivakumar K, Patil S, Veerabhadrappa S, Kadashetti V. Prevalence and pattern of tobacco related habits among the college students of Satara district. J Indian Assoc Public Health Dent. 2015; 13:169-73. DOI:10.4103/2319-5932.159057
17. Karaca M. Analysis of Tobacco Control Policy with System Approach: Smokeless World for Young People in Turkey. ADDICTA Turk J Addict. 2020; 6:1–29.
18. Polanska K, Znyk M, Kaleta D. Susceptibility to tobacco use and associated factors among youth in five central and eastern European countries. BMC Public Health. 2022; 22:72. doi: 10.1186/s12889-022-12493-6.
19. Walker MW, Navarro MA, Hoffman L, Wagner DE, Stalgaitis CA, Jordan JW. The Hip Hop peer crowd: An opportunity for intervention to reduce tobacco use among at-risk youth. Addict Behav. 2018; 82:28–34. doi: 10.1016/j.addbeh.2018.02.014.
20. Orsal O, Ergun A. The Effect of Peer Education on Decision-Making, Smoking-Promoting Factors, Self-Efficacy, Addiction, and Behavior Change in the Process of Quitting Smoking of Young People. Risk Manag Healthc Policy. 2021; 14:925–45. doi: 10.2147/RMHP.S280393.
21. Akkuş D, Eker F, Karaca A, Kapısız Ö, Açıkgöz F. High School Youth Peer Education Program An Effective Model to Prevent Substance Abuse happen? J Psychiatr Nurs. 2016; 7:34–44. DOI: 10.5505/phd.2016.59489
22. Lisha NE, Jordan JW, Ling PM. Peer crowd affiliation as a segmentation tool for young adult tobacco use. Tob Control. 2016; 25:i83–9. doi: 10.1136/tobaccocontrol-2016-053086.
23. Jazwa A, Heath E, Jivani S, Redmon P, Sinha B. Lessons learned about post-secondary institution tobacco policy change by Tobacco-Free Generation Campus Initiative Grantees, 2018–2020. J Am Coll Health. 2021; 2023; 71:2016-2024. doi: 10.1080/07448481.2021.1953032.
24. Karletsos D, Hutchinson P, Leyton A, Meekers D. The effect of interpersonal communication in tobacco control campaigns: A longitudinal mediation analysis of a Ghanaian adolescent population. Prev Med. 2021 Jan; 142:106373. doi: 10.1016/j.ypmed.2020.106373.
25. Ran M, Peng L, Liu Q, Pender M, He F, Wang H. The association between quality of life (QOL) and health literacy among junior middle school students: a cross-sectional study. BMC Public Health. 2018; 18:1183. doi: 10.1186/s12889-018-6082-5.
26. Petteway R, Ames A. Baltimore City neighbor-hood health profiles. Baltimore: Baltimore City Health Department, 2011.
27. Fuentel, Pastor A, Conde P, Vazquez MS, Ramos C, Prousf MB, et al. Residents perceptions of the alcohol environment. A Participatory photovoice project in two districts with different socio-economic status in a large city. Health Place.2021; 69:102566. doi: 10.1016/j.healthplace.2021.102566.
28. Argan M, Yılmaz A, Argan MT, Yetim G. Anyone See My Voice? A Theoretical Framework on the Use Potential of the Photovoice Method in Sports Sciences. Gazi J Phys Educ Sport Sci. 2020; 25:149-66.

Author Contribution:

GM, NB: Concept, design, data acquisition, analysis, interpretation, drafting, revision, final approval, accountable for all aspects of the work.

SK, TG: Concept, design, data acquisition, analysis, interpretation, drafting, revision, final approval.