

# ORIGINAL ARTICLE

## Designing a Social Marketing-Based Intervention to Promote Sun-protective Behaviors among Urban Adolescent Boys: A Study Protocol

Mostafa Maleki<sup>1</sup>, MSc; Mohsen Shams<sup>2</sup>, PhD; Narges Roustaei<sup>3</sup>, PhD; Elham Shakibazadeh<sup>1</sup>, PhD

<sup>1</sup>Department of Health Education and Promotion, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran;

<sup>2</sup>Department of Health Education and Promotion, School of Health, Yasuj University of Medical Sciences, Yasuj, Iran;

<sup>3</sup>Department of Biostatistics and Epidemiology, School of Health, Yasuj University of Medical Sciences, Yasuj, Iran

### Corresponding Author:

Elham Shakibazadeh, PhD; Department of Health Education and Promotion, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Tel: +98 21 42933333; Fax: +98 21 42933261; Email: elham50sh@yahoo.com

Received: 21 February 2022    Revised: 01 August 2022    Accepted: 03 August 2022

### ABSTRACT

**Background:** Skin cancer is one of the most preventable diseases. The purpose of this study is to describe a social marketing-based intervention design protocol to promote sun-protective behaviors among adolescent boys living in urban areas in Yasuj, south west of Iran.

**Methods:** This study will be conducted based on six specific steps including a qualitative study, a systematic review, development of appropriate tools, a cross-sectional study, intervention designing, and a feasibility study. The main objective of the qualitative study is to elicit the views and opinions of adolescent boys, their parents, and teachers about sun-protective behaviors. In the second step, factors affecting sun-protective behaviors will be reviewed systematically. Based on the findings of the first and second steps, an appropriate model/theory of behavior change will be selected, and a standardized questionnaire will then be developed. In the fourth step, a cross-sectional survey will be conducted using the developed questionnaire to assess current sun-protective behavior practices.

**Results:** Findings of the first to fourth stages will provide a comprehensive picture of the issue and the affecting factors. During the fifth step, the structure and the content of the intervention package, as well as educational and promotional materials, will be developed and pre-tested. Finally, in the sixth step, a feasibility study will be conducted.

**Conclusion:** This study will provide practical information on the achieving of content and construct of a community-based social marketing intervention. This protocol reports on how to achieve audience-oriented insights for designing a tailored intervention aimed at promoting sun-protective behaviors among adolescent boys using social marketing.

**Keywords:** Adolescent, Skin Neoplasms, Social Marketing, Study Protocol, Sun Protection

**Please cite this article as:** Maleki M, Shams M, Roustaei N, Shakibazadeh E. Designing a Social Marketing-Based Intervention to Promote Sun-protective Behaviors among Urban Adolescent Boys: A Study Protocol. *IJCBNM*. 2022;10(4):290-300. doi: 10.30476/IJCBNM.2022.94408.1988.

## INTRODUCTION

As released in the systematic analysis for the global burden of disease study in 2019, the most common incident cancers in men were nonmelanoma skin cancer (4.3 million incident cases).<sup>1</sup> The direct and indirect costs of skin cancer and the mortality rates have an increasing trend worldwide.<sup>2,3</sup> The incidence rate of skin cancer in Iran is also increasing so it is now one of the most common types of cancer in this country.<sup>4</sup> As specified by the National Cancer Registry System in Iran, skin cancer was the third most prevalent cancer in the country and the second and the third most common cancers in males and females, respectively in 2016. Overall, 11.07% of all types of cancer in Iran are associated with skin cancer (non-melanoma), of which 9.49% and 7.69% of the cases reported among men and women, respectively.<sup>5</sup>

Most types of skin cancer attributed to cumulative exposure to ultraviolet (UV) rays.<sup>6</sup> Excessive exposures to sunlight in the early years of life, particularly in childhood and teenage years, increases skin cancer risks in later life; accordingly, during this period, the more sunburns a person receives, the higher the risk of skin cancer will be in later years.<sup>7,8</sup>

Studies show that due to exposure of adolescents to sunburn, adolescence is an important period of life to increase the risk of skin cancer in later life.<sup>9,10</sup> A systematic review conducted in the United States of America showed that 80% of the exposures to UV rays could take place before the age of 20.<sup>11</sup> It was concluded that the most efficient sun protection programs are implemented during childhood and adolescence.<sup>12,13</sup> There is ample evidence that adolescent-focused interventions are cost-effective in preventing skin cancer.<sup>14,15</sup> Therefore, the teenage years are a very important period for the primary prevention of skin cancer caused by cumulative sun exposure.

According to the evidence, 86% of skin cancers are preventable using sun-protective measures.<sup>16</sup> However, studies show that sun-protective behaviors are not desirably being

practiced among different groups of people.<sup>4,17</sup> Results of a review in Iran revealed that individuals and groups recruited in various studies respected sun-protective behaviors as essential measures, however, they did not fully perceive the severity of the harmful effects of sunlight on their skin, and they did not even have good attitudes towards this issue. The findings of this study implied that measures taken to prevent skin cancer were at a low level among Iranians in most cases.<sup>17</sup> In another study in Iran, 58.8% of the participants believed that using sunscreen was challenging. In this respect, less than two-thirds of the participants declared that protection measures such as using sunscreen and wearing long clothes could be effective in skin cancer prevention.<sup>18</sup>

Similar evidence showed that gender is a key determinant of sun-protective behaviors, in a way that boy teenagers take care of their skin much less than adolescent girls.<sup>13,19</sup> For example, a survey demonstrated that existing sun-protective behaviors among adolescent boys living in urban areas in Iran were poor even though they had moderate levels of knowledge and attitudes towards such behaviors.<sup>4</sup> In this regard, findings of a survey indicated that 72.2% of girls and 27.3% of boys were using sunscreen.<sup>13</sup> In another study, this rate for females and males was 80.4 and 13.5, respectively.<sup>19</sup> In general, many studies have been conducted in Iran and the world to promote sun protection behaviors among adolescent girls and boys, but the results of these studies show that adolescent boys perform less sun protection actions.<sup>20</sup> Therefore, adolescent boys are among the priority groups for promoting skin cancer prevention behaviors.

Adopting appropriate and effective community based behavioral strategies can significantly reduce the risk of skin cancer.<sup>21,22</sup> In studies conducted in Iran, the educational approaches used to prevent skin cancer.<sup>23</sup> While other approaches such as community-based or audience-oriented approach can also be used. Prevention of skin cancer among

different groups of community, including adolescents, is one of the cases in which community-based nursing can play a very effective role in designing and implementing preventive interventions. In this regard, the World Health Organization emphasizes the use of nurses' abilities and skills in improving the public health of the community, including the prevention of skin cancer.<sup>24</sup>

In similar study, it is recommended that school nurses should be involved in school health promotion programs to implement skin cancer intervention and training programs.<sup>25</sup> Similar studies addressed this issue that nurses are one of the most reliable reference groups for educating the public about skin cancer prevention behaviors.<sup>26, 27</sup>

Although skin cancer prevention behaviors among boys and girls have been studied in Iran, the social marketing approach has not been used. However, there is an emphasis on using this approach to promote sun protective behaviors.<sup>28, 29</sup> For example, a social marketing campaign was used to raise public awareness of the dangers of sunlight.<sup>28</sup> In Australia, a comprehensive, community-based social marketing intervention with participation of community-based nurses applied to raise awareness about adverse effects of ultraviolet rays of sun and methods of protection against it among the general public, including students.<sup>30</sup>

It seems that less attention has been paid to the community-based social marketing approach in designing skin cancer prevention programs among Iranian adolescents. This paper aims to present a study protocol for designing a social marketing-based intervention to promote sun-protective behaviors among urban adolescent boys.

## **MATERIALS AND METHODS**

This paper presents the different stages and components of each of these stages to determine the structure and content of social marketing-based intervention to promote sun-protection behaviors among male adolescents in Yasuj,

south west of Iran 2022.

In designing social marketing-based interventions, a qualitative study, and/or a quantitative study is performed to conduct audience, market, and channel analyses.<sup>31</sup> In the present study, the research team intends to use a combination of quantitative and qualitative studies for this purpose. By conducting formative research, the characteristics of the target group, their views and opinions about promoting sun-protective behaviors, appropriate and effective communication channels, and the initial idea for intervention will be identified.

The following steps will be conducted to achieve a tailored intervention: a qualitative study, a systematic review, development of appropriate tools, a cross-sectional study, intervention designing, and a feasibility study. Each of these steps is described in detail below.

### *Qualitative Study*

A qualitative study with directed content analysis will be conducted based on the social marketing approach and its main concepts particularly the marketing mix or product, price, place and promotion (4 Ps). The 4 Ps of marketing are the key factors that are involved in social marketing interventions.<sup>32</sup>

The qualitative study aims to obtain the view and opinions of the participants about the benefits of sun protection behaviors and their' barriers, their preferred methods to promote sun-protective behaviors, their desired communication channels for communicating with adolescent boys, and to convey messages and contents of the intervention. Our qualitative study will be conducted with three groups: adolescents aged 12-18 years, their parents, and their teachers. The purposeful sampling method with maximum variation will be used to select the interviewees.

Focus group discussions and in-depth individual interviews will be used for qualitative data collection. The interviews with participants will be conducted in the schools. To do this, these people will be

coordinated in advance and they will be invited to the school for an interview. Among the teachers, those with at least two years of work experience will be interviewed.

The adolescents and their teachers will be face-to-face interviewed and parents will participate in a focus group discussion meeting with 8-12 participants. A note-taker and a facilitator will be present in each meeting. All the interviews and focus group discussions will be directed by the first author. At the beginning of each interview and focus group discussion meeting, the main objectives of the study will fully be explained to the participants and they will be ensured that participation or withdrawal in this study will be voluntary and their personal information remains confidential. After that, the participants will be asked to sign a written consent form. In addition to the written consent of their parents or legal guardians, assent of adolescents will be earned. All interviews will be recorded by a voice recorder. The following semi-structured questions will be used for the interviews. The guide questions raised in the focus group discussions or in-depth individual interviews are based on the 4Ps of the marketing mix, including:

1. In your opinion, are there any sun-preventive behaviors among adolescent males in Yasuj? If yes? What are they?
2. In your opinion, what are the benefits of sun-protection practices among teenage boys?
3. What barriers does a teenage boy face if he wants to practice sun-preventive behaviors?
4. In your opinion, what motivates adolescent boys to practice sun-protection behaviors?
5. Who has the most influence on teenage boys to practice sun-preventive behaviors? Why?
6. Which settings are more appropriate to educate and encourage adolescent boys to practice sun-protection behaviors?
7. What do you suggest to encourage teenage boys to practice sun-protection behaviors?

Data will be collected until data saturation. Data will be analyzed by using the MAXQDA software (ver. 10). We will use directed content analysis to categorize the data.<sup>32</sup>

In the present study, qualitative data collection and analysis regarding the sun-protective behaviors will be conducted based on the social marketing mix, namely the features of the protective behaviors against the harmful effects of sunlight as a product (product), the costs of the product (price), the location where these behaviors occur (place) and the way this product is promoted (promotion). Data analysis will be performed simultaneously with data collection and will be carried out by using directed content analysis in three phases, namely preparation, organization, and reporting. In the preparation phase, the audio files of each interview will be typed word by word. The researcher will listen to the tapes several times and will review the transcribed texts, in such a way as to reach a general understanding of the data. In the organization phase, an inductive approach will be used to carry out the analysis by breaking the text into separate lines, extracting the meaning units, and performing open coding. The initial codes will be categorized based on their similarities and differences according to the social marketing mix or 4Ps. During the constant comparison of the data, the sub-categories that arise will be merged or eliminated and the results will be reported as the concepts of the social marketing mix.

Two researchers will read the qualitative data separately and assign their desired codes to the participants' answers at the sentence level. Once the coding is completed, both researchers check each other's codes and reach a consensus. Otherwise, a third opinion will be asked for disagreements. One of the researchers will subsequently group the codes extracted from the marketing mix categories and will discuss them with the other researcher to reach an agreement.

Four criteria proposed by Guba and Lincoln will be used for the trustworthiness of qualitative data. These four criteria are

credibility, dependability, transferability, and confirmability.<sup>33,34</sup> To achieve credibility these actions will be done: in-depth interviews in multiple sessions and situations, the researcher's prolonged engagement in the data, selection of variant participants with different characteristics, member check by participants, and the control and supervision of the researchers on all stages of the study. A complete recording of decisions and activities, re-coding of interviews and comparison of two codes, and use of observer review will be used to attain dependability. Transferability will be gained through an accurate and purposeful description of the study method, and an external review of research results to judge whether there are similarities between research results and their own experiences. A member of the research team will check codes, and extracted categories to be sure about the confirmability.

#### *Systematic Review*

A systematic review will be conducted, aimed at systematically reviewing qualitative and quantitative studies without limitation in their methodology to address 1) What factors are shaping sun-protective behaviors among adolescent boys? and 2) What interventions have been effective to promote sun-protective behaviors among adolescent boys?

The systematic protocol will be registered in the PROSPERO. The search strategy will be developed for Web of Science, PubMed, Scopus, Cochrane and Scientific Information Database, IranMedex, and Magiran in Persian through the identification of all relevant terms. Documents from 2000 to 2022, focusing on sun-protection behaviors, without any restrictions on geographical locations or study design, published in English and Persian will be included. If a full text of the papers will not be available, that paper will be excluded.

We will also search grey literature and review the reference lists of relevant studies to identify additional studies. The articles' titles will be independently reviewed by two reviewers, and those irrelevant to the topic

will be excluded. The abstracts and the full texts of all potentially eligible papers will be reviewed based on inclusion criteria by two reviewers. A third reviewer will help to resolve disagreements. For all articles that will meet the inclusion criteria, the quality assessment will be performed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist.<sup>35</sup> Two reviewers will conduct the assessment independently, with discussion until consensus will reach in the case of discrepancies. Data will be extracted using a standardized form developed for the review. To report the systematic review findings, the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) will be used as a standardized checklist.

#### *Development an Appropriate Tool*

The research team will identify appropriate theory/ies of behavior change suited to the study objectives using the findings of the qualitative study and systematic review.

To achieve a standardized questionnaire based on the selected theory, the research team will develop an appropriate tool. The psychometric properties will be conducted for the designed tool. Content validity ratios, content validity index, face validity, and construct validity (exploratory factor analysis and confirmatory factor analysis) will be used in the validity calculation section. After content validity and face validity have been confirmed, a questionnaire will be provided to 300 adolescents aged 12-18 years using a multi-stage sampling method. According to reliable resources about sample size determination for Cronbach's Alpha test, the sample size of 300 people is suitable for reliability.<sup>36,37</sup> After completing the questionnaire and entering the data, the reliability of the instrument will be determined based on the calculation of Cronbach's alpha and McDonald's omega.

#### *Cross-Sectional Survey*

Current sun-protective behaviors and the effective factors will be assessed using the tool among adolescent boys aged 12-18 years

in Yasuj. The sample size will be calculated based on the Cochran formula. Multi-stage cluster sampling method will be used to select the participants.

The data will be collected in the secondary and high schools of the Yasuj. Inclusion criteria will be: being adolescent boys aged 12-18 years, having informed consent, and signing the participation form by themselves or their parents. Adolescents will be excluded from the study if they have skin problems or diseases. Data will be analyzed in SPSS (ver. 16) using the descriptive and analytical (Chi-squared test, ANOVA, correlation, and regression analysis) statistic tests. The results will be used to design the intervention package.

#### *Intervention Development*

By using the findings of the previous steps (qualitative study, systematic review, and the cross-sectional survey), the structure and the contents of the social marketing-based intervention package will be designed to promote sun-protective behaviors among adolescent males. The intervention will reflect the views and opinions of adolescents, their parents, and their teachers as well as the components of the marketing mix. Once the intervention is developed, its components, as well as educational and promotional materials and media, will be developed, pre-tested, and revised by the target group. To do the pre-test, we will collect the opinions and comments of adolescents through face-to-face interviews and related experts by emailing the materials and messages. In the pre-test, we will ask about the simplicity and comprehensibility, the ability of the messages to capture the audience's attention, the persistence of the messages in the mind of the audience, and the messages acceptance by the participants. The materials and messages will be revised based on the collected comments.

#### *Feasibility Study*

After the development of the intervention package, the research team

will seek to investigate the possibility of its implementation. For this purpose, acceptance, demand, implementation, and practicality of the intervention package components will be evaluated.<sup>38</sup> Acceptance of the intervention package means the reaction by the target group members and those involved in the implementation of the intervention (i.e., providers of the intervention package and the target group to whom the components of the intervention are provided) towards the intervention. Demand represents the probability of utilizing the intervention components by the target group members. Moreover, the implementation of the intervention package indicates how successfully the intervention program components can be presented or implemented to the target group and the practicality denotes how much the intervention package can be implemented in practice with the target group, given the resources and tools available and the existing conditions.

Most feasibility studies are performed with small sample sizes, wherein researchers are not looking for an adequately large sample size to perform statistical tests to confirm or reject hypotheses.<sup>39</sup> Accordingly, in the present study, a feasibility study will be conducted with a sample size appropriate to the existing conditions and the resources available. According to the components of the intervention package, the researcher will check to what extent these components are applicable.

To carry out the feasibility study, the researcher will first go to Yasuj Education Department and provide them with an intervention package and check their consent to implement the designed intervention. After obtaining permission from the Education Department, a middle school and a high school will be randomly selected to conduct a feasibility study. After that the researcher will first get the support of schools' principals. After obtaining the consent of the schools' authorities, the researcher will attend the classes of both schools and briefly introduce

the study and its objectives. Students will then be asked how many of them would be willing to participate in the feasibility study. By answering of the students to this question, the percentage of adolescent participation in the intervention will be determined. After that, the contact number of the teenagers' parents will be received from the schools' principals, and each parent of the teenagers will be contacted and their consent for their teenagers' participation in the study will be checked. If the parents are also going to participate in the study, they will be asked if they want to participate in this study. In this way, the consent rate of parents for the participation of themselves and their teenagers in the implementation of the intervention will be determined. After the participation of teenagers and their parents in the study is determined, two groups will be formed on WhatsApp with the presence of parents and teenagers separately, and educational and promotional materials and media of the program (for example, booklets, posters, pamphlets, banners), infographics, short films, etc.) will be provided to them through this group. In addition, messages will be sent to parents to support and encourage teenagers to practice sun protective behaviors. Also remind teenagers to do these behaviors. In the group of teenagers, tailored messages based on appearance and health will be sent. These messages will be sent regularly every day at 8 AM to encourage teenagers to practice protective behaviors against the sunlight. Questions and answers will be provided in WhatsApp groups to answer the questions of parents and teenagers.

In each school, a meeting will be held with the presence of principals and assistants and all teachers, and the study and its objectives will be fully presented to them, and the role of teachers and school principals in promoting skin cancer prevention behaviors will be emphasized. With the cooperation of school administrators and teachers, preparations will be made for holding parts of the intervention (for example, holding educational sessions

for students, carrying out brief interventions by the teachers) that are supposed to be implemented in the school.

After obtaining the consent and cooperation of administrators and teachers, this part of the intervention will be held in schools. For example, how to implement a brief intervention by the teachers (if determined based on the results of formative research) will be explained to them, and the implementation guide will be provided to all school teachers. They are requested to follow the brief intervention guide every time they come to teach in any of the classes and encourage students to protect their skin by performing protective behaviors against sunlight. In addition, it will be coordinated with school administrators and their consent to install posters and banners (if determined based on the results of formative research) will be examined in schools.

Training sessions (if determined based on the results of formative research) will be held by the person or teachers with whom the students have a better relationship. After that, a meeting will be held with the desired person or teacher and the program will be fully explained to them and their cooperation will be sought to hold training sessions. In order to hold training sessions, the content of the program along with the lesson plan of the training sessions will be given to the desired person or teachers and he will be requested to hold the sessions according to the lesson plan and goals of the program. In the WhatsApp group formed with the presence of students, the time of educational sessions is announced and they are invited to participate in the sessions. In this way, the percentage of students' participation in educational sessions is also determined. At the end of the educational sessions, reminder educational materials (such as pamphlets) will be distributed among the students.

#### *Ethical Considerations*

This study is based on the Ph.D. thesis approved by the Ethics Committee of Tehran

University of Medical Sciences, Tehran, Iran, with the Ethics code no. IR.TUMS.SPH.REC.1398.238. All the individuals in this study will receive full explanations about the objectives, data collection tools and methods, data collection time and place, reasons and necessity of their participation in the study, the confidentiality of their personal information and comments, and the right to withdraw from the study at any stage whenever they wish. They will be included in the study after obtaining informed written consent. After obtaining assent of adolescents and written consent of their parents or legal guardian, they enter in the study.

## DISCUSSION

The rate of skin cancer is rising in many countries, including Iran. The most important cause of skin cancer is constant exposure to sunlight, which varies between different age groups. Of all cancers, skin cancer has the greatest potential for prevention, and primary prevention measures are the key to preventing and controlling skin cancer.<sup>12</sup> Therefore, designing intervention programs aimed at promoting protective behaviors in different groups is essential. This report reflects on various steps towards achieving a tailored social marketing-based intervention package to promote sun-protective behaviors among adolescent boys. In social marketing, a comprehensive analysis of behaviors is conducted for providing a comprehensive picture of the current patterns and trends of current audience behaviors.<sup>34</sup> Examining the current behaviors of the target group and the relevant factors shaping them can accordingly help planners and health care providers have a clear picture of the target group and their health problems to design and implement tailored intervention programs. In this protocol, it is predicted that the current behaviors in the target group can be investigated through a qualitative study, a review study, and a cross-sectional survey. In this regard, it is emphasized that a combination of quantitative and qualitative

study findings should be used in order to obtain a better and deeper understanding of the facilitating factors and barriers to performing sun-protective behaviors. In the current study protocol, qualitative and quantitative data collection will help better understand sun-protective behaviors among adolescent boys. Other researchers also used different study methods to extract the views and opinions of teenagers and use them to develop the content of the intervention. For example, in a study in Australia, semi-structured telephone interviews were conducted with 10 teenagers aged 12 to 13 years to determine how they made decisions about sun protection.<sup>40</sup> In another similar study, 25 group discussion sessions were held with 188 teenagers in order to extract their views and perceptions about skin cancer prevention and their preferences regarding educational methods.<sup>41</sup> In another study, a collaborative approach was used to design program messages with the presence of 59 teenagers aged 11-14. In this study, 80 drafted messages were pre-tested and finalized in four focus group discussion sessions with teenagers.<sup>42</sup>

The results of the present study are expected to lead to a community-based intervention at the family and school level to prevent skin cancer. Community-oriented nurses can play a very effective role in implementing this intervention and achieving its goals. In similar studies, nurses participated in the design and implementation of this type of intervention. For example, in a study that sought to promote the use of sunscreen and increase skin self-examination among adolescents, nurses provided training sessions and how to self-examine the skin.<sup>43</sup> In this regard, it is emphasized that the role of nurses should not be neglected in programs to awareness raising of the public about the harms of sunlight and protective behaviors against it.<sup>44</sup> Coordinating parents at specific times and places for focus group discussion sessions may not be possible. In this case, the researcher will collect qualitative data in the form of individual interviews with prior coordination with them. It can be a potential

limitation for the present study.

## CONCLUSION

This protocol describes the steps to achieve the structure and the contents of a community based social marketing intervention to promote sun-protective behaviors among adolescent boys living in urban areas in Yasuj, Iran. It is expected that based on the developed protocol, it will be possible to achieve audience-oriented insights, by which a tailored intervention package will be designed and implemented to promote sun-caring behaviors among male adolescents.

## ACKNOWLEDGEMENT

The present paper was financially supported by Tehran University of Medical Sciences. We gratefully acknowledge the University.

**Conflict of Interest:** None declared.

## REFERENCES

- 1 You L, Lv Z, Li C, et al. Worldwide cancer statistics of adolescents and young adults in 2019: a systematic analysis of the Global Burden of Disease Study 2019. *ESMO Open*. 2021;6:100255.
- 2 Mirzaei-Alavijeh M, Gharibnavaz H, Jalilian F. Skin cancer prevention: psychosocial predictors of sunscreen use in university students. *Journal of Cancer Education*. 2020;35:187-92.
- 3 Pakzad R, Soltani S, Salehiniya H. Epidemiology and trend in skin cancer mortality in Iran. *Journal of Research in Medical Sciences*. 2015;20:921-2.
- 4 Janjani H, Nedjat S, Yunesian M, et al. Sun exposure and health safety practices of high school students in an urban population of Iran. *BMC Public Health*. 2019;19:1736.
- 5 Khanali J, Kolahi AA. National and Subnational Cancer Incidence for 22 Cancer Groups, 2000 to 2016: A Study Based on Cancer Registration Data of Iran. *Journal of Cancer Epidemiology*. 2021;2021:6676666.
- 6 Bowers JM, Hamilton JG, Wu YP, et al. Acculturation, sun tanning behavior, and tanning attitudes among asian college students in the northeastern USA. *International Journal of Behavioral Medicine*. 2022;29:25-35.
- 7 Kvaskoff M, Pandeya N, Green AC, et al. Site-specific determinants of cutaneous melanoma: a case–case comparison of patients with tumors arising on the head or trunk. *Cancer Epidemiology and Prevention Biomarkers*. 2013;22:2222-31.
- 8 da silva ES, Tavares R, da silva Paulitsch F, Zhang L. Use of sunscreen and risk of melanoma and non-melanoma skin cancer: a systematic review and meta-analysis. *European Journal of Dermatology*. 2018;28:186-201.
- 9 Askarian M, Dehghani Z, Danaei M, Vakili V. Knowledge and practice of medical students on healthy lifestyle: a cross-sectional study in Shiraz. *Journal of Health Sciences & Surveillance System*. 2013;1:77-82.
- 10 Wright CY, Albers PN, Oosthuizen MA, Phala N. Self-reported sun-related knowledge, attitudes and behaviours among schoolchildren attending South African primary schools. *Photodermatology, Photoimmunology & Photomedicine*. 2014;30:266-76.
- 11 Vasicek BE, Szpunar SM, Manz-Dulac LA. Patient knowledge of sunscreen guidelines and frequency of physician counseling: a cross-sectional study. *The Journal of Clinical and Aesthetic Dermatology*. 2018;11:35-40.
- 12 Henrikson NB, Morrison CC, Blasi PR, et al. Behavioral counseling for skin cancer prevention: evidence report and systematic review for the US Preventive Services Task Force. *JAMA*. 2018;319:1143-57.
- 13 Patel AR, Zaslow TL, Wren TA, et al. A characterization of sun protection attitudes and behaviors among children and adolescents in the United

- States. *Preventive Medicine Reports*. 2019;16:100988.
- 14 Fitch-Martin AR, Menger LM, Loomis AD, et al. "We don't really do anything unless it's really bad": Understanding adolescent sun protective knowledge, attitudes and behaviors in the US. *The Journal of Primary Prevention*. 2018;39:371-86.
  - 15 Shih ST, Carter R, Heward S, Sinclair C. Skin cancer has a large impact on our public hospitals but prevention programs continue to demonstrate strong economic credentials. *Australian and New Zealand Journal of Public Health*. 2017;41:371-6.
  - 16 Robertson FML, Fitzgerald L. Skin cancer in the youth population of the United Kingdom. *Journal of Cancer Policy*. 2017;12:67-71.
  - 17 Nahar VK, Hasani Z, Martin B, et al. Perceptions and practices of the Iranian population regarding skin cancers: a literature review. *Journal of Skin Cancer*. 2017;2017:4934108.
  - 18 Dehbari SR, Dehdari T, Dehdari L, Mahmoudi M. Predictors of sun-protective practices among Iranian female college students: application of protection motivation theory. *Asian Pacific Journal of Cancer Prevention*. 2015;16:6477-80.
  - 19 Golpour M, Bahari M, Hashemi SA, Golpour B. Knowledge level of school students and its related factors about the methods of protecting their body against sunlight exposure. *International Journal of Medical Investigation*. 2014;3:112-6.
  - 20 Thoonen K, van Osch L, de Vries H, et al. Are environmental interventions targeting skin cancer prevention among children and adolescents effective? A systematic review. *International Journal of Environmental Research and Public Health*. 2020;17:529.
  - 21 Bleakley A, Lazovich D, Jordan AB, Glanz K. Compensation behaviors and skin cancer prevention. *American Journal of Preventive Medicine*. 2018;55:848-55.
  - 22 Brunssen A, Waldmann A, Eisemann N, Katalinic A. Impact of skin cancer screening and secondary prevention campaigns on skin cancer incidence and mortality: a systematic review. *Journal of the American Academy of Dermatology*. 2017;76:129-39.
  - 23 Hazavehei SMM, Salimi N, Gheysvandi E, et al. The effect of educational interventions in increasing skin cancer preventive behaviors in people over 18 years: a systematic review. *Medical Science Journal of Islamic Azad University-Tehran Medical Branch*. 2018;28:171-80. [In Persian]
  - 24 Aygun O, Ergun A. The impact of sun protection program on the sun protection behavior of adolescents. *Clinical and Experimental Health Sciences*. 2018;8:166-74.
  - 25 Owen AL, Grogan S, Clark-Carter D, Buckley E. The impact of an appearance-focused facial-ageing intervention on adolescents' attitudes toward sun protection. *British Journal of School Nursing*. 2018;13:436.
  - 26 Aygun O, Muslu GK. The effect of a school-based sun protection program on students' sun protection behavior in Turkey. *Journal of Pediatric Nursing*. 2021;59:e61-9.
  - 27 Erkin Ö, Temel AB. A nurse-led school-based sun protection programme in Turkey. *Central European Journal of Public Health*. 2017;25:287-92.
  - 28 Correia J, Silva SC, Duarte P. The Importance of Social Marketing in Skin Cancer Prevention: The Case of Portugal. In: Galan-Ladero MM, Rivera RG, (eds). *Applied Social Marketing and Quality of Life*. USA: Springer; 2021. p. 47-61.
  - 29 Crowley T, Murphy M. Does Social Marketing Have a Role in Skin Cancer Education and Prevention? In: Wymer W, (eds). *Innovations in Social Marketing and Public Health Communication*. USA: Springer; 2015. p. 263-77.
  - 30 Sinclair C, Foley P. Skin cancer prevention in Australia. *The British Journal of*

- Dermatology. 2009;161:116-23.
- 31 Meier PS, Warde A, Holmes J. All drinking is not equal: how a social practice theory lens could enhance public health research on alcohol and other health behaviours. *Addiction*. 2018;113:206-13.
  - 32 Lindgren BM, Lundman B, Graneheim UH. Abstraction and interpretation during the qualitative content analysis process. *International Journal of Nursing Studies*. 2020;108:103632.
  - 33 Cope DG. Methods and meanings: credibility and trustworthiness of qualitative research. *Oncology Nursing Forum*. 2014;41:89-91.
  - 34 Schwandt TA, Lincoln YS, Guba EG. Judging interpretations: But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Evaluation*. 2007;2007:11-25.
  - 35 Jun H, Yoon SH, Roh M, et al. Quality Assessment and Implications for Further Study of Acupotomy: Case Reports Using the Case Report Guidelines and the Joanna Briggs Institute Critical Appraisal Checklist. *Journal of Acupuncture Research*. 2021;38:122-33.
  - 36 Bujang MA, Omar ED, Baharum NA. A review on sample size determination for Cronbach's alpha test: a simple guide for researchers. *The Malaysian Journal of Medical Sciences*. 2018;25:85-99.
  - 37 Kyriazos TA. Applied psychometrics: sample size and sample power considerations in factor analysis (EFA, CFA) and SEM in general. *Psychology*. 2018;9:2207-30.
  - 38 Bakker JP, Goldsack JC, Clarke M, et al. A systematic review of feasibility studies promoting the use of mobile technologies in clinical research. *NPJ Digital Medicine*. 2019;2:47.
  - 39 Hubbard G, Cherrie J, Gray J, et al. Sun protection education for adolescents: a feasibility study of a wait-list controlled trial of an intervention involving a presentation, action planning, and SMS messages and using objective measurement of sun exposure. *BMC Public Health*. 2020;20:131.
  - 40 Gamage N, Nguyen R, Clare IM, et al. Sun-health behaviours and attitudes towards sun safety amongst Australian teenagers: a qualitative update. *BMC Research Notes*. 2021;14:349.
  - 41 Abraham O, Szela L, Feng E, et al. Exploring Youth Perceptions About Cancer Prevention and Preferences for Education: a Qualitative Study. *Journal of Cancer Education*. 2021. doi:10.1007/s13187-021-02077-0
  - 42 Hingle MD, Snyder AL, McKenzie NE, et al. Effects of a short messaging service-based skin cancer prevention campaign in adolescents. *American Journal of Preventive Medicine*. 2014;47:617-23.
  - 43 Hubbard G, Kyle RG, Neal RD, et al. Promoting sunscreen use and skin self-examination to improve early detection and prevent skin cancer: quasi-experimental trial of an adolescent psycho-educational intervention. *BMC Public Health*. 2018;18:666.
  - 44 Sumen A, Oncel S. Effect of skin cancer training provided to maritime high school students on their knowledge and behaviour. *Asian Pacific Journal of Cancer Prevention*. 2015;16:7769-79.