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# The effects of face-to-face education for student health ambassadors on the health-promoting lifestyle of adolescent female students: a randomized controlled trial

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## Abstract

**Aim** Adolescence is a critical life stage with significant effects on lifestyle in later life. Promoting adolescents' lifestyle requires the use of appropriate educational approaches. This study aimed to evaluate the effects of face-to-face education for student health ambassadors (SHA) on the health-promoting lifestyle of adolescent female students.

**Subject and methods** This randomized controlled trial was conducted in 2018. A random sample of 208 adolescent female students was recruited from public schools for girls in Tehran, Iran, and allocated through cluster randomization to a control and an intervention group. Twelve students were selected from the intervention group as SHAs and were provided with face-to-face training about health-promoting lifestyle in five one-hour sessions. Then, they provided indirect education about health-promoting lifestyle to their peers during daily school activities and conversations. Prior to and two months after the study intervention, participants' health-promoting lifestyle was assessed using the Adolescent Health Promotion Short Form. The SPSS program (v. 24.0) was used for data description, and the Stata program (v. 13.0) was used for data analysis using the independent-samples *t* test, the chi-square test, and linear regression analysis.

**Results** There were no significant between-group differences with respect to the pretest mean scores of health-promoting lifestyle and its dimensions ( $P > 0.05$ ). However, the post-test mean scores of health-promoting lifestyle and its dimensions in the intervention group were significantly greater than the control group ( $P < 0.001$ ).

**Conclusion** Face-to-face education for SHAs significantly improves the success of their positive influence on the health-promoting lifestyle of adolescent female students. Integration of face-to-face training in ambassador-based health-promotion programs is recommended to increase the effectiveness of such programs.

**Keywords** Education · Health ambassadors · Health-promoting lifestyle · Adolescent girls

## Introduction

Lifestyle is a determining factor of health (Stanhope et al. 2019). Health-promoting lifestyle (HPL) refers to engagement in behaviors which empower individuals to gain greater control and promote both individual and public health (Snelling 2014). HPL has six main components, namely nutrition,

physical activity, life appreciation, social support, health responsibility, and stress management (Chen et al. 2014). According to the World Health Organization (WHO), 70–80% of all deaths in developed countries and 50–60% of deaths in developing countries are related to lifestyle. The lifestyle-related global death rate is progressively increasing and will reach 75% by 2030. Therefore, the WHO noted that lifestyle modification can help manage many health risks, including early deaths (Arazi et al. 2017).

Lifestyle includes healthy and unhealthy habits and behaviors which are mostly shaped during adolescence (Raj et al. 2013). In other words, adolescence is the best time for the formation of positive lifestyle habits and behaviors. Therefore, addressing the healthcare needs and promoting the lifestyle of adolescents, particularly female adolescents, are among the main goals of the WHO (Cherry et al. 2016; WHO 2018). However, studies in

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Iran report that female adolescents have an unhealthy lifestyle (Balali Meybodi et al. 2017; Heshmati et al. 2014; Vaezi et al. 2012).

Education is one of the key factors affecting lifestyle. Providing education to adolescents in educational settings can help promote a healthy lifestyle (Nies and McEwen 2018). Hence, developing and implementing educational programs to improve adolescents' HPL are essential and inevitable (Lloyd et al. 2017). Peer education is considered as an appropriate method for improving adolescents' knowledge. The aim of peer education is to improve knowledge, change attitudes and beliefs, and develop abilities that are necessary for engagement in health-related behaviors (Nelson and Nickols-Richardson 2014). The history of using peer education for health-related purposes goes back to 1980. Currently, peer education is considered as a reliable method for health-related education, probably due to its interactive character (Iranian Ministry of Health, Treatment and Medical Education 2017).

In order to promote HPL among adolescents through peer education, the Health Department of the Ministry of Education of Iran launched the Student Health Ambassadors (SHA) Project in collaboration with the Education and Health Promotion Department of the Ministry of Health. SHAs are volunteer students who are interested in group activities in different areas of physical, mental, social, and spiritual health. The SHA Project is based on peer education and aims to encourage school students to engage in HPL behaviors. In this project, a self-care education booklet is given to SHAs at schools. They are asked to read the booklet and then obtain the necessary instruction from teachers who are affiliated to the project, and subsequently educate their peers (Iranian Ministry of Health, Treatment and Medical Education 2017). However, due to a number of barriers, SHAs currently receive training only through the self-care education booklet. Self-learning through reading the booklet may not be effective enough and may be associated with inaccurate understanding of the educational materials and transfer of erroneous or misleading information to peers. The other weaknesses of self-learning through reading the booklet only are the lack of opportunity for answering SHAs' questions, providing them with instant feedback, and promoting their motivation for peer education. On the other hand, no study has yet evaluated the effects of the SHA Project on adolescents' lifestyle. Therefore, the present study was designed and performed to address these gaps, the aim being to evaluate the effects of face-to-face education for SHAs on the HPL of adolescent female students.

## Methods

This randomized controlled trial was conducted in 2018. The study population comprised all junior high-school students in public girls' schools in District 17 of Tehran city, Iran.

Multistage sampling was used. There were 12 public girls' high schools in the district in which the SHA Project was launched at the time of the study. One school was randomly selected from these 12 schools. The school had 12 classes, from which six classes or clusters were randomly selected and allocated to a control and an intervention group. For random allocation, the selected six classes were numbered, and their numbers were written on similar cards. All cards were put in a box, and a member of the school staff was asked to randomly take three cards for the intervention group. All 106 students in those three classes were then allocated to the intervention group, and all 102 students in the three remaining classes to the control group. Inclusion criteria were an age of 13–15 years, agreement to participate in the study, and no affliction of serious physical, perceptual, or learning disorders based on self-report data. Voluntary withdrawal from the study and moving to another school were considered as exclusion criteria.

Sample size was calculated with a confidence level of 95%, a power of 80%, a standard deviation of 15, a between-group mean difference of 10, and a cluster random allocation effect of 2.45. Accordingly, a requirement of 86 students per group was determined to be needed. Considering a probable attrition rate of 15%, sample size was increased to 101 per group.

Data collection instruments were a demographic questionnaire and the Adolescent Health Promotion Short Form (AHP-SF). The researcher-made demographic questionnaire included 13 items on age, educational level, height, weight, grade point average, family size, birth rank, living arrangement, family monthly income, and father's and mother's educational levels and employment status. The AHP-SF was used to assess participants' HPL. This questionnaire was developed by Chen et al. in Taiwan in 2014 for high-school students aged 13–19 years (Chen et al. 2014). It has 21 items in six dimensions, namely nutrition (items 1–3), social support (items 4–7), health responsibility (items 8–11), life appreciation (items 12–15), physical activity (items 16–18), and stress management (items 19–21). Item scoring was performed on a five-point Likert scale from 1 ("Never") to 5 ("Always"), resulting in a total AHP-SF score of 21–105, with higher scores representing a healthier lifestyle. Chen et al. assessed and approved the validity and reliability of the questionnaire and reported a Cronbach's alpha of 0.9 (Chen et al. 2014). For psychometric evaluation in the present study, the AHP-SF was translated into Persian with the permissions of its developers, and its content validity was then qualitatively assessed and confirmed by a panel of experts. Reliability assessment in the present study also showed that the Cronbach's alpha and the test-retest intraclass correlation coefficient of the questionnaire were 0.83 and 0.81, respectively.

For the study intervention, all participants were initially asked to complete the study instruments under the supervision of the first author. Then, four students were selected from each

class in the intervention group—12 in total. They were provided with face-to-face education based on the self-care education booklet designed for the SHA Project, including the aspects of nutrition, physical activity, healthy nighttime sleep, problem-solving, healthy thinking, and management of stress, anger, health, and mental health. Training was provided to all 12 SHAs through lectures, group discussions, question-and-answer sessions, video presentations, the booklet, and pamphlets in five one-hour sessions held in three consecutive weeks. After that, these 12 SHAs started providing indirect education about HPL to their peers during daily school activities and conversations. SHAs in the control group did not receive any face-to-face education and provided education about HPL to their peers based on self-learning through the self-care education booklet. Two months after the intervention, the participants of both groups completed the study instruments.

The SPSS (v. 24.0) and the Stata (v. 13.0) programs were used for data analysis. The data were described using measures of descriptive statistics, namely relative frequency, mean, and standard deviation, and were analyzed through the independent-samples *t* test, the chi-square test, and linear regression.

This study was approved by the Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran (code: IR.TUMS.FNM.REC.1397.093), and was registered in the Iranian Registry of Clinical Trials (IRCT20180810040755N1). Participation in the study was voluntary, and data management was confidential. Informed consent was obtained from all participants. After the end of the study, face-to-face education was provided to SHAs in the control group in a question-and-answer session.

## Results

In total, 208 students in a control ( $n = 102$ ) and an intervention ( $n = 106$ ) group were studied. All participants completed the study and were included in the final data analysis (Fig. 1). The means of participant age, weight, and height in the control group were  $14.05 \pm 0.78$  years,  $52.65 \pm 10.42$  kg, and  $159.84 \pm 6.57$  cm, respectively. These values in the intervention group were  $14.06 \pm 0.82$ ,  $53.39 \pm 12.45$ , and  $160.53 \pm 6.8$ , respectively. Groups did not significantly differ from each other with respect to participants and parental characteristics ( $P > 0.01$ ; Table 1).

At pretest, the independent-samples *t* test showed no statistically significant differences between the study groups regarding the mean scores of HPL ( $P = 0.60$ ) and its six dimensions, namely nutrition ( $P = 0.76$ ), social support ( $P = 0.55$ ), health responsibility ( $P = 0.11$ ), life appreciation ( $P = 0.43$ ), physical activity ( $P = 0.43$ ), and stress management ( $P = 0.2$ ). However, the same test showed that the post-test mean

scores of HPL and all its dimensions in the intervention group were significantly greater than the control group ( $P < 0.001$ ; Table 2). Moreover, the results of the linear regression analysis showed that after adjusting for the effects of the pretest scores, the post-test mean scores of HPL and all its dimensions in the intervention group were significantly greater than the control group ( $P < 0.001$ ; Table 2).

## Discussion

This study evaluated the effects of face-to-face education for SHAs on the HPL of adolescent female students. Findings revealed the effectiveness of face-to-face education for SHAs in significantly improving the HPL among adolescent female students in the intervention group. Although none of the previous studies in Iran have evaluated the effects of face-to-face education for SHAs, many studies reported the positive effects of peer education on the different aspects of lifestyle, including nutrition, physical activity, life appreciation, social support, health responsibility, and stress management. For instance, a two-group study in Hong Kong showed that direct patient education about hand hygiene by hand hygiene ambassadors was significantly effective in promoting patients' hand hygiene practice (Cheng et al. 2016). A single-group pretest/post-test study in the United States also showed that education for health ambassadors by community health educators significantly improved knowledge and decision-making ability about prostate cancer among African Americans (Vines et al. 2017). All these findings confirm that teacher–learner direct interactions can improve the effectiveness of ambassador-based educational programs.

We also found that face-to-face lifestyle education for SHAs significantly improved their peers' nutritional behaviors. Similarly, a study in the United States showed that a community-based participatory education program for obesity prevention consisting of multimedia education, peer education, and encouragement for healthy eating had significant positive effects on students' dietary behaviors (Bogart et al. 2014). Another study in Iran also found that peer education had positive effects on the consumption of fruit and vegetables among housewives (Sheybani et al. 2018). Adolescents are highly influenced by their peers, and therefore healthy eating education by peers can prevent eating disorders through encouraging them to develop healthy dietary behaviors and habits and properly fulfill their nutritional needs.

Our study findings also showed that face-to-face education for SHAs significantly improved the mean score of students' social support. Similarly, a study in Iran reported the positive effects of peer education on health-promoting behaviors of guidance-school students (Madani et al. 2015). Adolescents are at a stage in their life where they experience different



**Table 1** Between-group comparisons with respect to participants' characteristics

| Group                              |                     | Control<br>( <i>n</i> = 102) |      | Intervention<br>( <i>n</i> = 106) |      | <i>P</i> value* |
|------------------------------------|---------------------|------------------------------|------|-----------------------------------|------|-----------------|
|                                    |                     | <i>n</i>                     | %    | <i>n</i>                          | %    |                 |
| Educational grade                  | Seventh             | 29                           | 28.4 | 33                                | 31.1 | 0.98            |
|                                    | Eighth              | 39                           | 38.2 | 34                                | 32.1 |                 |
|                                    | Ninth               | 34                           | 33.3 | 39                                | 36.8 |                 |
| Prior semester grade point average | Very good           | 79                           | 77.5 | 81                                | 76.4 | 0.88            |
|                                    | Good                | 23                           | 22.5 | 25                                | 23.6 |                 |
| Father's educational level         | Illiterate          | 1                            | 1    | 3                                 | 2.8  | 0.59            |
|                                    | Primary             | 43                           | 45.6 | 42                                | 36.2 |                 |
|                                    | Diploma             | 45                           | 45.3 | 48                                | 44.1 |                 |
|                                    | University          | 13                           | 12.3 | 13                                | 12.7 |                 |
| Mother's educational level         | Illiterate          | 3                            | 2.9  | –                                 | –    | 0.38            |
|                                    | Primary             | 38                           | 37.2 | 38                                | 35.9 |                 |
|                                    | Diploma             | 49                           | 48   | 54                                | 50.9 |                 |
|                                    | University          | 12                           | 11.8 | 14                                | 13.2 |                 |
| Family size                        | Less than four      | 75                           | 73.5 | 88                                | 83   | 0.22            |
|                                    | More than four      | 27                           | 26.5 | 18                                | 17   |                 |
| Father's employment status         | Employed            | 96                           | 94.1 | 101                               | 95.3 | 0.65            |
|                                    | Unemployed          | 6                            | 5.9  | 5                                 | 4.7  |                 |
| Mother's employment status         | Employed            | 12                           | 11.8 | 14                                | 12.5 | 0.77            |
|                                    | Housewife           | 90                           | 88.2 | 92                                | 87.5 |                 |
| Birth rank                         | First               | 61                           | 59.8 | 63                                | 59.4 | 0.27            |
|                                    | Second              | 24                           | 23.5 | 30                                | 28.3 |                 |
|                                    | Third or more       | 17                           | 16.7 | 13                                | 12.3 |                 |
| Living arrangement                 | With both parents   | 98                           | 96.1 | 97                                | 91.5 | 0.27            |
|                                    | With father         | 2                            | 2    | 3                                 | 2.8  |                 |
|                                    | With mother         | 2                            | 2    | 6                                 | 5.7  |                 |
| Family monthly income              | Inadequate          | 9                            | 8.8  | 13                                | 12.3 | 0.42            |
|                                    | Reasonably adequate | 31                           | 30.4 | 37                                | 34.9 |                 |
|                                    | Adequate            | 62                           | 60.8 | 56                                | 52.8 |                 |

\*: Results of chi-square test

*n* = number

internal and external changes, and they therefore need strong social support in order to cope with transitions and develop their potential abilities.

The study intervention also had significant positive effects on the health responsibility dimension of the HPL. This is in line with the findings of a former study (Yadaki et al. 2017) but contradicts the findings of another study (Safabakhsh and Nazemzadeh 2013). Responsibility towards one's own health is an ability which can be gradually learned and acquired since early childhood and manifests in lifestyle behaviors. Education can help individuals develop greater awareness of their health and feel greater responsibility towards it.

Our findings also demonstrated the effectiveness of face-to-face education for SHAs, as opposed to just self-education via a booklet, in significantly improving students' life appreciation. A previous study also reported the same finding (Schoberberger et al. 2015). Life appreciation during

adolescence has significant effects on later feeling successful and confident during adulthood. Adolescents with greater life appreciation are more aware of the benefits of self-care and healthy lifestyle, and make efforts to adopt a healthy lifestyle, consequently experiencing fewer health problems and thereby reducing overall mortality rates in the community.

We also found the positive effects of face-to-face education for SHAs on their peers' physical activity. In line with this finding, a former study reported the effectiveness of a peer-led program in significantly promoting physical activity among inactive adults (Castro et al. 2011). However, another study showed that school-based peer education in four forty-minute sessions through lectures, video presentations, and group discussions had no significant effects on physical activity among Chinese adolescents (Cui et al. 2012). This study attributed the ineffectiveness of peer education on physical activity to policies in China which require students to perform physical

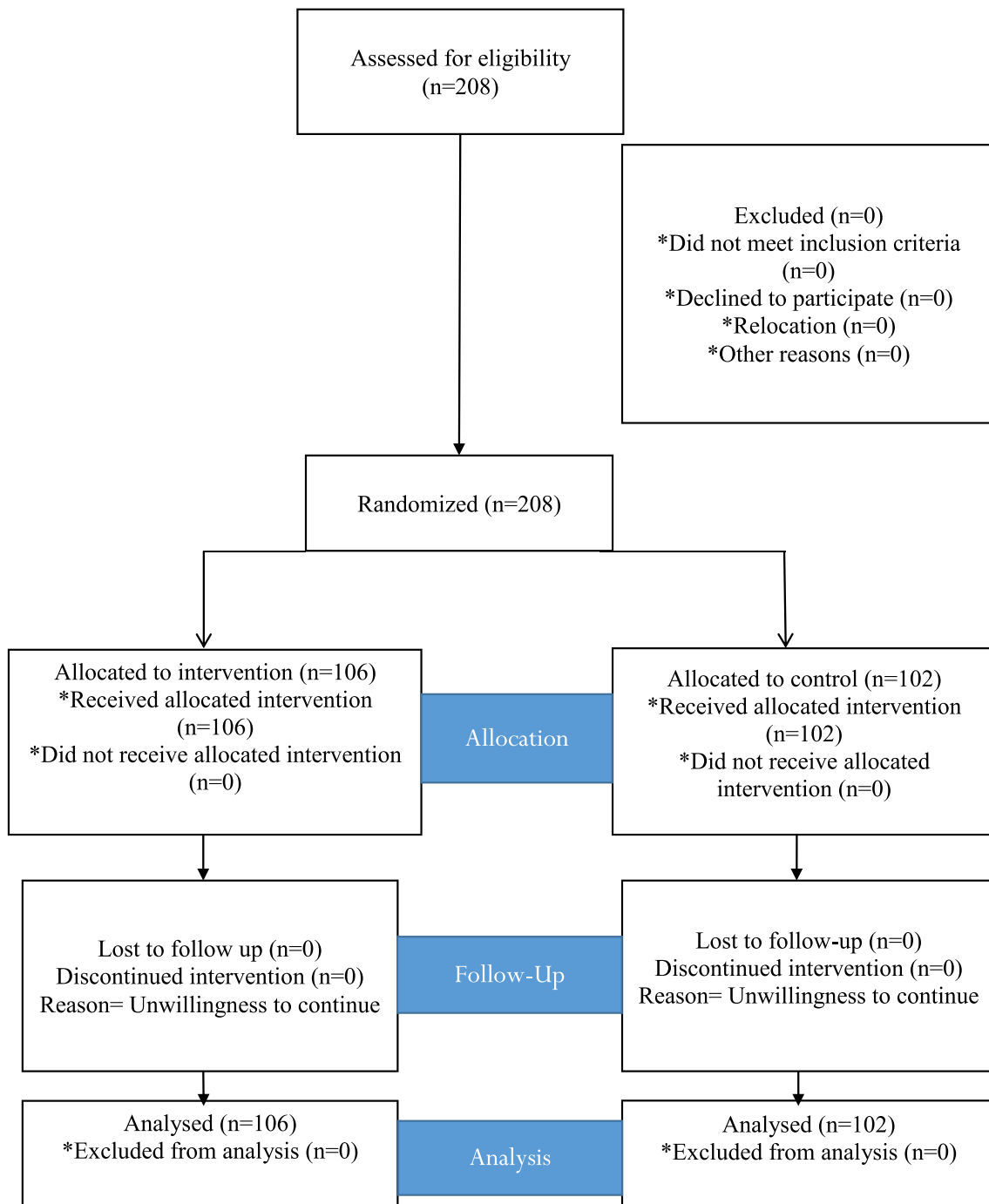


Fig. 1 Flow of participants in the study

activity at school for one hour a day. Such programs can indirectly affect the level of student physical activity out of school. Education on the positive effects of exercise and active lifestyle can, however, promote individual engagement in physical activity and thereby reduce the risk of early death.

The results of our study also demonstrated the significant positive effects of face-to-face education for SHAs on stress management among their peers. In line with this finding, a

former study showed that peer education was effective in significantly reducing stress among patients with multiple sclerosis (Dehghani et al. 2012), while another study into the promotion of health-related behaviors through peer education reported the ineffectiveness of a 12-session course about stress in significantly improving stress management ability among adolescents (Yan et al. 2014). This contradiction may be due to the differences between the studies with regard to their

**Table 2** Between-group comparisons respecting the total mean scores of HPL and its dimensions

| HPL dimension         | Group  | Control<br>( <i>n</i> = 102) |      | Intervention<br>( <i>n</i> = 106) |       | <i>P</i> value* | Adjusted <i>P</i> value <sup>^</sup> |
|-----------------------|--------|------------------------------|------|-----------------------------------|-------|-----------------|--------------------------------------|
|                       |        | Time                         | Mean | SD                                | Mean  |                 |                                      |
| Nutrition             | Before | 10.57                        | 2.55 | 10.67                             | 2.29  | 0.76            | <0.001                               |
|                       | After  | 10.44                        | 2.63 | 12.20                             | 2.34  | <0.001          |                                      |
| Social support        | Before | 15.28                        | 3.03 | 15.03                             | 3.06  | 0.55            | <0.001                               |
|                       | After  | 14.91                        | 3.32 | 16.06                             | 2.87  | <0.001          |                                      |
| Health responsibility | Before | 13.24                        | 3.72 | 12.41                             | 3.76  | 0.11            | <0.001                               |
|                       | After  | 12.82                        | 3.90 | 14.88                             | 3.81  | <0.001          |                                      |
| Life appreciation     | Before | 16.27                        | 3.08 | 16.59                             | 2.81  | 0.43            | <0.001                               |
|                       | After  | 15.72                        | 3.64 | 17.50                             | 2.53  | <0.001          |                                      |
| Physical activity     | Before | 9.98                         | 3.01 | 10.31                             | 3.13  | 0.43            | <0.001                               |
|                       | After  | 10.09                        | 3.43 | 12.05                             | 2.71  | <0.001          |                                      |
| Stress management     | Before | 10.63                        | 2.68 | 10.11                             | 3.20  | 0.20            | <0.001                               |
|                       | After  | 10.73                        | 2.89 | 12.06                             | 2.71  | <0.001          |                                      |
| Total                 | Before | 76                           | 12.4 | 75.15                             | 11.19 | 0.60            | <0.001                               |
|                       | After  | 74.73                        | 14.4 | 84.79                             | 11.94 | <0.001          |                                      |

\*: Results of independent-samples *t* test; ^: Results of linear regression analysis

HPL = health-promoting lifestyle

*n* = number

SD = standard deviation

contexts and participant characteristics such as dietary and smoking behaviors and stress management knowledge. Students from different cultural backgrounds also show different reactions to stressors which may either help manage the stressors or result in experiencing higher levels of stress. Although it may not be possible to completely eliminate the sources of stress, stress management education can help individuals cope with their stress and reduce the negative effects of stressors.

The main limitation of this study was the impossibility of comparing the lifestyle of our participants with that of students who did not receive peer education through the SHA Project. Among the strengths of the study was cluster random allocation of participants to the study groups which helped prevent between-group information leakage.

## Conclusion

This study suggests that face-to-face education for SHAs has positive effects on the different aspects of the HPL among adolescent female students. Face-to-face education is an interactive and active teaching method which provides opportunities for giving instant feedback, having group discussions, and answering learners' questions immediately. Considering the significantly higher HPL scores in the intervention group in our study, allocating larger human and financial resources to face-to-face education for SHAs is rational. The findings of the present study can be used as a basis for further studies into

the SHA Project. Health and education policy-makers are recommended to develop and implement face-to-face education programs for SHAs in order to improve the effectiveness of the SHA Project, improve adolescents' HPL, and thereby improve public health and facilitate sustainable development.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Informed consent** Informed consent was collected from every participant.

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