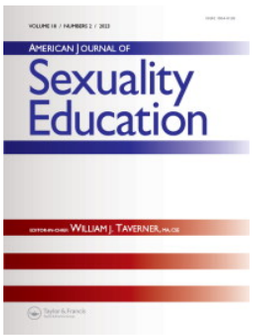

American Journal of Sexuality Education

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/wajs20

The Effect of the Transtheoretical Model-Based Healthy Youth Program on Sexual Health Knowledge and Behavior of College Women

Ozlem Karatana, Ayse Ergun & Saime Erol

To cite this article: Ozlem Karatana, Ayse Ergun & Saime Erol (2023) The Effect of the Transtheoretical Model-Based Healthy Youth Program on Sexual Health Knowledge and Behavior of College Women, American Journal of Sexuality Education, 18:2, 300-317, DOI: 10.1080/15546128.2022.2086655

To link to this article: https://doi.org/10.1080/15546128.2022.2086655

AMERICAN JOURNAL OF SEXUALITY EDUCATION
2023, VOL. 18, NO. 2, 300–317
https://doi.org/10.1080/15546128.2022.2086655

Taylor & Francis
Taylor & Francis Group

The Effect of the Transtheoretical Model-Based Healthy Youth Program on Sexual Health Knowledge and Behavior of College Women

Ozlem Karatana[a], Ayse Ergun[b], and Saime Erol[b]

[a]Nursing Department, School of Health Sciences, Dogus University, Istanbul, Turkey; [b]Division of Nursing, Public Health Nursing Department, Faculty of Health Science, Marmara University, Istanbul, Turkey

ABSTRACT

College women are at more risk in terms of sexual behavior than male students. This study was carried out to determine the effect of the transtheoretical model-based Healthy Youth Program on college women's sexual health knowledge and behaviors. The sample of the study, which was conducted with a one-group pretest-posttest quasi-experimental design, consisted of 207 first-year college women. It was determined that the Healthy Youth Program was effective in improving the sexual health knowledge and behaviors of college women. It can be used as a guide in sexual health education in colleges.

KEYWORDS

Sexual health; comprehensive sexual health education; college women; transtheoretical model

Young individuals between the ages of 15–24, as described by the World Health Organization (WHO), tend to discover sexuality with the onset of romantic relationships and sexual experiences (Kuperberg & Padgett, 2017; World Health Organization, 2003). During this period, risky behaviors can be seen including having sexual intercourse without feeling physiologically and psychologically ready, having unprotected intercourse, unwanted pregnancies and miscarriages, early marriage, having multiple sexual partners or frequent partner change, and having sexual experience under a drug's effect (Taffa et al., 2017; Yared et al., 2017). When the literature is examined, these risky behaviors are mostly seen in first-year college students (Moore & Smith, 2012; Olmstead et al., 2020; Roberson et al., 2015). The fact that sexually transmitted diseases are most common in women between the ages of 15 and 24 (United Nations Educational, Scientific and Cultural Organization, 2018), STDs cause cervical and HPV-related cancers, ectopic pregnancies, and infertility in women (Centers for Disease Control and Prevention, 2015), and the birth rate of 22.3 per thousand for women aged

CONTACT Ozlem Karatana ozlemkaratana@gmail.com Nursing Department, School of Health Sciences, Dogus University, Istanbul, Turkey.

15–19 (Martin et al., 2017) indicates that women are a more risky group than men in terms of sexual behavior.

To prevent risky sexual behaviors of college women and to have them give conscious and correct decisions on sexuality, age-appropriate sexual health education should be provided (PHAC, 2008; Pound et al., 2016; SIECUS, 2009). In the literature, it is seen that sexual health education not only reduces STD and HIV, but also prevents unwanted pregnancies, delays the age of onset of sexual intercourse, increases the use of condoms, provides safe and healthy sexual behavior, and supports youth to develop an understanding of respecting the rights of other individuals (Oringanje et al., 2016; United Nations Educational, Scientific and Cultural Organization, 2015; Vanwesenbeeck et al., 2016). Also, sexual health education makes a significant contribution to improving public health outcomes and achieving sustainable development goals (Kanem, 2017; United Nations Educational, Scientific and Cultural Organization, 2018).

Sexual health education programs developed and implemented around the world focus on two different approaches sexual abstinence and comprehensive sexual health (Fields et al., 2015). The sexual abstinence education approach aims to delay sexual intercourse until marriage and is based on the lack of sexual experience of young individuals. Comprehensive sexual health education, on the other hand, explains to young individuals the benefits of delaying sexuality until they are emotionally and physically ready instead of giving the message of "avoiding sexual intercourse until marriage," and also teaches young individuals how to protect themselves from infections and unwanted pregnancy when they decide to have sexual intercourse (AVERT, 2014). This approach also recognizes human rights and promotes gender equality. While providing the necessary information to prevent risky sexual behaviors, it also improves healthy sexual attitudes and behaviors (United Nations Educational, Scientific and Cultural Organization, 2013). Young individuals who do not have adequate sexual health education are at risk for sexually transmitted diseases and unwanted pregnancies (Olmstead et al., 2020; Taffa et al., 2017).

Although there are studies in the literature evaluating the impact of comprehensive sexual health education on knowledge and behavior (Boti et al., 2019; Bourne et al., 2020; Clatos & Asare, 2016; Esen & Siyez, 2017; Win et al., 2020), there are few model-based studies on comprehensive sexual health education (Alimohammadi et al., 2020; Wang et al., 2009; Yakubu et al., 2019). The transtheoretical model (TTM), which is one of the behavioral change models, started by those working to overcome substance abuse, emphasizes the importance of making appropriate interventions at the different stages of change for the individual to gain healthy behavior (Prochaska et al., 2015). Also, TTM recommends evaluating the decisional balance, which includes

self-efficacy and perception of pros-cons (pros: perceived benefits, cons: perceived barriers) that directly affect sexual abstinence behavior. Improving self-efficacy and pros-cons increases the effectiveness of the intervention (Vela & Ortega, 2020). Decisional balance and self-efficacy should be increased so that young individuals can say no to peer pressure or social norms about having an unwanted sexual experience. The Healthy Youth Program (HYP) is a program created by researchers in line with the literature, which includes comprehensive sexual health group training and individual counseling meetings in line with the needs of young people. This study was carried out to determine the effect of the transtheoretical model-based Healthy Youth Program on sexual health knowledge, self-efficacy, pros-cons, and stages of change in college women.

Methods

Participants and settings

This study is a quasi-experimental study that includes a one-group pretest-posttest and follow-up conducted with the first-year college women in Istanbul. Ethical approval and institutional permissions were obtained from the University Ethics Committee for the study. Written consent was obtained from the students who participated in the study. HYP was announced to the students through social media groups. Collage women participated in a volunteer-based program. No payment has been made.

To determine the sample size, a power analysis was performed using the G Power 3.1.9.4 program based on the scores of the Self-Efficacy Scale for Sexual Abstinence (SESSA) and the Sexual Health Knowledge Test (SHKT) before the study (21.53 ± 5.14 according to the SESSA score, alpha error 5%; 23.30 ± 5.34 according to SHKT score, alpha error 5%) (Karatana et al., 2021). The sample size was determined to be at least 156 so the study had 80% power and $p < 0.05$. The study was completed with 207 students who participated in the training and fully completed the data collection tools in the pretest, post-test, and follow-up periods (1st follow-up; 30th day, and 2nd follow-up; 60th day). The research process is stated in Figure 1.

Data collection and instruments

The data were collected through an online questionnaire application between February and December 2020, including pretest, post-test, 1st follow-up (30th day), and 2nd follow-up (60th day). Data collection tools are sociodemographic characteristics, Stages of Change for Sexual Abstinence (SCSA),

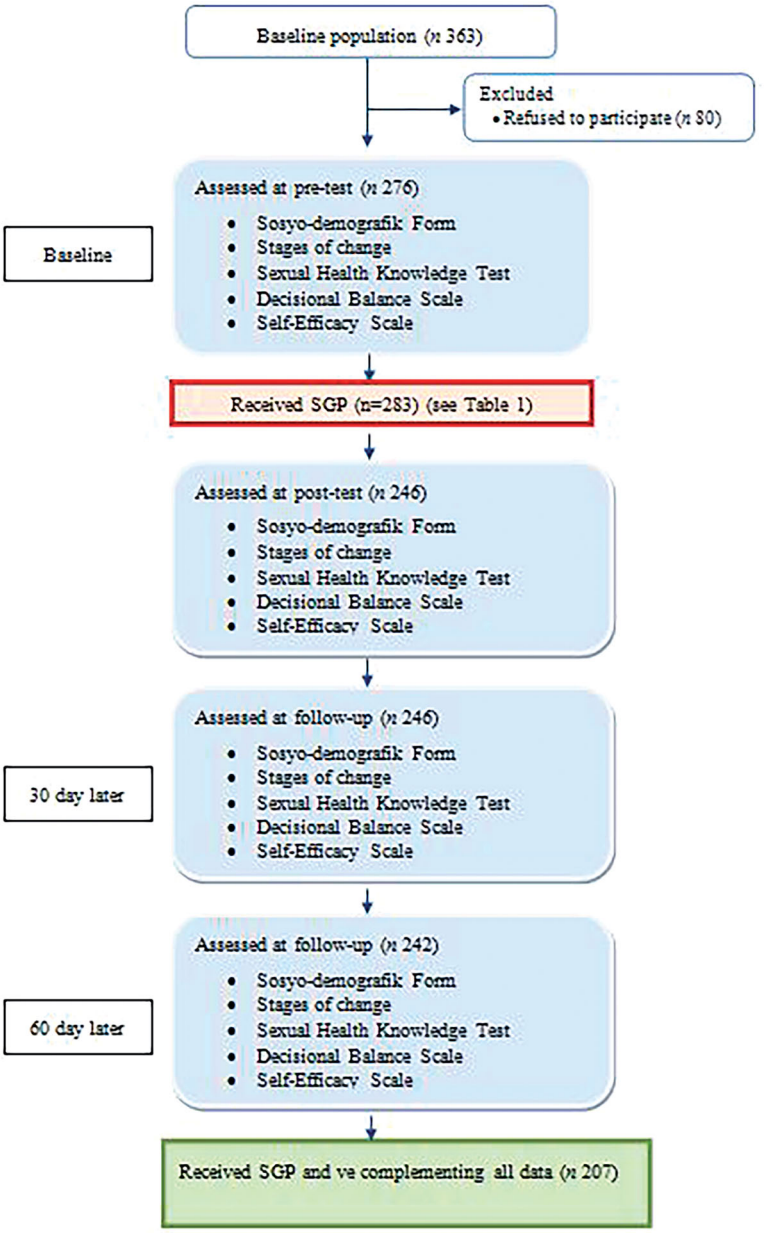

Figure 1. Process of the study.

Sexual Health Knowledge Test (SHKT), Decisional Balance Scale for Sexual Abstinence (DBSSA), and Self-Efficacy Scale for Sexual Abstinence (SESSA).

Sociodemographic characteristics form

This form consists of socio-demographic characteristics and the sexual health section of the CDC (Centers for Disease Control and Prevention)

Risky Health Behavior questionnaire. The form contains 13 questions regarding age, marital status, place of residence, sexual identity, and sexual behavior.

Stages of Change for Sexual Abstinence (SCSA)

It consists of five multiple-choice questions that evaluate the stage of the person according to the transtheoretical model (Hulton, 2001) where these stages are pre-contemplation, contemplation, preparation, action, and maintenance (Hulton, 2001). The stages of change are explained below;

1. Pre-contemplation: I don't want to be sexually abstinent.
2. Contemplation: I don't need the information about sexual abstinence right now. I would like to learn about sexual abstinence on my schedule and when I feel I need it.
3. Preparation: Knowledge about sexual abstinence is always needed and I want to learn.
4. Action: I have knowledge about sexual abstinence and I have been trying to stay away from sexual intercourse for the last 6 months.
5. Maintenance: I have knowledge about sexual abstinence and I have been staying away from sexual intercourse for more than 6 months.

Sexual Health Knowledge Test (SHKT)

It is a 40-question multiple-choice test developed by Evcili and Golbasi (2017) to measure the knowledge levels of the participants and whose validity and reliability studies have been conducted. Each option marked correctly by the participants is evaluated with 1 point, and the option left blank or wrong is evaluated with 0 points. The score to be obtained from the test varies between 0 and 40. It is accepted that the higher the score, the higher the level of sexual health knowledge. One of the most frequently used methods to determine internal consistency reliability is Cronbach's alpha coefficient. For the alpha coefficient of the scales 0.50 or below low, 0.50–0.70 medium, 0.70–90 high, and 90 indicate excellent reliability levels. The Cronbach's alpha reliability coefficient of the test was reported as 0.88 (Evcili & Golbasi, 2017). In this study, Cronbach's alpha reliability coefficient was found to be 0.83.

Decisional Balance Scale for Sexual Abstinence (DBSSA)

The scale, which was developed by Hulton (2001) in line with TTM and whose Turkish validity and reliability study was conducted by Karatana et al. (2021), measures the pros and cons of sexual abstinence. It has three sub-dimensions internal-pros, external-pros, and cons. The internal-pros

sub-dimension consists of five items, the external-pros sub-dimension consists of four items, and the cons sub-dimension consist of seven items, for a total of 16 questions. The scale is a 5-point Likert type that determines the importance of the participants' decisions about sexual abstinence between "strongly agree" and "strongly disagree." High pros scores and low cons scores are considered factors that positively affect sexual abstinence. Cronbach's alpha reliability coefficients were found >0.80 in the original study (Hulton, 2001). In this study, it was found that 0.76 for the cons sub-dimension, 0.77 for the external-pros sub-dimension, and 0.61 for the internal-pros sub-dimension.

Self-Efficacy Scale for Sexual Abstinence (SESSA)

This scale consists of six questions (Hulton, 2001; Karatana et al., 2021), which evaluate the self-efficacy of individuals in sexual abstinence in a 5-point Likert type (not confident = 1 point—very confident = 5 points). High scores indicate high self-efficacy for sexual abstinence. The Cronbach's alpha reliability coefficient was 0.91 in the original study, and 0.88 in this study (Hulton, 2001).

Healthy Youth Program

The Healthy Youth Program (HYP) includes group training courses and individual counseling meetings held in line with the needs of the youth. The training content was created in accordance with the TTM change stages (Table 1). Group training courses were held in five online sessions of 60 min. Because it is a sensitive subject, the choice of the students to open images is left to them. Lecture, discussion, and question-answer methods were used along with the slide presentation. Questions about reproductive health/sexual health that the participants could not ask or hesitated to ask during the sessions were sent to the first researcher *via* text message and answered. Participants were answered *via* message. All individual counseling sessions were done *via* text.

The purpose of HYP is to prevent risky sexual health behaviors by increasing students' sexual health knowledge, their self-efficacy in sexual abstinence and their perception of benefit, and by reducing their perception of harm. Benefit perception reflects positive aspects of behavior change, harm perception reflects barriers to change. In behavior change, the perception of harm outweighs, and to achieve a behavior change, the perception of harm score should be decreased and the perception of benefit scores should be increased.

Table 1. Preparation for HYP.

Characteristics of stage	Purpose of HYP	Educational messages
Pre-contemplation • Not aware of the problem • No intention to change behavior • Resistant to change	• To increase knowledge • To raise awareness • Being aware of the problem • Transition to the advanced stage	• Risky sexual behaviors negatively affect the individual's future goals, health, and academic achievements. • Sexual abstinence behavior is beneficial for health. • Sexual abstinence prevents infertility. • Sexual abstinence prevents cervical cancer.
Contemplation • Aware of the problem • Tries to understand the problem • Intends to change the behavior within 6 months	• Increasing the pros • Reducing the cons • Supporting environment • Increasing self-efficacy • Transition to the advanced stage	• Sexual abstinence has positive effects in psychological, sociological, and physical aspects. • Sexual abstinence protects against STDs and unwanted pregnancies. • Sexual abstinence is supported by family and society.
Preparation • Ready to change behavior within a month • Planning for behavior change	• Setting goals • Avoiding risky sexual behavior • Transition to the advanced stage	• Do you promise to refrain from sex until you feel physically, socially, and psychologically ready, or until you get married? • What might be the pros and cons of sexual abstinence behavior for you? • You can get individual counseling to improve sexual aversion.
Action and maintenance • Act and continue to change behavior	• Preventing relapse • Determining a roadmap on how to maintain sexual abstinence behavior	• Establishing boy/girl friendships that adopt sexual aversion behavior. • Individual consultancy

Data analysis and evaluation

The data were evaluated with SPSS 26 package program using descriptive statistical methods (Mean, Percentage, Standard deviation) and the Friedman Test, Marginal homogeneity since the data were not normally distributed, and the Wilcoxon signed-rank test in further analysis at the level of $p < 0.05$. In this study, since the number of individuals in the maintenance stage is low, the action and maintenance stages were analyzed together.

Results

The mean age of the students was 19.98 ± 2.69 and 96.6% of them were single. It was determined that 10.6% of them experienced sexual intercourse and the age of first sexual experience was 19.13 ± 2.31, 58.5% of them stated that they did not receive sexual health education. Other sexual behavior characteristics are given in Table 2.

While 10.6% of the students were sexually active, this rate dropped to 3.4% in the post-test and remained constant in the follow-up. While 40.9% of them stated that they used alcohol and had sexual intercourse, this rate decreased to 13.6% in the post-test and it was observed that it remained constant in the follow-up (Table 3).

Table 2. Socio-demographic information.

Variables	Min.–Max.	*M* ± *SD*
Age ($n = 207$)	17–34	19.98 ± 2.69
Age of first sexual experience ($n = 22$)	14–25	19.13 ± 2.31
	n	%
Marital status ($n = 207$)		
Single	200	96.6
Married	7	3.4
Having sexual health education ($n = 207$)		
Yes	86	41.5
No	121	58.5
Sexual experience ($n = 207$)		
Yes	22	10.6
No	185	89.4
First sexual experience ($n = 22$)		
Primary-secondary school	2	9.1
High school	7	31.8
College	8	36.4
I am married-I did not have sexual intercourse before marriage	5	22.7
Using alcohol and having sexual intercourse ($n = 22$)		
Yes	9	40.9
No	13	59.1
Number of sexual partners in college ($n = 22$)		
None	9	40.9
1	9	40.9
2–4	3	13.6
5–10	1	4.5
Protection in sexual intercourse ($n = 22$)		
Yes	16	72.7
No	4	18.2
Occasionally	2	9.0
Prevention methods ($n = 22$)		
Long-acting method	2	9.1
Contraceptive pill	2	9.1
Condom	10	45.5
Morning-after pill	1	4.5
Withdrawal	7	31.8
STD testing status ($n = 22$)		
Yes	5	22.7
No	17	77.3
STD diagnosis ($n = 22$)		
Yes	1	4.5
No	21	95.5

SD: standard deviation; Min: minimum; Max: maximum; M: mean.

Table 3. Comparison of the pretest, post-test, 1st follow-up, and 2nd follow-up of students' sexual experience, and having sexual intercourse with alcohol use.

	Pretest[a]		Post-test[b]		1st follow up[c]		2nd follow up[d]		Marginal homogeneity (*Mh*/*p*)		
Variables	*n*	%	*n*	%	*n*	%	*n*	%	(b-a)	(c-b)	(d-c)
Having sexual intercourse ($n = 207$)									3.63*	.00	.00
Yes	22	10.6	7	3.4	7	3.4	7	3.4			
No	185	89.4	200	96.6	200	96.6	200	96.6			
Having sexual intercourse with alcohol use ($n = 22$)									2.44*	.00	.00
Yes	9	40.9	3	13.6	3	13.6	3	13.6			
No	13	59.1	19	86.4	19	86.4	19	86.4			

Mh: marginal homogeneity.
*$p < 0.05$.
[a]Pre-education.
[b]Post-education.
[c]Post-education (30th day).
[d]Post-education (60th day).

The Internal and External Pros and Self-Efficacy post-test scores of the Decisional Balance Scale for Sexual Abstinence were significantly higher than the pretest ($Z = -8.17$, $p < 0.05$, $Z = -7.06$, $p < 0.05$; $Z = -6.37$, $p < 0.05$, respectively). There was no significant difference between post-test and follow-up scores.

The post-test and second follow-up scores of the cons sub-dimension of the Decisional Balance Scale were found to be significantly lower than the pretest ($Z = -5.64$, $p < 0.05$; $Z = -7.60$, $p < 0.05$). First, follow-up scores were higher than the post-test. Sexual Health Knowledge Test post-test scores were significantly higher than the pretest and the 1st follow-up score ($Z = -9.49$, $p < 0.05$; $Z = -4.34$, $p < 0.05$). There was no statistically significant difference between the 1st follow-up and 2nd follow-up scores (Table 4).

When evaluated according to the stages of change, the internal pros, self-efficacy, and SHKT post-test scores of the students in the contemplation stage were found to be higher than the pretest, and the cons-post-test scores were found to be lower than the pretest. In the preparation stage, the internal-external pros, self-efficacy, and SHK post-test scores were higher than the pretest, and the cons post-test score was lower than the pretest. The self-efficacy and SHK post-test scores of the students in the action and maintenance stages were higher than in the pretest (Table 5).

The ratio of students in the action and maintenance stages increased from 5.6 to 83.2% at the post-test and to 85.9% at the second follow-up (Figure 2).

Within the scope of the study, 11 students requested *individual counseling*. Trust-based communication was established with the students while providing individual counseling on gynecological diseases, hymen membrane ($n = 2$), masturbation, male-female relations ($n = 2$), sexual content messages, sexual identity, vaginismus, and sexual violence-cheating ($n = 2$). Information was given about the current problems and the long-term health risks that may occur later. Students were supported by adopting a problem-solving approach toward the behavioral change related to reproductive and sexual health.

Discussion

This study is the first study conducted under the leadership of a nurse in Turkey to increase the sexual health knowledge and sexual abstinence of college women. According to the results of our study, it was determined that college women's sexual health knowledge, self-efficacy, and benefit perception increased and their perception of harm decreased with HYP. In addition, it was observed that the students progressed through the stages

Table 4. Comparison of students' decisional balance, self-efficacy, and sexual health knowledge pretest, post-test, 1st follow-up, and 2nd follow-up scores.

	Pretest[a]	Post-test[b]	1st follow up[c]	2nd follow up[d]		Wilcoxon test (*Z*/*p*)		
Scale	Median (25.–75. quarter)	Median (25.–75. quarter)	Median (25.–75. quarter)	Median (25.–75. quarter)	X^2/p	(b-a)	(c-b)	(d-c)
Internal pros	18 (17–20)	20 (18–23)	21 (19–23)	21 (18–24)	108.88*	−8.17b > a*	−1.65	−.03
External pros	16 (12–18)	17 (15–20)	17 (15–20)	17 (15–20)	82.36*	−7.06b > a*	−.25	−.58
Cons	16 (12–20)	14 (10–18)	16 (14–20)	13 (10–17)	138.95*	−5.64a > b*	−8.41c > b*	−10.27c > d*
Self-efficacy	24 (23–28)	27 (24–30)	27 (24–30)	27 (24–27)	92.18*	−6.38b > a*	−.37	−.38
Sexual health knowledge	24 (20–27)	29 (23–33)	27 (23–32)	28 (22–32)	128.46*	−9.49b > a*	−4.34b > c*	−.74

X^2: Friedman test; *Z*: Wilcoxon signed-rank test.
*$p < 0.05$.
[a]Pre-education.
[b]Post-education.
[c]Post-education (30th day).
[d]Post-education (60th day).

Table 5. Comparison of decisional balance, self-efficacy and sexual health knowledge pretest, post-test, 1st follow-up and 2nd follow-up scores of students according to the stages of change.

		Pretest[a]	Post-test[b]	1st follow up[c]	2nd follow up[d]		Wilcoxon test (*Z*/*p*)		
Stages of change	Scales	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	X^2/p	(b-a)	(c-b)	(d-c)
PC ($n=8$)	Internal pros	15.50 (3.16)	16.25 (2.91)	17.62 (4.27)	17.25 (3.01)	2.51	−0.59	−0.94	−0.17
	External pros	12.25 (2.86)	13.37 (3.33)	14.62 (3.54)	14.12 (4.29)	3.63	−0.98	−0.94	−0.52
	Cons	24.50 (7.61)	21.75 (6.58)	24.12 (5.51)	21.25 (7.06)	4.78	−1.76	−1.52	−1.82
	Self-efficacy	21.12 (8.69)	23.00 (7.30)	22.87 (7.54)	26.00 (2.39)	0.88	−1.02	−0.40	−1.19
	Sexual health knowledge	25.00 (6.80)	27.62 (8.19)	27.50 (8.28)	27.25 (7.34)	3.78	−0.18	−0.79	−0.67
C ($n=31$)	Internal pros	18.03 (2.60)	20.12 (3.56)	20.61 (3.02)	20.38 (2.88)	**11.92***	**−2.85***	−0.55	−0.86
	External pros	16.03 (2.76)	16.61 (3.04)	16.51 (3.76)	16.64 (3.79)	6.23	−1.31	−0.62	−0.02
	Cons	17.19 (4.09)	15.45 (4.72)	17.48 (4.40)	14.90 (4.48)	**14.46***	**−2.01***	**−2.76***	**−3.69***
	Self-efficacy	24.22 (4.08)	26.80 (2.68)	26.64 (2.51)	26.87 (2.61)	**13.80***	**−3.28***	−0.42	−0.66
	Sexual health knowledge	22.90 (4.65)	27.67 (5.59)	27.12 (5.84)	26.45 (5.95)	**19.42***	**−4.04***	−1.19	−1.20
P ($n=95$)	Internal pros	18.84 (3.02)	21.27 (3.10)	21.04 (3.13)	21.15 (3.45)	**51.53***	**−6.13***	−1.13	−0.89
	External pros	15.57 (3.76)	17.52 (2.78)	17.38 (2.96)	17.58 (3.12)	**42.63***	**−5.31***	−0.62	−1.31
	Cons	15.87 (5.20)	13.87 (4.78)	16.45 (4.34)	13.25 (5.05)	**65.38***	**−3.58***	**−6.09***	−6.71*
	Self-efficacy	25.28 (3.69)	26.30 (3.30)	26.65 (3.25)	26.66 (3.05)	**31.49***	**−2.82***	−1.30	−1.25
	Sexual health knowledge	23.53 (4.90)	27.91 (6.54)	26.29 (6.48)	26.03 (6.91)	**54.68***	**−6.07***	**−3.06***	−1.09
A and M ($n=8$)	Internal pros	18.37 (3.29)	19.37 (3.46)	19.75 (3.45)	19.50 (3.58)	7.27	−1.55	−1.13	−0.37
	External pros	13.00 (4.07)	14.50 (3.54)	14.00 (4.56)	14.25 (3.80)	1.62	−1.37	−0.44	−0.00
	Cons	19.62 (7.63)	17.00 (5.73)	18.50 (5.01)	16.50 (7.27)	6.12	−1.70	−2.03	−1.69
	Self-efficacy	22.87 (3.56)	25.62 (3.20)	25.37 (3.24)	23.25 (7.18)	**13.84***	**−2.41***	−0.81	−1.34
	Sexual health knowledge	23.00 (8.68)	29.00 (6.71)	28.12 (8.09)	28.87 (8.40)	**13.80***	**−2.53***	−0.24	−0.52

Pc: precontemplation; C: contemplation; P: preparation; A: action; M: maintenance.
*$p < 0.05$.

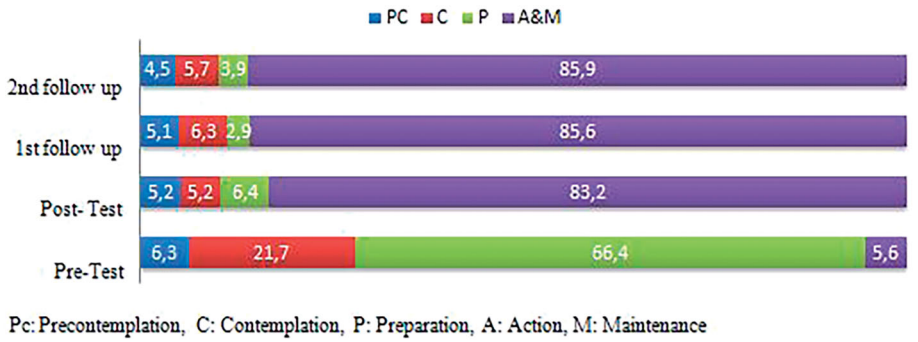

Figure 2. Rate of students' sexual abstinence stages of change.

of sexual abstinence at the end of the program. It shows that HYP is an effective program in terms of the sexual health knowledge and behavior of college women.

Sexual health knowledge has an important effect on the healthy sexual attitudes and behaviors of young individuals (Sümer, 2015). Increasing their knowledge level through sexual health education is necessary to protect them from risky sexual behaviors. In the literature, it is stated that sexual health education is effective in increasing the level of knowledge about reproductive health (Boti et al., 2019; Hoffman & Argeros, 2020; Özkan et al., 2020; Win et al., 2020). In studies conducted by Win et al. (2020) in Malaysia, Boti et al. (2019) in Ethiopia, and Chi et al. (2015) in China with first-year students, they concluded that comprehensive sexual health education positively affected students' knowledge, attitude, and behavior. In the study conducted by Esen and Siyez (2017) with 9th-grade students ($n = 36$), they found that the score remained constant in follow-up tests after comprehensive sexual health education. Similarly, in our study, it was determined that HYP increased the sexual health knowledge scores of the students and the scores remained constant during the follow-up. This result is important for HYP to support the permanence of sexual health information.

In this study, decisional balance and internal and external pros scores increased after HYP and remained constant during follow-up periods. The cons score was lower in the post-test and the second follow-up period than in the pretest. In the study conducted by Duh et al. (2017), Esen and Siyez (2017), and Ibrahim et al. (2012), it was stated that students' sexual decision-making scores increased after education.

Wang et al. (2009) stated that at the end of the TTM-based sexual health education study conducted with 10th-grade students ($n = 281$) in Taiwan, the decision balance scores of the students who received education were high and decreased in the next 15 months. Similarly, in our study, the increase of the cons score, which is expected to remain constant in the first

follow-up to the pretest level is considered a negative behavioral change, but the decrease in the second follow-up shows the positive contribution of individual counseling during the follow-up period. In line with this result, individual counseling may be recommended in schools along with comprehensive sexual health education.

Self-efficacy is an individual's self-confidence to perform the desired behavior in any situation (Bandura, 1986). The level of self-efficacy of the individual has an important role in controlling risky sexual behaviors (Pender et al., 2011). It has been reported that school-based comprehensive sexual health education increases youth's self-efficacy (Rotheram-Borus et al., 2018). In the study conducted by Bourne et al. (2020) with medical students, Constantine et al. (2015), and Hulton (2001) with high school students, it was stated that the self-efficacy scores of the students increased at the end of the comprehensive sexual health education. In our study, it was determined that HYP made a positive contribution to the increase of self-efficacy similar to the studies in the literature (Boti et al., 2019; Morales et al., 2016; Widman et al., 2018).

In addition, there are studies in the literature in which self-efficacy scores decreased during the follow-up period. It was observed that the self-efficacy scores increased at the end of the HEART (Health Education and Relationship Training) program, which is a web-based sexual health program implemented by Widman et al. (2018) with female adolescent students ($n = 222$), and the self-efficacy scores decreased in the follow-up at the 4th month. It was stated that at the end of the COMPAS (Competencies for adolescents with healthy sexuality) program, which Morales et al. (2016) conducted with adolescents aged 15–18 years ($n = 622$) in Spain, their self-efficacy scores increased, but their self-efficacy scores decreased at the 12-month evaluation. In this study, it can be thought that keeping the self-efficacy score constant at the post-test level increases the effectiveness of the HYP by supporting the behavioral change.

In our study, in the post-test, it was observed that there was a positive development in the stages of sexual abstinence, pre-contemplation, contemplation, and preparation stages to the action stage. Clatos and Asare (2016), in their study with the families of disabled individuals ($n = 15$), stated that after the comprehensive sexual health education program, the rate of pre-contemplation and contemplation stages decreased and the rates of preparation and action stage increased. Similarly, in this study, it was determined that while more than half of the students were in the preparation stage before the training, the majority of the students passed to the action stage at the end of the training. In the follow-up, the number of students in the movement stage was similar to the rates in the post-test. This result is important in terms of showing the effectiveness of HYP. It is thought that

the fact that the HYP is structured according to the TTM stages of change, responding to the needs of students at each stage of change contributes to the increase in the number of students who are in the action and maintenance stage. Maintaining the action and maintenance rates during the follow-up period supports the effectiveness of the program.

Limitations

The fact that students are with their families due to the COVID-19 pandemic may have limited their relationship with their boyfriends and supported sexual abstinence. The absence of a control group in the study may have limited the evaluation of this situation. In further studies, the effect of HYP can be evaluated by using a control group. The third limitation of the study is that the results covered a relatively short, three-month follow-up period. It may be suggested to evaluate the long-term results of HYP with further studies.

Conclusion

In the literature, although different training contents can be created according to TTM stages of change, common contents that meet the needs of all stages can also be applied. In this study, comprehensive sexual health education topics were structured according to the stages of change and a joint education program was applied to the students who are in different stages of change. Our study results showed that HYP increased the knowledge, self-efficacy, and pros among female university students, decreased the cons, and made progress toward the action and preparation stages. In line with these results, HYP can be suggested to be applied to young individuals to gain healthy sexual behaviors.

Acknowledgments

The authors sincerely thank the young individuals who took part in this study

Ethical approval

The study protocol was approved was obtained by the Ethics Committee (20.06.2019-143).

Author contributions

OK, AE, and SE: study conception/design. OK and AE: data collection and analysis. AE: statistical expertise. OK, AE, and SE: drafting of the manuscript. OK and AE: administrative/technical/material support. AE and SE: supervision.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

ORCID

Ozlem Karatana http://orcid.org/0000-0002-1985-8256
Ayse Ergun http://orcid.org/0000-0003-3132-2005
Saime Erol http://orcid.org/0000-0001-7752-605X

References

Alimohammadi, L., Zarei, F., & Mirghafourvand, M. (2020). The effect of counseling based on Bandura's self-efficacy theory on sexual self-efficacy and quality of sexual life. *Women & Health*, *60*(4), 473–486.

AVERT (2014). *Sex education that works*. Retrieved October 1, 2020, from http://www.avert.org/sex-education-works.htm

Bandura, A. (1986). *National Institute of Mental Health. Prentice-Hall series in social learning theory. Social foundations of thought and action: A social cognitive theory*. Prentice-Hall Inc.

Boti, N., Hussen, S., Shegaze, M., Shibru, S., Shibiru, T., Zerihun, E., Godana, W., Abebe, S., Gebretsadik, W., Desalegn, N., & Temtime, Z. (2019). Effects of comprehensive sexuality education on the comprehensive knowledge and attitude to condom use among first-year students in Arba Minch University: A quasi-experimental study. *BMC Research Notes*, *12*(1), 700–707. https://doi.org/10.1186/s13104-019-4746-6

Bourne, S. J. F., Lee, C. M., Taliaferro, E., Zhang, A. Y., Dalomba, N. F., Panton, C., Roberts, M. B., & Magee, S. &. (2020). Impact of teaching sexual health education on medical students. *Family Medicine*, *52*(7), 518–522.

Centers for Disease Control and Prevention (2015). *Sexually transmitted disease surveillance 2014*. U.S. Department of Health and Human Services. Retrieved September 9, 2020, from https://www.cdc.gov/std/stats14/surv-2014-print.pdf

Chi, X., Hawk, S. T., Winter, S., & Meeus, W. (2015). The effect of comprehensive sexual education program on sexual health knowledge and sexual attitude among college students in southwest China. *Asia Pacific Journal of Public Health*, *27*(2), NP2049–NP2066. https://doi.org/10.1177/1010539513475655

Clatos, K., & Asare, M. (2016). Sexuality education intervention for parents of children with disabilities: A pilot training program. *American Journal of Health Studies*, *31*(3), 151–162.

Constantine, N. A., Jerman, P., Berglas, N. F., Angulo-Olaiz, F., Chou, C.-P., & Rohrbach, L. A. &. (2015). Short-term effects of a rights-based sexuality education curriculum for high-school students: A cluster-randomized trial. *BMC Public Health*, *15*, 293–306.

Duh, E., Medina, S. P., Coppersmith, N., Adjei, N., Roberts, M. B., & Magee, S. (2017). Sex ed by brown med: A student-run curriculum and its impact on sexual health knowledge. *Family Medicine*, *49*(10), 785–788.

Esen, E., & Siyez, D. M. (2017). Cinsel Sağlık Eğitimi Programının 9. Sınıf Öğrencilerinin Cinsel Sağlık Bilgi Düzeyleri ve Tutumlarına Etkisi. Sağlık Eğitimi Programının 9. Sınıf Öğrencilerinin Cinsel Sağlık Bilgi Düzeyleri ve Tutumlarına Etkisi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *32*(3), 560–580.

Evcili, F., & Golbasi, Z. (2017). Cinsel Sağlık Bilgi Testi: Geliştirme, Geçerlik ve Güvenirlik Çalışması. *ACU Sağlık Bilimleri Dergisi*, *1*, 29–33.

Fields, J., Gilbert, J., & Miller, M. (2015). Sexuality and education: Toward the promise of ambiguity. In J. DeLa (Ed.), *Handbook of the sociology of sexualities*. Springer.

Hoffman, J. L., & Argeros, G. (2020). An online sexual health educational intervention involving young adult female students: A mixed methods study. *Journal of Community Health*, *45*(2), 407–411.

Hulton, L. J. (2001). The application of the transtheoretical model of change to adolescent sexual decision-making. *Issues in Comprehensive Pediatric Nursing*, *24*(2), 95–115. https://doi.org/10.1080/01460860118376

Ibrahim, N., Rampal, L., Jamil, Z., & Zain, A. M. (2012). Effectiveness of peer-led education on knowledge, attitude and risk behavior practices related to HIV among students at a Malaysian public university–A randomized controlled trial. *Preventive Medicine*, *55*(5), 505–510. https://doi.org/10.1016/j.ypmed.2012.09.003

Kanem, N. (2017). *Advancing comprehensive sexuality education to achieve the 2030 agenda for sustainable development*. https://www.unfpa.org/press/advancing-comprehensive-sexuality-education-achieve-2030-agenda-sustainable-development

Karatana, Ö., Ergün, A., & Beyhan, A. (2021). Adaptation of the Decisional Balance Scale for sexual abstinence and the self-efficacy scale for sexual abstinence to Turkish: A validity and reliability study. *İnönü Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu Dergisi*, *9*(1), 28–41.

Kuperberg, A., & Padgett, J. E. (2017). Partner meeting contexts and risky behavior in college students' other-sex and same-sex hookups. *Journal of Sex Research*, *54*(1), 55–72.

Martin, J. A., Hamilton, B. E., Osterman, M. J. K., Driscoll, A. K., & Matthews, T. J. (2017). Briths: Final data. *National Vital Statistics Report*, *66*(1), 1. https://www.cdc.gov/nchs/data/nvsr/nvsr66/nvsr66_01.pdf

Moore, E. W., & Smith, W. E. (2012). What college students do not know: Where are the gaps in sexual health knowledge? *Journal of American College Health*, *60*(6), 436–442. https://doi.org/10.1080/07448481.2012.673521

Morales, A., Espada, J. P., & Orgilés, M. (2016). A 1-year follow-up evaluation of a sexual-health education program for Spanish adolescents compared with a well-established program. *European Journal of Public Health*, *26*(1), 35–41.

Olmstead, S. B., Conrad, K. A., & Davis, K. N. (2020). First-year college students' experiences of a brief sexual health seminar. *Sex Education*, *20*(3), 300–315. https://doi.org/10.1080/14681811.2019.1654446

Oringanje, C., Meremikwu, M. M., Eko, H., Esu, E., Meremikwu, A., & Ehiri, J. E. (2016). Interventions for preventing unintended pregnancies among adolescents. *Cochrane Database of Systematic Reviews*, *3*(1), 11–21.

Özkan, H., Üst Taşğı n, Z., & Ejder Apay, S. (2020). Cinsellikle İlgili Eğitim Alan Ve Almayan Öğrencilerin Cinsel Sağlık Bilgi Düzeylerinin Karşılaştırılması. *Ebelik ve Sağlık Bilimleri Dergisi*, *3*(1), 11–21.

Pender, N. J., Murdaugh, L. C., & Parsons, A. M. (2011). *Health promotion in nursing practice* (6th ed.). Pearson.

Pound, P., Langford, R., & Campbell, R. (2016). What do young individuals think about their school-based sex and relationship education? A qualitative synthesis of young

individuals's views and experiences. *BMJ Open*, *6*(9), e011329. https://doi.org/10.1136/bmjopen-2016-011329

Prochaska, J. O., Redding, C. A., & Evers, K. E. (2015). *The transtheoretical model and stages of change* (Glanz , Ed.). Jossy-Bass.

Public Health Agency of Canada (2008). *Canadian guidelines for sexual health education*. Public Health Agency of Canada. Retrieved September 21, 2020, from https://www.canada.ca/content/dam/phac-aspc/migration/phac-aspc/publicat/cgshe-ldnemss/pdf/guidelines-eng.pdf

Roberson, P. N. E., Olmstead, S. B., & Fincham, F. D. (2015). Hooking up during the college years: Is there a pattern? *Culture Health and Sexuality*, *5*(5), 576–591.

Rotheram-Borus, M. J., Davis, E., & Rezai, R. (2018). Stopping the rise of HIV among adolescents globally. *Current Opinion in Pediatrics*, *30*(1), 131–136.

Sexuality Information and Education Council (2009). *Report of public support of sexuality education*. Retrieved June 22, 2020, from https://reliefweb.int/sites/reliefweb.int/files/resources/8556521DD9D4A9E64925762000240120-UNESCO-Aug2009.pdf

Sümer, Z. H. (2015). Gender, religiosity, sexual activity, sexual knowledge, and attitudes toward controversial aspects of sexuality. *Journal of Religion and Health*, *54*(6), 2033–2044. https://doi.org/10.1007/s10943-014-9831-5

Taffa, N., Haimanot, R., Desalegn, S., Tesfaye, A., & Mohammed, K. (2017). Do parents and young individuals communicate on sexual matters. *The Ethiopian Journal of Health Development (EJHD)*, *13*(3), 1–7.

United Nations Educational, Scientific and Cultural Organization (2013). Young individuals today, time to act now: Why adolescents and young individuals need comprehensive sexuality education and sexual and reproductive health services in Eastern and Southern Africa. Retrieved October 7, 2020, from http://unesdoc.unesco.org/images/0022/002234/223447E.pdf

United Nations Educational, Scientific and Cultural Organization (2015). *Yapılandırılmış Cinsel Sağlık Eğitimi Küresel İnceleme.* Retrieved August 7, 2020, from http://saglikta-genc.org/zile/uploads/2018/01/UNESCO-CSE_Report_2015_Turkce.pdf

United Nations Educational, Scientific and Cultural Organization (2018). *International technical guidance on sexuality education: An evidence-informed approach for schools* (Vols. I and II). Teachers and Health Educators. Retrieved August 7, 2020, from http://unesdoc.unesco.org/images/0026/002607/260770e.pdf

Vanwesenbeeck, I., Westeneng, J., de Boer, T., Reinders, J., & van Zorge, R. &. (2016). Lessons learned from a decade implementing comprehensive sexuality education in resource poor settings: The world starts with me. *Sex Education*, *16*(5), 471–486. https://doi.org/10.1080/14681811.2015.1111203

Vela, C., & Ortega, C. (2020). Adoption of change: A systematic review of the transtheoretical model. *Sports and Exercise Medicine–Open Journal*, *6*(1), 27–38. https://doi.org/10.17140/SEMOJ-6-179

Wang, R. H., Cheng, C. P., & Chou, F. H. (2009). Predictors of sexual abstinence behaviour in Taiwanese adolescents: a longitudinal application of the transtheoretical model. *Journal of Clinical Nursing*, *18*(7), 1010–1017.

Widman, L., Golin, C. E., Kamke, K., Burnette, J. L., & Prinstein, M. J. (2018). Sexual assertiveness skills and sexual decision-making in adolescent girls: Randomized controlled trial of an online program. *American Journal of Public Health*, *108*(1), 96–102.

Win, S. S., Lasimbang, H. B., Win, M. M. C., Parash, M. T. H., Aung, S. N. L., Tat, Y. B., & Myint, T. (2020). Knowledge, attitude and practice towards sexual and reproductive health including comprehensive sexuality education among first-year students of Unı

versıty Malaysıa Sabah (UMS), Malaysia. *Malaysian Journal of Public Health Medicine*, *20*(1), 184–191.

World Health Organization (2003). *Promoting the health of young individuals in Custody*. Retrieved September 9, 2020, from http://www.euro.who.int/document/e81703.pdf

Yakubu, I., Garmaroudi, G., Sadeghi, R., Tol, A., Yekaninejad, M. S., & Yidana, A. (2019). Assessing the impact of an educational intervention program on sexual abstinence based on the health belief model amongst adolescent girls in Northern Ghana, a cluster randomised control trial. *Reproductive Health*, *16*(1), 124. https://doi.org/10.1186/s12978-019-0784-8

Yared, A., Sahile, Z., & Mekuria, M. (2017). Sexual and reproductive health experience, knowledge and problems among university students in Ambo, central Ethiopia. *Reproductive Health*, *14*(1), 41–41.