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UNIVERSITY STUDENTS' LEVEL OF KNOWLEDGE AFTER ONLINE SEXUAL AND REPRODUCTIVE HEALTH EDUCATION: A QUASI-EXPERİMENTAL RESEARCH

ÇEVRİMİÇİ CİNSEL SAĞLIK VE ÜREME SAĞLIĞI EĞİTİMİ SONRASI ÜNİVERSİTE ÖĞRENCİLERİNİN BİLGİ DÜZEYLERİ: YARI DENEYSEL BİR ARAŞTIRMA

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Abstract

Objectives: Sexual/Reproductive Health (SRH) is a very important issue for university students in the young adult group. This study examined the differences in SRH knowledge levels between university students who wanted to participate in online SRH education and those who did not.

Materials and Methods: Students enrolled at a university in the spring semester of the 2022-2023 academic year participated in the quasi-experimental research. The researchers selected the sample through non-probability sampling. The minimum sample size was calculated using the G-Power 3.1 software, and 180 students participated. The Introductory Information Form and Sexual Health Knowledge Test (SHKT) were used to collect data. The study was conducted using a pre-test, training, and post-test design.

Results: Among the university students participating in the study, it was determined that the SHKT total score averages and the total score averages in the sub-subject groups were significantly higher in the training group ($p<0.05$). The study determined that the SHKT score averages of the university students in the group receiving education were negatively affected by the number of siblings, and the education level of their fathers had a moderately positive effect ($p<0.05$).

Conclusion: It was observed that the level of sexual health knowledge of the students who received online sexual health education was higher than those who did not. As a result of the training series given from traditional information sources, it is predicted that the safe sexual behaviour skills of the students will increase and their risky and unhealthy sexual practices will decrease.

Keywords: University student, Online, Education, Sexual health, Reproductive health.

Özet

Amaç: Cinsel Sağlık/Üreme Sağlığı (CSÜS) genç yetişkin grupta bulunan üniversite öğrencileri için oldukça önemli bir konudur. Bu çalışma, çevrimiçi Cinsel Sağlık/Üreme Sağlığı eğitimine katılmak isteyen ve katılmak istemeyen üniversite öğrencileri arasındaki CSÜS bilgi düzeyinde farklılıkları incelemiştir.

Gereç ve Yöntem: Yarı deneysel araştırmaya 2022-2023 eğitim öğretim yılı bahar döneminde bir üniversiteye kayıt yaptıran öğrenciler katılmıştır. Araştırmacılar örneklemi, olasılıksız örnekleme yoluyla seçmişlerdir. Minimum örneklem büyüklüğü G-Power 3.1 yazılımı kullanılarak hesaplanmış ve 180 öğrenci katılmıştır. Verilerin toplanmasında Tanıtıcı Bilgi Formu ve Cinsel Sağlık Bilgi Testi (CSBT) kullanılmıştır. Araştırma ön test, eğitim ve son test tasarımı kullanılarak gerçekleştirilmiştir.

Bulgular: Araştırmaya katılan üniversite öğrencileri arasında CSBT toplam puan ortalamaları ve alt konu gruplarındaki toplam puan ortalamalarının eğitim grubunda anlamlı olarak daha yüksek olduğu belirlenmiştir ($p<0,05$). Araştırmada eğitim alan gruptaki üniversite öğrencilerinin CSBT puan ortalamalarının kardeş sayısından olumsuz etkilendiği, baba eğitim durumunun ise orta düzeyde olumlu yönde etkilendiği belirlenmiştir ($p<0,05$).

Sonuç: Çevrimiçi cinsel sağlık eğitimi alan öğrencilerin cinsel sağlık bilgi düzeylerinin almayanlara göre daha yüksek olduğu görülmüştür. Güvenilir bilgi kaynaklarından verilen eğitim serileri sonucunda öğrencilerin güvenli cinsel davranış becerilerinin artacağı, riskli ve sağlıksız cinsel uygulamalarının ise azalacağı öngörülmektedir.

Anahtar Kelimeler: Üniversite öğrencisi, Online, Eğitim, Cinsel sağlık, Üreme sağlığı.

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INTRODUCTION

Sexual and Reproductive Health (SRH) education promotes healthy behaviors and prevents adverse health outcomes among young adults. However, there is limited research in Türkiye, on the effects of providing sexual and reproductive health education to university students. The unprovided comprehensive sexual health education in Türkiye has led to knowledge gaps and increases in risky behaviours (1). Many sexual and reproductive health problems, such as sexually transmitted infections (STIs), adolescent pregnancies, and maternal, fetal and newborn deaths, are common among young people (between the ages of 10 and 24). According to the World Health Organization (WHO), at least 10 million unintended pregnancies occur among adolescents each year, and 3.9 million of the approximately 5.6 million abortions that occur each year are performed under unsafe conditions, causing maternal and neonatal mortality and morbidity (2). Unfortunately, Türkiye is one of the countries where the sexual and reproductive health of young people (10-24 years old) does not reach the desired level (3). It is clear that studies should be carried out to improve adolescent sexual and reproductive health (4).

Sexual and Reproductive Health (SRH) education is essential for all people, including 10-24 ages (youth), to reduce risky sexual behavior, prevent STIs, and reduce maternal and neonatal mortality and population-based epidemics. Comprehensive school-based education can increase adolescents' knowledge about sexual health (5). Providing education with a comprehensive curriculum in the sexual and reproductive health education process help young people to learn about all aspects of SRH (such as sexuality, sexual orientation and sexual rights, sexual intercourse, anatomy and physiology of genital organs, health assessment, sexual dysfunctions, family planning, STIs, violence and sexual abuse) (6). This education; included SRH, sexual attitudes, gender, sexual and interpersonal relationships, social and peer pressure to have sex, information about reproductive health services and improving communication and decision-making in this area (4,7). Comprehensive sexual and reproductive education with a well-rounded curriculum enables young people to learn about all aspects of SRH (6). In Türkiye, SRH education is not included as a separate subject in the national curriculum of primary, secondary and high schools, but only in the universities' health and medical science curriculum. The issues of SRH are not adequately covered in the formal curriculum. However, the media influences young people negatively from time to time. Parents are eager but hesitate to talk to their children about SRH, and young people represent risky sexual and reproductive health behaviours (8,9). There are not enough health and medical facilities and sufficient quantity and quality well-equipped health staff to provide services to young people in this area in Türkiye.

Young people are the most dynamic and influential part of the social system, as well as the smartest and decision-makers of tomorrow. Young people's decisions affect their future. In particular, their decisions about sexual and reproductive health have multidimensional effects on their lives.[10] Young people face different risks, such as unintended pregnancies, pregnancy complications, adolescent marriages, and STIs, due to the increase in unprotected sex with turning to the age of first sexual intercourse to younger generations. This situation poses a global threat.[11] Studies have been done with students generally studying health sciences in different parts of our country. Conducted studies on nursing and midwifery students have determined that providing SRH education to students increased their knowledge level despite being health sciences students (9,12). Related literature has shown that the Internet is

the primary source of information for many young people about SRH (3,5,8,13-16). The studies have shown that students want to attend SRH education at universities (3,8,14,17-20).

SRH education is limited only to the health sciences courses at universities (7-21). Research shows that SRH issues are not covered well in the educational system, the media sometimes harms the youth, and parents demand the ability to talk about SRH issues like risky sexual behaviors with their children, and youth but hesitate. Additionally, there is a lack of good health facilities and special-equipped healthcare professionals to provide services to youths in this area (9,13). SRH education is vital in reducing healthcare services needs by promoting healthy sexual behaviors among young people, ensuring healthy communities, and reducing the economic burden on the health system.

In this regard, SRH education aims to achieve the 2030 Sustainable Development Goals; to ensure health and well-being (SDG-3), gender equality in communities where sex is perceived as a woman's task (SDG-5), reduce inequalities (SDG-10) and build peaceful and inclusive communities and ensure access to justice for all (SDG-16) (22). Furthermore, providing SRH education online as an alternative to traditional education has advantages, such as save from time and place, not being stigmatized, present equal opportunity to all people regardless of gender identity, privacy, comfort and safety to talk about sexuality (21). All types of SRH education should include some specific topics: attitudes about sexuality, gender, sexual relations, social and peer pressure to have a sex-active life, information about reproductive health services, and improving communication skills and decision-making skills in the community (4,7). This study included all the subjects in the online SRH education (Table 1).

Table 1. The academic content of online SRH education

Sessions	Subjects	Time
Week 1	What is Sexuality and Sexual Health?	120 minutes
Week 2	Sexual Orientations and Sexual Rights	120 minutes
Week 3	Anatomy and Physiology of Genital Organs	120 minutes
Week 4	Sexual Identity Development According to Life Periods	120 minutes
Week 5	Sexual Health Education	120 minutes
Week 6	Sexual Myths	120 minutes
Week 7	Evaluation of Sexual Health	120 minutes
Week 8	Female Sexual Dysfunctions	120 minutes
Week 9	Male Sexual Dysfunctions	120 minutes
Week 10	Special Situations Affecting Sexuality	120 minutes
Week 11	Family Planning	120 minutes
Week 12	Sexually Transmitted Diseases	120 minutes
Week 13	Sexual Violence and Abuse	120 minutes
Week 14	Provision of Sexual Health/Reproductive Health Services in Health Institutions	120 minutes

Due to the development of learner-centered learning, SRH education can be delivered in various formats (5,23). Web-based SRH education has advantages over traditional face-to-face education, such as the capacity to achieve more people at a lower cost, providing privacy and facilitating communication. People, who hesitate to participate in face-to-face SRH education, can participate more in online education environments (21,24). Evgin and Sümen (2022) found that online education increased university students' knowledge levels (25).

Aim of the study

This study examined the differences in online SRH education between university students who wanted to participate and did not choose to attend online SRH education.

METHODS

Design

This study used a quasi-experimental research design, and the participants were divided into two groups: the intervention group (students who chose and completed online SRH education) and the control group (students who did not choose to follow this SRH education). The study used a pre-test, educational intervention and post-test design. The research was conducted in accordance with STROBE criteria.

Participants

It was held at a state university located in the west of the Black Sea region of Turkey. The population consisted of all students (N=17.402) enrolled in the 2022-2023 semester of the university (September-December) in study. The study sample included students who voluntarily participated and did not participate in online SRH education. The minimum sample size to be included in the study was calculated using the GPower 3.1 software. It was defined as 70 students for the intervention group and 70 for the control group with a one-way significance level, 0.5 effect size, 95% confidence interval, 0.05 error level, 80% power and 10% backup sample size (26). Participants were selected from a state university in Türkiye through a convenience homogeneous sampling method. One hundred and eighty students who met the inclusion criteria participated in the study sample in two groups. Rather than the calculated sample size, as much possible number of students participating in each group was preferred in the study because of SRH awareness increasing. Students who were actively enrolled in the education of the university, have oral and written communication skills, have chosen and completed online SRH education, have not attended SRH education before, had no problems with speech, visual or hearing, and voluntarily participated in the study.

Data Collection Tools

The researchers collected the data through self-report and face-to-face methods using Participant Introductory Information and Sexual Health Knowledge Test.

Participant Introductory Information

The form prepared by the researchers in line with the literature consists of 14 questions regarding the participants' sociodemographic characteristics (such as age, educational status of parents, and the number of siblings) (4,6,12).

Sexual Health Knowledge Test

The development, validity and reliability study of the test was done by Evcili and Golbasi (2017). The test consists of 40 questions and 11 sub-dimensions (1. Universal values related to sexuality, 2. Sexual identity development, 3. Sexual orientations, 4. Gender, 5. Anatomy of the reproductive system, 6. Sexual relationship / Sexual satisfaction, 7. Reproductive physiology, 8. Contraception, 9. STIs, 10. Sexual violence, 11. Safe sexual behaviors). Each option marked correctly by the participant is scored as "1", and each option mislabeled or left blank is scored as "0". The lowest score on the test is 0, and the highest is 40. It is accepted that a higher score has a meaning of a higher SRH knowledge level (27).

Data Collection Process

Anonymised data was collected to ensure confidentiality. The researchers administered a survey to students in both groups who were eligible to participate in the study. Participants were asked to write a standard pseudonym describing themselves on the survey forms. It took approximately 15 minutes to complete the pretest and posttest data. Participants were asked to sign a confidentiality protocol to prevent any influences during the research process.

SRH Education

As part of the research, expert opinions were gathered from two lecturers who are experts in the area related to the education to be provided to students. After expert advice, necessary arrangements were made for the academic content. Online SRH education was provided within the limits specified in Table 1 as part of the study. With the students in the education group, online education covering various topics related to SRH was delivered by the same lecturer for 14 weeks, 2 hours per week, during office hours and weekdays. The lecturer and the students determined the education time for each week together. If the student could not attend the online course that day, it was possible to check the course file on the online platform and consult the teacher if necessary.

Analysis of Data

Data obtained from the survey were analyzed using IBM SPSS 26.0 Statistics software. The normal distribution of the data was evaluated according to the results of Skewness and Kurtosis findings. Descriptive analysis (frequency, percentage, mean, median, minimum, maximum and standard deviation) is used for continuous variables and presentation of data. Parametric analysis (such as independent samples t-test, correlation) is applied for causality analysis between variables. The significance level was 0.05 in the study.

Ethical Approval

Permission was obtained from the ethics committee (14.06.2022, 2022-SBB-0275) and the institution (30.06.2022, E-71504618-600-2200059542) for doing the study, and the authors for using the knowledge test during the study data collection process. Informed consent was obtained from all students participating in the study.

RESULTS

The results of this study revealed that the intervention group had significantly higher scores on sexual health questions than the control group ($p<0.05$). The significance difference between the two groups' knowledge means is 6.94 points, and the p-value <0.05 indicates statistical significance. The results show that has a positive impact on university students' knowledge.

The university students in both groups were very similar in terms of many socio-demographic characteristics (class, age, gender identity, employment status, number of siblings, educational level of parents, employment status of parents, oldest place of residence, type of residence during university education, getting any information about SRH before the online education) ($p>0.05$). Married students who participated in this online SRH education significantly outnumbered married students in the group of students who did not choose to participate in this education ($p<0.05$). In addition, students with no partner significantly choose not to be involved in education as much, and students in the health sciences prefer to be involved in education more than the other disciplines for both groups ($p<0.05$) (Table 2).

Students in the intervention group gave 60% more correct answers to the knowledge test questions (there were significant differences in 24 questions, no difference in 16 questions) than those in the control group. Correct responses from students who participated in the education were significantly higher than those from students who did not ($p<0.05$) (Table 3).

Table 2. Sociodemographic characteristics of students

	Sexual Health Educated (n=85)		Sexual Health Uneducated (n=95)		Total (n=180)		X^2	p
	n	%	n	%	n	%		
Class grade								
Preparation	-	-	3	3.2	3	1.7		
1st	30	35.3	38	40.0	68	37.8		
2nd	20	23.5	30	31.6	50	27.8	3.665	.056
3rd	27	31.8	17	17.9	44	24.4		
4th	8	9.4	7	7.4	15	16.8		
Age mean	21.00 (min=18, max:32)		20.00 (min=18, max:30)		21.00 (min=18, max:32)			
Sexual identity								
Female	60	70.6	59	62.1	119	66.1	1.441	.230
Male	25	29.4	36	37.9	61	33.9		
Marital status								
Single	69	81.2	93	97.9	162	90.0	12.136	**.000**
Married	16	18.8	2	2.1	18	10.0		
Working status								
Working	10	11.8	10	10.5	20	11.1	.001	.979
Not working	75	88.2	85	89.5	160	88.9		
Partner presence								
Yes	45	52.9	30	31.6	75	41.7	8.423	**.004**
None	40	47.1	65	68.4	105	58.3		
Number of siblings								
Two and below	34	40.0	39	41.1	73	40.6	.021	.886
Three and above	51	60.0	56	58.9	107	59.4		
Total number of siblings	3.00 (min=1, max:10)		3.00 (min=1, max:10)		3.00 (min=1, max:10)			
Mother's education								
Middle school and below	56	65.9	61	64.2	117	65.0	.055	.814
High school and above	29	34.1	34	35.8	63	35.0		
Father's education								
Middle school and below	40	47.1	48	50.5	88	48.9	.216	.642
High school and above	45	52.9	47	49.5	92	51.1		
Mother's working								
Working/Retired	28	32.9	38	40.0	66	36.7	.963	.327
Not working	57	67.1	57	60.0	114	63.3		
Father's working								
Working/Retired	73	85.9	89	93.7	162	90.0	2.229	.135
Not working	12	14.1	6	6.3	18	10.0		
Longest lived place								
Town/Village/Town/District	23	27.1	30	31.6	53	29.4	.441	.507
City/Metropolitan/Metropolitan	62	72.9	65	68.4	127	70.6		
Residence type								
Homestay/Alone	15	17.6	11	11.6	26	14.4	.891	.345
Peer interactive (state or private dormitory, with a roommate)	70	82.4	84	88.4	154	85.6		
Education area								
Health sciences	39	45.9	23	24.2	62	34.4	9.480	**.024***
Liberal arts	11	12.9	16	16.8	27	15.0		
Science	15	17.6	26	27.4	41	22.8		
Educational sciences	20	23.5	30	31.6	50	27.8		
Year of the education program								
Two years	55	64.7	78	82.1	133	73.9	6.166	**.013**
Four years	30	35.3	17	17.9	47	26.1		
Being a health sciences program student								
Yes	39	45.9	23	24.2	62	34.4	**9.331**	**.002**
No	46	54.1	72	75.8	118	65.6		
Obtaining information about sexual health before								
Yes	13	15.3	8	8.4	21	11.7	1.444	.230
No	72	84.7	87	91.6	159	88.3		
Total	85	100.0	95	100.0	180	100.0		

* Bonferroni

Table 3. Comparison of students' responses to the expressions of the 'Sexual Health Knowledge Test'*

Qs	Sexual Health Educated (n=85)				Sexual Health Uneducated (n=95)				Total (n=180)				X^2	p
	CA		WA		CA		WA		CA		WA			
	n	%	n	%	n	%	n	%	n	%	n	%		
Q1	66	77.6	19	22.4	60	63.2	35	36.8	126	70.0	54	30.0	4.485	**.034**
Q2	76	89.4	9	10.6	67	70.5	28	29.5	143	79.4	37	20.6	8.676	**.003**
Q3	47	55.3	38	44.7	30	31.6	65	68.4	77	42.8	103	57.2	10.307	**.001**
Q4	77	90.6	8	9.4	61	64.2	34	35.8	138	76.7	42	23.3	16.005	**.000**
Q5	61	71.8	24	28.2	56	58.9	39	41.1	117	65.0	63	35.0	3.240	.072
Q6	43	50.6	42	49.4	24	25.3	71	74.7	67	37.2	113	62.8	12.313	**.000**
Q7	71	83.5	14	16.5	52	54.7	43	45.3	123	68.3	57	31.7	17.187	**.000**
Q8	71	83.5	14	16.5	62	65.3	33	34.7	133	73.9	47	26.1	6.840	**.009**
Q9	73	85.9	12	14.1	51	53.7	44	46.3	124	68.9	56	31.1	21.700	**.000**
Q10	47	55.3	38	44.7	26	27.4	69	72.6	73	40.6	107	59.4	14.512	**.000**
Q11	74	87.1	11	12.9	73	76.8	22	23.2	147	81.7	33	18.3	2.482	.115
Q12	61	71.8	24	28.2	46	48.4	49	51.6	107	59.4	73	40.6	10.140	**.001**
Q13	63	74.1	22	25.9	67	70.5	28	29.5	130	72.2	50	27.8	.137	.711
Q14	72	84.7	13	15.3	52	54.7	43	45.3	124	68.9	56	31.1	18.800	**.000**
Q15	72	84.7	13	15.3	70	73.7	25	26.3	142	78.9	38	21.1	2.644	.104
Q16	55	64.7	30	35.3	57	60.0	38	40.0	112	62.2	68	37.8	.423	.516
Q17	73	85.9	12	14.1	66	69.5	29	30.5	139	77.2	41	22.8	5.966	**.015**
Q18	77	90.6	8	9.4	76	80.0	19	20.0	153	85.0	27	15.0	3.158	.076
Q19	29	34.1	56	65.9	28	29.5	67	70.5	57	31.7	123	68.3	.447	.504
Q20	39	45.9	46	54.1	35	36.8	60	63.2	74	41.1	106	58.9	1.514	.218
Q21	80	94.1	5	5.9	83	87.4	12	12.6	163	90.6	17	9.4	1.665	.197
Q22	42	49.4	43	50.6	41	43.2	54	56.8	83	46.1	97	53.9	.706	.401
Q23	67	78.8	18	21.2	67	70.5	28	29.5	134	74.4	46	25.6	1.217	.270
Q24	38	44.7	47	55.3	39	41.1	56	58.9	77	42.8	103	57.2	.245	.621
Q25	76	89.4	9	10.6	62	65.3	33	34.7	138	76.7	42	23.3	13.305	**.000**
Q26	79	92.9	6	7.1	68	71.6	27	28.4	147	81.7	33	18.3	12.284	**.000**
Q27	79	92.9	6	7.1	62	65.3	33	34.7	141	78.3	39	21.7	18.651	**.000**
Q28	48	56.5	37	43.5	23	24.2	72	75.8	71	39.4	109	60.6	19.546	**.000**
Q29	51	60.0	34	40.0	42	44.2	53	55.8	93	51.7	87	48.3	4.479	**.034**
Q30	59	69.4	26	30.6	48	50.5	47	49.5	107	59.4	73	40.6	6.637	**.010**
Q31	41	48.2	44	51.8	14	14.7	81	85.3	55	30.6	125	69.4	23.724	**.000**
Q32	21	24.7	64	75.3	9	9.5	86	90.5	30	16.7	150	83.3	6.438	**.011**
Q33	45	52.9	40	47.1	30	31.6	65	68.4	75	41.7	105	58.3	8.423	**.004**
Q34	68	80.0	17	20.0	67	70.5	28	29.5	135	75.0	45	25.0	1.672	.196
Q35	76	89.4	9	10.6	50	52.6	45	47.4	126	70.0	54	30.0	28.899	**.000**
Q36	73	85.9	12	14.1	66	69.5	29	30.5	139	77.2	41	22.8	5.966	**.015**
Q37	65	76.5	20	23.5	67	70.5	28	29.5	132	73.3	48	26.7	.535	.464
Q38	82	96.5	3	3.5	70	73.7	25	26.3	152	84.4	28	15.6	16.040	**.000**
Q39	36	42.4	49	57.6	32	33.7	63	66.3	68	37.8	112	62.2	1.434	.231
Q40	56	65.9	29	34.1	57	60.0	38	40.0	113	62.8	67	37.2	.664	.415

* Qs: Questions; CA: Correct answer; WA: Wrong answer

Other interesting results show that the mean of the total score of the Sexual Health Knowledge Test (SHKT), which determines the level of knowledge about the sexual health of those who chose and completed the online SRH education, is significantly higher ($p<0.05$). Similar results were found in most sub-dimension groups (sexual health/reproductive health, values related to sexuality, sexual identity development, sexual orientations, gender-social gender, anatomy of the reproductive system, sexual intercourse/sexual satisfaction, contraception and sexually transmitted infections). The knowledge scores in these sub-dimensions were significantly higher than in the control group ($p<0.05$). There was no significant difference in the mean scores for knowledge of the sub-dimensions of reproductive physiology and safe sexual behaviors between the intervention and control groups ($p>0.05$). However, it can be seen that these scores are higher in the intervention group ($p>0.05$) (Table 4, Table 2).

Despite being health science students, the mean total test scores of the students in the control group were lower (21.74 ± 8.28) than those of the health science students in the intervention group (27.51 ± 5.86). On the other hand, the mean total test scores of the non-health science students who chose and completed the online education program had a higher knowledge score (29.48 ± 5.01) than the control group (21.61 ± 6.72). Participants in the study were categorized based on several factors, including gender identity (female, male), marital status (single, married), employment status (employed, unemployed), presence of partners (yes, no), number of siblings (two and below, three and above), educational status (secondary school and low, high school and above), parental employment status of (employed, unemployed), place of residence (town/village/district, city/metropolitan area) and type of residence during higher education (homestay/individual), interaction with peers (state dormitory/private dormitory/roommates), place of most prolonged residence (town/village/district, city/metropolitan area), year of the program in which the student was enrolled (two years, four years), and any previous information on SRH (yes, no) (Table 2).

There was no significant difference between the test knowledge means of the 3rd and 4th-degree students in interventional and control groups ($p>0.05$). Among the students, whether they were students of a health science program or not, the knowledge levels of those in the intervention group were significantly higher ($p<0.05$). Additionally, the general knowledge of the preparatory, 1st and 2nd-degree students who chose and completed the online SRH education was significantly higher than those who did not choose the education ($p<0.05$). At the same time, there was no significant difference between the 3rd and 4th-degree students ($p>0.05$) (Table 5).

Table 4. Comparison of students' Sexual Health Knowledge Test total and sub-dimentions' scores

	Sexual Health Knowledge Test							
	Sexual Health Educated (n=85)			**Sexual health Uneducated (n=95)**			**t***	**p**
	Mean (Median) ±Sd	**Min-Max**	**Skewness Kurtosis**	**Mean (Median) ±Sd**	**Min-Max**	**Skewness Kurtosis**		
Total Score	28.58 (29.00)±5.47	13.00-38.00	-.689 .411	21.64 (23.00)±7.09	6.00-34.00	-.587 -.417	7.390	**.000**
Sub-dimensions								
Universal Values Regarding Sexuality	1.67 (2.00) ±.61	.00-2.00	-1.679 1.720	1.34 (2.00) ±.72	.00-2.00	-.613 -.862	3.368	**.001**
Gender Identity Development	2.73 (3.00) ±.97	.00-4.00	-.314 -.484	1.82 (2.00) ±1.06	.00-4.00	.149 -.704	5.972	**.000**
Sexual Orientations	2.18 (2.00) ±.79	.00-3.00	-.937 .797	1.35 (1.00) ±.99	.00-3.00	.064 -1.047	6.250	**.000**
Sex-Gender	2.57 (3.00) ±.68	.00-3.00	-1.517 1.869	1.96 (2.00) ±.96	.00-3.00	-.513 -.730	4.855	**.000**
Anatomy of the Reproductive System	1.92 (2.00) ±.86	.00-3.00	-.410 -.485	1.56 (2.00) ±.94	.00-3.00	-.093 -.854	2.662	**.008**
Sexual Intercourse / Sexual Satisfaction	3.29 (4.00) ±.92	1.00-4.00	-1.089 .123	2.90 (3.00) ±1.07	.00-4.00	-.653 -.605	2.591	**.010**
Physiology of Reproduction	1.74 (2.00) ±.82	.00-3.00	-.018 -.659	1.53 (1.00) ±.92	.00-3.00	.255 -.831	1.646	.101
Contraception	4.55 (5.00) ±1.38	.00-6.00	-.801 .315	3.38 (4.00) ±1.50	.00-6.00	-.424 -.934	5.444	**.000**
Sexually Transmitted Infections	4.25 (4.00) ±1.43	.00-7.00	-.449 -.164	2.74 (2.00) ±1.52	.00-7.00	.478 -.184	6.849	**.000**
Sexual Violence	2.59 (3.00) ±.66	.00-3.00	-1.606 2.346	2.14 (3.00) ±1.11	.00-3.00	-.901 -.671	3.362	**.001**
Safe Sexual Behaviours	1.08 (1.00) ±.78	.00-2.00	-.144 -1.309	.94 (1.00) ±.74	.00-2.00	.102 -1.153	1.287	.200

* t: Independent student t-test

Table 5. The effect of students' undergraduate education characteristics and sexual health education status on information scores

Total Score		Sexual Health Knowledge Test									
		Sexual Health Educated (n=85)					Sexual health Uneducated (n=95)				
		n	Mean (Med)±Sd	Min-Max	Skewness Kurtosis	Test value	n	Mean (Med) ±Sd	Min-Max	Skewness Kurtosis	Test value
Student of Health Science Program	Yes	39	27.51(29.00) ±5.86	13.00-36.00	-.727 .064	t= -1.668 p= .099	23	21.74(23.00) ±8.28	6.00-31.00	-.961 -.237	t= .075 p=.940
						t= 3.208	**p= .002**				
	No	46	29.48(29.00) ±5.01	14.00-38.00	-.530 .565		72	21.61(23.00) ±6.72	6.00-34.00	-.400 -.540	
						t= 3.208	**p= .000**				
Students' classes	Prep class. first- and second-year college student	50	29.14(30.00) ±4.88	18.00-36.00	-.507 -.753	t= 1.137 p= .259	71	20.65(23.00) ±7.01	6.00-31.00	-.642 -.463	t= -2.412 **p=.018**
						t= 7.860	**p= .000**				
	3rd year and college senior	35	27.77(27.00) ±6.21	13.00-38.00	-.689 .706		24	24.58(27.00) ±6.61	12.00-34.00	-.550 -.844	
						t= 1.888	p= .064				

* t: Independent student t-test ** The significance level is .050

The relationship between the test score means of the university students in the intervention group and the number of siblings (moderately strong and negative) and the educational level of fathers (moderately strong and positive) was determined ($p<0.05$). When the number of siblings decreased and also the fathers' education level increased, the test scores of students in the intervention group increased.

The class degree between the university students created a significant relationship (moderately strong and positive) for knowledge total test scores in the control group ($p<0.05$), but not in the other group ($p>0.05$). The knowledge of SRH increased with the increasing grade level in the control group, despite the lack of distinction between the degrees of the classes in the intervention group (Table 6).

Tablo 6. The relationship between some sociodemographic characteristics and students' knowledge scores

	Sexual Health Knowledge Test Score			
	Educated (n=85)		Uneducated (n=95)	
	r*	p**	r*	p**
Class/ Year of the course	-.099	.365	.284	**.005**
Age	.015	.888	.079	.446
Number of siblings	**-.240**	**.027**	-.033	.751
Mother education status	.082	.457	.022	.835
Father's education	**.221**	**.042**	-.080	.441

* r: Pearson correlation ** The significance level is .050

DISCUSSION

This study aimed to evaluate the difference in SRH knowledge between university students who received and did not receive online SRH education. The study found that the students who did not have a partner preferred not to participate in the education. Parallel to the finding, Fisher et al.'s (2023) study also found that students who did not have a partner did not seek information about sexual health (5). Similarly, it is noted that the most common age period for STIs is during the years of active sexual life. Given that sexual activities increase and diversity in the presence of partners, it can be interpreted as an expected finding that students with partners prefer to attend training on SRH. SRH studies for young people are an issue that needs to be emphasized (28).

The study revealed that students in the field of health sciences preferred to attend the training more than students in other disciplines. In our country, elective and mandatory courses related to sexual health are mostly available to students in the field of health. Students in other fields of science can only take sexual health courses as electives. Considering that elective classes have a limited quota, it is observed that not all students have access to formal sexual education in schools (3). It has been noted that an increase in sexual health knowledge leads to more positive attitudes towards sexual health, and as a result, healthy sexual behaviors occur (15). In line with this, students in the health field have been found to exhibit more expected behaviors regarding sexual health (29). The study by Guan (2021) also indicated that students with low SRH knowledge engage in riskier sexual behaviors (15). Studies conducted with university students in Ethiopia and China have found that comprehensive sexual health education positively influences students' knowledge, attitudes, and behaviors (30,31). A study conducted in Ethiopia in 2017 emphasized the importance of providing sexual health education to young people in countries where sexuality is considered a taboo topic. It highlighted that offering sexual health education in schools can be protective against STIs and, therefore, underscored the necessity of providing sexual health education to young individuals (32). To enable young individuals to make informed sexual choices, prevent early-age and unwanted pregnancies, and protect against sexually transmitted diseases, sexual health education should be provided throughout their lives in an age-appropriate manner (33). In line with the Sustainable Development Goals to be achieved by 2030, it is essential to embed the right to education into overarching plans and policies that contribute to the establishment of effective, accountable, and inclusive institutions at all levels. This will help in achieving the goal of ensuring that all individuals can access a healthy and quality life by protecting themselves from

communicable diseases (Goal 3) and reducing inequalities in receiving sexual health education (Goals 4, 10, and 16) (Global Goals for Sustainable Development, 2023) (22).

The study observed that students who received online SRH Education provided 60% more correct answers to the knowledge test questions than students who did not receive education, and this difference was statistically significant. Similar to this finding, in another study conducted in Türkiye, it was found that 60.7% of the students studying in the field of health who took the sexual health course considered themselves more competent in SRH than those who did not take the course (9). Another study conducted with students studying in the field of health revealed that students who took sexual health courses found their knowledge levels about sexual health to be sufficient than those who did not (3). In a different study conducted with students studying in the field of health in Türkiye, it was determined that the level of knowledge of students about STIs increased significantly following the SRH education (12). Furthermore, a study conducted in the USA to assess SRH knowledge among students in the health field found that students answered the questions correctly at a rate of 66% (10). One study, in which 661 female university students between the ages of 18-26 were given HPV training online at a university in the midwest region of the USA, found that the knowledge levels of the students about HPV increased after the training (34). These studies from various countries worldwide demonstrate an improvement in the level of knowledge resulting from the training provided to university students.

While the SHKT total mean score of the students studying health and not receiving SRH education in the study was 21.74±8.28, it increased to 27.51±5.86 after the education. On the other hand, the SHKT total mean score of the students outside the health field was 21.61±6.72 before the education, and it increased to 29.48±5.01 after the education. In other words, this study determined that the knowledge scores of the students who received SRH education increased significantly ($p<0.05$). Similarly, in the study by Evcili and Golbasi (2018), the students in the intervention group had a SRH knowledge score of 19.30±6.15 before the training, while their mean knowledge score increased to 25.57±8.06 after the intervention (35). In two cross-sectional studies conducted in Türkiye, the total mean SRH knowledge score of university students was found to be 19.94±6.16 and 19.93±7.73, respectively, similar to the pre-test finding of this study (13,35). In a survey conducted with students outside the health field, the correct answer score of a knowledge test about STIs was calculated as 20.35±6.07 (28). In different studies, it was stated that the level of knowledge of university students who received SRH education increased (6,21,29,33). A study conducted in Thailand found that the text message intervention increased the SRH literacy of adolescents (36). In this respect, it is seen that young people generally have similar levels of SRH knowledge, which needs further improvement.

Among the university students in the research, the total SHKT mean score and sub-topic groups mean scores were significantly higher in the group which received the SRH education ($p<0.05$). Although there was no significant difference between the mean knowledge scores of the student groups who received and did not receive education in the Physiology of Reproduction and Safe Sexual Behaviors sub-topics in the SHKT, the scores were found to be higher in the group that received the education ($p>0.05$). The study by Evcili and Golbasi (2018) also found that the student's scores in the SRH knowledge test and all sub-dimensions increased significantly after peer education (35). In an educational intervention conducted with nursing students, it was observed that the participants' knowledge of reproductive health and their

average scores in developing protective behaviors against potential sexual health issues significantly increased after the training (12). It was determined that HPV and safe sex life education given to students studying outside the field of health in Türkiye increased the awareness levels of students (18). A study conducted with students outside the healthcare field in Australia reported that students who received SRH education showed an increase in safe sexual practices, protection against STIs, and the use of family planning methods (5). After the web-based SRH program given to female university students in Hong Kong, the participants stated that their knowledge about family planning methods, sexual consent and STIs increased (24). Another study conducted with university students outside the health field in Iran found that students' level of knowledge about SRH and STIs increased after sexual and reproductive health education (37). In this context, it can be said that sexual health education increases students' knowledge on various topics related to sexual health, regardless of the country where it is provided.

Among students, it was found that the knowledge scores of students who received sexual health education from preparatory class, 1st-year, and 2nd-year students were significantly higher than those who did not receive education ($p<0.05$). In the group of students who did not receive education, it was also observed that the year of study had a positive and significant impact on their mean knowledge scores. In line with this finding, various studies have determined that as the academic year of students progresses, their level of sexual health knowledge also increases (5,6,15,16,19,20,38). In the study by Evcili and Golbasi (2017), the mean score of SRH knowledge of students aged ≥22 years, that is, students who often study in the 3rd and 4th year, was found to be higher than the others (39). The fact that elective courses are often offered in the first and second years of university at the institution where the research was conducted may have contributed to the increase in students' knowledge levels. It has been emphasized that the level of SRH knowledge of students who seek resources to obtain sexual and reproductive health information is higher with the onset of sexual relationships (5). In this context, for the group of university students who did not receive education, considering that the class they attended increased with age, and taking into account the beginning of peer communication and sexual closeness, it can be suggested that their knowledge levels may have increased.

It is stated that familial factors play an essential role in sexual health education (5). This study revealed that as the number of siblings of the students decreased and the education level of the fathers increased, the level of SRH knowledge increased. The literature has shown that sexual health knowledge increases with an increase in the mother's educational level, or there is no significant relationship between the mother's educational level and sexual health knowledge (39). There are different findings on the relationship between familial factors and SRH knowledge. In the study of Gursoy and Yesildere Saglam (2022), the sexual health knowledge level of those whose parents were illiterate was found to be lower than the other groups (13). Various studies reported that the level of SRH knowledge is not related to the education level of the mother and father, and the vital factor is the level of education and communication of the parents with their children on SRH issues (3,37). Özcan et al. (2016) found that those who received sexual health education from their families had higher knowledge about SRH (14). A study conducted with university students in Indonesia reported that the ability of students to talk about sexual issues with their families is related to SRH knowledge (38). In countries like Turkey, where traditional gender roles are prevalent, and a patriarchal system is dominant, an increase in the father's education level is expected to lead to increased family planning method usage, a decrease in the number of

children in families, and an improvement in women's and children's access to education, employment, and social opportunities. In line with this, it has been noted that the process of obtaining information on sexual health and the level of discussion of these topics in parent-child communication will increase (19,39,40). In this context, sexual health education is also expected to contribute to achieving Sustainable Development Goal 5, which aims to achieve gender equality and empower women and girls (Sustainable Development Goals, 2023) (22).

Limitations

One of the strengths of the study is its inclusivity, as the university where the research was conducted attracts students from various regions across the country, ensuring a diverse participant pool. Nevertheless, the research's reliance solely on students from a state university poses constraints on the generalizability of the findings. It's important to note, however, that this research serves as a pilot study for future investigations. The use of non-probability sampling method in the study may reduce generalizability. There may be differences in the distribution of students into groups in terms of sociodemographic characteristics. In addition, no randomization was performed in this study and a quasi-experimental design was used. The lack of randomization in the study may affect internal validity. The lack of interim follow-up in the study can be considered one of the limitations.

CONCLUSIONS

The study revealed that the level of SRH knowledge of the students who received online SRH education was higher than those who did not. It is predicted that online SRH education will lead to an increase in students' knowledge of safe sexual behavior, a decrease in risky and unhealthy sexual practices, and a reduction in mortality and morbidity rates. Considering that sexual health is deemed equally important as fundamental needs like breathing, nutrition, and excretion in the hierarchy of basic human needs, all students must be provided with SRH education at universities, which is the last step of their education level. It is recommended to create public service announcements that attract the interest of university students and aim to enhance their sexual health knowledge and sensitivity. Additionally, setting up informative booths at regular intervals on campus throughout the academic year could also be suggested. Furthermore, it is recommended to conduct current research that examines various variables related to the topic and employs different educational techniques.

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Conflict of Interest

There is no conflict of interest among the authors.

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