

Supplementary file 1. Characteristics of 10 Studies Included in the Present Study

Author, Year, Location, Setting	Intervention Frequency	Framework	Study Design	Precipitants	Instrument	Findings
Shin et al, 2011, Korea, college (25)	Sex education, during elementary, middle, and high school and college	Ministry of Education, Science, and Technology (MEST)	Descriptive, comparative study proportional quota sampling	A total of 2180 females and 3609 males, unmarried college students	-A sexual attitudes questionnaire five-point, Likert-type scale	- Failed to influence the sexual attitudes or sexual activity; - Failed to make any difference to contraceptive use or STD infection rate; -In middle school associated with a decrease in the unintended pregnancy rate.
Grose et al., 2014 USA, School (18)	Sexual education, eighth-grade students by a facilitator, and held for 50 minutes each day for 10 days	Walnut women’s center (WAWC) sexual education program	a pretest– posttest survey	25 to 30 (N=95) boys and girls in each class	-Sexual knowledge (sexual health knowledge, services knowledge) -Contraceptive beliefs (healthy sexual relations, -Birth control access, birth control responsibility) scales	- More progressive attitudes toward girls and women, less agreement with hegemonic masculinity ideology; - Increases in sexual health and resource knowledge.
Sevilla et al., 2016 Spanish, Secondary Education Institute (26)	SOMOS sex education program, developed in 12 sessions of 50 minutes each	SOMOS compulsory secondary education (ESO) of a secondary education institute	Pre-test/post-test design	A number of 123 adolescent students (test group: 71, control group: 52)	-Levels of sexual experience of Schofield; -Scale of attitudes towards sexuality (ATSS) of Fisher and Hall.	- The development of positive attitudes towards sexuality; - Significant decrease in negative attitudes towards masturbation.

Chun, 2012 Korea students (27)	Sexual education The integrative 5- weeks (15 hours)	Self- determination theory	Pre-test/post-test design	A total of 59 female students were assigned to the experimental (n=29) and control (n=30) groups	-Sexual knowledge and the sexual autonomy questionnaires before the program, right after, and 10 weeks after the intervention	- Group differences on sexual autonomy score; -No group differences on sexual knowledge at any time.
Minaya et al., 2008 Dominican Republic, school (28)	Sex education	Encuesta Nacional de Jovenes, (ENJOVEN)	Survey	A number of 1,851 females and 1,723 males. This study used only females' responses	-HIV/AIDS knowledge and condom use questioner.	Effective in increasing HIV/AIDS knowledge and condom use.
Vivancos et al. 2013 East Anglia, Norwich, UK British university (46)	School-based sexual education on 14 years of age	-----	Web-based survey	All= 711 (Females=492)	-Online questionnaire, asked questions about risky behaviors.	-STI diagnosis for female students associated with younger age at first intercourse and difficulty to discuss sex with one's parents; -No associations with unprotected intercourse in females.
Williams, Monnica T et al., 2006 North America, school (47)	Sexual education,	combination contraceptive and abstinence education	Internet survey	1,400 students	-Online multi choice questionnaire.	-More satisfaction with sex education from informal sources; -Receiving sex education from parents or schools reported with fewer pregnancies and abortions.
Jian Tao Lee 2011 Taiwan postpartum wards medical centers in northern Taiwan (31)	Sexual education, Group A 10–15 mins of individual, education by a staff member	IPSHEP intervention (Assess learning stage, interactive pamphlet, & individual education)	Experimental study randomized to three groups	N=250 Experimental A=70 Experimental B=92 Control group =88	-IPSHEP a self- report instrument that measures four dependent variables including sexual health knowledge, sexual health attitudes, contraceptive self-efficacy (CSE).	- Greater contraceptive self-efficacy; -More likely to choose more effective contraceptive methods at 2 months postpartum than other groups.
Pamela K. Kohler, (2008) United States (23)	Sex education any formal instruction any where	National survey of family growth	National survey cohort	A number of 1150 adolescent girls and 1121 adolescent boys	-In-home interview process including audio computer	-Less teen pregnancy; -Lower likelihood of vaginal intercourse.

					assisted self-interviewing (ACASI).	
Gh. Mahmodi, R. Hassanzadeh, G. Heidari (2007) Mazandran Medical University students Iran ⁽³²⁾	Sexual education by a psychologists and physicians; - Six weeks of 2-hour session by educational video and power point.	-----	Quasi-experimental and research design was post-test with one group	A total of 92 (36 females & 56 males) university students. Random stratified sampling method	A questionnaire consisting of 20 items on a 5-point Likert-type scale response option (with a score rang of one to five)	<ul style="list-style-type: none"> - Sex education effect on: - Health behavior -Sex appropriate behavior; - Mental health and prevention of sexual problem;. - Family health - Appropriate gender identity. - Different effect of sex education between male and female students.

