

# Gender Difference in Mediating Effects of Self-Efficacy for the Prevention of Sexually Transmitted Diseases (STD) among College Students' STD Knowledge, Susceptibility, and Sexual Autonomy

Park, Mijeong, Ph.D., RN

Assistant Professor, Department of Nursing, Hoseo University, Asan, Korea

**Purpose:** The purpose of the study was to examine the impact of self-efficacy in the prevention of sexually transmitted diseases (STD), knowledge of and susceptibility to STD, and the role of gender in sexual autonomy. **Methods:** Data were collected from 267 college students using self-report questionnaires during the period from the first to the twentieth of June 2015. Data were analyzed using  $\chi^2$  test, Fisher's exact test, t-test, Pearson correlation coefficients, simple and multiple regression techniques with the PASW/WIN 20.0 program. Mediation analysis was performed according to the Baron and Kenny method and Sobel test. **Results:** In male students, self-efficacy for STD prevention showed a full mediating effect in the relationship between STD susceptibility and sexual autonomy ( $\beta = -.08, p = .370$ ). But in female students, it had a partial mediating effect ( $\beta = -.25, p = .001$ ). And self-efficacy for STD prevention showed partial mediating effects in the relationship between knowledge of STD and sexual autonomy in the both male ( $\beta = .25, p = .005$ ) and female students ( $\beta = .33, p < .001$ ). **Conclusion:** To enhance college students' sexual autonomy, it may be useful to build effective strategies enhancing students' knowledge about and susceptibility to STD and to develop a self-efficacy promotion program for college students.

**Key Words:** Sexually transmitted disease, Knowledge, Disease susceptibility, Self-efficacy, Personal autonomy

## INTRODUCTION

Humans can make more responsible decisions and prevent and solve problems associated with sex when they are appropriately educated. The development of computers and the internet has made media with sexual content readily available to the entire population. This openness has led to radical changes in sexual attitude and behavior of college students, including increased spread of sexually transmitted diseases (STD), sexual crimes, abortion, and unmarried mothers [1]. Worldwide, more than one million people are affected by STD every day, and it is estimated that there are 357 million new cases every year. Chlamydia and gonococcus are the most commonly reported diseases, and these frequently occur in individuals in their late teens and early 20s [2,3]. Bacterial STD such as chlamydia and gonococcus are risk factors for HIV

(human Immunodeficiency Virus), increasing the risk of HIV infection by 360~500% [4]. Thus, it is important to prevent, detect and cure STD early in young people.

Although they are treated as adults by the law, biology, and society, Korean college students might be not mature enough that has not yet properly experienced the transient step from adolescence to adulthood. College students who entered adolescence without appropriate sex education during junior high school and high school often do not have thoughts focused on human relationships during dating, and may experience sexual confusion [5,6]. As a result, college students often experience problems associated with sex [7,8]. There are many cases in which college students engage in sexual intercourse without any preventive measures against STD because of a lack of knowledge about it [9]. In addition to causing STD, such behavior can lead to unwanted pregnancy and abortion.

### Corresponding author: Park, Mijeong

Department of Nursing, Hoseo University, 20 Hoseo-ro, 79 beon-gil, Baebang-eup, Asan 31499, Korea.  
Tel: +82-41-540-9535, Fax: +82-41-540-9558, E-mail: [mijeong@hoseo.edu](mailto:mijeong@hoseo.edu)

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As a result, multilateral academic and social efforts to help college students make responsible decisions are required [5].

Sex is a basic human desire that is inevitable, and college students can prevent sexually-related problems if they have an understanding of safe and sensible sexual behaviors. To accomplish this, they should be educated appropriately. Given that sexual autonomy is a power to assert oneself [10], people with high sexual autonomy can maintain safe sexual health [5]. Sexual autonomy can be affected by knowledge of and susceptibility to STD and self-efficacy for STD prevention [1,5,11]. Self-efficacy for STD prevention, which includes self-confidence when using condoms and other measures to prevent STD, is considered as an important concept as it enables sexual autonomy as well as responsibility for dating, and allows desirable child birth and parenting [12]. Thus, it is important to determine college students' self-efficacy for STD prevention, and clarify how their self-efficacy for STD prevention is related to their knowledge about and susceptibility to STD and sexual autonomy.

While men are allowed to have sexual intercourse before or after marriage, women are expected to remain abstinent before marriage and maintain chastity during marriage, which means that there are dual norms of sexuality under Korean androcentric sexual culture [13]. As a result, male and female college students' perceptions and attitudes regarding sexuality differ [14,15]. However, most studies of college students' sexuality conducted to date have not considered gender separately [1,5,14]. Although self-efficacy as a cognitive mediation role connected to various variables and behaviors is emphasized for sexual health and prevention of sexual diseases [12], few studies have investigated the effects of self-efficacy on sexuality related variables. Therefore, this study was conducted to shed light on gender differences in the mediating effects of self-efficacy as they relate to STD prevention and sexual autonomy. The results of this study will extend knowledge regarding the role of self-efficacy in STD prevention as it relates to college students' sexual autonomy. Moreover, the findings presented herein will facilitate development of sex health education programs for college students.

## METHODS

### 1. Study Design

A cross-sectional survey design was used for finding the relationships among college students' knowledge about and susceptibility to STD and sexual autonomy, and gen-

der differences in mediating effects of their self-efficacy for STD prevention.

### 2. Subjects

113 male and 154 female students were recruited from three universities located in cities of A, C, and W. Participants understood the purpose of the study and agreed to participate. Sample size was calculated by using G\*Power 3.1.7 [16], a program for the analysis of statistical power. At least 107 subjects per group were required for multiple regression when the significance level was set to .05, two predictive factors were adopted, the effect size was set to a medial value .15 at the 95% test power level.

### 3. Measurements

#### 1) STD knowledge

This study used 18 items of the STD-related knowledge measurement scale developed by Shin et al. [1]. This scale consists of HIV and STD related items such as 'STD can be transmitted by patients with STD.' The measuring criterion requires the subject to mark "yes" if the content of statement is correct, "no" if it is incorrect, and "I am not sure" if the subject failed to fully understand the content of the statement. For scoring, 1 point was given when the answer was correct, while 0 points were given if the answer was wrong or the subject was not sure of the answer; therefore, scores ranged from 0 to 18 points, with a higher score indicating higher levels of knowledge about STD. Cronbach's  $\alpha$  was 0.96 in the study of Shin et al. [1], while it was 0.86 in this study.

#### 2) STD susceptibility

This study revised 10 items pertaining to the HIV and STD susceptibility measurement scale developed by Mahoney, Thombs and Ford [17], and adjusted by Kim [11] for the study purpose. This scale consists of items regarding the partner's and subject's susceptibilities to STD such as, 'I have no risks of getting any STD.' The tool used was based on five-point Likert scales with rating from 1 (strongly disagree) to 5 (strongly agree). A high average score indicated higher levels of susceptibility. In Kim's [11] study, the Cronbach's  $\alpha$  values regarding the partner's and the subject's susceptibility to STD were 0.85 and 0.77, respectively, and the Cronbach's  $\alpha$  value was 0.80 for all 10 items in this study.

#### 3) Self-efficacy for STD prevention

This study identified the self-efficacy of prevention of

STD by measuring the degree of self-confidence of the participant's competence in enabling a condom to be used in a sexual situation. The 18 items on the condom use self-efficacy scale developed by Mahoney et al., [17] and modified by Kim [11] were used. This scale consists of items evaluating mechanics, partner's opposition, self-assertiveness, and excitement state, such as, 'I can use a condom.' The tool was based on a five-point Likert scale, with rating from 1 (strongly disagree) to 5 (strongly agree). Higher average score was associated with higher degree of self-efficacy of STD prevention. In Kim's [11] study, the Cronbach's  $\alpha$  values of mechanics, partner's opposition, self-assertiveness, and excitement state were .83, .83, .81, and .74, respectively, while it was .78 for the 18 items in this study.

#### 4) Sexual Autonomy

This study used 15 items of the sexual autonomy measurement scale developed by Chang [12]. The scale consists of items regarding adjustment and counter movements to sexual intercourse including, 'I can reject sexual intercourse that I don't want.' The tool was based on five-point Likert scales with rating from 1 (strongly disagree) to 5 (strongly agree). A higher average score was associated with a higher degree of sexual autonomy. Cronbach's  $\alpha$  was .86 for the total 15 items in Chang's [12] study, while it was .71 in this study.

#### 4. Ethical Considerations

This study was conducted after approval (YWNR-15-2-034) from Y University's Life Ethics Consideration Committee. Confidentiality and anonymity of answered questionnaires were maintained throughout the study process. Since the survey questionnaires have sensitive and private questions, privacy was provided to each student when they answered the questionnaires. Also, they were instructed to submit the completed questionnaires after sealing in an envelope provided without leaving any identifiable marks. After completion of the questionnaire, participants were given a gift card as a token of appreciation for their time and effort.

#### 5. Data Collection

This study was reviewed and approved by the Y University's Life Ethics Consideration Committee. Data were collected from June 1 to June 20, 2015. Researchers approached potential participants and explained the goals and purpose of this study. Once they understood and agreed to participate into the study voluntarily, they were asked

to sign on the written consent form before receiving survey questionnaires. Data obtained from the participants were kept confidential and encoded for analysis.

#### 6. Data Analysis

Data were analyzed using the PASW/WIN 20.0 program as follows. Participants' general characteristics and major variables were analyzed using descriptive statistics. Gender differences in general characteristics and the variables were analyzed by  $\chi^2$  test, Fisher's exact test, and a t-test. Correlation among the variables was analyzed using Pearson's correlation coefficient. Mediating effects of the self-efficacy for STD prevention in the relationships among knowledge of STD, susceptibility to STD, and sexual autonomy were tested according to Baron and Kenny's method [18] using simple and multiple regression.

## RESULTS

### 1. General Characteristics

Of the 268 subjects, 113 were male and 154 were female. There were no significant gender differences in education experiences about safe sex and condom use or in STD experiences. However, significantly more male (22.1%) than female (4.5%) students reported having had sex ( $\chi^2=19.67$ ,  $p < .001$ ) (Table 1).

### 2. Gender Differences in STD Knowledge, Susceptibility, Self-efficacy for STD Prevention, and Sexual Autonomy

There were no significant gender differences in STD knowledge and sexual autonomy. However, the students showed statistically significant differences in STD susceptibility ( $t=-5.42$ ,  $p < .001$ ) and self-efficacy for STD prevention ( $t=6.05$ ,  $p < .001$ ). Specifically, female students' mean score for STD susceptibility (2.77) was higher than that of male students (2.20), while the male students' mean score for self-efficacy for STD prevention (3.24) was higher than that of female students' (2.75) (Table 1).

### 3. Gender Difference in Correlations of STD Knowledge, Susceptibility, Self-efficacy for STD Prevention, and Sexual Autonomy

In male students, their STD knowledge was positively correlated with their self-efficacy for STD prevention ( $r=.30$ ,  $p=.001$ ) and sexual autonomy ( $r=.36$ ,  $p < .001$ ), while their

self-efficacy for STD prevention had a positive correlation with their sexual autonomy ( $r=.45, p<.001$ ). Moreover, their STD susceptibility was negatively correlated with their self-efficacy for STD prevention ( $r=-.26, p=.005$ ) and sexual autonomy ( $r=-.19, p=.043$ ). In female students, their STD knowledge was positively correlated with their self-efficacy for STD prevention ( $r=.68, p<.001$ ) and sexual autonomy ( $r=.58, p<.001$ ), while their self-efficacy for STD prevention was positively correlated with their sexual autonomy ( $r=.59, p<.001$ ). Moreover, their STD susceptibility was negatively correlated with their STD knowledge ( $r=-.43, p<.001$ ), self-efficacy for STD prevention ( $r=-.50, p<.001$ ), and sexual autonomy ( $r=-.48, p<.001$ ) (Table 2).

#### 4. Gender Difference in Mediating Effects of Self-efficacy for STD Prevention

This study tested the regression hypotheses for independent variables through multicollinearity, error terms, and outlier examination before data analysis. The variance inflation factor was lower than 10 (1.10~1.33), the Durbin-Watson statistic was close to the reference value of 2 (1.95~2.01), and Cook's Distance did not exceed 1.0 (0.14~0.21). Thus, the study results are reliable as the basic hypotheses for the regression formula are all satisfied.

This study used 3-step regression equations to test the mediating effects of self-efficacy for STD. Proposed medi-

**Table 1.** College Students' Characteristics

(N=267)

Variables	Categories	Male (n=113)	Female (n=154)	$\chi^2$ or t (p)
		n (%) or M±SD	n (%) or M±SD	
Grade	Freshmen	38 (33.6)	55 (35.7)	6.61 (.086)
	Sophomore	27 (23.9)	54 (35.1)	
	Junior	23 (20.4)	25 (16.2)	
	Senior	25 (22.1)	20 (13.0)	
Learning experience in safe sex	Yes	50 (44.2)	66 (42.9)	0.05 (.901)
	No	63 (55.8)	88 (57.1)	
Learning experience in condom use	Yes	40 (35.4)	62 (40.3)	0.65 (.446)
	No	73 (64.6)	92 (59.7)	
Had sexual intercourse <sup>†</sup>	Yes	25 (22.1)	7 (4.5)	19.67 (<.001)
	No	88 (77.9)	146 (94.8)	
Had a STD <sup>†</sup>	Yes	2 (1.8)	1 (0.6)	0.74 (.576)
	No	111 (98.2)	153 (99.4)	
STD knowledge		0.59±0.40	0.56±0.36	0.53 (.600)
STD susceptibility		2.20±0.81	2.77±0.87	-5.42 (<.001)
Self-efficacy for STD prevention		3.24±0.64	2.75±0.68	6.05 (<.001)
Sexual autonomy		3.51±0.74	3.49±0.85	0.19 (.850)

STD=sexually transmitted disease; <sup>†</sup> There was a missing response; <sup>†</sup> Fisher's exact test.

**Table 2.** Correlational Relationships among Variables

(N=267)

Variables	Categories	STD knowledge	STD susceptibility	Self-efficacy for STD prevention	Sexual autonomy
		r (p)	r (p)	r (p)	r (p)
Male students	STD knowledge	1	.03 (.719)	.30 (.001)	.36 (<.001)
	STD susceptibility		1	-.26 (.005)	-.19 (.043)
	Self-efficacy for STD prevention			1	.45 (<.001)
	Sexual autonomy				1
Female students	STD knowledge	1	-.43 (<.001)	.68 (<.001)	.58 (<.001)
	STD susceptibility		1	-.50 (<.001)	-.48 (<.001)
	Self-efficacy for STD prevention			1	.59 (<.001)
	Sexual autonomy				1

STD=sexually transmitted disease.

ators (e.g., self-efficacy for STD) were regressed against each independent variable in the first equation, dependent variables against independent variables in the second equation, and dependent variables against independent variables and mediators in the third equation (Tables 3, 4).

According to Baron and Kenny [18], the following conditions should be met for a factor to have mediating effects. Independent variables should be significantly affected in the first equation, while independent variables should have significant effects on dependent variables in

**Table 3.** Mediating Effect of Self-efficacy for STD Prevention in the Relationship between STD Knowledge and Sexual Autonomy ( $N=267$ )

Equations	Categories	B	$\beta$	t	p
Male students	1. STD knowledge $\rightarrow$ Self-efficacy for STD prevention Adj. $R^2=0.08$ , $F(p)=11.21$ (.001)	0.05	.30	3.35	.001
	2. STD knowledge $\rightarrow$ Sexual autonomy Adj. $R^2=0.12$ , $F(p)=16.52$ (<.001)	0.07	.36	4.07	<.001
	3. STD knowledge, self-efficacy for STD prevention $\rightarrow$ Sexual autonomy STD knowledge $\rightarrow$ Sexual autonomy Self-efficacy for STD prevention $\rightarrow$ Sexual autonomy Adj. $R^2=0.24$ , $F(p)=18.92$ (<.001)	0.05 0.44	.25 .37	2.86 4.32	.005 <.001
Female students	1. STD knowledge $\rightarrow$ Self-efficacy for STD prevention Adj. $R^2=0.46$ , $F(p)=129.20$ (<.001)	0.13	.68	11.37	<.001
	2. STD knowledge $\rightarrow$ Sexual autonomy Adj. $R^2=33$ , $F(p)=76.23$ (<.001)	0.14	.58	8.73	<.001
	3. STD knowledge, self-efficacy for STD prevention $\rightarrow$ Sexual autonomy STD knowledge $\rightarrow$ Sexual autonomy Self-efficacy for STD prevention $\rightarrow$ Sexual autonomy Adj. $R^2=40$ , $F(p)=51.54$ (<.001)	0.08 0.46	.33 .36	3.88 4.27	<.001 <.001

STD=sexually transmitted disease.

**Table 4.** Mediating Effect of Self-efficacy for STD Prevention in the Relationship between STD Susceptibility and Sexual Autonomy by Gender ( $N=267$ )

Equations	Categories	B	$\beta$	t	p
Male students	1. STD susceptibility $\rightarrow$ Self-efficacy for STD prevention Adj. $R^2=0.06$ , $F(p)=8.13$ (.005)	-0.21	-.26	-2.85	.005
	2. STD susceptibility $\rightarrow$ Sexual autonomy Adj. $R^2=0.03$ , $F(p)=4.19$ (.043)	-0.17	-.19	-2.05	.043
	3. STD susceptibility, Self-efficacy for STD prevention $\rightarrow$ Sexual autonomy STD susceptibility $\rightarrow$ Sexual autonomy Self-efficacy for STD prevention $\rightarrow$ Sexual autonomy Adj. $R^2=0.19$ , $F(p)=14.30$ (<.001)	-0.07 0.50	-.08 .43	-0.90 4.85	.370 <.001
Female students	1. STD susceptibility $\rightarrow$ Self-efficacy for STD prevention Adj. $R^2=0.24$ , $F(p)=49.36$ (<.001)	-0.39	-.50	-7.03	<.001
	2. STD susceptibility $\rightarrow$ Sexual autonomy Adj. $R^2=0.23$ , $F(p)=45.50$ (<.001)	-0.47	-.48	-6.75	<.001
	3. STD susceptibility, Self-efficacy for STD prevention $\rightarrow$ Sexual autonomy STD susceptibility $\rightarrow$ Sexual autonomy Self-efficacy for STD prevention $\rightarrow$ Sexual autonomy Adj. $R^2=0.39$ , $F(p)=49.00$ (<.001)	-0.25 0.59	-.25 .47	-3.43 6.37	.001 <.001

STD=sexually transmitted disease.

the second equation, mediators should have meaningful influence on dependent variables in the third equation, and the influence of independent variables on dependent variables should be less in the third equation than in the second equation. If the influence of independent variables on dependent variables is not significant when mediators are controlled in the third equation, the relevant factor plays a full mediator role, while it plays a partial mediator role if the influence in question is not significant.

In the male students, the mediating effects of their self-efficacy for STD prevention in the relation in which their STD knowledge and STD susceptibility influence their sexual autonomy have been corroborated using Baron and Kenny's method [16]. Their self-efficacy for STD prevention plays a partial mediator role as the influence of their STD knowledge, the independent variable, is significant in the third equation for knowledge of STD ( $\beta = .25, p = .005$ ). However, their self-efficacy for STD prevention plays a full mediator role since their STD susceptibility, the independent variable, does not have meaningful effects in the third equation for STD susceptibility ( $\beta = -.08, p = .370$ ). In the female students, the mediating effects of their self-efficacy on STD prevention in the relation in which their STD knowledge and STD susceptibility influence their sexual autonomy have been corroborated. Their self-efficacy for STD prevention plays a partial mediator role as the influence of their STD knowledge, the independent variable, is significant in the third equation for STD knowledge ( $\beta = .33, p < .001$ ). Their self-efficacy for STD plays a partial mediator role since their STD susceptibility, the independent variable, has meaningful influence in the third equation for STD susceptibility ( $\beta = -.25, p = .001$ ) (Figure 1).

The results of the Sobel test [19] for testing the significance of the mediating effects of self-efficacy for STD prevention are as follows. In the case of the male students, the mediating effects of their self-efficacy for STD prevention in the relationship between their STD knowledge and sexual autonomy was corroborated ( $Z = 2.68, p = .007$ ), and the same effects were also confirmed in the relationship between their STD susceptibility and sexual autonomy ( $Z = -2.45, p = .014$ ). In the female students, the mediating effects of their self-efficacy for STD prevention in the relationship between their STD knowledge and sexual autonomy have been corroborated ( $Z = 4.00, p < .001$ ), and the same effects were also confirmed in the relationship between their STD susceptibility and sexual autonomy ( $Z = -4.73, p < .001$ ).

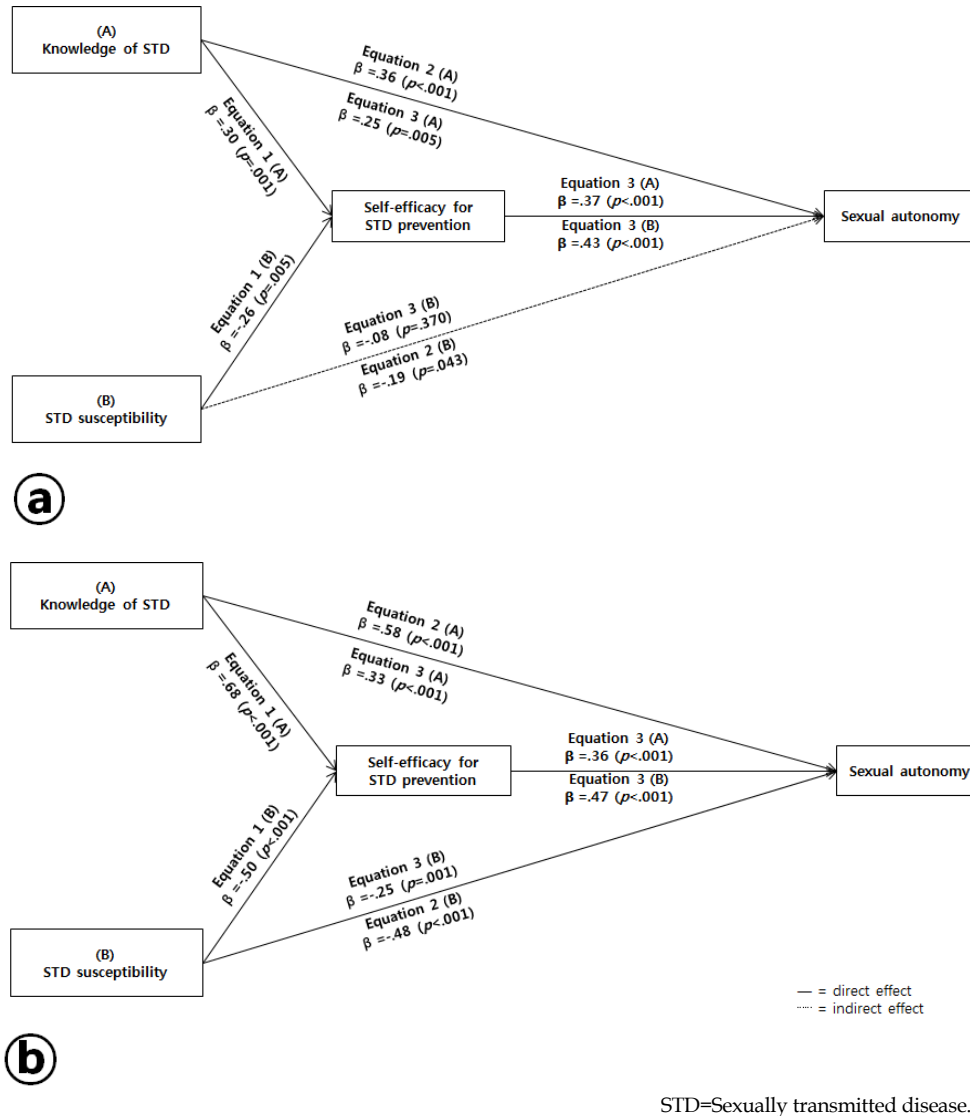
## DISCUSSION

This study evaluated gender differences in mediating

effects of self-efficacy for STD prevention in the relationship among STD knowledge, STD susceptibility, and sexual autonomy to provide basic data for development of a customized program to promote college students' sexual autonomy as an effective way of preventing sexual health problems in Korea.

In this study, less than 50% of both male and female college students were found to have received education regarding safe sex and condom use. As the concern for sexuality and libido are heightened in early adulthood, social problems of STD, unwanted pregnancy and sex-related crimes etc. occur more often [1,5,7]. Given that various issues related to college students' sex have been raised and preventive measures are emphasized, it should be of concern that more than half of the college students surveyed for this study have not received sex education. This lack of education coupled with inappropriate sources of information about sex may lead to problems associated with sex among college students. Accordingly, it is necessary to provide a suitable sex education program for college students. In this study, only 7% of female students reported having had sex, while 22.1% of males reported to have sexual experiences. Moreover, 1.8% of the male students and 0.6% of the female students had been affected by STD. These frequencies are lower than those reported by Shin et al. [20], who found that 50.8% of male college students and 19.0% of female college students had sexual experiences, as well as those reported by Lee et al., [4], who found that 10.0% of male college students and 8.9% of female college students had been affected by STD. This study attempted to obtain honest responses in that anonymity was guaranteed, and the questionnaire was administered in an independent place and returned in sealed envelopes. However, due to Korean culture in which people feel shameful if they have sex when unmarried, it is possible that this study results differ from those of previous studies as some might not respond honestly. Since sexual experiences increase rapidly during college life, resulting in more occurrence of STD such as chlamydia and gonorrhea [3,13], additional study is necessary.

The scores related to STD knowledge were low, with male students having a mean score of 5.86 and females 5.61 out of 18. These scores are lower than those scores presented by Shin et al., [1], but similar to those reported by Shin et al. [20], both of whom used a similar tool as to that employed in this study. The reason for the low level of STD knowledge among male and female students was likely that their levels of education regarding safe sex and condom use are low. The STD may induce serious problems such as organ strictures and infertility in addition to



**Figure 1.** Model showing the influence of knowledge about and susceptibility to STD on sexual autonomy, and the mediating effect of self-efficacy of STDs in male (a) and female students (b).

the symptoms of infection [4]. Accordingly, promotion of accurate knowledge of the effects of STD may serve as a powerful measure that can prevent their spreads.

The male students' mean score for STD susceptibility was 2.20, while that of female students was 2.77 out of 5. There was no previous study found employing female college students as subjects. Kim [11] adopted the same measurement tool in a study of only male students and found a mean score lower than that of this study. Repetitive research seems necessary to determine the STD susceptibility of both male and female students. In this study, female students were found to have greater susceptibility to STD than male students. This difference likely occurred

because it is more likely for female students to have serious problems associated with sexual health such as unwanted pregnancy and STD.

The male and female student's scores for condom use were 3.24 and 2.75, respectively. There was no previous study found investigating use of condoms by female college students. Kim [11] utilized the same measurement tool with only male students as its subjects and found a mean score lower than that of this study. Condom use cannot be implemented without collaboration with the male partner [20]. As a result, it is difficult to identify previous studies related to condom use with female students. In Korean society, men have a higher tendency to have sexual intercourse

acknowledged as an autonomous choice [14,15]. Therefore, the use of condoms has been emphasized among men; accordingly, studies of condom use have been designed to investigate male populations [13,21]. However, female college students should be educated regarding condom use so that they can protect themselves from STD and pregnancy [13].

The sexual autonomy scores were high, but no significant gender differences were observed, with scores of 3.51 and 3.49 being calculated for males and females, respectively. These findings were similar to those reported by Shin et al., [1], who used the same measurement tool. These results suggest that college students have come to have sexual morals and a sense of sex different from previous generations and more freely make decisions about sex because of the current recognition of sex culture and the development of mass media.

Female students' STD knowledge, STD susceptibility, self-efficacy for STD prevention, and sexual autonomy were found to be significantly correlated with each other, but male students' STD knowledge and susceptibility appeared to have no significant correlation. There is no comparison since similar previous studies have not been found. The reason of the results, however, is that male students' experience or inexperience of sexual relations and openness to sex rather than their STD knowledge have some influence on the recognition of the risk of STD infection.

Overall purpose of this study was to test the mediating effects of self-efficacy on STD prevention. First, self-efficacy played a partial mediator role in the relationship between STD knowledge and sexual autonomy for both male and female students and its size is similar in both groups. This means that self-efficacy for STD prevention based on STD knowledge acts as a crucial factor for male and female students' sexual autonomy; however, there are other factors than self-efficacy that influence STD prevention. Although comparison is difficult as there have been no studies carried out in a similar method with college students, exploratory research seems necessary for various variables including attitudes toward sex, gender roles etc. that can have influence on sexual autonomy.

Second, the male students' self-efficacy for STD prevention plays a full mediator role in the relationship between their STD susceptibility and sexual autonomy. This means that male students' efficacy for STD prevention increases and their sexual autonomy is enhanced when their STD susceptibility decreases. STD susceptibility means recognition of the risk of infection, which would likely cause anxiety. For male students, such anxiety influences

their confidence regarding STD prevention, as can be seen in a study conducted by Kim [11]. Accordingly, for male students, it is necessary to provide systematic sex education so that they do not have anxiety regarding knowledge and understanding of STD. It is also necessary to provide diverse strategies to increase self-efficacy of STD prevention by offering information of preventative behavior and efficient methods.

The female students' self-efficacy for STD prevention plays a partial mediator role in the relationship between their STD susceptibility and sexual autonomy. This means that their self-efficacy based on their susceptibility is a great influential factor for the promotion of sexual autonomy, but that there are no other influential factors. Thus, it seems necessary to explore various mediating factors that influence female students' sexual autonomy. Female students showed markedly lower sexual autonomy than males as sexual sensitivity increased. Wrong or over-exaggerated information regarding STD may heighten female students' sexual sensitivity and increase negative perceptions of sexuality, which can eventually decrease sexual autonomy [5]. Accordingly, it is necessary to provide female students with information enabling them to protect themselves from getting STD and offer educational programs to promote positive perceptions of healthy sexuality.

Overall, male and female students showed differences in sexual experience, and both groups had higher sexual autonomy as their STD knowledge and self-efficacy for STD prevention increased. Furthermore, their self-efficacy for STD prevention plays a partial mediator role in the course in which they enhance their sexual autonomy equipped with STD knowledge. However, male students' self-efficacy for STD prevention plays a full mediator role, while that of female students' plays a partial mediator role in the course of the promotion of their sexual autonomy with their STD susceptibility lowered. To promote college students' healthy recognition of sex, a strategy for promoting their self-efficacy for STD prevention is necessary. Although Baron and Kenny's [18] procedure is a classic method to examine whether any mediating effect exists, it has low statistical power and difficulty in controlling measurement error [22-24]. Thus, future studies test the mediating effects of self-efficacy for STD prevention as they relate to STD knowledge, susceptibility and sexual autonomy through structural equation modeling.

## CONCLUSION

Mediating effects of self-efficacy of STD prevention was



examined for gender comparison. To promote sexual autonomy with consideration of the gender differences, it is necessary to develop customized strategies to promote sexual sensibility for female students and self-efficacy among male students. Educational programs should be developed to increase male and female college students' knowledge of sex that focuses on the promotion of their self-efficacy for STD prevention. Both male and female college students' sexual autonomy should be investigated by adding other variables that can influence the self-efficacy for STD prevention.

## REFERENCES

1. Shin YH, Chun YK, Cho SM, Cho YR. The effects of a sex education program on knowledge related to sexually transmitted disease and sex autonomy among university students. *Journal of Korean Academy of Nursing*. 2005;35(7):1304-13.
2. World Health Organization media Centre. Sexually transmitted infections (STIs). WHO; 2015 [cited 2016 January 20]. Available from: <http://www.who.int/mediacentre/factsheets/fs110/en/>
3. Westrom L, Joesoef R, Reynolds G, Hagdu A, Thompson SE. Pelvic inflammatory disease and fertility. A cohort study of 1,844 women with laparoscopically verified disease and 657 control women with normal laparoscopic results. *Sexually Transmitted Diseases*. 1992;19(4):185-92.
4. Lee SJ, Ha US, Kim SW, Cho YH, Yoon MS. Prevalence of chlamydial and gonococcal infections and sexual behavior in university students in Korea. *Korean Journal of Urology*. 2004; 45(7):707-13.
5. Kim KW, Kang KH, Jeong GH. Self-efficacy and sexual autonomy among university students. *Journal of Korean Public Health Nursing*. 2012;26(1):51-9. <http://dx.doi.org/10.5932/JKPHN.2012.26.1.051>
6. Woo NS, Ka YH. A study on the sexual knowledge, sexual attitudes and sexual behavior in Korean and American college students. *The Korean Journal of Woman Psychology*. 2005; 10(2):113-33.
7. Kang HS, Jang SB. Development of college student's condom attitude scale. *Journal of Korean Academy of Nursing*. 2004;34 (5):751-9.
8. Ko YS. A study on male and female university students' sexual attitude and sexual behavior [master's thesis]. Seoul: Ewha Womans University; 2001.
9. Choi MS, Ha NS. A study on the knowledge, attitude, and experience in sex and sexual autonomy of college students. *Korean Journal of Women Health Nursing*. 2004;10(4):318-30.
10. Wolf S. *Freedom within reason*. Oxford: Oxford University Press; 1994.
11. Kim SJ. Predictors of male college students' condom use based upon the health belief model. [master's thesis]. Suwon: Ajou University; 2009.
12. Chang SB. Development of sexual autonomy measurement for college students. *Korean Journal of Women Health Nursing*. 2002;8(1):106-15.
13. Cho GY, Kim YH. Factors affecting sexual autonomy among female university students. *Journal of the Korea Academia-Industrial cooperation Society*. 2014;15(11):6710-8. <http://dx.doi.org/10.5762/KAIS.2014.15.11.6710>
14. Shim CS, Lee YS, Oh SH. Study on the relationship between gender-role stereotypes, sexual assault awareness and permissible limit in the college students. *Korean Journal of Women Health Nursing*. 2012;18(2):117-25.
15. Yoo MS, Park JW, You MA. The relationships among gender egalitarianism, sexual attitudes and sexual harassment myths among Korean university students. *Journal of Korean Society Maternal and Child Health*. 2012;16(1):14-22.
16. Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*. 2009;41(4):1149-60.
17. Mahoney CA, Thomb DL, Ford OJ. Health belief and self-efficacy models: their utility in explaining college student condom use. *AIDS Education and Prevention*. 1995;7(1):32-49.
18. Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*. 1986;51(6):1173-82.
19. Sobel, ME. Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*. 1982; 13:290-312.
20. Shin KR, Park HJ, Kang MJ, Park IS, Bae KE, Seo SR, et al. Survey on actuation sexual attitude among college students. *Health Promotion Research Report*. Seoul: Korea Health Promotion Foundation, 2011 November.
21. Lee HK. Predictors of condom use intentions according to experience of sexual intercourse in male college students. *Korean Journal of Women Health Nursing*. 2010;16(2):194-203. <http://dx.doi.org/10.4069/kjwhn.2010.16.2.194>
22. Ji SH, Kang YS. Discussion on mediation tests of structural equation model in social science field. *Journal of the Korean Data Analysis Society*. 2014;16(6):3121-31.
23. Preacher KJ, Hayes AF. SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*. 2004;36(4):717-31.
24. Rucker DD, Preacher KJ, Tormala ZL, Petty RE. Mediation analysis in social psychology: current practices and new recommendations. *Social and Personality Psychology*. 2011;5(6): 359-71. <http://dx.doi.org/10.1111/j.1751-9004.2011.00355.x>