Research Article

Sex education during the school-aged years influences sexual attitudes and sexual health in college: A comparative study from Korea

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Abstract
Sex education is provided routinely to school-aged children in many countries without enough evidence that it will benefit them when they become adults. The purpose of this study was to examine the long-term influence of the sex education that was provided during the school-aged years on the attitudes, behaviors, and sexual health among male and female college students in Korea. For this descriptive, comparative study, the data were obtained from 3609 male and 2180 female college students by using the proportional quota sampling method. Overall, the female students had more opportunities for sex education. Receiving this education during the school-aged years lowered the sexual double standard score but was not related to sexual activity among the male and female students. Receiving sex education at different time points during the school-aged years had differential influences on the sexual attitudes and indicators of sexual health between the male and the female students. The results of this study suggest extending the role of school nurses to include redesigning the content of sex education programs, based on the sex and age of the students, and using midwives to provide sex education in community settings.

Key words retrospective studies, sex differences, sex education, sexual behavior.

INTRODUCTION
Sex education has been provided routinely to school-aged children in many countries. The National Foundation for Educational Research in England and Wales investigated the policies for sex education in 17 countries (NFER, 2009). Sex education was statutory in 16 of the countries that were investigated. Some countries mandated sex education for children as young as 4 years old (Hungary) or 5 years old (Scotland and the Netherlands). Korea was one of four countries that not only mandated sex education but also did not give ways for parents to prevent their children from receiving this education. In Korea, 10 h of sex education per year is mandated for school-aged children in elementary school, middle school, and the first year of high school (16 years old). This regulation for mandatory sex education for school-aged children is encouraging, yet reliable evidence to support this educational approach is lacking. To our knowledge, the long-term influence of childhood sex education on young adults has not been documented.

Young adulthood, especially the time during college, is a critical time for sexual health, which is a state of physical, mental, and social well-being in relation to sexuality (WHO, 2011) when the previous sex education can play a significant role. During college, individuals complete the work of building their sexual attitudes (Kim, 2005) and become sexually active (Grunseit et al., 2005; Woo et al., 2006; Hur et al., 2007). With their sexual debut, college students’ sexual health is placed at risk. College students have reported practicing unsafe sex (Bontempi et al., 2009) and are at high risk for sexually transmitted disease (STD) infections (CDC, 2010) and sexual violence (Fisher et al., 2000). Damaged sexual health has been shown to have a negative impact on the physical and mental health of collegians and inhibit the pursuit of further education (Parkes et al., 2010). It is also a loss for society as it has been shown to have an impact on the students’ later life, such as infertility and physical complications among women and stillbirth and congenital defects in the fetus (CDC, 2010).

Sex education can influence school-aged children to form unbiased sexual attitudes when they become young adults. The sexual attitudes among college students are closely associated with sexual health. For example, sexual attitudes, such as permissiveness towards sex and sexual behaviors during the school-aged years, predicted unsafe sexual behaviors among the school-aged years, predicted unsafe sexual behaviors during college (Bae & Kang, 2007; Wetherill et al., 2010). The sexual double standard, which is described as a sexual attitude of being unequally permissive to men in relation to sexual behaviors (Marks & Fraley, 2006), had a negative impact on
sexual health, especially for women. Individuals with sexual double standards were more likely to justify male sexual aggression towards women (Lee et al., 2010). Social conventions that confirmed unequal gender dynamics suppressed women’s rights to speak out for themselves in sexual relationships, which resulted in a higher risk of STDs and HIV (Bermudez et al., 2010; East et al., 2010), and stigmatized women who did have STD infections (Smith et al., 2008). Sexual attitudes were related most closely to sexual health, but the influence of sex education on sexual attitudes was not identified clearly. Learning about the long-term influences of sex education on sexual attitudes is critical to evaluating the effectiveness of sex education.

The influence of sex education on sexual health has been documented with young adults. Getting sex education was associated with behavior modifications, such as practicing safe sex (Lou et al., 2004; Kirby et al., 2007), and with a lowered risk for STD infection (Dodge et al., 2009). However, the role of sex education among school-aged children or adolescents was not well supported. For example, getting sex education or having sexual knowledge did not modify the intentions or behaviors to promote sexual health among adolescents (Woo & Ka, 2005; Cho, 2006; Stephenson et al., 2008; Lou & Chen, 2009). These previous studies were limited to the short-term effects of sex education on sexual health. The long-term effects of childhood sex education on those children when they become college students need to be evaluated as the ultimate purpose of sex education during the school-aged years is to prepare the children to have good sexual health when they become young adults and practice sex.

PURPOSE

The purpose of this study was to examine the long-term influence of sex education that is provided during the school-aged years on the sexual attitudes, sexual activity, and indicators of sexual health among male and female college students in Korea. The research questions were:

1. Are there differences in the sex education opportunities, sexual attitudes, and indicators of sexual health among male and female college students?
2. Is receiving sex education during elementary school, middle school, high school, or college associated with a change in sexual attitudes or sexual activity among male and female college students?
3. Is receiving sex education during elementary school, middle school, high school, or college associated with indicators of sexual health, such as the pattern of contraception, history of STD infection, and experience of unintended pregnancy, among sexually active male and female college students?

The results of this study are expected to contribute to the development of an age- and content-matched sex education program for school-aged students by providing evidence for the differential influences of sex education from different time points of the school-aged years to both male and female college students.

METHODS

Design

A descriptive, comparative design was used to learn about the long-term differential influences of sex education during the school-aged years on the sexual attitudes, sexual activity, and indicators of sexual health between male and female college students. This is a part of a larger study that was conducted to learn about the sexual health and needs for sex education among Korean college students. Previously, a descriptive study that explored the types of sexual behaviors and sexual intercourse, comorbidities, and health behaviors of college students was published (Shin et al., 2010).

Participants and ethical considerations

For this study, the participants were limited to unmarried college students because being married would influence the sexual behaviors. Prior to the study, research ethics approval was received at Ewha Womans University, Seoul, Korea. The data were collected by researchers in five geographic areas. Prior to the data collection, advertisements were posted on the campus and handouts were distributed to the college students in the recruitment areas. The researchers explained the purpose of the study to the participants and gave them time to read the consent form before they agreed to participate in the study. The researcher stayed on the campus, which gave the participants the option to return a few days later if they needed some time to consider whether or not to participate in the study. The participants were informed about the confidentiality of the study and were notified of their freedom to withdraw from the study at any point. In order to ensure confidentiality, each participant was assigned a study number that was used in the study instead of their name.

Data collection

Proportional quota sampling was used to recruit a sample that represented the target population in relation to the demographic characteristics (Morrow et al., 2007). The target population of Korean college students was sampled, taking into account the students’ sex, location (five geographic areas), and type of university (4 year college, 2 year community college, and women’s college). According to the Ministry of Education, Science, and Technology (MEST), there were 1,919,504 students in 175,4 year colleges and 795,519 students in 148,2 year community colleges (MEST, 2010). In order to get a proportional quota sample, we divided Korea into five geographic areas and estimated the number of participants in each area (area I: 2,2556; area II: 1996; area III: 2900; area VI: 3738; and area V: 78), based on the number of college students that had been reported by the MEST. Again, we selected 4 year colleges, 2 year community colleges, and women’s colleges within each area, based on the number that had been reported by the MEST. Finally, 6000 participants were recruited, with consideration being given to the proportion of male and female students that had been reported by
the MEST (male = 3758 and female = 2242). Among those students, 211 were excluded because 39 had given incomplete data, 56 were in graduate school, and 116 were married. Finally, the data from 5789 participants (male = 3609 and female = 2180) were used.

**Instruments**

The questionnaires that were used in this study related to the demographic characteristics, sex education, sexual attitudes, sexual activity, and sexual health indicators of the college students. The data that were used from the demographic questionnaires were the students’ sex, age, and number of years in college. The questions about sex education asked about their experiences of receiving sex education during elementary school, middle school, high school, and/or college. A sexual attitudes questionnaire that was developed by Kang (2007) was used to measure the individuals’ attitudes towards permissiveness or conservativeness regarding sex, in terms of their perception, behaviors, virginity, sexual double standard (being equally permissive to men), and pornography (obscene material). Kang compared 13 previously developed sexual attitude scales and composed 35 questions for her descriptive study on Korean college students’ sexual life. In Kang’s study, the reliability of this questionnaire was 0.875. The questionnaire uses a five-point, Likert-type scale to indicate the degree to which the participants agree or disagree with particular statements that are related to sexual attitudes. A higher score means more conservative sexual attitudes. Examples of statements include “Sex is only for the younger generation” and “It is okay for men to have sex before marriage”. In this study, the reliability of the sexual attitude scale was 0.776. The question about sexual activity asked about the experience of having vaginal sex. Sexual health is a broad construct that is referred to as a state of physical, mental, and social well-being in relation to sexuality (WHO, 2011). As indicators of sexual health in this study, information about contraceptive use (“always”, “sometimes”, or “never”), STD infection experience, and experience of unintended pregnancy of oneself or one’s partner were used.

**Data analysis**

In order to facilitate the data analysis process, the Statistical Package for Social Sciences, version 18.0 (SPSS: An IBM Company, Chicago, IL, USA) was used. Descriptive statistics were collated in order to describe the demographic characteristics. Inferential statistics, such as the t-test, were used to compare the differences in sex education opportunities between the male and the female college students and the different influences of sex education on the sexual attitudes between the male and the female students. The χ²-test was used to determine whether or not receiving sex education made a significant difference to the indicators of sexual health among the male and female college students. Statistical significance was denoted by \( P < 0.05 \).

**RESULTS**

**Sex education, sexual attitudes, sexual activity, and indicators of sexual health**

Of the total sample, 62.3% were male and 37.7% were female. The male students (mean age: 22.13 ± 2.49 years) were older than the female students (mean age: 20.55 ± 1.71 years). Most of them were in their first or second year of college (male: 64.6%; female: 71.3%). The male students had fewer opportunities for sex education during elementary school \((P = 0.000)\), middle school \((P = 0.000)\), high school \((P = 0.000)\), and college \((P = 0.000)\), compared to the female students (Table 1). In terms of sexual attitudes, the male students scored higher in relation to sexual perception \((P = 0.000)\) and the sexual double standard \((P = 0.000)\) than the female students, indicating that the male students were more likely to be conservative and equally permissive to men in relation to sexual behaviors (Table 2). The female students scored higher on preserving virginity \((P = 0.000)\), indicating that they valued abstinence until marriage more than the male students. The total number of students who were sexually active was 2165 (Table 3). More of the male students \((n = 1792, 49.7\%)\) were sexually active than the female students \((n = 373, 17.1\%)\). Among those who were sexually active, 56% of the female students always were practicing safe sex, while 45.8% of the male students always were practicing safe sex \((t = 14.968, P = 0.001)\). No significant difference was found in either the STD infection rate or the unintended pregnancy rate between the sexually active male and female students.

<table>
<thead>
<tr>
<th>Time</th>
<th>Male ( (n = 3609) )</th>
<th>Female ( (n = 2180) )</th>
<th>( t )-value</th>
<th>( P )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary school</td>
<td>2061 (57.1)</td>
<td>1582 (72.6)</td>
<td>-12.576**</td>
<td>0.000</td>
</tr>
<tr>
<td>Middle school</td>
<td>2782 (77.1)</td>
<td>1877 (86.1)</td>
<td>-9.470**</td>
<td>0.000</td>
</tr>
<tr>
<td>High school</td>
<td>2565 (71.1)</td>
<td>1730 (79.4)</td>
<td>-7.612**</td>
<td>0.000</td>
</tr>
<tr>
<td>College</td>
<td>566 (15.7)</td>
<td>614 (28.2)</td>
<td>-11.058**</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**P < 0.01. §The total numbers differ due to missing data.**

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Influence of sex education on sexual attitudes and sexual activity

Receiving sex education during the school-aged years influenced the sexual attitudes of both the male and the female college students (Table 4). For example, both the male and the female students who had sex education during any time during their school-aged years, except for college, scored lower in relation to the sexual double standard, indicating that those who had received sex education were less likely to have an unequal evaluation of sexual behavior, based on sex. Sex education during college did not influence the sexual attitudes or sexual activity of both the male and the female students.
Influence of sex education on the indicators of sexual health

Receiving sex education during the school-aged years had an influence on the indicators of sexual health mainly for the male college students (Table 5). The male students who had received sex education during elementary school ($\chi^2 = 4.213$, $P = 0.040$), middle school ($\chi^2 = 32.735$, $P = 0.000$), and high school ($\chi^2 = 19.879$, $P = 0.000$) were likely to have lower STD infection rates, compared to their counterparts. For the female students, although sex education did not make any difference to their contraceptive use or STD infection rate, receiving sex education during middle school was associated with a decrease in the unintended pregnancy rate, compared to those who had not received sex education ($\chi^2 = 7.461$, $P = 0.006$).

DISCUSSION

The prevalence of sex education in this study revealed issues of sex education in Korea at two critical time points. First, there was a large disparity between the male and the female students in whether or not they had received sex education during elementary school. The elementary school years are a critical time point for sex education because this is the time when students experience the development of their secondary sexual characteristics. Yet, only half of the male students in this study had received sex education during elementary school. The differences in the prevalence of exposure to sex education, in spite of the regulation to provide sex education every year, call attention to the need to develop stronger policies to mandate sex education for school-aged children. Another way to ensure the provision of sex education to school-aged children might be to support school nurses to provide the college students with appropriate information about safe sex.

It is worth noting that those college students, both male and female, who had received sex education at any time during their school-aged years, besides college, were less likely to have a sexual double standard. This indicates that, through continuous sex education during the school-aged years, it might be possible to influence school-aged children to have a more equal evaluation of sexual behaviors in relation to sex when they become young adults. A sexual double standard is detrimental to women’s health, not only because it is associated with the justification of sexual violence towards women (Lee et al., 2010) but also because it is associated with the stigmatization of female victims (Smith et al., 2008) of sexual violence, which further prevents them from seeking proper care.

Sex education at different time points during the school-aged years had a different influence on the sexual attitudes between the male and female college students in this study. The influence of sex education at different time points on different aspects of sexual attitudes, according to the participants’ sex, indicated the need to match the age, sex, and content of the sex education to the population. For instance, sex education during elementary school and middle school influenced the attitudes towards sexual behaviors among the female students. Thus, information about sexual behaviors should be included in the sex education that is provided to female students before high school. This idea is supported by a previous report that indicated that Korean male and female adolescents had different preferences for sex education topics and different levels of sex knowledge (Kim & Lee, 2000).

In this study, receiving sex education during the school-aged years was associated with practicing safe sex and decreased STD infection rates among the male college students. This is in accordance with the previous finding that men who had received sex education at school had lower STD infection rates (Dodge et al., 2009). However, this was not true with the female students in this study. The differential influence of sex education for the male and female students in Korea may be ascribed to a cultural factor. Influenced by Confucianism, the rights of women are less valued than those of men in Korea. As a result of this unequal gender dynamic, it is possible that the female students did not have

Table 5. Influence of sex education on the indicators of sexual health of the male students ($n = 1792$)

<table>
<thead>
<tr>
<th>Time</th>
<th>Contraception</th>
<th>STD infection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Elementary school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>530</td>
<td>370</td>
</tr>
<tr>
<td>Yes</td>
<td>469</td>
<td>406</td>
</tr>
<tr>
<td>$\chi^2$-value</td>
<td>11.160**</td>
<td>4.213</td>
</tr>
<tr>
<td>$P$-value</td>
<td>0.004</td>
<td>0.040</td>
</tr>
<tr>
<td>Middle school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Yes</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>$\chi^2$-value</td>
<td>–</td>
<td>32.735**</td>
</tr>
<tr>
<td>$P$-value</td>
<td>–</td>
<td>0.001</td>
</tr>
<tr>
<td>High school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Yes</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>$\chi^2$-value</td>
<td>–</td>
<td>19.879</td>
</tr>
<tr>
<td>$P$-value</td>
<td>–</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**$P < 0.01$. STD, sexually transmitted disease.
input as to when they engaged in sexual behaviors, which in turn prevented them from protecting themselves from STD infections. About 60% of Korean female adolescents stated that they had sex either because their partner wanted to or because they were drunk, while only 30% of them reported having sex because they were in love (Kim & Lee, 2000). Similar phenomena of neglecting women's rights were reported by young women in Japan, who share a similar cultural background to Koreans. Young Japanese women reported that one of the barriers to using condoms was a lack of confidence to refuse sex when they did not have condoms available (Kaneko, 2007).

College students reported that sex education was ineffective because they did not get the information that they needed (von Sadovszky et al., 2006). This indicates that the content of sex education needs to be re-examined. Perceived ineffectiveness might be the reason that Korean college students considered friends, mass media, and the Internet (Hur et al., 2007) as the main sources for sex information. This is a concern because getting information about sex from unreliable sources might lead the college students to biased sexual attitudes or inaccurate information, which might put them at risk for poorer sexual health. Extending the role of midwives to providing sex education might be one way to provide college students with reliable and useful sources of sex information. Midwives are knowledgeable and have concrete and up-to-date information in regards to sexual health; that is, contraception and STD prevention (Perry, 2002).

Limitations of the study
One of the limitations of this study was that the participants were recruited nationally and thus the content of the sex education during elementary school, middle school, high school, and college was not controlled. Also, a social desirability bias might have influenced the participants because the data were gathered in the form of a self-report survey that asked about the participants' sexual attitudes, sexual behaviors, and sexual health. A memory bias might have influenced the results because the participants had to retrospectively recall their sex education.

CONCLUSION
This study explored the long-term influences of sex education on the sexual attitudes, sexual activity, and indicators of sexual health among male and female college students in Korea. The differential influences of sex education from different time points during the school-aged years on the sexual attitudes of the students, according to their sex, point to the need to redesign sex education to match the sex and age of the audience. Providing educational programs for school nurses to enhance their capacity to develop tailored sex education for their students might be beneficial in the long term. Midwives in the community setting can be a valuable resource for female college students. Considering that sex education was associated with the indicators of sexual health mainly among the male students, unequal gender dynamics appear to exist in Korea. Therefore, nurses should be advocates for female students in sexual relationships to have protected sex. Also, further research is needed to identify if there is any factor that moderates the relationship between sex education and sexual health.

ACKNOWLEDGMENTS
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