Author's response to reviews

Title: Awareness of Human papillomavirus and factors associated with intention to obtain HPV vaccination among Korean youth: Quasi experimental study

Authors:

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Author's response to reviews: see over
Reviewer's report 1:

Compulsory Revisions

1. A key assumption upon which this intervention is based is that child education and intent to vaccinate are critical to HPV vaccine uptake in Korea. However, it is not clear to what extent children make their own vaccination decisions (or influence those who do) in Korea. More information about the context of HPV vaccination in Korea is needed to orient readers and to justify the case for such an intervention. Specifically, is the vaccine recommended and available to both girls and boys? What age groups? Is it free? Where is it offered? Are school vaccination programs in place? Who are the vaccine decision makers? Is parental permission required? If possible, research findings on the predictors of and barriers to vaccination in Korea should be elaborated upon, since findings from other countries may not be relevant to the Korean context. In short, the authors’ assertion that “HPV education should be provided for children of both genders, and should be tailored to their sociocultural background” should be supported by available evidence in Korea.

Answer:

1) The status of HPV vaccination in Korea, the related policy, and other information is now explained and compared with those in Western countries in the Introduction:

“On the other hand, a study conducted in Korea found that adolescents demonstrated an apparent lack of awareness of the HPV vaccine and related health beliefs, and their HPV vaccination rates were reportedly as low as 1.3% among boys and 9.5% among girls. Although recommended age ranges for HPV vaccination in Korea have been established as 9–26 years for girls and 9–15 years for boys, a school-based HPV vaccine program has yet to be introduced in this country, and so the costs of the HPV vaccination must be borne entirely by their parents.”

2) A description of the sociocultural background for this study is now included in the Introduction:

“There are few statistical data pertaining to sexually transmitted diseases (STDs) in Korea, and monitoring of the prevalence of STDs in the past has relied on reports from a sentinel surveillance system. The findings from such reports have led to genital warts (condyloma acuminate), which are caused by HPV infection, being officially designated as one of the
seven communicable infections since 2001 [5]. The Korean Society of Gynecology Oncology reported that the prevalence of these warts increased from 2.1% in 2004 to 16.5% in 2011, and was the highest for those younger than 30 years [6]. One study found that the incidence of STDs in Korea among those aged 15–29 years accounted for 40% of the incidence in the entire population of Korea, and the incidence of genital warts in particular was estimated to be almost five times higher in 2011 than in 2001 [7]. In 2010, it was estimated that on average 5.3% of Korean adolescents were sexually active. Of these, 10% had experienced an STD, and 44.7% of those with an STD had not received treatment for it. It is also noteworthy that the proportion of sexually active middle-school students increased from 0.5~1.5% in 2007 to 2.3~3.1% in 2010 [7, 8]. These facts have led to a change in the focus of strategies designed to prevent STDs, including HPV-related infections (mainly warts), so that they are directed toward young Korean adolescents rather than adults.”

2. Self-efficacy is a key construct of HBM, yet it does not appear to have been evaluated (not included in Tables). Given that these are youth (who may lack self-efficacy and autonomy to make vaccination decisions), this seems to be an important omission. If it was not included, authors should explain why and/or note it as a limitation.

Answer:

1) This issue is addressed in the Methods section:

“The four main variables of the theoretical constructs of the HBM were selected in this study since they were the first to be developed and research has confirmed their usefulness in preventing HPV infection [3, 12, 23].”

2) The limitation of the HBM construct was added to the discussion of the HBM framework:

“With respect to the HBM constructs applied in this study, self-efficacy was not examined, despite its prominent role in health behaviors. Thus, the extended HBM variables—including cue to action, motivating factors, and self-efficacy—should be confirmed with respect to HPV prevention among Korean adolescents.”

3-1. Additional data should be provided to support the following assertions (Discussion section), or the language should be softened for accuracy:

“…results support the provision of focused, timely, and ongoing education in the school
setting to increase HPV vaccination rates” – This seems too strong, given that the evaluation assessed immediate (post-intervention) intention to vaccinate, not vaccination rates. At a minimum, this language could be softened to state that “education in the school setting may help increase vaccination rates.”

Answer:

1) The relationships between HPV education and increasing HPV vaccination rate were determined in studies conducted in Western countries. This point has been made in the Discussion.

2) The data pertaining to the Korean situation (HPV vaccination, increased high-risk HPV infection of young Koreans, and the adolescent fertility rate) have been added to the Discussion:

“As mentioned above, the circumstances surrounding HPV vaccination and HPV education in Korean schools are different from those in Western society, with both being very limited so far. A recent study showed that contrary to the observed reduction in the rate of cervical cancer, the rate of HPV-related head and neck cancers is increasing in Korea, as it is in the USA [26]. Furthermore, high-risk HPV infections such as HPV 16, HPV 33, and HPV 18 were very strongly detected in association with male genital warts; this finding was attributable to the changed sexual behaviors of the younger generation in Korea [27]. The adolescent fertility rate, which is one of the established gender-inequality indexes, reportedly increased from 2.3% in 2011 to 5.5% in 2012 [28]. It therefore appears that the instigation of HPV education for both genders of Korean youth would be a timely intervention.”

3-2. Authors should be cautious about drawing conclusions about the potential of this intervention “to reduce the likelihood that [students] will take part in risky sexual behaviors,” when sexual behavior (or intent) was not measured.

“Findings suggest that all adolescents should be taught not only about the HPV vaccination but also the facts about HPV prevention in the classroom, and that this should be done by experts.” –This study did not compare education in classroom settings to other settings, nor did it compare education delivered by teachers to other sources, such as parents, nurses, or peers.
Answer:

That information is not supported by evidence, and so it has been deleted.

3-3. There is a link that needs to be made between children’s intent to vaccinate and actual vaccination. Data about vaccine decision-making in Korea would help support the authors’ argument, but the limitations and unknowns regarding vaccine decision making should be noted.

Answer:

Relevant information was explained in the discussion:

“The role of parents in this issue was not examined in the present study. However, parents could play an indirect role toward educating their children regarding HPV [38, 39]. Although they are not yet required to provide permission for their adolescent children to receive the HPV vaccination, since there is as yet no mandatory school vaccine program in Korea, parents could be indirectly informed of the necessity for their children to learn about HPV prevention by providing students with a handout to be taken home. This may increase parental awareness and affect their attitudes toward HPV prevention, including vaccination. If parents support their children in this way, it is expected that both girls and boys would be knowledgeable and motivated to receive the HPV vaccination in the future when they are eventually faced with the decision regarding whether or not to have it. The role of educating parents regarding HPV and uptake of the HPV vaccination by Korean adolescents should be confirmed in further studies.”

3-4. “The first step toward promoting HPV prevention would be to provide HPV education in the classroom as early as possible” – Given that we don’t know whether the observed knowledge or attitude changes were sustained beyond post-test (or whether they influenced vaccination uptake), this seems unfounded.

Answer:

1) That information is not supported by evidence, and so it has been deleted.
2) This is already described in the Discussion:

“Furthermore, the positive perceptual changes in awareness of STDS and cancer prevention, the associated attitudes, and actual vaccine uptake were not used as outcome measures for quantifying the efficacy of the provided HPV education.”

3) Additional limitations were added to the Discussion:

“It should also be noted that the current intentions of Korean students regarding HPV vaccination may also have affected their uptake thereof.”

And

“Regardless of the data, the education intervention applied in this study represents an example of gender-based sex education for Korean youth, and appears to be the first exposure to such materials for fifth-grade students. It is expected that the implementation of such educational strategies for students will raise their awareness of gender equality in HPV prevention and increase their motivation and willingness to assimilate the subsequently provided HPV education.”

4. In the Discussion, authors note that “almost all of the HBM variables were significantly related to intention” to vaccinate, but they do not elaborate on which variables were not related or what the implications might be for future curricula development. Also, could it be that other variables are important to consider? For example, to what extent does perceived social norms (re vaccination) play a role in Korean culture?

Answer:

Based on the findings of our study, gender differences and similarities were added and some tips for HPV education are discussed:

1) “Gender differences were found at posttest. There was an increase in the intention to submit to an injection for STD prevention among the boys, but not in the intention to submit to an injection for cancer prevention. The education appeared to encourage the boys more toward STD prevention than cancer prevention (i.e., penile, oral, and anal cancers). However, there was an increase in the intention to obtain injections to protect against both STDS and cancer among the girls, illustrating that preadolescent girls were motivated by the education
strategy to prevent both STDs and cancer (i.e., cervical cancer).”

2) Moreover the girls were more concerned about the pain at injection than the boys, and their concern about this pain was not reduced by the HPV education. Therefore, future studies should investigate more sensitive approaches for providing information about the subject to girls. Based on the results of the present study, the relationship among rates of HPV infection, HPV vaccination, and cervical cancer should be taught to Korean preadolescent girls and boys. The Korean youth should be supported to recognize and accept not only the concept of HPV vaccination, but also the facts about HPV itself, its potential consequences, and its prevention.”

5. Among the limitations noted, authors should acknowledge that we do not know whether short-term changes in knowledge and attitudes/intentions were sustained, or whether they translated into changes in sexual-risk behaviors, discussions with parents about vaccination, or subsequent vaccination.

Answer:

The discussion on the effects of the educational intervention has been elaborated upon:

“Furthermore, the positive perceptual changes in awareness of STDs and cancer prevention, the associated attitudes, and the actual vaccine uptake were not used as outcome measures for quantifying the efficacy of the provided HPV education. It should be noted that the current intentions of Korean students regarding HPV vaccination may also have affected their uptake thereof.”

and

“Regardless of the data, the education intervention applied in this study represents an example of gender-based sex education for Korean youth, and appears to be the first exposure to such materials for fifth-grade students. It is expected that the implementation of such educational strategies for students will raise their awareness of gender equality in HPV prevention and increase their motivation and willingness to assimilate the subsequently provided HPV education.”
Minor Essential Revisions

1. It would be helpful to offer some information about the setting in which this school is located (Gangneung City): Why was this setting selected? Is anything about rates of cervical cancer or access to vaccination or sexual/reproductive health services in this area?

Answer:

1) The geographical and school information have been added to the Methods:

“Gangneung city is in the Kang Won Do province, which is one of the eight administrative regions in Korea, and is located on the eastern coast of the country; it is approximately 2.5 hours drive from Korea’s capital, Seoul. In 2013 there were 37 primary schools in Gangneung city, with a total of 11,283 students. The setting for this study was selected by recommendation, mainly because all of the fifth-grade students were able to participate. The selected school comprised 21 classes, with a total of 506 students overall and 117 fifth-grade students.”

2) The limited data available for Gangneung city have been added to the Discussion:

“Unfortunately, no relevant information regarding the rate of HPV infection in Gangneung city was available, and so the data for Kang Won Do were compared with the national average. The results showed that the age-standardized incidence rate of cervical cancer was 6.6 for Kang Won Do in 2010, which is higher than the national average for the same year 5.9 per 100,000 person [43]. Regardless of the data, the education intervention applied in this study represents an example of gender-based sex education for Korean youth, and appears to be the first exposure to such materials for fifth-grade students.”

2. It is acknowledged that teacher competency and autonomy may play a role in the quality of education provided, and that sexual health education (contraception, STD prevention) is typically offered at older grade levels. It would be helpful if authors could also speak to whether any teacher training is required for such an intervention, and what teacher (or classroom) qualities might be important for such an intervention to succeed.

Answer:
A brief discussion of this topic has been added to the Discussion:

“HPV education should be tailored to the students’ needs and characteristics. A recent study delivered a coaching program to elementary-school fifth- and sixth-grade students with a view to improving their knowledge and attitudes toward sex [42]. The Korean Association of School Health Teachers suggested drawing up guidelines for HPV education for Korean teachers according to the student level so as to better prepare Korean school health teachers with regard to HPV education.”

3. If possible, please elaborate on the “gender-based HPV prevention approach” (Discussion) as it relates to the context (or current debate) in Korea. Are there stigma concerns, or has health equity been an issue in targeting females only?

Answer:

The following has been added:

1) In the Introduction:

“In addition, previous studies have found gender differences with respect to awareness of HPV, and attitudes and intention toward HPV vaccination among Korean adolescents, university students, and adults [14, 18, 22]. Thus, HPV education should be gender based and should commence from the primary school setting, so that both genders can be taught that HPV is a matter of concern for both women and men, raising awareness of their equal responsibility for HPV prevention.”

2) Under “HPV education” in the Methods:

“The underlying concept of HPV education in this study was that it should be gender based, so that it was fundamentally designed with a view to promoting gender equality regarding HPV prevention. It was intended that both the girls and boys would become aware of their mutually dependent responsibility regarding HPV prevention.”

3) In the Discussion:

“The adolescent fertility rate, which is one of the established gender-inequality indexes, reportedly increased from 2.3% in 2011 to 5.5% in 2012 [28]. It therefore appears that the instigation of HPV education for both genders of Korean youth would be a timely
intervention.”

4. Was student comfort in co-ed classes assessed? If not, how can we know that they were in fact comfortable with co-ed classes, or that single-sex education wouldn’t be more effective?

Answer:

This is now mentioned in the Discussion:

“Finally, this study did not examine the effectiveness of coeducational classes compared to single-sex classes for HPV education among youth; this needs to be identified in further studies.”

Discretionary

1. The introduction makes no mention of HPV as a cause of cervical and other cancers, which should be added, given that this is the primary public health concern related to HPV and apparently a central focus of the intervention

Answer:

This is mentioned in the first part of the Introduction:

“The recognition that human papillomavirus (HPV) infection is associated with a high risk of cervical cancer has resulted in a paradigmatic shift in the focus of cervical cancer prevention from female adults to youth, with the introduction of a prophylactic vaccination against HPV [1].”

2. Authors should specify how the vaccine was positioned in the curriculum. It is curious that Table 2 refers generally to the prevention of viral infection, STDs and cancer, without specifying HPV infection or cervical/penile/anal/other HPV-associated cancers. Were respondents not assessed specifically on knowledge and attitudes regarding HPV infection and associated cancers?

Answer:
It was assumed that prior to the HPV education intervention the students knew little about specific HPV-related diseases such as genital warts and penile and anal cancers. Therefore, despite the likelihood of interindividual differences, only their understanding of the general concepts of STDs and cancers were measured at the pretest. It was similarly assumed that after the HPV education intervention the students were able to recognize the facts surrounding HPV infection, and so their knowledge regarding HPV and their intention to obtain the HPV vaccination were measured only at the posttest.

3. It is noted that girls’ concern about injection pain was not reduced by the intervention; but was content developed to minimize perceived pain from needles among children? [This isn’t clear.]

Answer:

1) With regard to the pain associated with the HPV vaccination, it was explained during the education intervention that it is no more painful than other vaccinations. The intervention was thus not effective for girls who had experienced pain at a previous vaccination.

2) This is commented upon in the discussion:

Therefore, future studies should investigate more sensitive approaches for providing information about the subject to girls.
Reviewer's report 2:

Major Compulsory Revisions
1. Why did you choose the school in Gangneung city? Please define reasons for choosing the school.

Answer:

1) The geographical and school information have been added to the Methods:

“Gangneung city is in the Kang Won Do province, which is one of the eight administrative regions in Korea, and is located on the eastern coast of the country; it is approximately 2.5 hours drive from Korea’s capital, Seoul. In 2013 there were 37 primary schools in Gangneung city, with a total of 11,283 students. The setting for this study was selected by recommendation, mainly because all of the fifth-grade students were able to participate. The selected school comprised 21 classes, with a total of 506 students overall and 117 fifth-grade students.”

2) The limited data available for Gangneung city have been added to the Discussion:

“Unfortunately, no relevant information regarding the rate of HPV infection in Gangneung city was available, and so the data for Kang Won Do were compared with the national average. The results showed that the age-standardized incidence rate of cervical cancer was 6.6 for Kang Won Do in 2010, which is higher than the national average for the same year 5.9 per 100,000 person [43]. Regardless of the data, the education intervention applied in this study represents an example of gender-based sex education for Korean youth, and appears to be the first exposure to such materials for fifth-grade students.”

2. When did the posttest be conducted? At the end of the education program or sometime after the class. Please make it clearer.

Answer:
3. In the discussion part, why do you think “These results support the provision of focused, timely, and ongoing education in the school setting to increase HPV vaccination rates and decrease HPV-related morbidity” (line 25-26)? In your study, you conducted 2-hour and one-day education and did not assess the persistence. Please discuss the details.

Answer:

1) The relationships between HPV education and increasing HPV vaccination rate were determined in studies conducted in Western countries. This point has been made in the Discussion.

2) The data pertaining to the Korean situation (HPV vaccination, increased high-risk HPV infection of young Koreans, and the adolescent fertility rate) have been added to the Discussion:

“As mentioned above, the circumstances surrounding HPV vaccination and HPV education in Korean schools are different from those in Western society, with both being very limited so far. A recent study showed that contrary to the observed reduction in the rate of cervical cancer, the rate of HPV-related head and neck cancers is increasing in Korea, as it is in the USA [26]. Furthermore, high-risk HPV infections such as HPV 16, HPV 33, and HPV 18 were very strongly detected in association with male genital warts; this finding was attributable to the changed sexual behaviors of the younger generation in Korea [27]. The adolescent fertility rate, which is one of the established gender-inequality indexes, reportedly increased from 2.3% in 2011 to 5.5% in 2012 [28]. It therefore appears that the instigation of HPV education for both genders of Korean youth would be a timely intervention.”

3) This is now mentioned in the Discussion:

“Finally, this study did not examine the effectiveness of coeducational classes compared to single-sex classes for HPV education among youth; this needs to be identified in further studies.”

4) The discussion on the effects of the educational intervention has been elaborated upon:

“Furthermore, the positive perceptual changes in awareness of STDs and cancer prevention, the associated attitudes, and the actual vaccine uptake were not used as outcome measures for quantifying the efficacy of the provided HPV education. It should be noted that the current
intentions of Korean students regarding HPV vaccination may also have affected their uptake thereof.”

and

“The education intervention applied in this study represents an example of gender-based sex education for Korean youth, and appears to be the first exposure to such materials for fifth-grade students. It is expected that the implementation of such educational strategies for students will raise their awareness of gender equality in HPV prevention and increase their motivation and willingness to assimilate the subsequently provided HPV education.”

- Minor Essential Revisions

4. The contents of lecture is very important to understand the study, so you should attach the handout given to the students as appendix.

Answer:
Yes, I attached the contents in the appendix file.

5. To understand educational effects among elementary students, the interaction between the students and their parents would be an essential factor. Maybe you should add any discussion.

Answer:
Relevant information was explained in the discussion:

“The role of parents in this issue was not examined in the present study. However, parents could play an indirect role toward educating their children regarding HPV [38, 39]. Although they are not yet required to provide permission for their adolescent children to receive the HPV vaccination, since there is as yet no mandatory school vaccine program in Korea, parents could be indirectly informed of the necessity for their children to learn about HPV prevention by providing students with a handout to be taken home. This may increase parental awareness and affect their attitudes toward HPV prevention, including vaccination. If parents support their children in this way, it is expected that both girls and boys would be knowledgeable and motivated to receive the HPV vaccination in the future when they are
eventually faced with the decision regarding whether or not to have it. The role of educating parents regarding HPV and uptake of the HPV vaccination by Korean adolescents should be confirmed in further studies.”