

## Effects of peer education interventions aimed at changing awareness of cervical cancer in nursing students

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### **Abstract**

In recent years, there has been an increase in the incidence rate of cervical cancer among young women in their 20s and 30s. For women in this age group who are likely to get married or bear children, cervical cancer is an extremely serious issue. Owing to this cancer, they may be unable to conceive a child, and in extreme cases, it may cost them their lives. This study aimed at implementing peer education (PE) to change awareness of cervical cancer in nursing students, reveal the effects of PE, and provide further support. The results of the PE intervention revealed that women obtained greater knowledge about cervical cancer, such as the causes or initial symptoms, and that this education significantly improved their awareness of cervix cancer screening, sexually transmitted diseases, and the cervical cancer vaccine. These results show that PE interventions aimed at changing awareness of cervical cancer in nursing students is effective. The findings are novel, although there have been reports of the effects of PE on the prevention of induced abortion or human immunodeficiency virus in Japan. The results also suggest that mothers play a key role in improving their daughters' awareness of cervical cancer, and that it was important to appeal to young women's self-care abilities.

### **Introduction**

In recent years, there has been an increase in the incidence rate of cervical cancer among young women in their 20s and 30s in Japan [1]. For women in this age group who are likely to get married or bear children, cervical cancer is an extremely serious issue. This cancer may prevent women from conceiving a child and could also claim their lives. Human papillomavirus (HPV) causes cervical cancer, and a woman can be infected by this virus during sexual intercourse. The cervical cancer detection rate can be as high as 100% [2], but its screening rate as low as 15% in Japan [3]. Previous studies have shown that as many as 76% of people did not know that HPV causes cervical cancer in Japan [4].

In 2004 in Japan, the Ministry of Health, Labour and Welfare revised a part of the "Guidelines for Health Education Focused on Prevention of Cancer and for Cancer Screening" such that the uterine cancer screening age was brought forward from 30 years to 20 years and the screening interval was defined as every two years [5]. These changes were not accepted by the Japan Society of Obstetrics and Gynecology, particularly the biennial screening. Because there are higher risks associated with the sexual behaviors of young people such as their age at the time of their first intercourse and the increase in

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the number of induced abortions or deliveries resulting from unwanted pregnancies, incidence of sexually transmitted diseases, and tendency to change sexual partners currently [6]. Any or all of these behaviors may lead to cervical cancer caused by HPV infection. This is also an issue in school or adolescent health. Previous studies have shown that no-screening rates correlate with mortality by cervical cancer [7], thus improving the screening rate is an urgent task.

A white paper on adolescent sexual behavior reveals that a friend is the most influential person in the development of sex awareness during adolescence [6]. It is found that sex education through PE by one's contemporaries may be effective not only for high school students but also for nursing students who provide PE [8,9]. In Japan, the activities of PE usually consist of only preventing sexually transmitted diseases [10,11], HIV [12-15], and induced abortion [16], and no activity aims at the prevention and early detection of cervical cancer.

Given the above, we believe that demonstrating the effects of PE aimed at changing awareness of cervical cancer may lead to an increased cancer-screening rate and contribute to the early detection of the cancer and decreased morbidity and mortality among young women.

### **Objectives**

This study aimed at implementing PE to change awareness of cervical cancer in nursing students, reveal the effects of PE, and provide further support.

### **Methods**

#### 1. Survey period

Between April-May 2011

#### 2. Subjects

A total of 89 freshmen nursing students at N University, which is located in the Ko-Shin-Etsu region comprising Yamanashi, Nagano, and Niigata prefectures. Announcing the

holding of PE, participate in the study was prospective. Moreover, 18 female students who provided consent responded to the anonymous questionnaire.

#### 3. Overview of PE

Before providing the PE intervention, 10 students who were part of a peer group learned about the causes, clinical condition, and symptoms of cervical cancer; cervical cancer morbidity and mortality trends in Japan and in many foreign countries; efficacy of cervical cancer screening; and cervical cancer vaccine. The researchers helped the students learn about these facts and engaged them in the programming of PE. The program contents of PE are shown in the Table 1.

#### 4. Survey methods

The day before and on the actual day of the PE, we distributed a questionnaire to assess the subjects' awareness and knowledge of cervical cancer, experience of a cervical cancer screening, experience of the cervical cancer vaccination, and status of health promotion. After the PE intervention, the subjects were asked to describe their awareness about cervical cancer, knowledge about the cancer, and their impression of the PE in the meeting place. The answered questionnaires were collected afterwards.

#### 5. Survey contents

The questionnaire uses a multiple-choice format, where subjects mark all applicable choices. The survey contents are as follows: [Survey before PE]

1) Characteristics of the subject: Age, lifestyle, experience of having talked to someone about cervical cancer, the experience of a cervical cancer screening, and experience of the cervical cancer vaccination.

2) Knowledge about cervical cancer: Questions regarding the causes and initial

Table 1. PE program

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1. Icebreak and orientation (15min.)
2. Learning the contents about cervical cancer as a quiz (60min.)
• morbidity and etiology
• anatomy of uterus
• meanings and method of cancer screening
• cancer vaccination
3. Ending (15min.)
• question-and-answer session
• slide presentation highlighting the value of cancer screening
• questionnaire

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symptoms of cervical cancer. Response formats included both making a choice among several alternatives and choosing all suitable responses.

- 3) Awareness of cervical cancer: Questions about degree of interested in cervical cancer, sexually transmitted diseases, and the cervical cancer vaccine. And questions about degree of intention of cervical cancer screening and the cervical cancer vaccine. The responses were based on a five-point scale that ranged from “Absolutely applies” (a score of 5) to “Absolutely does not apply” (a score of 1).
- 4) Health promotion: A Japanese Language Version of the Health - Promoting Lifestyle Profile(HPLP II) is by Wei et al. [17], a questionnaire translated from the Health Promoting Lifestyle Profile II developed by Walker et al. [18], and is based on the Lifestyle and Health Habits Assessment developed by Pennder et al. [19]. The HPLP II uses the health promotion proposed by Pennder et al. and consists of 52 items regarding health promotion and six subscales (Health Responsibility, Spiritual Growth, Physical Activity, Interpersonal Relations, Nutrition, and Stress Management) involving health behavior factors. There are eight or nine

questions per subscale, and these are scored on the basis of the total scale and each subscale. The 4-point scale ranging from “Absolutely applies” (a score of 4) to “Absolutely does not apply” (a score of 1) is used for scoring. The scores are added and an average score is calculated.

The reliability/validity has been verified.

[Survey after PE]

Among the questionnaires used before PE, (2) Knowledge about cervical cancer and (3) Awareness of cervical cancer were surveyed again.

#### 6. Ethical considerations

The subjects were asked to cooperate and were informed that their responses would be analyzed and treated anonymously to avoid identification of individual respondents and would not be used for any non-research purposes. We obtained signed consent forms from them. This study was approved by the ethics committee of the Niigata University of Health and Welfare.

#### 7. Data analysis method

Statistics analysis was performed using the software package SPSS11.5 for Windows. The significance level was set at 5%.

## Results

1. Characteristics of the subjects (Table 2)

Table 2. Characteristics of the subjects (n=18)

Age (years old)		18	all
Life style	Living alone		9(50%)
	Living with family		9(50%)
Experience of having spoken to someone about cervical cancer	No		6(33.3%)
	Yes		12(66.7%)
To whom	mother		12
	friend/acquaintance		2
	brother/sister		1
	medical worker		1
	father		0
	partner		0
	teacher		0
Experience of cervical cancer screening	No		18(100%)
	Yes		0( 0%)
Experience of cervical cancer vaccination	No		17(94.4%)
	Yes		1 (5.6%)

All the subjects who participated in the PE were students. There were 18 and 16 students before and after the PE, respectively. Only 2 subjects opted to not participate in the PE. All subjects were 18 years old. Regarding their current lifestyle, 9 subjects (50%) were “living with their family” and 9 subjects (50%) were “living alone.” From among the 18 subjects, 12 (66.7%) had previously spoken to someone about cervical cancer, while 6 (33.3%) had never discussed it with anyone. For those who had previously discussed cervical cancer with someone, multiple answers were permitted: “mother” was the most popular person (12 subjects), followed by “friend/acquaintance” (2 subjects) and so on. None of the students had undergone a cervical cancer screening. Only 1 subject has been vaccinated for cervical cancer.

2. Knowledge about cervical cancer (Table 3 and 4)

The subjects were asked to identify the causes of cervical cancer on the basis of the following options: “Dietary habit,” “sexual intercourse,” “lack of exercise,” “virus infection,” “heredity,” “menstrual irregularity,” “lack of sleep,” “undernutrition,” and “others” (free description). The most commonly selected causes were “heredity” (9), “virus infection” (8), and “sexual intercourse,” (7).

The subjects were also asked to identify the initial symptoms of cervical cancer from the following list: “abdominal pain,” “genital bleeding,” “dyspareunia,” “increased vaginal discharge,” “miction pain,” “defecation pain,” “menstrual irregularity,” “no symptoms,” and “others” (free description). The top choices are “abdominal pain” (9), “genital bleeding” (5), and “no symptoms” (4).

3. Awareness of cervical cancer, sexually transmitted diseases, and cervical cancer

vaccine before PE (Table 5,6 and 7)

No subject selected “Does not apply” or “Absolutely does not apply” for degree of interest in cervical cancer, sexually transmitted diseases and the cervical cancer vaccine . No subject selected “Does not apply” or “Absolutely does not apply” for degree of intention of cervical cancer screening and the cervical cancer vaccine.

4. Association between characteristics and HPLP II in the subjects (Table 8)

We analyzed whether there was any association between health promotion and

the current lifestyle or the experience of having spoken to someone about cervical cancer. Findings reveal that there is no association between HPLP II and the current lifestyle. However, subjects who have previously spoken to someone about cervical cancer showed significantly high scores of both HPLP II as a scale and “Health Responsibility” as a subscale.

5. Association between awareness of cervical cancer and HPLP II (Table 9 and 10)

We analyzed whether there was any association between HPLP II and degree of

Table 3. Causes of cervical cancer that the subjects thought (multiple answers permitted)

Heredity	9(50%)
Virus infection	8(44%)
Sexual intercourse	7(39%)
Lack of sleep	2(11%)
Menstrual irregularity	1(6%)
Dietary habits	0
Lack of exercise	0
Undernutrition	0
Others	2(11%)
Others	2(11%)

Table 4. Symptoms of cervical cancer that the subjects thought (multiple answers permitted)

Abdominal pain	9(50%)
Genital bleeding	5(28%)
No symptoms	4(22%)
Menstrual irregularity	3(17%)
Miction pain	3(17%)
Defecation pain	2(11%)
Dyspareunia	2(11%)
Increased vaginal discharges	2(11%)
Others	0

Table 5. Degree of interest in cervical cancer

Absolutely applies	4(22%)
Applies	13(72%)
Indecisive	1(6%)
Does not apply	0
Absolutely does not apply	0

Table 6. Degree of interest in sexually transmitted disease

Absolutely applies	3(17%)
Applies	12(67%)
Indecisive	3(17%)
Does not apply	0
Absolutely does not apply	0

Table 7. Degree of interest in cervical cancer vaccination

Absolutely applies	9(50%)
Applies	8(44%)
Indecisive	1(6%)
Does not apply	0
Absolutely does not apply	0

Table 8. Association between health promotion and experience of having spoken to someone about cervical cancer in the subjects

subscale	experience	
	yes	no
Score of HPLP II*	149.0±14.2	134.0±6.1
Health Responsibility**	22.8±2.5	16.8±2.3
Spiritual Growth	26.8±3.1	24.8±1.8
Physical Activity	18.3±4.2	16.0±3.8
Interpersonal Relations	31.5±3.3	28.8±1.1
Nutrition	25.2±3.3	24.2±2.9
Stress Management	24.3±3.7	23.3±1.1

Mann-Whitney U test \*:p<.05, \*\*:p<.001

Table 9. Correlation between health promotion and degree of interest in cervical cancer

subscale	Spearman's rank correlation coefficient
Score of HPLP II	.274
Health Responsibility	.108
Spiritual Growth	.588*
Physical Activity	.131
Interpersonal Relations	.206
Nutrition	-.265
Stress Management	.478*

\*:p<.05

Table 10. Correlation between health promotion and degree of intention of cervical cancer screening

subscale	Spearman's rank correlation coefficient
Score of HPLP II	.263
Health Responsibility	.579*
Spiritual Growth	.436
Physical Activity	.306
Interpersonal Relations	.096
Nutrition	-.283
Stress Management	.153

\*:p<.05

interest regarding cervical cancer. The results reveal that the higher the subject's interest in cervical cancer, the greater the scores of "Spiritual Growth" and "Stress Management" as a subscale of HPLP II.

We analyzed whether there was any association between HPLP II and degree of intention of the cervical cancer screening. Subjects who intended to receive cervical cancer screening showed significantly high scores of "Health Responsibility" as a subscale of HPLP II.

6. Changes in knowledge about cervical cancer before and after PE (Figure 1 and 2)

After the PE, we questioned the subjects once gain on the causes and initial symptoms of cervical cancer. The subjects selected only "sexual intercourse" and "virus infection" as the causes of cervical cancer, and the responses "no symptoms" and "genital bleeding" were equally selected for items on the initial symptoms of cervical cancer.

7. Change in awareness of cervical cancer after PE (Table 11)

Each item degree of interest regarding cervical cancer, sexually transmitted diseases, and the cervical cancer vaccine showed significantly higher scores after PE

Figure1. Change in knowledge about causes of cervical cancer before and after PE

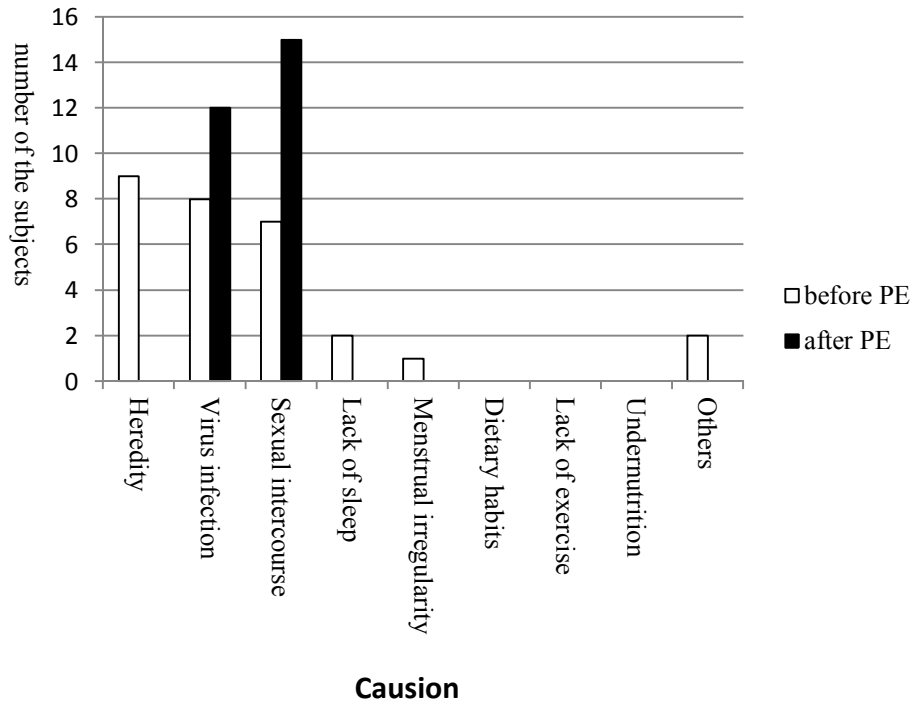


Figure2. Change in knowledge about symptoms of cervical cancer before and after PE

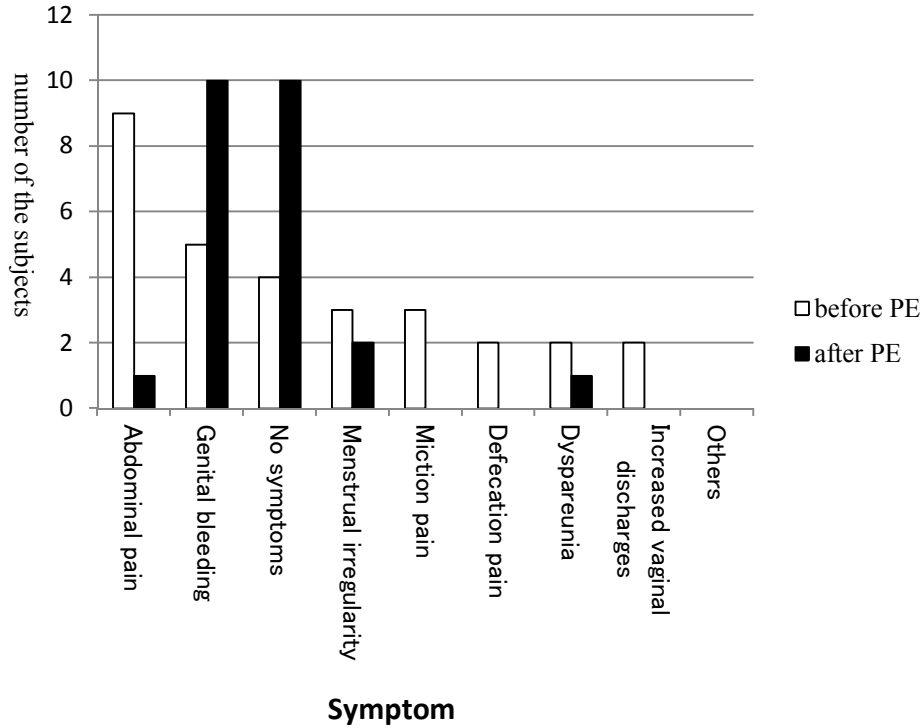


Table 11. Change in awareness of cervical cancer before and after PE

	before PE	after PE
Interest in cervical cancer***	4.17±.50	4.93±.24
Interest in sexually transmitted disease***	4.00±.58	4.88±.33
Interest in cervical cancer vaccination*	4.44±.60	4.94±.24
Intention of cancer screening**	3.83±.69	4.62±.60
Intention of cervical cancer vaccination*	4.06±.70	4.62±.60

Mann-Whitney U test \*.p<.05, \*\*.p<.01, \*\*\*.p<.001

than before PE, indicating an increase in the subjects' degree of interest.

The item on receiving cervical cancer screening showed significantly higher scores after PE than before PE, indicating an increase in the subjects' degree of cervical cancer screening. The item regarding the receiving of the cervical cancer vaccine showed significantly higher scores after PE than before it, indicating an increase in the subjects' degree of the cervical cancer vaccination.

## Discussion

### 1. Concrete support from the viewpoint of the characteristics and awareness of cervical cancer in nursing students

Nursing students are highly aware of cervical cancer because of the following reasons: two-thirds of the subjects have previously spoken to someone about cervical cancer, and some subjects had shown an interest in cervical cancer screening and the cervical cancer vaccination. On the other hand, the actual cervical cancer-screening rate reveals that no subject received a screening. In previous studies, the cervical cancer-screening rate among young women in their 20s was under 10% [20]. Improving the screening rate among these women is still an issue of concern in Japan. This issue can be found from the results in our study

that examined what young women assumed to be the causes and symptoms of uterine cancer. The results showed that half of the subjects thought the cause for cervical cancer was "heredity" and that the initial symptom was "abdominal pain." We think that such unreliable knowledge may be contributing to the low screening rate. The young age at which sexual behavior is initiated points this out. The sexual intercourse experience rate among third-year high school female students is over 40% [6]. This is 3 times the rate it was 30 years ago, which suggests that prevention education to provide knowledge and promote cervical cancer screening should be initiated prior to women turning 20 years old, and not when they turn 20 years old, as currently recommended.

Every subject who has previously spoken to someone about cervical cancer indicated that her mother was the person she would most likely talk to. From the result, we also obtained a new finding, which suggests that a mother can be a key person providing support for her young daughter with cervical cancer. The cervical cancer-screening rate among Japanese women, regardless of age, is around 15%, which is considered extremely low compared to those among European and American women 80%-90% [21]. The actual rate is far from the 50%



target that the government has proposed. In light of such current realities, we should build and support a prevention education program that both mothers and daughters can participate in, thus improving the screening rate.

2. Concrete support from the viewpoint of the characteristics and the association between awareness of cervical cancer and health promotion

To speak to somebody not only about cervical cancer but also other concerns regarding physical health and to be interested in prophylactic vaccination suggests that a person is highly conscious about their health. From this survey, the presence or absence of having previously spoken to someone about cervical cancer and the higher interest regarding the cervical cancer vaccination suggests high scores of “Health Responsibility” as a subscale of HPLP II.

In addition, the survey reveals that the higher the subject’s interest in cervical cancer, the greater the scores of “Spiritual Growth” and “Stress Management” as subscales of HPLP II. These results can be used to build practical support. Donna et al. [22] report that “Spiritual Growth” is strongly related to personal self-care abilities. Self-care abilities refer to the ability to pay attention to a certain thing, obtain knowledge, make a decision, and make a change [23]. That is to say, it is important for a young woman to consider cervical cancer not as someone else’s concern but as a possible disease for her so long as she has experienced sexual intercourse at least once, and to make a decision regarding prophylactic prevention. Consequently, providing support for young women is essential, because it is difficult but necessary for a female to face the issue of genital cancer and decide on using

prophylactics.

Moreover, with the “Stress Management” subscale, the intention to participate in workshops such as PE may influence a woman’s action. Our questionnaire included items such as “the frequency of workshop participation regarding health care” and “the frequency of reading an article or watching television related to health.” Regarding cervical cancer, an increasing number of posters about HPV and how it may cause cervical cancer are being advertised, which raises the young women’s awareness about cervical cancer [24]. However, in Japan, there are no promotions for cervical cancer screening, and no evidence of the effects of education and briefing sessions held for their parents regarding the cervical cancer vaccination; therefore, our findings indicate that education for young women is urgently needed.

3. Effects of PE for cervical cancer prevention among nursing students

We found that PE for nursing students was very effective because their knowledge about the causes and initial symptoms of cervical cancer became more reliable and their awareness of cervical cancer improved significantly. The effects of PE that focus on the prevention of induced abortion and HIV for teenagers have been reported in Japan, but the effects of PE that focus on cervical cancer prevention have not been examined. The effects of PE on cervical cancer prevention are clear from our results, and this may contribute to improving the screening rate and morbidity and mortality of young women. As mentioned above, we think it is desirable to observe the effects of a PE intervention in which both mothers and daughters can participate and that these interventions will be held not only on campus but also in the local community.

#### 4. Limitation of research

We performed the survey and analysis before and after the PE in this study. And population was only 18 nursing students. The results indicate that it is essential to allow young women to make a decision and to consider prophylactic actions not just after a PE; they must also continue improving their awareness levels and knowledge about this cancer. These subjects will be followed up on, and we will analyze the results.

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#### References

1. National Cancer Center(homepage on the internet). Center for Cancer Control and Information Services. MCIJ2006 (Monitoring of Cancer Incidence in Japan). Available from [http://ganjoho.jp/data/professional/statistics/odjrh\\_3000000\\_hwsa-att/mcij2006\\_report.pdf#search='MCIJ 2006'](http://ganjoho.jp/data/professional/statistics/odjrh_3000000_hwsa-att/mcij2006_report.pdf#search='MCIJ 2006').
2. Bosch, F.X., Lorincz, A., Muñoz, N., Meijer, C.J., & Shah, K.V. The causal relation between human papillomavirus and cervical cancer. *Journal of Clinical Pathology*. 2002; 55(4): 244-265.
3. Konno, R. The uterine cancer screening. *Diagnosis and Treatment*. 2005; 93(9), 225-232.
4. Nikkei Medical Online (homepage on the internet). A young Japanese woman has the low name recognition of cancer of the uterine cervix. Available from <http://medical.nikkeibp.co.jp/leaf/all/search/cancer/news/200809/507736.html>.
5. Ministry of Health, Labour and Welfare in Japan (homepage on the internet). Guidelines for health education focused on prevention of cancer and for cancer screening. Available from <http://www.mhlw.go.jp/shingi/2004/04/s0427-2.html>.
6. JASE (The Japanese Association for Sex education). A white paper on adolescent sexual behavior reveals. Tokyo: Shogakukan; 2007: 1-223.
7. Sato, S., Matunaga, G., Konno, R., & Yajima, A. Mass screening for cancer of the uterine cervix in Miyagi Prefecture, Japan: Effects and problems. *Acta Cytologica*. 1998; 42(2): 299-304.
8. Yamaguchi, N., Shimoyama, H., Tsukamoto, Y., Nakayama, K., & Misawa, S. The effect of peer education toward high school students by nursing college peer-supporters. *Niigata Society of Health and Welfare*. 2009; 9(1): 36.
9. Shimoyama, H., Yamaguchi, N., Tsukamoto, Y., Misawa, S., & Nakayama, K. The feature of learning of peer-supporters who carried out sexuality. *Niigata Society of Health and Welfare*. 2009; 9 (1): 37.
10. Ooya, S., & Kurihaya, A. Short-term effect of the peer education into the sexuality education: Through the practice of the sexuality education in the senior high school. *Japanese Journal of School Health*. 2006; 48(1): 32-45.
11. Yanaga, K., Tanaka, C., & Imamura, M. Sexually transmitted disease prevention: Meaning and problem of peer education. *Bulletin of St. Mary's College*. 2004; 19: 55-58.
12. Fujieda, A. The prevention education and its effect of HIV/AIDS. *The Japanese Journal of Perinatal Care*, 2003; 22(2): 120-126.
13. Hirano, T. A practical study of HIV/AIDS

- peer education for high school student: Dialogues concerning service learning. Japan Academic Association of Socio-education and Service Learning. 2010; 16: 84-93.
14. Kido, K., Hayashi, T., & Fujita, K. Building life skills for high school students: Effectiveness of an intervention by peer educators. *Bulletin of the Faculty of Social Welfare Yamaguchi Prefectural University*. 2007; 13: 123-130.
  15. Okuno, H., Higuchi, M., Nagata, F., & Kojima, K. The HIV/AIDS prevention educational practice and effect toward high school student. *Public Health*. 2006; 70(1): 76-79.
  16. Harada, A. The effect of the peer education about abortion and contraception. *Adolescentology*. 2005; 23(3): 318-327.
  17. Wei, C., Yonemitsu, H., Harada, K., Miyakita, T., Oomori, S., Miyabayashi, T., & Ueda, A. A Japanese language version of the health-promoting lifestyle profile. *Japanese Journal of Hygiene*. 2000; 54(4): 597-606.
  18. Walker, S.N., Sechrist, K.R., & Pender, N.J. The health-promoting life-style profile: Development and psychometric characteristics. *Nursing Research*. 1987; 36: 76-81.
  19. Pender, N.J. *Health promotion in nursing practice*. Norwalk, CT: Appleton-Century-Crofts. 1987.
  20. Ministry of Health, Labour and Welfare in Japan (homepage on the internet). Campaign towards 50% of cancer screening consultation rate achievement. Available from <http://www.gankenshin50.go.jp/campaign/outline/low.html>.
  21. Konno, R., Yamakawa, H., Suzuki, M. Current status and problems of cervical cancer screening. *Obstetrical and Gynecological Therapy*. 2007; 94(1): 120-131.
  22. Donna, M. Callaghan. Health-promoting Self-care, Behaviors, Self-care Self-efficacy, and Self-care agency. *Nursing Science Quarterly*. 2003; 16(3): 247-254.
  23. Onodera, T. *Reexamination of a concept of nursing*. Tokyo: Medical Science International; 1984.
  24. Noguchi, M., & Sugiura, K. Knowledge and awareness of cervical cancer prevention among female students of a nursing college. *Mie Nursing Journal*. 2011; 13, 131-139.