

What Messaging Best Promotes a 20-year-old Women's Intention to have Cervical Cancer Screening?

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What messaging best promotes a 20-year-old women's intention to have cervical cancer screening?

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Abstract

Background: Because they have not been HPV-vaccinated, the vast majority of women in Japan are defenseless against HPV-caused cervical cancer. Cervical cancer screening has become their only means for intervention early enough to save their uterus and often, their lives. Unfortunately, the cervical cancer screening rate in Japan has dropped recently to 10.2% for 20-25-year-olds. We need to recommend earlier, more frequent, and more effective screening for them. We have assessed several factors that could promote the intention of Japanese women toward having cervical cancer screening.

Method: We conducted an online survey of 412 Japanese women. Half of the respondents were given an information sheet concerning cervical cancer, the remaining half wasn't. After this educational intervention, we quizzed them about their knowledge concerning cervical cancer, about their and their family's cervical cancer screening practices, about having talks with their family about cervical cancer, and their intentions for having cervical cancer screening. Among the 127 women who admitted having had a sexual relationship, we evaluated their intention toward having cervical cancer screening. We assessed several factors that were likely to influence their intention to have cervical cancer screening.

Results: We determined that an education with an information sheet, whether or not they had ever talked with their family about cervical cancer, and whether members of their family had ever had cervical cancer screening, were associated with an effective impact on the women's positive intention to have cervical cancer screening. Knowing that cervical cancer is becoming more common among young women, that cervical cancer could influence their fertility, and that cervical cancer screening could prevent any lesions from advancing to become invasive cancer,

were also associated with an effective impact on the women's positive intention.

Conclusion: Personal educational intervention, talking with their family about cervical cancer, and the general health consciousness of their family, were all associated with an effective impact on the women's positive intentions toward cervical cancer screening. It is likely that the messaging for the need for cervical cancer screening for 20-year-olds targeting their innate desire to preserve their fertility would most effectively resonate with these young women.

Keywords: cervical cancer screening, cancer prevention, fertility, educational intervention

Background

In June of 2013, a small number of adverse medical events, including muscle pain and motor disability, were alleged to have occurred in several young girls following their immunization against HPV, prompting the Japanese Ministry of Health, Labor, and Welfare (MHLW) to suspend its previous official recommendation for HPV vaccination. Although the WHO and the global scientific community at large have strongly recommended that the MHLW resume its proactive recommendation for HPV vaccination, eight years later the recommendation remains suspended. Without an official endorsement, the HPV vaccination rate among young girls in Japan has been almost zero for several years now (1-4), leaving the vast majority of women in Japan largely defenseless against an array of HPV-caused cancers.

Cervical cancer screening has been the only means for the early detection of HPV-lesions as a way to prevent their progression to forms of cervical cancer that could cost women their fertility and even their lives. The MHLW recommends cervical cancer screening to begin at age 20. To encourage screening, when a woman in Japan approaches age 20, an invitation with a coupon for free cervical cancer screening is sent to her from her local government. However, the screening rate in Japan is unfathomably low compared to other countries. In some western countries, the rate is as high as 80% for women in their twenties (5), whereas in Japan, the rate was recently 10.2% for 20-25-year-olds, and only slightly better, 24.2%, for 26-30-year-olds. (6) Young Japanese women are thus unnecessarily exposed to a serious risk of cervical cancer.

Girls born in 2001 were 12 years-old in 2013 when the MHLW suspended its official recommendation for HPV vaccination. Those girls will become 20 this year (2021) and will become eligible for the first time for free cervical cancer screening. The entire medical

community needs to recognize the danger that these women are in and to strongly and effectively recommend to them, and the girls that follow them in future years, that they actively pursue their free cervical cancer screening.

For 19-20-year-old women who have had a sexual relationship, we report here our assessment of those factors which could potentially promote their intention to have cervical cancer screening and what kinds of messages might be most effective for promoting their positive intention to do so.

Methods

With our Internal Review Board approval, on November 16th and 17th of 2020, we conducted an online survey of Japanese women listed in an internet survey panel as being 19-20 years-old at the time of our survey. Informed consent was obtained from all women. Valid survey answers were obtained from 412 women. A self-administered questionnaire obtained information from the women on their socio-demographic characteristics, such as their employment status, having or not having had sex, civil status, having a child or not, and the total household income.

Next, half of the women (206, 50%) were educated with an information sheet concerning cervical cancer. The educational sheet included information regarding the types of morbidity caused by cervical cancer, the necessity of cervical cancer screening for the prevention of that morbidity, and that they had come of age during a period when the official recommendation for HPV-vaccination was suspended (**Table 1**). The remaining half of the participants (206, 50%) did not receive the information sheet.

After the educational intervention sheet was given to half of the women, we asked both groups

about their knowledge concerning cervical cancer and its screening, about her and her family's history of having cervical cancer screening, about her having talks with her family about cervical cancer, and about her intention toward having cervical cancer screening. Among 127 women who admitted to having had a prior sexual relationship, we evaluated their intention toward having cervical cancer screening, as we would especially recommend that these women receive such screening. Finally, we assessed with our survey several factors that were likely to influence the intentions of this high-risk group of women toward having cervical cancer screening.

Statistics

Using Medcalc, differences between groups were calculated by the chi-square test and the logistic regression test for categorical variables. The level of statistical significance was set at $p=0.05$.

Results

Characteristics of the internet survey responders

The relevant characteristics of the survey responders who had a sexual relationship are shown in **Table 2**. No statistically significant differences existed between the two groups.

External factors that affected the respondent's intention to have cervical cancer screening

In regards to the question about their intention to have cervical cancer screening, 83.8% of the women who received an information-sheet-education had a positive intention to have cervical cancer screening sometime soon, 16.2% had a negative intention. Among the non-sheet-

educated women, 77.4% had a positive intention, 13.2% were negative, and 9.4% did not answer the question. Education with the information sheet was associated with an effective impact on the women's positive intention ($p < 0.05$) (**Table 3**).

Among the women who had talked with their family about cervical cancer, 92.9% had a positive intention to have cervical cancer screening sometime soon and 7.1% had a negative intention. Among the women who had not talked with their family about cervical cancer, 71.8% had a positive intention to have cervical cancer screening sometime soon, 21.1% had a negative intention, and 7.1% did not answer. Whether or not they had ever talked with their family about cervical cancer was associated with an effective impact on the women's positive intention ($p < 0.01$) (**Table 3**).

Among the women who had a family who had cervical cancer screening, 93.2% had a positive intention to have cervical cancer screening sometime soon and 6.8% had a negative intention. Among the women who had not talked with their family about cervical cancer, 74.7% had a positive intention to have cervical cancer screening sometime soon, 19.3% had a negative intention, and 6.0% did not answer. Whether their family had ever had cervical cancer screening or not was associated with an effective impact on the women's positive intention ($p < 0.05$) (**Table 3**). Surprisingly, whether or not they had a person around them who had cervical cancer was not significantly associated with the women's positive intention to have cervical cancer screening (**Table 3**).

Internal factors affecting their intention to have cervical cancer screening

Knowledge of cervical cancer

Among the women who knew that cervical cancer is increasingly common among young women, 86.0% had a positive intention to have cervical cancer screening, 12.9% had a negative intention, and 0.1% did not answer. Among the women who did not know that cervical cancer is common among young women, 67.6% had a positive intention to have cervical cancer screening sometime soon, 20.6% had a negative intention, and 11.8% did not answer. Whether they knew that cervical cancer is common among young women or not was associated with an effective impact on the women's positive intention ($p < 0.01$) (**Table 4**).

Among the women who knew that cervical cancer could influence their fertility, 81.7% had a positive intention to have cervical cancer screening, 16.5% had a negative intention, and 1.8% did not answer. Among the women who did not know that cervical cancer is common among young women, 77.8% had a positive intention to have cervical cancer screening sometime soon, 5.6% had a negative intention, and 16.6% did not answer. Whether or not they knew that cervical cancer could influence their fertility was associated with an effective impact on their positive intention ($p < 0.01$) (**Table 4**).

Whether they knew that HPV is infected through a sexual relationship, that cervical cancer could cause the uterus to be removed and that they could die from cervical cancer were not significantly associated with the women's positive intention to have cervical cancer screening (**Table 4**).

Knowledge of cervical cancer screening

Among the women who knew that cervical cancer screening could prevent invasive cancer from advancing, 88.5% had a positive intention to have cervical cancer screening and 11.5% had a negative intention. Among the women who did not know that cervical cancer screening

could prevent invasive cancer from advancing, 65.0% had a positive intention to have cervical cancer screening sometime soon, 22.5% had a negative intention, and 12.5% did not answer. Whether or not they knew that cervical cancer screening could prevent invasive cancer from advancing was associated with an effective impact on the women's positive intention ($p < 0.001$) (**Table 5**). Whether or not they knew that the MHLW was recommending cervical cancer screening to 20 year-olds and for more women, and that cervical cancer screening is useful in early cancer detection, were not significantly associated with the women's positive intention to have cervical cancer screening (**Table 5**).

Discussion

For our survey, we targeted 20-year-old women, who had just reached the MHLW-recommended age for starting to have cervical cancer screening, and 19-year-old women, who were approaching that recommended age. Having an educational intervention that was targeted to them, having talks with their family about cervical cancer, and the health consciousness of their family, were each independently associated with an effective impact on the women's positive intention to seek cervical cancer screening. Surprisingly, knowing of friends or acquaintances who had suffered from cervical cancer was not associated with a positive intention. These findings suggest that, in addition to interventions directly targeting these women, educational interventions with their family could also further promote the women's positive intention to have cervical cancer screening. However, the range within which we could effectively intervene was limited to the women and their families, since it did not seem to extend to their friends or acquaintances.

This impression is consistent with the results of our previous study, in which we sent the parents a cervical cancer information sheet containing a cartoon about cervical cancer to show to their daughters. Parents receiving the leaflet became significantly more motivated to recommend to their daughters that they receive their first cervical cancer screening than those who did not get the leaflet. As a result of that intervention, the cervical cancer screening rate of the daughters was significantly increased. (7)

In another study, we sent invitation leaflets for cervical cancer screening to the daughter and an additional leaflet to their mothers. We requested that the mother recommend that her daughter undergo the screening described on the leaflet for the reasons listed. The screening rate of the daughters whose family received the combination of leaflets with their mother was significantly higher than the rate of the daughters who received only a personalized daughter-directed leaflet. (8)

We conclude from those studies and this latest one that we should continuously and directly intervene with 20-year-old and older women, and indirectly via their families, to raise their collective health consciousness to make them more likely to have family talks about cervical cancer and its methods of prevention, as a conducive way of promoting these at-risk women's positive intention to have proper screening. Towards that end, we have assessed the kinds of messaging that could best resonate with these specific women for having cervical cancer screening. The message: "Cervical cancer is common among young women like you." was significantly associated with stimulating a more positive intention to have cervical cancer screening. We assume that, by helping these young women recognize that cervical cancer is their problem, we can alter their natural indifference.

The messages of the possible loss of their uterus and the possibility of death from cervical cancer did not resonate nearly as well, as such thoughts are not yet “realistic” for a 20-year-old woman, as neither are perceived by them as a “significant imminent danger”. On the other hand, the message of “Cervical cancer could influence your fertility” was easily recognized as a highly personal matter and did resonate well. The risk of acquiring cervical cancer and losing their child-bearing ability was something they could grasp, which is an example of psychological “present bias”, whereas loss of a uterus or death could not be imagined. We conclude that having talks with their family and educational intervention with a leaflet about the deadly consequences of unchecked cervical cancer were unable to bridge the gap between the present good health and some unimaginable future death from cervical cancer.

Concerning cervical cancer screening, messages showing an official recommendation for cervical cancer screening and the benefits of early detection of cervical cancer were not associated with improving their positive intention to have cervical cancer screening, but the message of “Cervical cancer screening could prevent early HPV lesions from advancing to invasive cancer” was significantly associated with the positive intention to have cervical cancer screening. Perhaps they knew that HPV vaccination could have prevented most pre-cancerous lesions, but didn’t know that cervical cancer screening was also a means of prevention of advancing invasive cervical cancer.

Quinn et al. reported that England’s national call-and-recall system and their incentive payments to general practitioners have increased cervical screening coverage to about 85%. Such improvements in the national screening program have led to a 35% fall in the incidence of invasive forms of cervical cancer in all regions of England and in all age groups from 30 to 74.

The decline in mortality in older women was largely unrelated to screening, but without screening, it is estimated that there might have been 800 more deaths from cervical cancer in women under 55 in 1997. (9)

We must make more concrete information concerning cervical cancer screening available to young women, instead of merely repeating vague recommendations with little hint at the repercussions of failing to act. Taking the above results of this study, we think that we should immediately begin messaging that cervical cancer screening is essential for 20-year-olds if they wish to preserve their fertility.

Conclusions

Educational interventions directed to these women, their own having talks with their family about cervical cancer, and the family's health consciousness were all associated with having an effective impact on the women's positive intention to have cervical cancer screening. A message advocating that cervical cancer screening is necessary for 20-year-olds to preserve their fertility could effectively resonate with these young women.

Abbreviation

HPV: Human papillomavirus; MHLW: The Japanese Ministry of Health, Labor, and Welfare

Declarations

Ethics approval and consent to participate

This study was approved by the Institutional Review Board and the Ethics Committee of the

Osaka University Hospital (#14361). All protocols are carried out in accordance with relevant guidelines and regulations. The researchers obtained informed consent from participants of the survey on the questionnaire. Informed consent was obtained by clicking an “I agree” button by all participants in this study. We included only those who consented to participate.

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interest

The authors have no conflict of interest relevant to this article.

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There is no funding.

Authors' contributions

A.M. : writing manuscript, study design, interpretation of result, Y.U. : study design, interpretation of result, A.Y. : sample preparation, T.K. : sample preparation, E.K. : sample preparation, K.H. : sample preparation, S.N. : sample preparation, T.K. : sample preparation

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Tables

Table 1. Content of the information sheet

Content of the information sheet

1. Cervical cancer is caused by HPV, which 80% of women get through a sexual relationship.
2. Cervical cancer screening is recommended for women 20 years-old and older. It is free.
3. Cervical cancer screening can find cells which are becoming cervical cancer. If we find this pre-cancer cell, we can cure your cervical cancer without removing your uterus.
4. The HPV vaccination rate is now less than 1%, although the prevention of cervical cancer by the HPV vaccine is occurring all over the world. If you have had a sexual relationship without having an HPV vaccination, cancer screening is now your only way for prevention of cervical cancer.
5. Women born in 2000 are now defenseless against cervical cancer, since 86% of them was not vaccinated because the Japanese Ministry of Health, Labor, and Welfare suspended its official recommendation for HPV vaccination as a consequence of reports of alleged adverse medical events.
6. Cervical cancer is the most common cause of death for women in their twenties, except for suicide.
7. Future increased incidence of cervical cancer in women born in 2000 is estimated to be about 3,600. One in 75 women will now be at higher risk for acquiring of cervical cancer, and one of 325 women will be newly at risk for future death from this disease in its progressive form.
8. The number of women getting cervical cancer is increasing; the rate is about two times that of their mother's age.
9. The number of women who die from cervical cancer is 1.7 times more than the number of women who die in traffic accidents.

Table 2. Characteristics of the internet survey responders

Responder Characteristics	Education Intervention (+)	No Education (-)	p-value
Subjects	206	206	
Employment status			n.s.
company employee (other)	11 (5.3%)	13 (6.3%)	
stay-at-home	3 (1.5%)	2 (1.0%)	
part-time staff	10 (4.9%)	8 (3.9%)	
student	173 (84.0%)	177 (85.9%)	
other	9 (4.3%)	6 (2.9%)	
Having sex			n.s.
Yes	74 (35.9%)	53 (25.7%)	
No	108 (52.4%)	131 (63.6%)	
NA	24 (11.7%)	22 (10.7%)	
Civil status			n.s.
unmarried	199 (96.6%)	204 (99.0%)	
married	7 (3.4%)	2 (1.0%)	
Having child			n.s.
No	200 (97.1%)	204 (99.0%)	
Yes	6 (2.9%)	2 (1.0%)	
Household income			n.s.
<2 million yen	30 (21.9%)	21 (15.7%)	
2-4 million yen	8 (5.8%)	9 (6.7%)	
4-6 million yen	10 (7.3%)	9 (6.7%)	
6-8 million yen	10 (7.3%)	9 (6.7%)	
8-10 million yen	5 (3.6%)	8 (6.0%)	
>10 million yen	4 (2.8%)	6 (2.9%)	
unknown	70 (51.1%)	72 (53.7%)	

Table 3. External factors influencing to intention to having cervical cancer screening

Intention of having cervical cancer screening				
	Positive	Negative	NA	Total
Educational intervention				<i>p</i><0.05
Education (+)	62 (83.8%)	12 (16.2%)	0 (0%)	74 (100%)
Education (-)	41 (77.4%)	7 (13.2%)	5 (9.4%)	53 (100%)
Did you ever talk with your family about cervical cancer?				<i>p</i><0.01
Yes	52 (92.9%)	4 (7.1%)	0 (%)	56 (100%)
No	51 (71.8%)	15 (21.1%)	5 (7.1%)	71 (100%)
Has any of your family ever had cervical cancer screening?				<i>p</i><0.05
Yes	41 (93.2%)	3 (6.8%)	0 (%)	44 (100%)
No	62 (74.7%)	16 (19.3%)	5 (6.0%)	83 (100%)
Do you know a person around you who has had cervical cancer?				n.s.
Yes	15 (93.8%)	1 (6.2%)	0 (%)	16 (100%)
No	88 (79.3%)	18 (16.2%)	5 (4.5%)	111 (100%)

Table 4. Messages concerning cervical cancer which might influence intention of having cervical cancer screening

Intention of having cervical cancer screening				
	Positive	Negative	NA	Total
Cervical cancer is common among young women.				p<0.01
Known	80 (86.0%)	12 (12.9%)	1 (0.1%)	93 (100%)
Unknown	23 (67.6%)	7 (20.6%)	4 (11.8%)	34 (100%)
HPV is infected through a sexual relationship.				n.s.
Known	51 (83.6%)	9 (14.8%)	1 (1.6%)	61 (100%)
Unknown	52 (78.8%)	10 (15.2%)	4 (6.0%)	66 (100%)
Cervical cancer could influence your fertility.				p<0.01
Known	89 (81.7%)	18 (16.5%)	2 (1.8%)	109 (100%)
Unknown	14 (77.8%)	1 (5.6%)	3 (16.6%)	18 (100%)
Cervical cancer could take away your uterus.				n.s.
Known	78 (82.1%)	15 (15.8%)	2 (2.1%)	95 (100%)
Unknown	25 (78.1%)	4 (12.5%)	3 (9.4%)	32 (100%)
You could die from cervical cancer.				n.s.
Known	76 (81.7%)	15 (16.1%)	2 (2.2%)	93 (100%)
Unknown	27 (79.4%)	4 (11.8%)	3 (8.8%)	34 (100%)

Table 5. Messages concernig cervical cancer screening influencing intention to having cervical cancer screening

Intention to having cervical cancer screening				
	Positive	Negative	NA	Total
The MHLW recommends cervical cancer screening for 20-year and older women.				n.s.
Known	57 (83.8%)	10 (14.7%)	1 (1.5%)	68 (100%)
Unknown	46 (78.0%)	9 (15.3%)	4 (6.7%)	59 (100%)
Screening is useful for the early detection cervical cancer.				n.s.
Known	69 (83.1%)	12 (14.5%)	2 (2.4%)	83 (100%)
Unknown	34 (77.3%)	7 (15.9%)	3 (6.8%)	44 (100%)
Cervical cancer screening could prevent advanced invasive cancer.				<i>p</i><0.001
Knew	77 (88.5%)	10 (11.5%)	0 (%)	87 (100%)
Didn't know	26 (65.0%)	9 (22.5%)	5 (12.5%)	40 (100%)