博士論文

Persuasiveness of statistics and patient's and
mother's narratives in HPV vaccine communication:
A randomized controlled study in Japan

（子宮頸がん予防ワクチンのコミュニケーションにおける
　統計データ，患者・母の体験談の影響力の検討：
　無作為化比較試験）

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Persuasiveness of statistics and patient's and mother's narratives in HPV vaccine communication:
A randomized controlled study in Japan

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Abstract

Background: The human papillomavirus (HPV) vaccination percentage among age-eligible girls in Japan is only in the single digits. This signals the need for effective vaccine communication tactics. The present study aimed to examine the influence of statistical data and narrative HPV vaccination recommendation massages on recipients' vaccination intentions.

Methods: This randomized controlled study covered 1432 mothers who had daughters aged 12–16 years. Message persuasiveness was compared using four conditions: statistical messages only; narrative messages of a patient who experienced cervical cancer, in addition to statistical messages; narrative messages of a mother whose daughter experienced cervical cancer, in addition to statistical messages; and a control. Vaccination intentions to have one's daughter(s) receive the HPV vaccine before and after reading intervention materials were assessed. Statistical analysis was conducted using the two sample t-test and the analysis of covariance, with adjustment of p-values for multiple testing using the method of Holm.

Results: Vaccination intentions after intervention in the three intervention conditions were higher than the control condition ($p<0.003$). Intention in the narratives in addition to statistics condition was higher than the statistics only condition ($p=0.026$). No significant difference was found between the patient's narrative and the mother's narrative condition.

Discussion: Adding narrative to statistical messages may be expected in promotion of HPV vaccination to enhance message persuasiveness. Further studies are needed to understand more about factors influencing the persuasiveness of narratives.

1. Introduction

1.1. Communication in public health

A number of public health issues are closely related to communication. Lack of information and limited awareness about health risks and preventive measures of diseases pose problems for people's health. Finding ways to best communicate public health information has increasingly become a priority. Since its emergence as a defined area of study in the late 1960s, researchers and practitioners in psychology, medicine, sociology, and persuasion have considered communication as central to the process of disease prevention and health promotion, and now health communication has become a key contributor in public health [1]. The *Healthy People 2010* defined health communication as the study and use of communication strategies to inform and influence individual and community decisions that enhance health [2]. Considering this, it is essential to convey evidence-based information as well as to strategically influence the audience to make better health decisions in public health practices.

1.2. HPV vaccination crisis in Japan

The concept of health communication mentioned above is especially important in the current HPV vaccination crisis in Japan. Cervical cancer, which is commonly caused by chronic infection with an oncogenic strain of HPV, is the third most commonly diagnosed cancer and the fourth leading cause of cancer deaths among women worldwide [3,4]. Approximately 10,000 people are diagnosed with, and about 3,000 people die of, cervical cancer annually in Japan [5]. Mortality due to cervical cancer has increased, and in recent years patients in their 20s and 30s have been most widely affected [5]. HPV vaccination is recommended by the World Health Organization and has been made available in most

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industrialized countries, mainly targeting girls aged about 12–16 years [6]. The Ministry of Health, Labour and Welfare of Japan approved the manufacture and sale of the vaccines Cervarix in 2009 and Gardasil in 2011.

The HPV vaccination rate for girls aged 12–16 years was as high as about 70% in 2011 and 2012 in Japan [7,8]. However, in March 2013, The Asahi Shimbun, considered one of the most authoritative newspapers in Japan, reported on a girl who had allegedly suffered from severe adverse effects attributed to the HPV vaccine. Newspapers, television, and other media followed suit, and continuously reported on adverse events of HPV vaccination, including movement disorders and memory disturbances. Although HPV vaccines became a routine prophylactic vaccine for girls aged 12–16 years under Japan's Preventive Vaccination Law in April 2013, the Japanese government decided to suspended its proactive recommendation of HPV vaccination in June 2013, in consideration of public concerns about those adverse events. As a result, the HPV vaccination rate fell sharply, to only a few percent by 2014 [9,10]. Fears concerning adverse reactions to HPV vaccination are now a significant reason for avoiding vaccination in Japan and other countries [11–15], despite studies demonstrating the safety of HPV vaccines [16,17]. In this critical situation, conveying scientific information alone may not sway the biased anti-HPV vaccination sentiment; influential and persuasive communication tactics to encourage the audience to make less biased decisions are needed.

1.3. Possible procedure for approaching parents and their daughters

In Japan, unlike in many other developed countries, the primary care doctor system is underdeveloped, and school-administered HPV vaccination has not been routinely performed. Most mothers and their daughters do not have health professionals whom they can

consult with about HPV vaccines. They gather information independently and judge by themselves whether or not vaccination will be sought. Accordingly, when proactive recommendation of HPV vaccination resumes in the future, publicizing online and offline vaccination recommendation messages from the Ministry of Health, Labour and Welfare, municipalities and hospitals will be a means for recommending vaccination to mothers and their daughters. Therefore, examining persuasive messages that recommend HPV vaccination is an urgent issue in Japan.

1.4. Persuasiveness of statistical and narrative evidence

Since Aristotle, the use of evidence has been a primary means of enhancing message persuasiveness. Evidence is the set of factual statements that originate from a source other than the communicator and are offered to verify the communicator's claims [18]. Evidence can be divided broadly into two categories: statistical and narrative evidence [19]. Statistical evidence, such as frequencies and percentages, provide proof in the form of summary information across a larger number of cases [19]; e.g., "The frequency of severe adverse reactions to the HPV vaccine, such as acute disseminated encephalomyelitis, is one in 4.3 million." Narrative evidence refers to the use of case stories or examples to support the argument offered by the communicator [19]; e.g., "I am suffering from the aftereffect of cervical cancer. Therefore, I recommend you receive the HPV vaccine to prevent cervical cancer."

Statistical and narrative evidences offers the advantage of being easy to use when health professionals create HPV vaccination recommendation messages in media such as leaflets and websites. Additionally, studies indicate that evidence produces general persuasive effects that appear surprisingly stable [18-21]. However, persuasive effect of statistical and

narrative evidences may be weakened in the critical situation of HPV vaccination in Japan because individuals' attitudes toward and intentions of HPV vaccination may be negatively distorted and resistant to recommendation for vaccination. No study has examined whether statistical and narrative evidences are still persuasive in the context of HPV vaccine communication in Japan. Thus, my first research question emerges herein.

Research question 1: *will reading a HPV vaccination recommendation message including a statistical evidence or a narrative evidence result in better attitude toward and higher intention to receive the HPV vaccine than receiving no message condition under the circumstances of the HPV vaccination crisis in Japan?*

1.5. Persuasiveness of statistical vs. narrative evidence

Until recently, the dominant paradigm in health communication has involved using statistical evidence and appeals to reason to persuade people to adopt health behaviors [22]. However, using narratives to motivate health behavior is recently an emerging form of persuasion in public health [22-24], because narrative communication (e.g., storytelling) is the basic mode of human interaction, and therefore it is a fluent way of giving and receiving information [23]. Persuasiveness of narrative evidence comparing with statistical evidence has been examined in various health related topics such as alcohol-education, nutrition-education and cancer prevention-education [22]. Especially in vaccination promotion, using narratives is proposed to counter against anti-vaccination messages in mass media and on the internet, which propagate doubt, fear, and opposition to vaccination [25]. That is because those anti-vaccination messages often use emotional narratives of alleged victims of vaccine's side reactions [26], and a study found that such narratives increased the perception of risk of vaccine's side reaction to a greater extent than statistical information [27]. Thus, scholars of

vaccine communication have recently began to direct their interest to using narrative such as describing people feeling relief at knowing that they and their loved ones are protected by vaccination, or describing an experience of a person who lost one's health owing to a preventable disease [28,29]. Several recent studies in the context of vaccine communication show that narrative messages about experiences of disease increase the audience's risk perception of developing the disease, vaccination intention, and behaviors to prevent the disease to a greater degree than do didactic messages [30–33].

However, health-related narrative persuasion research is still emerging. It remains relatively small in size, and only some studies have examined health-behavior outcomes in non-student samples [34]. Scholars has focused on the relative persuasiveness of messages presenting statistical evidence compared with those presenting narrative evidence. Reviews of studies show mixed results [18,19,21]. Comparison and usage of persuasiveness of statistics and narratives has not yet reached conclusion among communication scholars [35].

In Japanese current situation where side reactions to HPV vaccines are extremely concerned, presenting statistical data on risks and benefits of HPV vaccines will be essential to support audiences' balanced decision making regarding vaccination, and presenting only narrative messages may be neither sufficient nor desirable. Therefore, HPV vaccination recommendation messages in Japan for the time being may be two ways; using only statistical evidence, or adding narrative evidence to statistical evidence. However, few studies have compared message persuasiveness between a combination of narrative and statistical evidence and statistical evidence alone [22]. The only study examined it — presenting messages of non-health-related topic to undergraduate students — showed that a combination of narrative and statistical evidence was more persuasive than statistical evidence alone [36]. No study has examined whether a combination of narrative and statistical evidence was more persuasive

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than statistical evidence alone in HPV vaccination communication in non-student samples. Thus, my second research question emerges herein.

Research question 2: *will a narrative message in addition to statistical messages result in better attitude toward and higher intention to receive the HPV vaccine than statistical messages only among participants who are mothers with daughters in Japan?*

1.6. Theoretical explanations of narrative persuasiveness

Although the level of theoretical development for understanding the mechanisms and processes involved in narrative persuasion is still limited [37], several theoretical perspectives have been proposed to explain how and why would narrative communication contribute to attitudinal and behavioral changes. In the beginning of the studies, models of behavior change — the most representative being the social cognitive theory [38,39] — have been applied. Then, theories of persuasion in psychology — the most representative being the extended elaboration likelihood model [40] and the transportation-imagery model [41] — have been proposed and evaluated.

Social Cognitive Theory

According to Bandura's social cognitive theory, individuals learn not only from their own direct experience but also by observing and modeling others' behaviors [38,39]. Individuals are more likely to imitate behaviors that they have observed than behaviors that have been recommended. This behavioral modeling is central to observational learning. By observing a model, individuals can learn a behavior and will be more likely to perform it if the model performs the behavior in attractive ways. In one of the studies that examined if personal experience narratives promote observational learning and behavioral modeling,

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African American women who survived breast cancer talked about their cancer experiences to small groups of African American women [42]. The study found that self-reported use of mammography and breast-self-examination increased from pre- to post exposure among women who attended the program [42]. Additionally, a qualitative evaluation of the program found that the narrators of the narratives were seen as truthful and perceived as credible role models because they were perceived as having similar social, cultural, and ethnic backgrounds; i.e., African American women [43]. Another study showed that participants exposed to a narrative video featuring breast and cervical cancer patients' stories experienced strong emotions when the narrators have the same ethnic backgrounds, which led to increased knowledge and lowered perceived barriers and cancer fatalism [44]. Thus, studies of social cognitive theory indicate that individuals tend to more likely adopt behaviors demonstrated by models they consider similar to themselves [45].

Extended elaboration likelihood model

The Elaboration Likelihood Model (ELM) [46,47] is a model that explains attitude change by persuasion. The ELM suggests that under different conditions, receivers will vary in the degree to which they are likely to engage in issue involvement (i.e., "elaboration"). The degree to which elaboration occurs influences the activation of two different kinds of persuasion processing: the central route (i.e., systematic processing) and the peripheral route (i.e., heuristic processing). Generally, attitude change obtained through the central route is likely to endure over time, is more resistant to counter-persuasion, and is more directive of subsequent behavior [47]. The central route is most appropriately used when the receiver is motivated and has the ability to think about the message. As the receivers' involvement with the issue increases, their motivation to think about the message increases. Additionally, as the

message's comprehensibility increases, the receivers' ability to think about the message increases. Thus, the ELM has been used to explain recipients' responses to overtly persuasive messages.

However, attempts to use the ELM to explain narrative persuasion have yielded mixed results [40]. Then, the Extended Elaboration Likelihood Model has been proposed by Slater and Rouner [40] to expand on the traditional ELM to explain a greater range of persuasive situations focusing on the ways that narratives are processed. These authors suggested that attitudinal changes by narrative persuasion is generated when audience has internalized the values and experiences embodied in the story, rather than to a direct acceptance of arguments presented in that narrative [40]. The concept of issue involvement in the traditional ELM was replaced with the concept of absorption in narratives, which was defined as vicariously experiencing the characters' emotions and personality [40]. According to the extended ELM, recipients' identification with characters is a relevant factor in understanding the effects of narrative persuasion, assuming that identification with characters may influence the degree of absorption in the story. Namely, the extended ELM assumes that the more strongly a recipient can identify with a character in a narrative, the more deeply the recipient will be absorbed in the story, and consequently the more persuasive the message will be. The model also assumed that the individuals who identify with a narrator of a narrative cannot generate criticisms and counter-arguments regarding the implicit messages in the narrative [40]. This model was empirically tested in a study using a television drama presenting a favorable message regarding gay marriage [48]. The study found that participants exposed to the drama showed lower critical commentaries regarding gay marriage comparing with participants exposed to a control film, which suggested that the viewing of the film had interfered in the production of counterarguments [48]. The study also showed that there was a

positive correlation between the degree of identification with the protagonist in the drama and the degree of support for gay marriage [48].

Transportation-Imagery Model

Transportation-Imagery Model has been proposed by Green and Brock [41] as the explanatory mechanism of narrative persuasion, focusing on narratives that evoke vivid imagery. Transportation is defined as "an integrative melding of attention, imagery, and feelings, focused on story events" [49], which refers to a cognitive state in which recipients become highly engaged in a story. Transportation is assumed to lead to persuasion because individuals who are transported into a story may identify with the characters of the narrative, and the identification makes the characters' perspective have greater influence on the beliefs of those individuals [41,49]. It is also assumed that if transported individuals are absorbed in the story, they are less likely to counter argue and therefore tend to believe the implicit message in the story [41,49]. In studies tested the model, participants read written narratives, and then the impact that the implicit beliefs in the story had on the participants' beliefs was evaluated [41,49]. Those studies found that the participants experiencing the greater transportation during reading the text showed a greater degree of acceptance of the beliefs portrayed in the narrative.

1.7. Identification and similarity

As theoretical perspectives reviewed above indicate, identification with characters is proposed to be one of the central mechanisms thorough which narratives can change attitude [50,51]. Identification is a mechanism through which audience members experience reception and interpretation of the text internally, as if the events were happening to them [52]. During

identification, the audience imagines that he or she becomes the character and replaces his or her personal identity and role as an audience member with the identity and role of the character [52]. A number of studies show that greater identification with characters is associated with greater persuasiveness of narratives [53-61]. For example, participants read an article about caffeine overdose in one study [57]. To manipulate protagonist-reader similarity and degree of identification, participants below the age of 30 were randomly assigned to read an article in which the protagonist was also young and of the same sex or much older and of the opposite sex. The study found that similarity influenced identification, which in turn increased severity perceptions of caffeine overdose. In another example, a study among college students found more HPV vaccine inoculation behaviors in the group who viewed a video of the narrative of a college student than the narrative of a medical expert [33]. It was indicated that participants could more easily identify with the narrative of a peer who has similarity to themselves [33].

The extended ELM by Slater and Rouner [40] has proposed that recipients' perceived similarity to characters in narratives may lead to identification with those characters. Additionally, as mentioned earlier, studies of the social cognitive theory also indicates that individuals appear to more readily adopt behaviors demonstrated by models they consider similar to themselves [42-45]. In addition to studies mentioned above [33,57], several studies showed that perceived similarity of a recipient to a character in a narrative increased the degree of identification with the character [51,60,61]. Thus, studies indicate that perceived similarity is one of the factors that increase the degree of identification.

When health professionals create health messages, similarity of narrators in narratives to recipients may be easy to apply. Namely, although health professionals may have difficulty to write good stories that make recipients absorbed in, they may be able to arrange

narrators in narratives who has similarities to recipients. For example, when health professionals promote health issues to mothers, they may be able to provide a mother's narrative. Thus, narrators' similarity to recipients and recipients' identification with narrators may be applicable when health professionals create health messages.

Japanese refer to the HPV vaccine as "sikyu keigan wakuchin" (i.e., cervical cancer vaccine). Therefore, a narrative of a cervical cancer patient who recommends HPV vaccination may be persuasive for some audiences. However, healthy individuals may have difficulty identifying with a patient because of absence of similarity between them. When targeting mothers to promote HPV vaccination, the narrative of a mother who has a daughter may be easier to identify with and more persuasive than the narrative of a cervical cancer patient, because the narrator has a similarity to recipients (i.e., the position of mother with daughter(s)).

Judgements of perceived similarity is considered to be based on actual or perceived characteristics of message source such as socioeconomic status, group membership, place of residence, and life experience [62]. Previous studies manipulated sex, age, race, living situation, life experience, and pre-existing belief to generate perceived similarities between message sources and recipients [51,55,57,58,60,61]. However, no study has examined impact of the position of mother as similarity between a narrator and recipients on narrative persuasiveness. Thus, my third research question emerges herein.

Research question 3: *will the narrative of a mother whose daughter experienced cervical cancer result in better attitude toward and higher intention to have their daughters receive the HPV vaccine than the narrative of a patient who experienced cervical cancer among participants who are mothers with daughters?*

1.8. Assessing persuasive effect － attitude, intention, and behavior

Most research on narrative effects has been conducted in the fields of social psychology, not in health-behavior research [22]. In social psychology, persuasion has also been labeled as attitude change [63]. Although for a time there was considerable discussion of definitions of attitude, a broad consensus emerged that an attitude is a person's general evaluation of an object [64]. Scholars in the fields of social psychology have considered that persuasion is to change attitude of recipients towards an object, and they have studied variables, processes and strategies of attitude change [65,66]. They have assumed that attitudes are important determinants of behavior, and correspondingly that one way to changing an individual's behavior will be to change that person's attitude. This assumption is supported by systematic reviews showing that attitudes and behaviors are commonly consistent [67-69].

However, the effects that attitude determines behavior are stronger under certain circumstances. To explain attitude-behavior relations and the determinants of volitional behavior, the Reasoned Action Theory (RAT) has been proposed by Fishbein and Ajzen [70,71]. The RAT focuses on understanding behavioral intentions. A behavioral intention represents an individual's readiness to perform a specified action. The RAT proposes that one's intention to perform or not perform a given behavior is a function of four factors: one's attitude toward the behavior, one's injunctive norm, one's descriptive norm, and perceived behavioral control. Thus, the RAT focuses on factors influencing the formation on behavioral intentions, assuming that intentions are related to actions. Indeed, systematic reviews have showed that voluntary actions can often be successfully predicted from intentions [72-77].

Thus, in experimental persuasion research, the most common outcome assessments have been of attitudes, intentions, and behaviors [78]. In studies that a research question

concerns the relative persuasiveness of two message kinds, those three outcomes yield substantively identical conclusions; the mean effect sizes (describing the difference in persuasiveness between two message types) for attitudinal outcomes, for intention outcomes, and for behavior outcomes are statistically indistinguishable and hence functionally interchangeable [79]. In the present study, it may be difficult to assess the behavior of receiving the HPV vaccines as an outcome because the HPV vaccination rate is only a few percent in Japan. Therefore, the present study assessed attitude and intention as outcomes.

1.9. Study aims

The present study aimed to examine message persuasiveness using statistical data and narratives on attitude toward and intention to have their daughters receive the HPV vaccines among participants who were mothers with daughters aged 12–16 years, in Japan. Regarding persuasiveness of narratives, the present study focused on participant's identification with a narrator of a narrative, and examined influence of similarity between participants and a narrator of a narrative on participant's attitude toward and intention to have their daughters receive the HPV vaccines. This will help ensure that persuasive vaccine recommendation messages will be disseminated when proactive recommendation of the vaccination eventually resumes. A randomized controlled study was conducted to answer the three research questions.

Research question 1: *will reading a HPV vaccination recommendation message including a statistical evidence or a narrative evidence result in better attitude toward and higher intention to receive the HPV vaccine than receiving no message condition under the circumstances of the HPV vaccination crisis in Japan?*

Research question 2: *will a narrative message in addition to statistical messages result in better attitude toward and higher intention to have their daughters receive the HPV vaccines than statistical messages only among participants who are mothers with daughters in Japan?*

Research question 3: *will the narrative of a mother whose daughter experienced cervical cancer result in better attitude toward and higher intention to have their daughters receive the HPV vaccines than the narrative of a patient who experienced cervical cancer among participants who are mothers with daughters?*

2. Methods

2.1. Study design and participants

The present study applied a web-based randomized controlled study design with one control group and three intervention groups. Participants were recruited from persons registered in a survey company database in Japan. The number of the registered persons was about 114.4 million as of August 2017. Eligibility criteria were mothers who have a daughter(s) aged 12–16 years who has never received HPV vaccination. In September 2017, a recruiting e-mail with screening questions was sent to 14,495 registered persons who matched eligibility criteria with reference to the database (excluding participants of a pretest that was conducted in August 2017). Then, recipients responded to screening questions, and 1,463 persons who were eligible proceeded to a web-based survey (see Appendix 1 for screening for an online survey). To exclude impersonation responses, the web-based survey asked participants screening questions again in the beginning of the survey (see Appendix 2 for an online survey). Eventually, a total of 1,432 mothers completed the survey.

When participants consented to participate in the study on the web screen, they were randomly assigned to a group that received statistical messages only, a group that received a patient's narrative messages in addition to statistical messages, a group that received a mother's narrative messages in addition to statistical messages, or a control group, by algorithm included in the web-based survey computer program. Information about the assignment was withheld from participants. Because required sample size in each intervention group was 394 participants (this will be discussed later), recruiting stopped when the number of participants of all of the intervention groups reached 394. Numbers of participants were 394 in a group that received statistical messages only, 408 in a group that received a patient's narrative messages in addition to statistical messages, 411 in a group that received a mother's narrative messages in addition to statistical messages, and 219 in a control group (Figure 1).

All participants were asked about items such as sociodemographic information, history of cancer and sexually transmitted disease, and whether they knew about the media coverage of adverse reactions to the HPV vaccines. Participants in the intervention groups were asked their intention to have their daughter(s) receive the HPV vaccines before and after reading the intervention material. They were also asked their attitude toward HPV vaccination after reading the material (see Appendix 2 for an online survey). Participants in the control group were asked their intention of vaccination without reading intervention materials. Token gifts were given to all participants upon completion of the study by the survey company. The present study was approved by the ethical review committee at the Graduate School of Medicine, The University of Tokyo (No. 11624). All subjects gave written informed consent in accordance with the Declaration of Helsinki.

Figure 1 Participant flow.
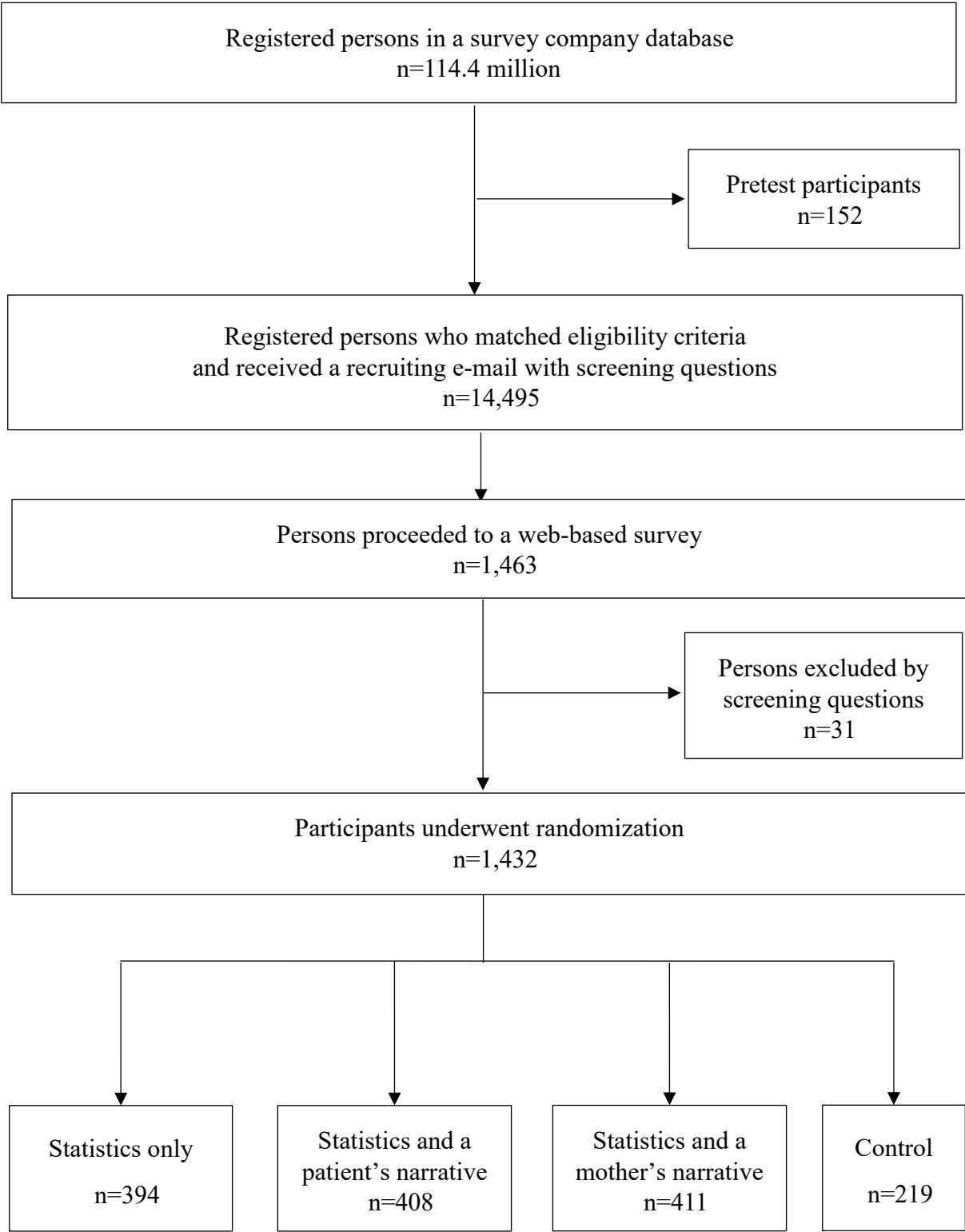
2.2. Intervention materials

Because it is not currently known whether there is a threshold in terms of form, length and content of narrative and non-narrative messages below which persuasive effect cannot be expected, researchers have noted the difficulty in selecting and creating appropriate narrative and non-narrative messages for comparison within studies [22,55]. The present study recognized the same difficulty as the previous studies. Therefore, the present study created statistical messages and narrative messages based on the criteria as follows. In terms of form and length, the intervention material in the present study comprised one monochrome page on A4-size paper when narrative messages were added to statistical messages. This A4-size material was created assuming to be used as a leaflet for HPV vaccination recommendation. In terms of content, messages were selected from existing messages of HPV vaccination recommendation in media of public health institutions such as the Ministry of Health, Labour, and Welfare and the United States Centers for Disease Control and Prevention. Those existing messages were combined and modified to create intervention messages for the present study.

More precisely, statistical content on the materials of the three intervention groups was taken from the websites of the Ministry of Health, Labour, and Welfare [80]; National Cancer Center Japan [81]; and a consensus statement from 17 relevant Japanese academic societies on the promotion of the HPV vaccines [17]. Sentences taken from those existing materials were combined and slightly modified for the sequence and coherence of the whole content. Those statistical messages included cervical cancer morbidity and mortality and HPV vaccines efficacy and safety. The statistical messages were identical among the three intervention materials. The statistical messages contained a total of 745 Japanese characters.

Narrative contents of a patient and a mother were taken from a website of the United

States Centers for Disease Control and Prevention [82] and slightly modified. In the narrative content, the narrator told the experience of being diagnosed with cervical cancer, having a total hysterectomy, giving up the dream of having children, suffering from complications, fearing cancer recurrence, and recommending HPV vaccination. These narrative contents were identical between the two intervention materials (patient's and mother's narratives) except for the subject of the narrative (i.e., "I," in the patient's narrative and "my daughter" in the mother's narrative). The patient's and mother's narratives contained a total number of 341 and 357 Japanese characters, respectively. Appendices 3-5 shows intervention materials: statistical messages only, a patient's narrative in addition to statistical messages, and a mother's narrative in addition to statistical messages, respectably.

2.3. Outcome measures

The primary outcome was intention to have one's daughter(s) receive the HPV vaccines after intervention. Intention before intervention was assessed for covariate adjustment for baseline value and changes in intention before and after intervention. Because there was no validated scale to assess intention of HPV vaccination that was applicable to the present study, a measure was adapted from a previous study [83]. Participants responded to the following three questions on 1–6 scales ranged from "extremely unlikely", "unlikely", "a little unlikely", "a little likely", "likely" to "extremely likely": (1) "How likely would you have your daughter(s) receive the HPV vaccines sometime soon?"; (2) "If you were faced with the decision of whether to have your daughter(s) receive the HPV vaccines today, how likely is it that you would choose to have her receive the vaccines?"; and (3) "How likely would you have your daughter(s) receive the HPV vaccines in the future?". These questions intended to assess vaccination intention in three points of time; today, soon, and in the future.

Scores of each question of (1), (2) and (3), and a mean value calculated by dividing the sum of scores of the three questions by three was used in the analysis. Higher scores indicate greater intentions.

The secondary outcome was attitude toward HPV vaccination. Because there was no validated scale to assess attitude toward the HPV vaccines that was applicable to the present study, a measure was adapted from a previous study [84]. Participants rated "having my daughter(s) receive the HPV vaccines" on a scale consisting of five 1–6 semantic differential items (bad/good, foolish/wise, harmful/beneficial, threatening/assuring, risky/safe). Higher scores indicate more favorable attitudes. This semantic differential evaluation is one of the most popular means of assessing attitude, which has been developed by Osgood and colleagues [85]. The semantic differential evaluation asks respondents' feelings about an object and the meanings they ascribe to the object. Osgood and colleagues proposed that individuals employ dimensions when they rate the feelings and the meanings; the dimensions are evaluation (e.g., good or bad), potency (e.g., powerful or powerless), and activity (e.g., active or passive) [85]. Considering this, in the measure used in the present study, two pairs of bad/good and foolish/wise may correspond to evaluation of having daughter(s) receive the HPV vaccines, and three pairs of harmful/beneficial, threatening/assuring, and risky/safe may correspond to perceived potency of the HPV vaccines. Although attitude is generally assessed by combining dimensions, scores in the present study were calculated in three ways considering the dimensions; dividing the sum of scores of the two items by two (i.e. evaluation), dividing the sum of scores of the three items by three (i.e. potency), and dividing the sum of scores of the five items by five (i.e. total). Those mean values were used in the analysis.

Additionally, the present study assessed the degree of participants' identification with

a narrator of narrative. Some of previous studies assessed the degree of identification in terms of components such as liking, feeling like you know, and wanting to be like [52]. Because such measurement items were not applicable to the narratives in the present study and no validated measure for identification with narrative characters has been devised [52], questions were created in the present study referring to previous studies that asked respondents to rank the psychological distance they felt between themselves and narrative characters [52,86,87]; "Did you think that the content of the voice of the experiencer could happen to your daughter?" and "Did you think that the content of the voice of the experiencer were other people's affairs?" on 1–6 scales ranged from "extremely disagree" to "extremely agree" (see Q18 in Appendix 2). A score of each question was used in the analyses.

2.4. Sample size

Sample size was calculated using α error probability, power of a statistical test (1－β error probability), and an effect size that was estimated by a previous study. A previous study of HPV vaccination communication showed that the effect size for comparing vaccination intention between "statistics only" and "a narrative in addition to statistics" conditions was Cohen's d=0.2 [32]. Thus, the effect size was set at 0.2. The α error probability was set at 0.05. The power (1－β) was set at 0.8 [88]. These parameters were input into the G*Power 3, which is a software to compute statistical power analyses [89]. The two sample t-test was selected in the software. Then, the G*Power 3 computed the sample size at 394, which indicated that 394 participants were required for comparing vaccination intention between the statistics only group and the narrative in addition to statistics group in the present study. Based on this estimation, the sample size for each intervention group was set at 394. The sample size for a control group was set at about 200 because the number of participants who

matched the eligibility criteria was presumed to be limited among registered persons in the database of the survey company.

2.5. Statistical analysis

Descriptive statistics were used to describe participants' sociodemographic information, history, and baseline intention to vaccinate, by summarizing in percentages for categorical variables and as means±SD for continuous variables. Intention of vaccination or attitude toward vaccination was compared using the two sample *t*-test in three pairs; between the control group and three intervention groups corresponding to research question 1; between the intervention group presented statistics only messages and the two intervention groups presented narrative (i.e., a patient's and a mother's) in addition to statistical messages corresponding to research question 2; between the intervention group presented a patient's narrative in addition to statistical messages and the intervention group presented a mother's narrative in addition to statistical messages corresponding to research question 3. Additionally, corresponding to research question 2 and 3, an analysis of covariance (ANCOVA) was conducted with the intention of vaccination as the dependent variable, the group assignment as the independent variable, and the baseline intention (i.e., before reading the intervention materials) as the covariate, because covariate adjustment for a baseline value of a quantitative outcome is recommended due to an expected correlation between the baseline value and the outcome [90-92]. In those primary analyses, mean values were calculated by dividing the total score of all items by the number of items in the measures of intention and attitude, and were used in the analysis. All *p*-values presented in the results of those primary analyses were after adjustment for multiple testing using the method of Holm [93].

Additionally, scores divided by items (i.e., each of three questions for intention, and mean values of evaluation and potency of attitude) were used for secondary analyses. Further, the mean values of baseline intentions were compared using the two sample *t*-test between the presence and absence of participants' experiences, to explore factors that were related to intention without intervention; participants who experienced vaccination recommendation by health professionals, and participants who did not; participants who knew the media coverage about severe side reactions to HPV vaccines, and participants who did not; participants who knew the suspension of proactive recommendation of HPV vaccination, and participants who did not; participants who experienced cervical cancer, and participants who did not; participants who experienced any cancer other than cervical cancer, and participants who did not; participants who experienced sexually transmitted diseases, and participants who did not. *P*-values presented in the results of those secondary analyses were not adjusted for multiple testing because those results will be reported as exploratory analyses [94].

Regarding the assessment of identification, the two sample *t*-test was used for comparison of scores between the patient's narrative in addition to the statistics group and the mother's narrative in addition to the statistics group. Correlations between scores of identification and intentions after intervention were examined using the Pearson's product moment correlation coefficient.

A *p*-value of <0.05 was set as significant in all statistical tests. All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 21.0 (IBM Corp., Armonk, NY, USA).

3. Results

3.1. Participant characteristics

Table 1 shows the participants' baseline characteristics. Participant age ranged from 30 to 61 years (mean=44 years, SD=4.7). 49.7% of their daughters were 12-14 years old, and the remaining were 15-16 years old. Participants were distributed throughout Japan. About 90% of participants were not advised by health professionals to have their daughter(s) receive the HPV vaccines. About 90% of participants knew the media coverage of adverse reactions to the HPV vaccines and suspension of the proactive recommendation for HPV vaccination by the government. About 10% of participants had histories of cervical cancer or sexually transmitted disease personally or on familiar persons.

Table 1 Participant sociodemographic information, history and baseline intention of vaccination.

	Statistics only (n=394)	Statistics and patient's narrative (n=408)	Statistics and mother's narrative (n=411)	Control (n=219)	Total (n=1432)
Age, mean year (SD)	44.2 (4.6)	43.9 (4.6)	44.2 (4.9)	43.8 (4.6)	44.1 (4.7)
Age of daughters, %					
12-14 years old	50.5	49.0	48.9	50.7	49.7
15-16 years old	49.5	51.0	51.1	49.3	50.3
Highest education, %					
Less than high school	3.3	2.7	3.4	3.2	3.1
High school graduate	30.2	30.6	29.2	31.5	30.2
Some college	41.1	40.4	43.8	47.5	42.7
College graduate	23.6	25.5	23.1	17.4	23.1
Graduate school	1.8	0.7	0.5	0.5	0.9
Household income, %					
Less than 2 million yen	7.4	7.1	7.1	10.5	7.7
2–6 million yen	34.5	36.5	37.0	34.2	35.8
More than 6 million yen	43.4	42.9	41.6	42.5	42.6
Unknown	14.7	13.5	14.4	12.8	14.0
Advised by health professionals to have their daughter(s) receive HPV vaccines, %					
Yes	8.1	6.1	6.3	5.5	6.6
No	91.9	93.9	93.7	94.5	93.4
Knew about media coverage of adverse reactions to HPV vaccines, %					
Yes	87.6	89.2	91.5	93.6	90.1
No	12.4	10.8	8.5	6.4	9.9

Knew about suspension of the proactive recommendation for HPV vaccination by the government, %					
Yes	84.0	86.5	86.9	86.3	85.9
No	16.0	13.5	13.1	13.7	14.1
History of cervical cancer including familiar persons, %					
Yes	7.4	10.0	9.5	8.2	8.9
No	92.4	89.0	90.5	91.3	90.7
No answer	0.3	1.0	0	0.5	0.4
History of cancer other than cervical cancer including familiar persons, %					
Yes	15.7	21.3	17.5	19.2	18.4
No	84.0	78.2	82.0	80.8	81.3
No answer	0.3	0.5	0.5	0	0.3
History of sexually transmitted disease including familiar persons, %					
Yes	7.6	9.8	8.3	7.3	8.4
No	92.1	89.2	90.0	91.8	90.6
No answer	0.3	1.0	1.7	0.9	1.0
Intention of vaccination before reading the intervention material, mean (SD)	2.56 (0.96)	2.53 (0.91)	2.41 (0.94)	-	2.50 (0.94)

SD=standard deviation

3.2. Primary analyses: intention and attitude between groups

Internal consistencies of questions about intention to have one's daughter(s) receive the HPV vaccines and questions about attitude toward vaccination were excellent (Cronbach's α=0.952, M=2.73, SD=0.99 in intention; Cronbach's α=0.945, M=3.02, SD=0.98 in attitude).

Table 2 shows the intention of and attitude toward HPV vaccination when comparing between the control group and the three intervention groups. Both intention and attitude in the three intervention groups were significantly higher than the control group with adjustment of *p*-values for multiple testing (*M*=2.81 vs. 2.30, *p*<0.003 in intention; *M*=3.14 vs. 2.39, *p*<0.003 in attitude).

Table 3 shows the intention of and attitude toward HPV vaccination when comparing between the intervention group presented statistics only messages and the two intervention groups presented narrative messages (i.e., a patient's and a mother's) in addition to statistics. There were no significant differences both in intention and in attitude between the groups when the baseline intentions (i.e., before reading the intervention materials) were not adjusted. When the baseline intentions were adjusted as the covariate, the estimated intention was significantly higher in the two intervention groups presented narrative in addition to statistical messages than the intervention group presented statistics only messages with adjustment of *p*-values for multiple testing (*M*=2.83 vs. 2.76, *p*=0.026).

Table 4 shows the intention of and attitude toward HPV vaccination when comparing

between the intervention group presented a patient's narrative in addition to statistical

messages and the intervention group presented a mother's narrative in addition to statistical

messages. There were no significant differences both in intention and in attitude between the

groups, with or without adjustment of the baseline intentions.

Table 2 Intention of and attitude toward HPV vaccination comparing control with three intervention groups.

	Control (n=219)	Three intervention groups (n=1213)	p [a]
Intention, mean (SD)	2.30 (0.90)	2.81 (0.99)	<0.003
Attitude, mean (SD)	2.39 (0.85)	3.14 (0.96)	<0.003

SD=standard deviation

[a] *P*-values were adjusted for multiple testing using the method of Holm.

Table 3 Intention of and attitude toward HPV vaccination comparing statistics only with two statistics and narrative groups.

	Statistics only (n=394)	Two statistics and narrative groups (n=819)	p [a]
Intention, mean (SD)	2.81(1.00)	2.81 (0.99)	0.984
Attitude, mean (SD)	3.10 (1.00)	3.16 (0.94)	0.324
Intention, estimated mean after adjustment of baseline intention (95%CI)	2.76 (2.71-2.81)	2.83 (2.80-2.87)	0.026

SD=standard deviation

CI=confidence interval

[a] *P*-values were adjusted for multiple testing using the method of Holm.

Table 4 Intention of and attitude toward HPV vaccination comparing patient's narrative with mother's narrative.

	Statistics and a patient's narrative (n=408)	Statistics and a mother's narrative (n=411)	p [a]
Intention, mean (SD)	2.85 (1.01)	2.77 (0.96)	0.430
Attitude, mean (SD)	3.21 (0.98)	3.12 (0.90)	0.324
Intention, estimated mean after adjustment of baseline intention (95%CI)	2.80 (2.75-2.85)	2.82 (2.77-2.87)	0.526

SD=standard deviation

CI=confidence interval

[a] *P*-values were adjusted for multiple testing using the method of Holm.

3.3 Secondary analyses

Table 5, 6, and 7 show the results of the secondary analyses using the scores divided by items (i.e., each score of three questions for intention, and scores for evaluation and potency of attitude). As Table 5 shows, intention to have daughter(s) receive vaccination today, soon and in the future, and evaluation and potency of attitude in the three intervention groups were significantly higher than the control group, without adjustment of p-values for multiple testing ($p<0.001$, respectably). As table 6 shows, when the baseline intentions were adjusted as the covariate, intentions to have daughter(s) receive vaccination today and soon in the two intervention groups presented narrative (i.e., a patient's and a mother's) in addition to statistical messages were significantly higher than the intervention group presented statistics only messages, without adjustment of p-values for multiple testing ($M=2.71$ vs. 2.63, $p=0.027$ in intention today; $M=2.81$ vs. 2.71, $p=0.006$ in intention soon). There were no significant differences in any other comparisons.

Table 8 shows results of the comparison of intention without intervention between the presence and absence of participants' experiences. Intentions without intervention of participants who have experienced vaccination recommendation from health professionals, of participants who did not know the media coverage about severe side reactions to HPV vaccines, and of participants who did not know the suspension of proactive recommendation of HPV vaccination, were significantly higher than the counterparts, without adjustment of p-

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values for multiple testing (*M*=2.71 vs. 2.48, *p*=0.034; *M*=3.26 vs. 2.41, *p*<0.001; *M*=3.00 vs.

2.42, *p*<0.001, respectably). There were no significant differences in intentions without

intervention between participants who experienced diseases and participants who did not.

Regarding the degree of identification, no significant difference was found in the

score of identification between the patient's narrative in addition to statistics group and the

mother's narrative in addition to statistics group (*p*=0.351 in "could happen to your

daughter?", *p*=0.696 in "other people's affairs?"). No explicit correlation was found between

the score of identification and intention after intervention in the three intervention groups

(*r*=0.152, *p*<.001 in "could happen to your daughter?"; *r*=-0.063, *p*=0.071 in "other people's

affairs?").

Table 5 Intention of and attitude toward HPV vaccination divided by items comparing control with three intervention groups.

	Control (n=219)	Three intervention groups (n=1213)	p [a]
Intention, mean (SD)			
Today	2.13 (0.96)	2.68 (1.06)	<0.001
Soon	2.25 (0.94)	2.78 (1.00)	<0.001
Future	2.53 (0.99)	2.97 (1.05)	<0.001
Attitude, mean (SD)			
Evaluation	2.66 (0.93)	3.43 (0.99)	<0.001
Potency	2.21 (0.86)	2.95 (1.00)	<0.001

SD=standard deviation

[a] *P*-values were not adjusted for multiple testing.

Table 6 Intention of and attitude toward HPV vaccination divided by items comparing statistics only with two statistics and narrative groups.

	Statistics only (n=394)	Two statistics and narrative groups (n=819)	p [a]
Intention, mean (SD)			
Today	2.69 (1.07)	2.68 (1.05)	0.847
Soon	2.79 (1.00)	2.77 (1.00)	0.759
Future	2.94 (1.05)	2.98 (1.05)	0.585
Attitude, mean (SD)			
Evaluation	3.35 (1.06)	3.47 (0.95)	0.065
Potency	2.92 (1.02)	2.96 (0.99)	0.590
Intention, estimated mean after adjustment of baseline intention (95%CI)			
Today	2.63 (2.57-2.68)	2.71 (2.67-2.75)	0.027
Soon	2.71 (2.65-2.77)	2.81 (2.77-2.85)	0.006
Future	2.94 (2.88-3.00)	2.98 (2.94-3.02)	0.253

SD=standard deviation

CI=confidence interval

[a] *P*-values were not adjusted for multiple testing.

Table 7 Intention of and attitude toward HPV vaccination divided by items comparing patient's narrative with mother's narrative.

	Statistics and a patient's narrative (n=408)	Statistics and a mother's narrative (n=411)	p [a]
Intention, mean (SD)			
Today	2.71 (1.10)	2.64 (1.01)	0.305
Soon	2.82 (1.03)	2.72 (0.98)	0.171
Future	3.02 (1.06)	2.94 (1.03)	0.244
Attitude, mean (SD)			
Evaluation	3.51 (0.99)	3.43 (0.92)	0.249
Potency	3.01 (1.03)	2.91 (0.94)	0.139
Intention, estimated mean after adjustment of baseline intention (95%CI)			
Intention Today	2.68 (2.62-2.74)	2.67 (2.61-2.73)	0.734
Soon	2.76 (2.70-2.82)	2.78 (2.72-2.84)	0.596
Future	2.96 (2.90-3.02)	3.00 (2.94-3.06)	0.314

SD=standard deviation

CI=confidence interval

[a] *P*-values were not adjusted for multiple testing.

Table 8 Intention without intervention in terms of participants' experiences.

	Yes	No	p [a]
Experience of vaccination recommendation by health professionals, n	95	1137	
Mean (SD)	2.71 (1.03)	2.48 (0.93)	0.034
Knowledge of media coverage about severe side reactions, n	1290	142	
Mean (SD)	2.41 (0.89)	3.26 (1.02)	<.001
Knowledge of suspension of proactive recommendation of HPV vaccination, n	1230	202	
Mean (SD)	2.42 (0.90)	3.00 (1.03)	<.001
Experience of cervical cancer [b], n	127	1299	
Mean (SD)	2.45 (0.86)	2.51 (0.95)	0.545
Experience of cancer other than cervical cancer [b], n	263	1164	
Mean (SD)	2.51 (0.92)	2.50 (0.95)	0.825
Experience of sexually transmitted diseases [b], n	120	1298	
Mean (SD)	2.42 (0.97)	2.50 (0.93)	0.407

SD=standard deviation

[a] *P*-values were not adjusted for multiple testing.

[b] Experiences of oneself or familiar persons. Participants who did not answer the questions were excluded.

4. Discussion and Conclusion

4.1. Discussion

4.1.1. Persuasiveness of statistical and narrative evidence

The present study conducted a randomized controlled study to compare message persuasiveness in terms of statistical evidence, narrative evidence in addition to statistical evidence, and a narrator difference of narratives. The first research question was: *will reading a HPV vaccination recommendation message including a statistical evidence or a narrative evidence result in better attitude toward and higher intention to receive the HPV vaccines than receiving no message condition under the circumstances of the HPV vaccination crisis in Japan?* The present study showed that, even under the circumstances of the HPV vaccination crisis in Japan, statistical only messages as well as a narrative of a patient or a mother in addition to statistical messages significantly improved mothers' attitude and intention to have their daughter(s) receive the HPV vaccines than a no message condition. This result was consistent with a number of studies that showed message persuasiveness using statistical or narrative evidence [18-20], and added to those studies a finding of stable persuasiveness of presenting statistical and narrative evidence.

4.1.2. Persuasiveness of statistics only vs. narrative in addition to statistics

The second research questions was: *will a narrative message in addition to statistical messages result in better attitude toward and higher intention to receive the HPV vaccines*

than statistical messages only among participants who are mothers with daughters in Japan?

The present study found no significant difference in attitude toward and intention of

vaccination between the intervention group presented statistics only messages and the two

intervention groups presented narrative (i.e., a patient's and a mother's) in addition to

statistical messages when the baseline intentions were not adjusted. However, when the

baseline intentions were adjusted as the covariate, the estimated intention was significantly

higher in the narrative in addition to statistics condition than the statistics only condition. This

result was consistent with a previous study showed that a combination of narrative and

statistical evidence was more persuasive than statistical evidence alone in non-health-related

topics among undergraduate students [36]. Few studies have compared persuasiveness of a

combination of narrative and statistical evidence with presenting statistical evidence alone so

far [22]. The present study added a new evidence showing that a combination of narrative and

statistical messages may be more persuasive than statistical only messages in a health-related

topic among non-student samples.

As secondary analyses showed, intentions to have daughter(s) receive vaccination

today and soon were significantly higher in the two intervention groups presented narrative in

addition to statistical messages than the intervention group presented statistics only messages.

Taking this into account, it is considered that increases in intention today and soon contributed

to the increase in total intention in the narrative in addition to statistics groups. Intentions

today and soon may be harder to increase than intention in the future. Therefore, it may be an important finding that a combination of narrative and statistical evidences increased intention today and soon more than statistical evidence alone.

Adding narrative evidences to statistical evidences may be especially important in creating vaccine promotion messages, because anti-vaccination messages in mass media and on the internet often use emotional narratives of alleged victims of vaccine's side reactions [26]. A study shows that it is the same as in the Japanese situation regarding HPV vaccination; narratives of girls who suffer from side reactions to HPV vaccines frequently appeared in Japanese anti-HPV vaccination messages online [95]. Scholars propose that applying some of the strategies of anti-vaccination movement, in addition to evidence-based vaccine information, may help create much stronger defenses against anti-vaccine messages; such as in presenting narratives of cervical cancer experiences [25,28]. In the practice of promotion of HPV vaccination, adding narrative messages to statistical messages may be able to enhance persuasiveness as well as effectively counter against anti-vaccination messages using narratives.

4.1.3. Persuasiveness of patient's vs. mother's narrative

The third research questions was: *will the narrative of a mother whose daughter experienced cervical cancer result in better attitude toward and higher intention to have their*

daughters receive the HPV vaccines than the narrative of a patient who experienced cervical

cancer among participants who are mothers with daughters? The present study found no

significant differences both in intention and attitude between the patient's narrative group and

the mother's narrative group, with or without adjustment of the baseline intentions. The

possible reasons for those results may be as follows.

First, the present study determined the sample size for comparing vaccination

intention between "statistics only" and "a narrative in addition to statistics" conditions.

Therefore, the sample size may have been insufficient in a comparison between the patient's

and the mother's narrative, and significant differences in intention and attitude were not

detected.

Second, the process of identification involves multiple dimensions such as sharing

the character's feelings and perspective, internalizing the character's goals, and the loss of

self-awareness by being absorbed in the story [52]. Considering this, the narrative message

used in the present study was created for research purposes and therefore may have been too

short and dull without a picture or the name of the narrator to develop the process of

identification for recipients. Due to the simpleness of the narrative, the degree of participants'

identification with a mother may have been restricted to be small, and therefore significant

differences in intention and attitude were not detected between the patient's and the mother's

narrative.

Third, fear of side reactions to HPV vaccines in the critical situation of HPV vaccination in Japan may have impacted on the results. As secondary analyses showed, experience of vaccination recommendation from health professionals, knowledge of media coverage about severe side reactions to HPV vaccines and of the suspension of proactive recommendation of HPV vaccination were related to vaccination intention. This result is consistent with a previous report in Japan [96]. However, experience of cervical cancer, other kinds of cancer, and sexually transmitted diseases were not related to vaccination intention, despite previous studies indicating that disease experience is one of the facilitators to HPV vaccination [97,98]. In the critical situation of HPV vaccination in Japan, fear of side reactions to HPV vaccines may have surpassed the influence of disease experience, and therefore the relation between disease experience and vaccination intention may have not been detected. In the same way, even if participants may have identified with the mother to a greater extent than the patient in the narrative, fear of side reactions to HPV vaccines may have surpassed the effect of identification. Therefore, intention and attitude in the mother's narrative group may have not increased, and significant differences in intention and attitude may have not been detected between the patient's and the mother's narrative.

Fourth, as mentioned in the Introduction section, according to the social cognitive theory [38,39], individuals will be more likely to perform a behavior when they observe a model performs it. Considering the proposition that Japanese people have a collectivistic

culture and they tend to be influenced by views and behaviors of peers [99,100], observing a

behavior of a model in messages may enhance persuasiveness more than identification with a

narrator of a narrative in the Japanese HPV vaccine communication. Future studies focusing

on observational learning and behavioral modeling may be useful; e.g., a study that uses the

narrative of a mother who had her daughter receive the HPV vaccines, found no adverse

effects, and was relieved.

4.1.4. Limitations

The findings of the present study must be interpreted with several limitations. First,

narrative persuasion is generally hindered when the persuasive intent is obvious, as in the

intervention materials of the present study, because some audiences may react against being

manipulated [101]. This constraint of intervention materials in the present study should be

noted in addition to shortness and dullness as discussed above. Second, although the present

study attempted to assess the participants' degree of identification with a narrator of narrative,

the attempt may have failed; neither significant difference in the degree of identification

between the two narrative groups nor explicit correlation between the degree of identification

and intention were found. However, mothers may obviously identify more with a mother's

narrative than a patient's narrative, considering previous studies showing that similarity of the

audience to a narrator increase the degree of identification [33,51,52,57,60,61]. Development

of a validated measure to assess the degree of identification is expected in future studies.

Third, the present study assessed vaccination intentions directly after message exposure. The long-term effects of promotional messages are especially important in this context given that HPV vaccination requires multiple injections over a series of weeks. Fourth, the present study assessed attitude toward vaccination and vaccination intentions rather than actual vaccination behaviors. As mentioned earlier in the Introduction section, studies show that attitude and intention predict behavior. However, the estimation of the mean attitude-behavior correlation ranges from roughly 0.40 to 0.50 [67-69], and of the mean intention-behavior correlations ranges from roughly 0.40 to 0.60 [72-77]. These gaps between attitude/intention and behavior should be noticed in interpretation of the study results. Fifth, the present study adapted measures of attitude and intention from previous studies. Study results should be interpreted with caution because those measures have not been validated and outcome scores may have not reflected appropriately participants' attitudes and intentions. Sixth, required time for the response to questions may have also reflected the degree of intention of and attitude toward vaccination of the participants. However, the present study did not analyze it because of the absence of the data. Finally, considering the critical situation of HPV vaccination in Japan, participants' prior attitudes toward and intentions of vaccination may have been negatively distorted and affected the study results. Therefore, results of the present study should be interpreted with caution.

4.2. Conclusion and practice implications

Statistical messages of HPV vaccine efficacy and safety, the narrative of a patient who experienced cervical cancer in addition to statistical messages, and the narrative of a mother whose daughter experienced cervical cancer in addition to statistical messages, increased attitude toward and intention of vaccination among participants who were mothers with daughters. In the practice of HPV vaccine communication, exposure to messages of HPV vaccine efficacy and safety may increase a mother's vaccination intention whether it includes only statistical messages or narratives of cervical cancer experience in addition to statistical messages. The study results may indicate that, when proactive recommendation of HPV vaccination resumes in the future, active dissemination of messages about efficacy and safety of HPV vaccines by public health institutions including the Ministry of Health, Labor and Welfare and mother's exposure to those messages are the keys to improve their attitude toward and intention of HPV vaccination.

The present study found that vaccination intention was significantly higher in the narrative in addition to statistices condition than the statistics only condition. The public health institutions including the Ministry of Health, Labor and Welfare may be able to increase persuasiveness of HPV vaccination recommendation messages by adding narrative messages to statistical messages when they create materials such as leaflets and websites.

The present study found no significant differences both in intention and in attitude between the patient's narrative group and the mother's narrative group. Several possible reasons were considered for this result. Further studies are needed to understand more about factors influencing the persuasiveness of narratives such as identification. A deeper understanding of the factors will help health professionals to more effectively communicate with individuals and communities to encourage better decision making regarding HPV vaccination.

Abbreviations

HPV: human papillomavirus

ELM: Elaboration Likelihood Model

RAT: Reasoned Action Theory

ANCOVA: analysis of covariance

CONSORT: Consolidated Standards of Reporting Trials

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Conflicts of interest

None.

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Appendix 1 Screening for an online survey.

【リクルートメール文面】

■サイバーパネル■　アンケートへのご協力のお願い
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いつもサイバーパネルのアンケートにご協力いただき、
誠にありがとうございます。

下記アンケートへのご協力をお願い申し上げます。
皆様のご回答をお待ちしております。

■アンケート名：予防接種に関するアンケート
■アンケート No：2696xx
■対象者条件　　：
　　条件１）このメールが届いたサイバーパネル登録のご本人
■所要時間　　　：１分程度
　※ご回答内容等によって異なる場合がございます。
■御礼　　　　　：回答を完了された方全員に１ポイント
■締切り　　　　：〇月〇〇日（〇）13:10 まで
　※定員に達し次第、締め切らせていただく場合がございます。
　　誠に申し訳ありませんが、あらかじめご了承ください。
下記 URL からマイページにログインしてアンケートにご協力ください。
　https://www.cyberpanel.jp/

※会員の皆様には、サイバーパネル規約にて守秘義務をお願いしており
　ます。アンケート等で知り得た情報・データは、会員本人様以外の第
　三者へ口外しないように、また使用・転用しないようお願いいたしま
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　会員資格を一時停止、または抹消させていただくことがございます。
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今後ともサイバーパネルをよろしくお願い申し上げます。

このメールは送信専用メールアドレスからお送りしております。
このメールに返信することはできませんのでご了承ください。
お問合せは下記 URL よりサイバーパネル事務局にご連絡ください。
　https://www.cyberpanel.jp/inquiry/

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　サイバーパネル会員ページ
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【スクリーニング調査 ウェブ画面 文面】

　このアンケート調査は、東京大学大学院医学系研究科医療コミュニケーション学教室が、学術目的で行うもので、予防接種や病気の経験についてお伺いする質問が含まれています。
　回答内容はすべて統計的に処理され、あなたの回答内容について第三者が知ることはありません。
　上記をご理解の上、ご協力いただけるようでしたら、アンケートへの回答をお願いいたします。

　＜ラジオボタン＞
　協力する　　　　　協力しない

【スクリーニング調査の質問項目】

あなたの性別

男性	女性

あなたの年齢

20 歳代	30 歳代	40 歳代	50 歳代	60 歳代

あなたにはご一緒にお住いのお子さんがおいでですか。おいでの場合は、お子さんの人数をお知らせください。

1 人	2 人	3 人	4 人	5 人以上	子どもはいない

【1 人以上の子どもがいる人に】
お子さんの性別と年齢をお知らせください

●1 人目
①お子さんの性別

男子	女子

②お子さんの年齢
_____ 歳
（注：2 人目以降は回答した人数に応じた数の①②のセットを質問）

（注：上記で 12 歳〜16 歳の女子の子どもがいると回答した方のみ）
あなたの娘さんは、子宮頸がん予防ワクチンを接種しましたか。
※娘さんが複数いる場合、1 人でも接種していれば「はい」と回答してください。

はい	いいえ

Appendix 2 An online survey.

このアンケート調査は、東京大学大学院医学系研究科医療コミュニケーション学教室が、学術目的で行うもので、予防接種や病気の経験についてお伺いする質問が含まれています。
回答内容はすべて統計的に処理され、あなたの回答内容について第三者が知ることはありません。
上記をご理解の上、ご協力いただけるようでしたら、アンケートへの回答をお願いいたします。

（ひとつだけ）【必須】
○ 協力する
○ 協力しない

SC0.
あなたがお住まいの都道府県をお知らせください。

（ひとつだけ）【必須】
[回答を選択してください ▼]

SC1.
あなたの性別をお知らせください

（ひとつだけ）【必須】
○ 男性
○ 女性

SC2.
あなたの年齢をお知らせください

（ひとつだけ）【必須】
○ 25歳未満
○ 25〜29歳
○ 30歳代
○ 40歳代
○ 50歳代
○ 60〜65歳
○ 66歳以上

SC3.
あなたにはご一緒にお住いの、**あなたのお子さん**がおいでですか。おいでの場合は、お子さんの人数をお知らせください。

（ひとつだけ）【必須】
○ 1人
○ 2人
○ 3人
○ 4人
○ 5人以上
○ 子どもはいない

SC4.
お子さんの性別と年齢をお知らせください。

➡

（それぞれひとつずつ）【必須】

	性別		年齢
	男子	女子	
第1子	○	○	[　]
第2子	○	○	[　]
第3子	○	○	[　]
第4子	○	○	[　]
第5子	○	○	[　]

ここから先は、あなたの女のお子さん（娘さん）についてお伺いします。

SC5.
あなたの娘さんは子宮頸がん予防ワクチンを接種しましたか。
※娘さんが2人以上いる場合、1人でも接種していれば「はい」と回答してください。

（ひとつだけ）【必須】
○ はい　（子宮頸がん予防ワクチンを接種した娘さんがいる）
○ いいえ　（子宮頸がん予防接種ワクチンを接種した娘さんはいない）

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＜調査のご説明＞
「子宮頸がん予防ワクチンの情報提供と接種意向に関する調査」

</div>

1.この研究の概要

（1）研究課題
子宮頸がん予防ワクチンの情報提供と接種意向に関する調査

（2）研究機関名および研究責任者氏名
この研究が行われる研究機関と研究責任者は次に示す通りです。
【研究機関】東京大学大学院医学系研究科　医療コミュニケーション学
【研究責任者】奥原剛（医療コミュニケーション学　特任助教）
【研究従事者】石川ひろの（医療コミュニケーション学　准教授）
　※上記2名がデータの解析、論文執筆等を行います。

（3）研究目的
　子宮頸がん予防ワクチンに関する情報提供と接種意向との関連を調査することが目的です。
（なお、この調査でご覧いただく子宮頸がん予防ワクチンに関する情報や、ご回答いただく質問には、ワクチン接種を促す意図・目的はございません。）

（4）研究方法
　株式会社日本リサーチセンターの協力によりインターネット調査を実施いたします。皆様の回答内容は、個人情報を含まない研究用IDで管理するデータとなり、東京大学はこの匿名化されたデータを解析します。

2.ご協力いただくかどうかは皆様のご自由です
　この調査にご協力いただくかどうかは皆様の自由意思に委ねられています。調査実施時に「本アンケートに協力する」を選択することで調査協力への同意とさせていただきます。　調査には、予防接種や病気の経験についてお伺いする質問が含まれています。調査の途中で回答をやめたくなった場合はやめてもかまいません。ご協力いただけない場合でも、皆様の不利益につながることはありません。

3.個人情報は厳重に保護・保管いたします
　この調査から得られるデータは漏えいのないよう厳重に取り扱います。本アンケートではあなた個人を特定するような個人情報を取得することはございません。皆様のご回答データと氏名・住所・生年月日などの個人情報は完全に切り離して管理されます。個人情報は日本リサーチセンターより外部に出ることはございません。匿名化されたご回答データは、東京大学にて厳重に保管します。

4.研究結果の公表について
　研究の成果は、学会発表や学術雑誌等で公表します。皆様の氏名など個人情報が公表されることはいっさいございません。結果については、個人的なお問い合わせがあった場合、全体の結果をお伝えいたします。

5.皆様の利益と不利益について
　アンケート調査は20分程度で終わりますのでご協力をお願い申し上げます。この研究の成果は、ワクチンに関する情報提供の改善に寄与することが期待されます

6.研究終了後のデータ等の取扱について
　アンケート調査の結果はこの調査のためにのみ使用し、研究終了後は適切な方法で破棄します。なお、将来、新たな研究に用いる場合は、改めて東京大学医学部倫理委員会の承認を受けた上で用います。

7.謝礼について
　アンケート調査にご回答くださった皆様には規定の謝礼が支払われます。

8．研究から生じる知的財産権の帰属
本研究の結果として特許権などが生じる可能性がありますが、その権利は国、研究機関、民間企業を含む共同研究機関及び研究従事者などに属し、皆様はこの特許権等を持ちません。また、その特許権等に基づき経済的利益が生じる可能性がありますが、これについての権利も持ちません。

9.その他
　この研究は、東京大学医学部倫理委員会の承認を受けて実施するものです。なお、この研究に関する費用は、平成28-30年度文部科学省科学研究費補助金基盤研究(C)課題番号167100000384(主任研究者：奥原剛)から支出されています。本研究に関して、開示すべき利益相反関係はありません。

<div align="right">

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</div>

SC6.
上記ご理解の上、ご協力頂けるようでしたらぜひとも調査にご協力を頂きたく、お願い申し上げます。

（ひとつだけ）【必須】

○ 本アンケートに協力する

○ 本アンケートに協力しない

SC7.
またご回答頂いた方全員に、12月頃に、追加の簡単なアンケートをお願いする予定でおります。
こちらのアンケートにもご協力を頂くことは可能でしょうか。

（ひとつだけ）【必須】

○ 協力できる

○ 協力できない

あなたのお子さんに子宮頸がん予防ワクチンを接種させるかどうかについて、お考えを教えてください。
下記Q1～Q3のそれぞれで、当てはまるものをお選びください。

Q1.
あなたは近いうちにお子さんに子宮頸がん予防ワクチンを接種させますか。

➡️

（それぞれひとつずつ）【必須】

絶対に 接種させない	接種 させない	たぶん 接種させない	たぶん 接種させる	接種 させる	絶対に 接種させる
○	○	○	○	○	○

Q2.
もし、今日、お子さんに子宮頸がん予防ワクチンを接種させるかどうか決めなければならないとしたら、接種させますか。

➡️

（それぞれひとつずつ）【必須】

絶対に 接種させない	接種 させない	たぶん 接種させない	たぶん 接種させる	接種 させる	絶対に 接種させる
○	○	○	○	○	○

Q3.
将来、お子さんに子宮頸がん予防ワクチンを接種させますか。

➡️

（それぞれひとつずつ）【必須】

絶対に 接種させない	接種 させない	たぶん 接種させない	たぶん 接種させる	接種 させる	絶対に 接種させる
○	○	○	○	○	○

Q4.
あなたの年齢を教えてください。

【必須】

[　　　　]歳

Q5.
あなたの婚姻状況を教えてください。

（ひとつだけ）【必須】

○ 配偶者（夫）がいる
○ 配偶者はいない（離婚、死別など）

Q6.
あなたの最終学歴を教えてください。

（ひとつだけ）【必須】

○ 中学校
○ 高等学校
○ 専門学校・短期大学
○ 4年制大学
○ 大学院

Q7.
あなたの世帯全体の過去1年間の年間収入はだいたいどれくらいですか。

（ひとつだけ）【必須】

○ 200万円未満
○ 200万円以上600万円未満
○ 600万円以上
○ わからない

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次の質問に進む前に、子宮頸がんワクチンに関する資料の案をお見せします。
ここから [QuotaSA] = '2' ? "3" : "4" ページの資料をよくお読みください。
内容をよく読まないと、この後の質問に回答することができません。
※資料のページは、約10秒間固定されます（10秒たつまでは、次へ進むことができません）

※資料のページは、約10秒間固定されます（10秒たつまでは、次へ進むことができません）

子宮頸がん予防ワクチン　受ける？　受けない？

子宮頸がんについて

子宮頸がんは、性交渉によってヒトパピローマウイルスに感染し、持続感染することでがん化する病気です。日本での患者数は年間約1万人、年間約 3,000 人が死亡しています。子宮頸がんによる死亡率は増加しており、最近では 20 代から 30 代で患者さんが増えています。

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子宮頸がん予防ワクチンについて

子宮頸がん予防ワクチンを接種することで、ヒトパピローマウイルスの感染と子宮頸がんを予防することができます。推奨対象は、小学 6 年生～高校 1 年生相当の女子です。

ワクチンの有効性

子宮頸がん予防ワクチンは確固たる有効性が示されています。

- 世界の多くの国（65 か国）が、子宮頸がん予防ワクチンを国の予防接種プログラムとして実施しています。
- 子宮頸がん予防ワクチンが導入された 2007 年からの 3～4 年間で、子宮頸がんの前がん病変の発生率が約 50%減少していることが、複数の国（オーストラリア、アメリカ、デンマーク、スコットランド）から報告されています。

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ワクチンの安全性

子宮頸がん予防ワクチンの安全性は国内外の調査で確認されています。

- 国内での副反応の疑いの報告は、約 890 万回接種のうち 2584 人（約 0.03%）で、そのうちの約 90%が回復または軽快し通院不要となっています。未回復の方は 186 人で、10 万接種あたり 2 人（約 0.002%）です。
- 欧州の健康当局、フランス等の大規模な再調査によると、ワクチンを接種した人たちと、接種していない人たちとの間で、重い副反応の発生率の差がなかったことが報告されています。2015 年に名古屋市が実施した調査でも同様の結果でした。

お子さんを子宮頸がんから守るために、子宮頸がん予防ワクチンの接種をおすすめします。

※資料のページは、約10秒間固定されます（10秒たつまでは、次へ進むことができません）

お子さんが子宮頸がんを体験した、お母さんの声

　私の娘は、29 歳の時、検診で、子宮頸がんが見つかりました。子宮全摘手術を受け、娘は子宮を失うことになりました。結婚して 1 年のころで、赤ちゃんを楽しみにしていましたが、それは叶わぬ夢となりました。

　娘は幸いにも早期発見で命は助かりましたが、合併症による生活への影響は今も続いています。検査の結果がいつも心配で、電話が鳴るたびに、検査結果の悪い知らせなのではないかと、息が止まる思いだそうです。健康に長生きしてほしいと思いますが、がんが再発するのではという不安がいつも頭にあります。

　ほかの人たちに娘と同じつらい経験をしてほしくありません。できることなら、私は娘に子宮頸がん予防ワクチンを受けさせておきたかったです。まわりの人たちにも、「お子さんが子宮頸がんにならないように、ワクチンを受けさせてください」と言っています。

お子さんを子宮頸がんから守るために、子宮頸がん予防ワクチンの接種をおすすめします。

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子宮頸がん予防ワクチンを接種させることについての、あなたのお考えをお聞きします。
Q8〜Q12のそれぞれについて、あなたのお気持ちに近いものをお選びください。 [QuotaSA] = '1' ? "" : "＜font color = red＞＜u＞＜b＞先ほどの資料を読んだ後の、いま現在のお考えでお答えください。＜/u＞＜/font＞＜/b＞"

Q8.
娘に子宮頸がん予防ワクチンを接種させることは——、

➡

（それぞれひとつずつ） 【必須】

とても 悪い	かなり 悪い	やや 悪い	やや 良い	かなり 良い	とても 良い
○	○	○	○	○	○

Q9.
娘に子宮頸がん予防ワクチンを接種させることは——

➡

（それぞれひとつずつ） 【必須】

とても 有害だ	かなり 有害だ	やや 有害だ	やや 有益だ	かなり 有益だ	とても 有益だ
○	○	○	○	○	○

Q10.
娘に子宮頸がん予防ワクチンを接種させることは——、

➡

（それぞれひとつずつ） 【必須】

とても 愚かだ	かなり 愚かだ	やや 愚かだ	やや 賢い	かなり 賢い	とても 賢い
○	○	○	○	○	○

Q11.
娘に子宮頸がん予防ワクチンを接種させることは——、

➡

（それぞれひとつずつ） 【必須】

とても 不安だ	かなり 不安だ	やや 不安だ	やや 安心だ	かなり 安心だ	とても 安心だ
○	○	○	○	○	○

Q12.
娘に子宮頸がん予防ワクチンを接種させることは——、

➡

（それぞれひとつずつ） 【必須】

とても 危険だ	かなり 危険だ	やや 危険だ	やや 安全だ	かなり 安全だ	とても 安全だ
○	○	○	○	○	○

資料をもう一度みる

あなたのお子さんに子宮頸がん予防ワクチンを接種させるかどうかについて、[QuotaSA] = '1' ？ "お考えを教えてください。" : " <u>先ほどの資料を読んだ後の、いま現在のお考えを教えてください。</u> "
下記Q13～Q15のすべてで、当てはまるものをお選びください。

Q13.
あなたは近いうちにお子さんに子宮頸がん予防ワクチンを接種させますか。

➡

（それぞれひとつずつ）【必須】

絶対に 接種させない	接種 させない	たぶん 接種させない	たぶん 接種させる	接種 させる	絶対に 接種させる
○	○	○	○	○	○

Q14.
もし、今日、お子さんに子宮頸がん予防ワクチンを接種させるかどうか決めなければならないとしたら、接種させますか。

➡

（それぞれひとつずつ）【必須】

絶対に 接種させない	接種 させない	たぶん 接種させない	たぶん 接種させる	接種 させる	絶対に 接種させる
○	○	○	○	○	○

Q15.
将来、お子さんに子宮頸がん予防ワクチンを接種させますか。

➡

（それぞれひとつずつ）【必須】

絶対に 接種させない	接種 させない	たぶん 接種させない	たぶん 接種させる	接種 させる	絶対に 接種させる
○	○	○	○	○	○

資料をもう一度みる

今お答えいただいた回答についてお聞きします。

Q16_1.
先ほどの資料を読んで、あなたが子宮頸がんワクチンを**接種させる**と判断した理由を具体的にお知らせください。

※あなたの先ほどの回答
[Q14(1)] = '4','5','6' ？ "今日決めるなら、【"+NormalizeLabel([Q14(1)])+"】
" : "" [Q13(1)] = '4','5','6' ？ "近いうちには、【"+NormalizeLabel([Q13(1)])+"】
" : "" [Q15(1)] = '4','5','6' ？ "将来は、【"+NormalizeLabel([Q15(1)])+"】 " : ""

【必須】

Q16_2.
先ほどの資料を読んで、あなたが子宮頸がんワクチンを**接種させない**と判断した理由を具体的にお知らせください。

※あなたの先ほどの回答
[Q14(1)] = '1','2','3' ？ "今日決めるなら、【"+NormalizeLabel([Q14(1)])+"】
" : "" [Q13(1)] = '1','2','3' ？ "近いうちには、【"+NormalizeLabel([Q13(1)])+"】
" : "" [Q15(1)] = '1','2','3' ？ "将来は、【"+NormalizeLabel([Q15(1)])+"】 " : ""

【必須】

資料をもう一度みる

[QuotaSA] = '1' ? "子宮頸がん予防ワクチンについて感じていること・思っていることをお知らせください。どんなことでも結構です。" : "先ほどの資料を読んで、今感じていること・思っていることをお知らせください。どんなことでも結構です。"

【必須】

資料をもう一度みる

Q18.
先ほどの資料の「体験者の声」を読んだ後の、あなたのお気持ちに最も近いものはどれですか。それぞれについてひとつずつお選びください。

(それぞれひとつずつ)【必須】

	まったく そう思わない	ほとんど そう思わない	あまり そう思わない	すこし そう思う	かなり そう思う	とても そう思う
自分の娘に 起こりうる こととして 考えた	○	○	○	○	○	○
他人事だと 思った	○	○	○	○	○	○

資料をもう一度みる

68

Q19.
あなたは、医師・看護師など医療専門職の人から、お子さんに子宮頸がん予防ワクチンを接種させるよう勧められたことがありますか。

（それぞれひとつずつ）【必須】

はい	いいえ
○	○

Q20.
この調査の前から、子宮頸がん予防ワクチンの副作用に関するニュースを知っていましたか。

（それぞれひとつずつ）【必須】

はい	いいえ
○	○

Q21.
この調査の前から、子宮頸がん予防ワクチンの積極的な接種勧奨が、厚生労働省の判断により一時的に差し控えられていることを知っていましたか。

（それぞれひとつずつ）【必須】

はい	いいえ
○	○

Q22.
あなたは子宮頸がんになった経験がありますか。または、子宮頸がんになった人が身近にいますか。※答えたくない場合は、答えなくても結構です。

（それぞれひとつずつ）

はい	いいえ
○	○

Q23.
あなたは子宮頸がん以外のがんになった経験がありますか。または、子宮頸がん以外のがんになった人が身近にいますか。※答えたくない場合は、答えなくても結構です。

（それぞれひとつずつ）

はい	いいえ
○	○

Q24.
あなたは性病（性感染症）になった経験がありますか。または、性病（性感染症）になった人が身近にいますか。※答えたくない場合は、答えなくても結構です。

（それぞれひとつずつ）

はい	いいえ
○	○

[QuotaSA] = '1' ？ "" : "先ほどお読みいただいた子宮頸がん予防ワクチンに関する情報は、この調査のために厚生労働省等の資料をもとに作成したものです。"

子宮頸がん予防ワクチンについては、接種部位以外の体の広い範囲で持続する疼痛の副反応症例等について十分に情報提供できない状況にあることから、接種希望者の接種機会は確保しつつ、適切な情報提供ができるまでの間は、厚生労働省による積極的な接種勧奨は一時的に差し控えられています。

詳しくは厚生労働省のウェブサイトをご確認ください。
http://www.mhlw.go.jp/bunya/kenkou/kekkaku-kansenshou28/qa_shikyukeigan_vaccine.html

[次へ進む]ボタンを押して、アンケートを終了してください。

ありがとうございました。

子宮頸がん予防ワクチン　受ける？　受けない？

子宮頸がんについて

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(改ページ)

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(改ページ)

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子宮頸がん予防ワクチン　受ける？　受けない？

子宮頸がんについて
子宮頸がんは、性交渉によってヒトパピローマウイルスに感染し、持続感染することでがん化する病気です。日本での患者数は年間約1万人、年間約 3,000 人が死亡しています。子宮頸がんによる死亡率は増加しており、最近では 20 代から 30 代で患者さんが増えています。

(改ページ)

子宮頸がん予防ワクチンについて
子宮頸がん予防ワクチンを接種することで、ヒトパピローマウイルスの感染と子宮頸がんを予防することができます。推奨対象は、小学 6 年生〜高校 1 年生相当の女子です。

ワクチンの有効性
子宮頸がん予防ワクチンは確固たる有効性が示されています。
- 世界の多くの国（65 か国）が、子宮頸がん予防ワクチンを国の予防接種プログラムとして実施しています。
- 子宮頸がん予防ワクチンが導入された 2007 年からの 3〜4 年間で、子宮頸がんの前がん病変の発生率が約 50％減少していることが、複数の国（オーストラリア、アメリカ、デンマーク、スコットランド）から報告されています。

(改ページ)

ワクチンの安全性
子宮頸がん予防ワクチンの安全性は国内外の調査で確認されています。
- 国内での副反応の疑いの報告は、約 890 万回接種のうち 2584 人（約 0.03％）で、そのうちの約 90％が回復または軽快し通院不要となっています。未回復の方は 186 人で、10 万接種あたり 2 人（約 0.002％）です。
- 欧州の健康当局、フランス等の大規模な再調査によると、ワクチンを接種した人たちと、接種していない人たちとの間で、重い副反応の発生率の差がなかったことが報告されています。2015 年に名古屋市が実施した調査でも同様の結果でした。

(改ページ)

子宮頸がん体験者の声

　　29 歳の時に、検診で、子宮頸がんが見つかりました。子宮全摘手術を受け、子宮を失うことになりました。結婚して 1 年のころで、赤ちゃんを楽しみにしていましたが、それは叶わぬ夢となりました。

　　幸いにも早期発見で命は助かりましたが、合併症による生活への影響は今も続いています。検査の結果がいつも心配です。電話が鳴るたびに、検査結果の悪い知らせなのではないかと、息が止まる思いです。

　　健康に長生きしたいと思いますが、がんが再発するのではという不安がいつも頭にあります。ほかの人たちに私と同じつらい経験をしてほしくありません。できることなら、私も子宮頸がん予防ワクチンを受けておきたかったです。まわりの人たちにも、「お子さんが子宮頸がんにならないように、ワクチンを受けさせてください」と言っています。

お子さんを子宮頸がんから守るために、子宮頸がん予防ワクチンの接種をおすすめします。

子宮頸がん予防ワクチン　受ける？　受けない？

子宮頸がんについて
子宮頸がんは、性交渉によってヒトパピローマウイルスに感染し、持続感染することでがん化する病気です。日本での患者数は年間約1万人、年間約 3,000 人が死亡しています。子宮頸がんによる死亡率は増加しており、最近では 20 代から 30 代で患者さんが増えています。

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(改ページ)

お子さんが子宮頸がんを体験した、お母さんの声

　　私の娘は、29 歳の時、検診で、子宮頸がんが見つかりました。子宮全摘手術を受け、娘は子宮を失うことになりました。結婚して 1 年のころで、赤ちゃんを楽しみにしていましたが、それは叶わぬ夢となりました。

　　娘は幸いにも早期発見で命は助かりましたが、合併症による生活への影響は今も続いています。検査の結果がいつも心配で、電話が鳴るたびに、検査結果の悪い知らせなのではないかと、息が止まる思いだそうです。健康に長生きしてほしいと思いますが、がんが再発するのではという不安がいつも頭にあります。

　　ほかの人たちに娘と同じつらい経験をしてほしくありません。できることなら、私は娘に子宮頸がん予防ワクチンを受けさせておきたかったです。まわりの人たちにも、「お子さんが子宮頸がんにならないように、ワクチンを受けさせてください」と言っています。

お子さんを子宮頸がんから守るために、子宮頸がん予防ワクチンの接種をおすすめします。