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## Psychosocial factors related to the retrieval of results from free and anonymous voluntary counseling and testing for sexually transmitted infections: Use of a Health Belief Model

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### Abstract

**Objectives:** To identify the psychosocial factors related to the retrieval of results from free and anonymous voluntary counseling and testing (VCT) for sexually transmitted infections (STIs) at public health centers in Miyazaki Prefecture, Japan. The health belief model (HBM) was used to identify effective interventions to promote retrieval of the results.

**Methods:** We conducted a cross-sectional study, using anonymous, self-administered questionnaires to 652 participants who received VCT for HIV and other STIs, between September 2010 and December 2012, at public health centers in Miyazaki Prefecture.

**Results:** A total of 465 (71.3%) individuals responded, including 238 men (51.2%) and 227 women (48.8%). The average ages among the men and women were 35.8 (standard deviation, SD = 12.9) and 29.7 years (SD = 9.2), respectively. The perceived benefit was a significant predictive factor (odds ratio, 1.646) for retrieving STI test results. Most participants (85.0%) were willing to be contacted by the public health center staff; the preferred method of contact was by mobile telephone.

**Conclusions:** By promoting the perceived benefits of STI testing, public health staff can encourage participants to retrieve their STI test results. The most desirable communication method was one that preserved the participant's anonymity and allowed for direct contact with the participant.

**Keywords:** public health center, sexually transmitted diseases, health belief model

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### I. Introduction

Chlamydial infections in women may cause pelvic inflammatory disease, ectopic pregnancies, and infertility. The majority of men and women with chlamydial infections are asymptomatic, increasing the risk of unintentional spreading of the infection [1]. Gonococcal infections in women may also cause pelvic inflammatory disease, tubal scarring, and infertility. The majority of gonococcal infections in men produce symptoms, but not soon enough to prevent transmission to others [1]. Syphilis may also cause primary infections, such as ulcers or chancres at the infection site; secondary infections, such as skin rashes, mucocutaneous lesions,

or lymphadenopathy; neurologic infections, such as cranial nerve dysfunction, meningitis, stroke, acute or chronic altered mental status, loss of vibration sense, auditory or ophthalmic abnormalities; and tertiary infections, such as cardiac or gummatous lesions [1]. In conjunction with these infections, the risks of human immunodeficiency virus (HIV) infection [2] and cervical cancer [3, 4] may be higher in individuals with these infections than in non-infected individuals.

To prevent the transmission of sexually transmitted infections (STIs), early-stage detection of asymptomatic infections is essential. A previous study revealed that the prevalence of asymptomatic chlamydial infections among Japanese students was 9.5% for women and 6.7% for men [5]. By treating those who are infected, the risk of

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spreading the infection can be lowered. An effective strategy for early detection and treatment of STIs is the free and anonymous voluntary counseling and testing (VCT) offered by some public health centers in Japan. This testing is offered concurrently with voluntary counseling and HIV testing. In this model, examinees receive same-day notification of their HIV results, but are required to return to the public health center 1 week later to get the results of their other STI results. Hence, examinees who do not return are not notified of their STI test results.

Community-based interventions for STI testing have not been reported. However, community-based HIV interventions have succeeded in increasing the number of participants undergoing HIV testing. Effectively employed strategies have involved community mobilization [6-8] to destigmatize and normalize HIV counseling and testing, a community-based VCT program [7, 8] to increase access to VCT and make HIV status awareness more normative in the community, and a post-test support service [7, 8] to provide psychosocial support to clients tested for HIV infection. At Miyazaki Prefecture (Japan) public health centers, VCT is offered for chlamydial, gonococcal, and syphilis infections. For the purposes of this study, STIs were defined as chlamydial, gonococcal, and syphilis infections.

However, the psychosocial factors associated with STI testing are not well known. The health belief model (HBM) is one of the most common models used to examine beliefs about health-promoting behaviors [9]. The model was originally designed to explain the benefits of receiving free tuberculosis screening tests and is composed of 4 components: perceived susceptibility, perceived severity, perceived benefit, and perceived barrier [9]. The perceived susceptibility and the perceived severity terms refer to the perceived risk. If the perceived risk is high, one would be expected to avoid the behavior. The perceived benefit and perceived barrier represent a balance between the merits and disadvantages of the behavior. If the perceived benefit is high, an individual would be expected to display the behavior, and if the perceived barrier is high, behavior avoidance would be expected.

Previous studies, using the HBM for HIV testing [10-14], revealed that perceived susceptibility and perceived benefit are significant predictive factors. However, previous studies regarding STI testing [15, 16] did not examine all 4 components [15] and did not identify the predictive factor [16]. To our knowledge, this is the first study aimed at identifying the psychosocial factors related to obtaining results from free and anonymous VCT for STIs at public health centers in Japan, using the HBM. The study also aimed to identify effective interventions to promote the retrieval of test results.

## II. Methods

We conducted a cross-sectional study, using anonymous, self-administered questionnaires to 652 participants who received VCT for HIV and other STIs, between September 2010 and December 2012, at public health centers in Miyazaki Prefecture. The participants received both HIV and STI (chlamydia, gonococci, and syphilis) testing, and received their HIV results within an hour. However, STI test results were only available 1 week later, which necessitated a second trip to the public health center. To retrieve the STI test results, visiting the public health center was mandatory. If the test results were positive, a public health center physician wrote a referral and handed it to the participant, and the participant was urged to seek medical treatment.

The following measures were included in the questionnaire: participant's age and gender; whether or not the public health center staff could contact the participant; the preferred method for contact; perceived susceptibility to infection; perceived severity of infection; perceived benefit of retrieving results (relief, treatment); and perceived barriers to visiting the public health center (not being free, being name-based, fear, time, reluctance, stigma, transportation). Participants were asked to answer the perception questions using a 4-point scale; if they had a strong perception of a particular element, they scored a 4, if they did not have a perception of the element, they scored 1. Perceived benefit was assessed by summing the answers to 2 questions. Perceived barrier was assessed by summing the answers to 7 questions. Participants were asked whether or not the public health center staff could contact the participant using a 4-point scale (not reluctant, little reluctant, somewhat reluctant, very reluctant). We defined those who answered "not reluctant" or "little reluctant" as meaning that the public health center staff could contact the participant, and those who answered "somewhat reluctant" or "very reluctant" as meaning that the public health center staff could not contact the participant. We examined whether or not the clients retrieved their STI test results within 6 months of the testing; the last participant who retrieved their STI test results did so 6 months after testing.

Urine specimens were used to detect chlamydial and gonococcal infections using a nucleic acid amplification technique (transcription-mediated amplification method, Aptima Combo 2 assay for *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG), Hologic, Bedford, MA, USA); blood samples were used to detect syphilis infections using a hemagglutination method (*Treponema pallidum* hemagglutination method, Rapidiaauto TP, Fujirebio, Tokyo, Japan). In addition, an

immunochromatography method (enzyme immunoassay method, Daina Screen HIV-1/2, Abbott, Matsudo, Japan) was used to detect HIV infections.

Descriptive statistics were used to summarize the preferred type of contact. Student's t-test was used to compare ages between those who completed the questionnaire and those who did not and to compare participant ages between those who did and did not retrieve their STI test results. A chi-square test was used to compare genders between those who completed the questionnaire and those who did not. Fisher's exact tests were used to compare the STI test results between those retrieving and not retrieving their STI test results and to compare client receptiveness to subsequent public health center staff contact following retrieval of their STI results. Single and multiple logistic regression analyses were used to identify the psychosocial factors affecting participant retrieval of STI test results. The variables used in the multiple logistic regression analyses were age, gender, perceived susceptibility, perceived severity, perceived benefit, and perceived barriers. All statistical analyses were conducted using SPSS version 17.0 (IBM, Japan). Tests of statistical significance were based on two-sided p-values, a p-value < 0.05 was considered statistically significant.

The objective of the study was explained in a written document and provided to each participant; completion of the questionnaire was considered implied consent. The questionnaire was anonymous and each participant was given a unique designation. This designation was also added to the questionnaire and specimen collected. The study was approved by the ethical committee of National Institute of Public Health, Japan (approval number, NIPH-IBRA#10030).

### III. Results

A total of 469 (71.9%) participants agreed to complete the questionnaire. After eliminating incomplete questionnaires, the final response rate was 71.3% (n = 465). Those who did not complete the questionnaire were significantly older than those who did (p < 0.05). The

response rate of the male participants was significantly lower than that of the female participants (p < 0.05).

Table 1 shows the characteristics of the respondents who received VCT for STIs at the public health centers; 37 (8.0%) participants did not retrieve their STI test results. Among the respondents, the men in the study were significantly older than the women. There were no significant differences between the male and female respondents with regard to their retrieval of STI test results. Those who did not retrieve their STI testing results were significantly younger than those who did (p < 0.05).

Table 2 shows the descriptive statistics of the STI test results. None of the participants were infected with HIV, but 32 (6.9%) had STIs; 3 participants did not return to retrieve their STI test results. Chlamydia was the most common infecting organism detected. There were no significant differences in STI test results between those who did and did not retrieve their results.

Table 3 shows the results of a multiple logistic regression analysis of the HBM responses regarding the retrieval of STI test results. The crude odds ratio (OR) and 95% confidence intervals (CIs) for the perceived susceptibility, perceived severity, perceived benefit, and perceived barrier of retrieving the STI test results were 0.919 (0.615-1.374), 0.561 (0.177-1.783), 1.519 (1.031-2.239), and 1.006 (0.912-1.111), respectively. Those who were not notified of their STI test results were significantly younger (OR, 1.057; 95% CI, 1.009-1.107). With regard to variables related to the HBM, perceived benefit was identified as a significant predictive factor (OR, 1.646; 95% CI, 1.082-2.503) for respondents retrieving their test results. There were no significant differences in perceived susceptibility, perceived severity, or perceived barriers between those who retrieved their STI test results and those who did not.

Table 4 shows that 85.0% of participants were not reluctant to be contacted by the public health center staff; the preferred mode of contact was via mobile phone. There was no significant difference regarding contact from the public health center staff between those who did and did not retrieve their results.

**Table 1** Characteristics of people undergoing voluntary counseling and testing for sexually transmitted infections (STIs) at public health centers.

		Men		Women		p
		n	%	n	%	
		238	51.2	227	48.8	
Age	Mean	35.8		29.7		<0.05
	S.D.	12.9		9.2		
STI test results	Retrieved	218	91.6	210	92.5	0.7
	Not retrieved	20	8.4	17	7.5	

Table 2 Sexually transmitted infection (STI) test results.

	STI test results						
	Not retrieved		Retrieved		p	All	
	n	%	n	%		n	%
Not infected	34	91.9	399	85.8	0.7	433	93.1
Infected	3	8.1	29	6.2		32	6.9
Organism*							
Chlamydia	2	5.4	24	5.6		26	5.6
Gonococci	0	0.0	2	0.5		2	0.4
Syphilis	1	2.7	4	0.9		5	1.1

\*Cases of superinfection (chlamydial and gonococcal infections) are included.

Table 3 Multiple logistic regression analysis of the impact of health belief model responses on the retrieval of test results.

	Odds ratio (95% confidence interval)	p
Gender	0.739 (0.354-1.546)	0.4
Age	1.057 (1.009-1.107)	<0.05
Perceived susceptibility	1.157 (0.727-1.841)	0.5
Perceived severity	0.568 (0.174-1.847)	0.3
Perceived benefit	1.646 (1.082-2.503)	<0.05
Perceived barrier	1.026 (0.923-1.140)	0.6

R<sup>2</sup> = 0.071

Table 4 Descriptive statistics regarding public health center contact.

	Notification of sexually transmitted infection test results						
	Not retrieved		Retrieved		p	All	
	n	%	n	%		n	%
May contact	34	91.9	356	84.4	0.3	391	85.0
May not contact	3	8.1	66	15.6		69	15.0
Means of contact*							
Mobile phone	32	94.1	310	87.1		342	87.5
Home telephone	1	2.9	32	9.0		33	8.4
Letter	5	14.7	91	25.6		96	24.6
Text message	11	32.4	144	40.4		155	39.6
E-mail	7	20.6	45	12.6		52	13.3

\*Multiple answers were allowed.

#### IV. Discussion

Perceived benefit was a significant predictor of respondents retrieving their STI test results. Therefore, improving the perceived benefits would be an effective step for improving the number of patients retrieving their results. Dorr et al. [10] and Hou et al. [12] also showed that perceived benefit was a significant predictor of

individuals deciding to undergo HIV testing. Similarly, Grispén et al. [14] showed that perceived benefit was a significant predictor of HIV self-testing. A previous study revealed that an important predictor of an individual attending a screening program was the motivation to gain reassurance [17]. Thus, providing psychosocial support to clients following STI testing might be an effective means for encouraging clients to seek out STI testing.

Perceived susceptibility was not a significant predictor

of respondents retrieving their STI test results, although the prospective nature of the present study may have contributed to this result. A previous prospective study [10] also showed that perceived susceptibility was not a significant predictor. However, retrospective studies [11-13, 15] have shown that perceived susceptibility was a significant predictor of individuals receiving or intending to receive HIV testing; perceived susceptibility may also change after testing. Perceived severity was also not a significant predictor of individuals seeking to be tested. Most (98.5%) of the participants indicated that acquiring an STI was a very severe or a somewhat severe problem, possibly reflecting a ceiling effect (range, 1-4; mean, 3.86; SD = 0.38). In addition, perceived barrier was also not a significant predictor of individuals obtaining their results. Once participants had visited a public health center to receive STI testing, returning to the public health center to retrieve their results did not appear to be a barrier to getting the results.

The majority (85.0%) of the participants were not reluctant to be contacted by public health center staff. Those who reported a higher perceived benefit from the testing would still undergo testing even if it was not anonymous. Woods et al. [18] showed that 63% of high-risk men who underwent repeat HIV testing would not have undergone testing, if the reporting was mandatory. However, after being educated regarding the benefits of a name-based HIV testing program, 19% of the participants changed their minds. By emphasizing the benefits of being notified of the STI test results, public health center staff could be expected to gain permission to contact the participants and inform them of their results. The present participants indicated that the most desirable method of contact was via mobile phone and text messaging, as these modes were perceived to protect the participants' anonymity and allow the health center staff to directly contact the participant. Tsu et al. [19] also reported that the option of mobile phone notification significantly increased the proportion of youth who received post-test results and counseling. These results suggest that communication methods, such as mobile phones, are effective for notifying participants of their STI test results.

Our study has certain limitations. First, the reliability and validity of the HBM used in the present study have not been established. However, no other, more appropriate measures have been established for use. Second, we measured perceived susceptibility and perceived severity with a single test question, each. Generally, reliability is low when measurements involve only a single item. Therefore, further study is needed, using variables with documented reliability and validity. Third, we did not ask questions regarding the participants' STI histories; a history of previous STIs may influence the results of the questionnaire. Fourth, we

restricted the STI definition to include only chlamydial, gonococcal, and syphilis infections. Other STIs, such as HIV, human papillomavirus, or herpes simplex virus, were not included in the STI definition. This restriction was not precisely explained to the study participants, and this information would have been crucial for the participants to judge STI severity, and may have influenced the questionnaire results. Finally, there may have been some participants who took the test more than once, making duplicate responses another potential study limitation.

In conclusion, by emphasizing the perceived benefits of feeling relief and receiving treatment, if necessary, after retrieving STI test results, public health staff may be more effective at obtaining participant contact information and encouraging them to retrieve their STI test results. The most desirable communication method was one that preserved the participant's anonymity and allowed for direct contact with the participant, such as a mobile phone. Assuring anonymity is important when public health center staff communicate with tested individuals.

### Conflict of Interest

The authors have not received any financial support from any external agency or commercial entity and have no conflicts of interest to declare.

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