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Original Research Article

Understanding the Screening Behavior in Mothers and Adolescent Daughter's Human Papillomavirus Vaccine Uptake - The Transtheoretical Model

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ABSTRACT

Objective: Little has been done to understand the HPV vaccine acceptance to participants with regard to Pap screening. The objective of this study was to determine the practice and barriers of the screening behavior in mothers with adolescent daughter's HPV vaccine uptake.
Methodology: Transtheoretical model was used to ascertain the associations between stages of change and multiple linear regression was performed to compare means of self-efficacy, perceived benefits and barriers among stages.
Results: Between June and September 2013, a total of 176 (75.6%) questionnaires were returned. Most of samples aware that NHI provided free Pap tests for women aged 30 years older (93.2%). For women who do not have adolescent daughter's HPV uptake, due to the costs of vaccine (68.6%). The chi-square test showed that 69.3% of married women were in maintenance, there were more 2.9% have HPV uptake. In additions, there were 89.2% who intend to their daughters have HPV uptake in the future. Multiple comparisons revealed that samples had lowest self-efficacy in the precontemplation stage. Another had highest perceived benefits and lowest perceived barriers in relapse stage. Self-efficacy was significantly higher for women in maintenance and relapse.
Conclusion: The finding suggests that increasing situation-specific confidence (e.g., by informing women that the procedure is not painful) may lead precontemplation and preparation to arrive at the intention to engage in regular cervical screening. Also, increasing self-efficacy can promote Pap testing. Finally, Transtheoretical model has been applied successfully to cervical screening, the findings may be generalizable to this study population.

Keywords: Human Papillomavirus Vaccine, Pap screening, Transtheoretical model

INTRODUCTION

Cervical cancer is always the greatest threat to women's health, according to IARC(International Agency for Research on Cancer) latest statistics show that cervical cancer is now the fifth died of cancer worldwide, accounting for all female cancer deaths second.[1] In Taiwan, Department of Health reported that cervical cancer deaths for the females ranked sixth. According to the cancer group's survey, the incidence rate and death rate ranked the top two in Asia advanced countries, the report also pointed out that the incidence rate of cervical cancer after South Korea. Recently, incidence and mortality rates of cervical cancer worldwide

have decreased markedly in the past decades, mainly because of the Papanicolaou (Pap) test, which detects the disease and precancerous lesions. American Cancer Society[1] guidelines recommend initial screening for cervical cancer with Pap testing three years after the onset of sexual activity and no later than age 21. All women who are or have been sexually active and still have a cervix should be screened every year with the regular Pap test or every two years with the newer liquid-based test until age 30, with intervals then extended to two to three years based on past screening results and risk factors.[1] Since the late 1990s, cervical cancer has been among the top five causes of death in Taiwanese women.[2] Since 1996, the Bureau of National Health Insurance of Taiwan [3] has offered Pap screenings at no charge for women older than age 30 and screenings for a small copayment for women younger than age 30. Despite the reported health benefits and the availability of free or low-cost Pap screening, 30%-50% of adult Taiwanese women have never had a Pap test,[4] Human papilloma virus (HPV) is the culprit of cervical cancer and other cancers of the anal area. The recent availability of HPV vaccines provides the potential for a major step forward in reducing the public health burden of the most common sexually transmitted infection in the United States. Yet, this will only occur if there is widespread uptake of the vaccine.[5] Pap smears is the most effective and simple method for cervical cancer prevention. This method is by the Papanicolaou and Traut in 1943 invented the use of early detection of cervical cancer is the most successful in human history screening method. However, progress in screening rates, 33.4% from 1997 to 2008 continued to remain at 52.7% in Taiwan. Unlike the U.S. and western countries, cervical cancer screening rates remain in around 51-52% during the past 8 years in Taiwan. Department of Health in Taiwan is currently underway to promote the integrated cervical cancer prevention program, including a series of screening models, e.g. Pap smear, HPV genetic screening, and HPV vaccines. The related integrated model was as follow: (1) pap smear one to three years for 30 years old female; (2) HPV self-sampling for women 6 or more consecutive years without making a pap smear; (3) free HPV vaccination for the first-year junior high school girls, in remote areas and low-income families.

In Taiwan, given the poor participation in cervical screening, HPV vaccination offers a unique opportunity to reduce morbidity and mortality. Recent estimates indicate that only 20% of Taiwan girls in the target age group have received the three-doses. Researchers have extensively studied parents' willingness to have their adolescent daughter vaccinated. Due to human papilloma virus vaccine developed so far, more than 100 countries use human papilloma virus vaccine, more than 28 countries injections for human papilloma virus vaccine as a routine policy of injections at public expense the vaccine.[6-11] However, for people in the concept of vaccination, cervical cancer vaccine, there are still a "timeliness", "price factor" and "security" and the doubts and potential problems. In this regard, the objective of this study is to assess Pap smear behavior and vaccine acceptability among Taiwanese women, explore the impact of Transtheoretical model (TTM) stages of change factors of periodically Pap smear of Taiwanese women, and determine the structure of TTM in cervical screening are applicable to Taiwanese women.

MATERIALS AND METHODS

Transtheoretical model (TTM) used in this study, and the path analysis to confirm the relationship between change process,

decision-making balance, self-efficacy and stages of change in women's participation in screening behavior. Observation of cases will be used to enhance the screening stage, given measures consistent with the stage to effectively improve screening behavior. In addition, also survey HPV vaccination desire and attitude of people to further consideration of Taiwanese women's participation in screening behavior and vaccination attitude of the association analysis to provide discussion on improving prevention and screening effective. As the lack of relevant literature, and the lack of research on the process, this study taken multiple case study to empirical research, and in a qualitative way to collect and analyze data in order to understand how respondents interpret their ideas and facts.

Further, woman can be described along a series of stages of readiness to practice regular Pap screening as follow:[12]

i. ***Precontemplation*:** woman has never had a Pap test and has no intention to have one within the next six months.
ii. ***Contemplation*:** woman has never had a Pap test but intends to have one within the next six months.
iii. ***Preparation:*** woman has never had a Pap test but intends to have one within the month.
iv. ***Action:*** woman has had one Pap test in the past year and intends to continue getting regular Pap tests.
v. ***Maintenance:*** woman has had regular Pap tests and intends to continue to do so.
vi. ***Relapse risk*:** woman is on schedule but has no in tension to get a Pap test in the future.
vii. ***Relapse*:** woman has had Pap tests but none during the past year and does not intend to get one.

Research Instruments

***Demographic questionnaire*:** The questionnaire gathered information on participants' age, marital status, education, health insurance coverage, disease history, health perceptions, HPV history, history of abnormal Pap tests, and awareness of NHI's free coverage of Pap tests for women aged 30 years and older.

Cervical cancer screening stage questionnaire: By using criteria from Hogenmiller et al.[6] and incorporating the time descriptors from the TTM. Participants were first asked if they had Pap tests on a regular basis with the definition given. Women who received regular Pap tests then were asked if they planned to continue the tests on a regular schedule. Participants who had received one or more Pap tests but not on a regular basis were asked when they had received their most recent test and whether they planned to continue to have the tests on a regular schedule. Participants who had never received a Pap test were asked if they were considering having a Pap test, with options of (a) yes, in the next month; (b) yes, in the next six months; or (c) no. Participants' answers then were classified into one of the seven TTM stages.

***Self-Efficacy Scale*:** Self-efficacy for Pap tests was measured by the Self-Efficacy Scale,[14] a seven-item measure of confidence in one's ability to acquire a Pap test under various circumstances (e.g., if the Pap test might be painful). Responses are based on a 100-point scale with 10-unit intervals ranging from 0 (cannot do at all) to intermediate degrees of assurance such as 50 (moderately certain can do) to complete assurance at 100 (certainly can do). The higher the score, the more confidence the woman has to engage in Pap testing.

***Benefits and barriers scale*:** This scale consists of a 6-item benefits subscale and a 12-item barriers subscale, adapted from Byrd et al.[15] which assesses women's

perceived benefits of and barriers to obtaining a Pap test. Participants rated their perceived benefits and barriers in various situations on a four-point Likert scale (1 = strongly disagree to 4 = strongly agree). The higher the score, the greater the perceived benefits of and barriers to obtaining a Pap test.

Data collection and analysis: In this study, we have adopting Chung Shan Medical University Approval for the study was received from the institutional review boards at Chung Shan Medical University Hospital. Informed consent was obtained from participants prior to in-person interviews. We will obtain the respondents agreed before fill out the questionnaire. The average of the seven items from the Self-Efficacy Scale was computed to obtain the mean self-efficacy. The means of perceived benefits and barriers were the average scores across 6 items from the benefits subscale and 9 items from barriers subscale. Exact chi-square tests were used to ascertain the associations between stages of change and demographic variables. To control for potential confounders, multiple linear regression was performed to compare means of self-efficacy and perceived benefits and barriers among TTM-stage groups.

RESULTS

Of the 186 invited participants, 176 women validly responded and returned the questionnaire to the investigator for a 95% response rate. Mean age of participants was 39.82 years. Most women had health insurance, had no abnormal Pap test in the past and mostly think that they have good health (see Table 1). About 93.2% were aware that NHI provided free coverage for Pap tests for women aged 30 years and older. For women who do not have HPV vaccination, due to the costs of vaccine (68.6%).

Table 1 Demographic Characteristics (n=176)

Characteristic	n	%
Education		
High school or less	8	4.50
Some college	109	61.90
University or higher	59	33.60
Have health insurance		
Yes	172	97.70
No	4	2.30
Have a disease		
Yes	16	9.00
No	146	83.00
Not sure	14	8.00
Perception of personal health		
Poor	2	1.10
Fair	77	43.80
Good	97	55.10
Aware of free coverage for Pap testing		
Yes	164	93.20
No	12	6.80

Most women were in the action-maintenance (72.4%, n=131), with 14.4% in the relapse-relapse risk (n=22) and 12.5% in the contemplation-preparation stage (n=17), with a small proportion being in the precontemplation stage (3.3%, n=6). Respondents' stages of cervical screening were significantly associated with demographic variables, including number of Pap test, marital status, whether having HPV vaccination and abnormal Pap testing history (see Table 2). The exact chi-square test showed that 69.3% of married women were in action-maintenance among Pap-stage χ^2 (176) = 50.797, $p<0.01$, there were more 2.9% have HPV vaccination. In additions, there are 89.2% who hope their daughters have HPV vaccination.

Multiple linear regressions indicated that mean levels of self-efficacy and mean scores on perceived barriers and perceived barriers differed significantly by stages ($p < 0.05$). Multiple comparisons revealed that samples had lowest self-efficacy in the precontemplation stage. Another had lowest perceived benefits and highest perceived barriers in relapse-relapse risk stage. Table 3 has showed the more in detail. Analysis showed that women who hope their daughter to have HPV-vaccination were mostly full-

time employees (54.1%). Women who do not hope their daughter to have HPV-vaccination had 31.6% with no job. Women have never had Pap test, only 56.5% were married. Women have had Pap test, 91.5% were married.

Table 2 Associations Stages of Cervical Cancer Screening and Demographic Characteristics (n=176)

	Precontempla-tion		Contemplation Preparation		Action-Maintenance		Relapse risk-Relapse		Total		χ^2
Variable	n	%	n	%	n	%	n	%	n	%	
Marital status											50.797**
Married	3	1.7	10	5.7	122	69.3	18	10.2	157	86.7	
Other	3	1.7	7	4	9	5.1	4	2.3	23	13.1	
HPV vaccination											5.512*
Yes	1	0.6	1	0.6	3	1.7	0	0	5	2.9	
No	5	2.8	16	9.1	128	72.7	22	12.5	171	97.1	
Abnormal Pap test											43.649**
Yes	0	0	0	0	23	13.1	1	0.6	24	13.7	
No	4	2.3	14	8.0	108	61.4	21	11.9	147	83.5	
Never had a test	2	1.1	3	1.7	0	0	0	0	5	2.8	
Expected daughters having HPV vaccination											5.347
Yes	4	2.3	17	9.7	116	65.9	20	11.4	157	89.2	
No	2	1.1	0	0	15	8.5	2	1.1	19	10.8	
* $p < 0.05$; ** $p < 0.01$											

Table 3 Multiple Regression Results by Stage of Change for Self-Efficacy and Perceived Benefits and Barriers (n=176)

	Precontemplation			Contemplation Preparation			Action-Maintenance			Relapse risk-Relapse				
Variable	*n*	$\bar{x}$	*SD*	*n*	$\bar{x}$	*SD*	*n*	$\bar{x}$	*SD*	*n*	$\bar{x}$	*SD*	*F*	*P*
Efficacy	6	30.00	13.94	17	57.98	17.95	131	59.10	20.55	22	64.48	26.53	4.32	0.006
Benefit	6	3.06	0.25	17	3.22	0.50	131	3.35	0.44	22	3.56	0.52	2.94	0.035
Barrier	6	2.30	0.38	17	2.26	0.64	131	2.02	0.38	22	1.90	0.46	3.18	0.013

CONCLUSION

Women in the sample reported more frequent Pap screening than in other studies in Taiwan, considering that NHI has increased Pap test reimbursement to promote testing. About 6.8% of women were not aware that the NHI offered free Pap screenings for women older than age 30, which suggests a need for continued efforts to increase awareness of the free screening to increase Pap testing. Intervention programs such as mail communications and phone counseling have succeeded in raising awareness of Pap testing among Taiwanese women. Self-efficacy was significantly higher for women in action-maintenance and relapse-relapse risk, which was consistent with the predictions of the TTM and with previous work. The finding suggests that increasing situation-specific confidence (e.g., by informing women that the procedure is not painful) may lead precontemplation and contemplation-preparation to arrive at the intention to engage in regular cervical screening.

The finding suggests that women in precontemplation stage have experienced some difficulties during a pervious screening, which may have had a negative influence of regular screening. Therefore, interventions for women in precontemplation should focus on increasing self-efficacy to prevent discontinued screening. The finding suggests that increasing self-efficacy can promote Pap testing. Women in the relapse-relapse risk perceived more barriers than women in action-maintenance. The finding conflicts with earlier TTM work, in which people in earlier stages of the TTM perceived more barriers to regular Pap screening than those in later stages. Therefore, interventions for women in relapse-relapse risk should focus on decreasing barriers to prevent

discontinued screening. Unmarried women were more likely to have never had a Pap test than married participants, which is consistent with the findings. Survey found that, women who hope their daughter to HPV vaccination were having jobs. Women who do not hope their daughter to HPV vaccination were no jobs. It showed that price for the vaccine to women who do not have source of income is a big burden. Finally, Transtheoretical model has been applied successfully to cervical screening, the findings may be generalizable to this study population.

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