



Knowledge and attitudes regarding cervical cancer screening among women with physical disabilities living in the community

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ABSTRACT

The study aims to explore knowledge and attitudes regarding cervical cancer screening and to examine its determinants based on the perspectives of Taiwanese women with physical disabilities living in the community. A cross-sectional survey was employed in the study, and we recruited 498 women aged more than 15 years who were officially registered as having physical disabilities in Taipei County, Taiwan, in March 2009. A mail-out structured questionnaire designed to collect data concerning the participants' demographics, reported use, health experience and perception (understanding and attitudes) of cervical cancer screening among women with physical disabilities. We used a scoring system (range 0–10) to categorize the study subjects' awareness of screening (low vs. high). The results showed that 77.3% of subjects reported a low level of awareness (score ≤ 7), whereas 22.7% were in the high awareness level group (score > 7). The logistic regression model revealed that married women (OR = 3.30, 95%CI = 1.25–8.71), those with a higher educational level (OR = 2.88, 95%CI = 1.51–5.53), and those with a high familiarity with Pap smear resources (OR = 5.31, 95%CI = 2.82–9.98) had a significantly higher perception level of cervical cancer screening among women with physical disabilities. This study highlights the necessity of increasing the knowledge and awareness of cervical cancer screening and reducing the barriers to cervical cancer screening experienced by women with disabilities.

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1. Introduction

Cervical cancer is one of the leading causes of cancer death in women, and effective interventions against cervical cancer exist, including screening for and treating precancerous lesions and invasive cancer (WHO, 2006). However, there are still many barriers to the control of cervical cancer, such as the lack of awareness of cervical cancer among the population and health care providers, absent or poor quality screening plans and limited access to health care services. In addition to health awareness, many women may lack accurate information or they may not have heard of cervical cancer and do not recognize the early signs and symptoms when they occur (Alliance for Cervical Cancer Prevention,

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2004). These attitudes and beliefs about cervical cancer among the female population can increase the disease burden in the community.

Women with physical disabilities reported high levels of perceived stress; women who are limited by pain and lack social support are at particularly high risk (Hughes, Taylor, Robinson-Whelen, & Nosek, 2005). They are at risk for breast and cervical cancer, yet physical and attitudinal barriers contribute to lack of screening (Thierry, 2000). Consequently, disabled women were less likely to receive mammography and Pap smears within the recommended intervals (Tezzoni, McCarthy, Davis, Harris-David, & O'Day, 2006; Wei, Findley, & Sambamoorthi, 2006). Furthermore, Armour, Thierry, and Wolf (2009) analyzed the 2008 Behavioral Risk Factor Surveillance System in the US and found that women with a disability were significantly less likely than those without a disability to report receiving a Pap test during the past three years (78.9% vs. 83.4%, respectively).

However, despite the fact that women with disabilities experience limitations in life activities, the study of health in the context of disability for women is a relatively new field of inquiry (Hughes, 2006). Health professionals need to be better informed and must take into account the needs and characteristics of this vulnerable population and to acknowledge the rights of women with disabilities to access Pap smear screening (Lin, Lin, et al., 2010). Alliance for Cervical Cancer Prevention (2004) also stated that heightened awareness of cervical cancer and effective prevention strategies are effective health policies that help decrease cervical cancer incidence and mortality. Therefore, it is important to consider the perspectives of women in the community, their knowledge and attitudes about cervical cancer, and their service needs to develop services that will meet those needs. Therefore, the present paper aims to describe the knowledge and awareness of cervical cancer screening and to examine its determinants among Taiwanese women with physical disabilities living in the community.

2. Methods

A cross-sectional survey was employed in the study, and the sampling of study participants was described in our previous paper (Lin, Chen, Lin, & Sung, 2011). We recruited the study participants based on a population composed of 17,455 women with physical disabilities aged more than 15 years who were officially registered as having physical disabilities in Taipei County, Taiwan, in March 2009. Those physical disabilities include upper and lower limb impairments, spinal cord impairments and other nervous system impairments.

A mail-out structured questionnaire was designed to consider demographics and reported use, health experience and perception (understanding and attitudes) of Pap smear tests among women with physical disabilities. We assessed 10 health issues, which were validated by five experts to examine the perception of the respondents toward the Pap smear test. These issues included the following: (1) Women with previous normal Pap smear results still need to receive regular Pap smear tests. (2) Women without any gynecological symptoms still need to receive Pap smear tests. (3) The Taiwan NHI provides annual free Pap smear tests for women. (4) Pap smear tests are necessary even in women who are not sexually active. (5) Cervical cancer is not a contagious disease. (6) Women who have had a hysterectomy still need to receive regular Pap smear tests. (7) Understand hospitals are providing Pap smear clinics to speed the test. (8) Women should not flush the vagina before receiving a Pap smear test. (9) Women should take a shower instead of a bath before the Pap smear test. (10) Human papilloma virus (HPV) can lead to cervical cancer. The responding questionnaires were analyzed by SPSS 18.0 software. Numbers, percentages and the Chi-squared test were used to describe the participants' demographic characteristics and health experience and to analyze the association of these characteristics with their perception of Pap smear tests. Multivariate analysis by logistic regression, odds ratio (OR) and 95% confidence interval (CI) analyses were used to examine the factors that are potentially associated with Pap smear awareness in women with physical disabilities.

3. Results

The demographic characteristics of the participants are presented in Table 1. Their mean age was nearly 50 years; 53.5% were aged less than 50 years and 46.3% were older than 50 years. A total of 82.5% women had married and 55.8% had obtained an education level of senior high school or higher. Most of the respondents had lower limb (72.8%) or upper limb (31.8%) impairments. A total of 14.5% of the cases reported the co-occurrence of other impairments in addition to the primary disability. Most of the study participants had either a mild (54.5%) or moderate (32.6%) level of disability. With regard to the household income levels of the study participants, 62.9% of cases reported that their monthly income was less than 40,000 New Taiwan Dollars (NTD).

Table 2 shows the understanding and awareness of Pap smear screening among women with physical disabilities; 86.6% and 72.8% of cases agreed that "those with previous normal Pap smear results still need to receive regular Pap smear tests" and "those without any gynecological symptoms still need to receive Pap smear tests," respectively. Most of the respondents (72.3%) knew that "the Taiwan National Health Insurance (NHI) provides annual free Pap smear tests for women". However, only 45.6% of cases expressed that they know that "hospitals provide a rapid Pap smear screening service". With regard to reproductive health awareness, 66.4% of cases agreed that Pap smear tests are still necessary even if they are not sexually active, 58.2% respondents knew that "cervical cancer is not a contagious disease", and 47.6% of cases agreed that "women who have had a hysterectomy still need to receive regular Pap smear tests". Few respondents understood that they "should not flush the vagina before receiving a Pap smear test" (38.3%) or that they "should take a shower instead of a bath before a Pap smear test" (33.1%). Finally, only one third of the respondents knew that "human papilloma virus (HPV) can lead to

Table 1
Demographic characteristics of the women with physical disabilities.

Characteristics	<i>n</i>	%
Age (<i>n</i> = 480)		
Mean ± SD	49.97 ± 12.36	
<0	257	53.5
≥50	223	46.5
Marital status (<i>n</i> = 496)		
Unmarried	87	17.5
Married	409	82.5
Education level (<i>n</i> = 498)		
Junior high school or less	220	44.2
Senior high school or more	278	55.8
Physical impairment type (multiple choices)		
Lower limb (<i>n</i> = 496)	361	72.8
Upper limb (<i>n</i> = 497)	158	31.8
Spinal cord injury (<i>n</i> = 496)	52	10.5
Other nervous system impairment (<i>n</i> = 496)	36	7.3
Accompanied with another disability (<i>n</i> = 456)		
Yes	66	14.5
No	390	85.5
Disability level (<i>n</i> = 497)		
Mild	271	54.5
Moderate	162	32.6
Severe	57	11.5
Profound	7	1.4
Household monthly income (<i>n</i> = 445)		
<40,000 NTD	280	62.9
≥40,000 NTD	165	37.1

Table 2
Respondent knowledge and awareness of cervical cancer screening.

Health perception issues	Agree/known, <i>n</i> (%)	Disagree/unknown, <i>n</i> (%)	Uncertain, <i>n</i> (%)
Women with previous normal Pap smear results still need to have regular Pap smear tests (<i>n</i> = 491)	425 (86.6)	18 (3.7)	48 (9.7)
Women without any gynecological symptoms still need to have Pap smear tests (<i>n</i> = 491)	357 (72.8)	67 (13.6)	67 (13.6)
The Taiwan NHI provides annual free Pap smear test for women ≥30 years (<i>n</i> = 494)	357 (72.3)	102 (20.6)	35 (7.1)
Pap smear tests are necessary even if the woman is not sexually active (<i>n</i> = 491)	326 (66.4)	65 (13.2)	100 (20.4)
Cervical cancer is not a contagious disease (<i>n</i> = 493)	287 (58.2)	27 (5.5)	179 (36.3)
Women still need to have regular Pap smear tests following a hysterectomy (<i>n</i> = 496)	236 (47.6)	57 (11.5)	203 (40.9)
Understand hospitals are providing a rapid screening service (<i>n</i> = 493)	225 (45.6)	231 (46.9)	37 (7.5)
Women should not flush the vagina before having a Pap smear test (<i>n</i> = 494)	189 (38.3)	74 (15.0)	231 (46.7)
Women should take shower before having a Pap smear test (<i>n</i> = 493)	166 (33.1)	297 (60.2)	30 (6.1)
Human papilloma virus (HPV) can lead to cervical cancer (<i>n</i> = 492)	167 (33.9)	20 (4.1)	305 (62.0)

cervical cancer". Table 3 shows the calculated perception score distribution of the respondents; the mean score was 5.49 ± 2.57 for the study participants. We used a scoring system (range 0–10) to categorize the study participants' perception level of the Pap smear test (low vs. high). The results showed that 77.3% of the subjects had low perception scores (score ≤ 7) and 22.7% had high perception scores (score > 7).

Tables 4 and 5 analyze the relationship of the participants' demographic characteristics, health experience and Pap smear perception in the bivariate Chi-squared tests. We analyzed the variables marital status, educational level, the presence of nervous system impairments, household monthly income, Pap smear experience, familiarity with Pap smear resources, willingness to use the Pap smear test as improving medical resource, and the quality of hospital services. We put the above statistically significant factors in bivariate Chi-squared tests into the logistic regression model (Table 6). Model I analyzed the effects of predisposing factors, model II tested the predicted effects of predisposing and enabling factors, and model III examined three domains: predisposing, enabling and need factors, to predict the perception level of the Pap smear test among women with physical disabilities. In model I, the results showed that married women (OR = 3.75, 95%CI = 1.67–8.42) and those with a higher educational level (OR = 3.33, 95%CI = 1.84–6.40) were likely to have a higher perception level of Pap smear tests than their unmarried and less educated counterparts. Model II indicated that married women (OR = 4.0, 95%CI = 1.54–10.42) and those with a higher educational level (OR = 3.07, 95%CI = 1.66–5.70) were likely to have a higher perception level of Pap smear tests. Finally, model III revealed that married status (OR = 3.30, 95%CI = 1.25–8.71), higher

Table 3
Score distribution of knowledge and awareness (perception) of cervical cancer screening.

Scores (<i>n</i> = 498)	<i>n</i>	%
0	27	5.4
1	21	4.2
2	26	5.2
3	32	6.4
4	48	9.6
5	76	15.3
6	69	13.9
7	86	17.3
8	56	11.2
9	40	8.1
10	17	3.4
Mean ± SD	5.49 ± 2.57	

Table 4
Relationship between screening awareness and the demographic characteristics of women with physical disabilities according to Chi-squared tests.

Variable	Perception level ^a		χ^2	<i>p</i> Value
	Low, <i>n</i> (%)	High, <i>n</i> (%)		
Age (<i>n</i> = 477)			0.197	0.657
<50	199 (77.7)	57 (22.3)		
≥50	168 (76.0)	53(24.0)		
Marital status (<i>n</i> = 493)			11.265	0.001
Unmarried	79 (90.8)	8 (9.2)		
Married	301 (74.1)	105 (25.9)		
Education level (<i>n</i> = 495)			7.113	0.008
Junior high school and less	181 (83.0)	37 (17.0)		
Senior high school and more	202 (72.9)	75 (27.1)		
Upper limb (<i>n</i> = 494)			0.121	0.728
Yes	124 (78.5)	34 (21.5)		
No	259 (77.1)	77 (22.9)		
Lower limb (<i>n</i> = 493)			0.760	0.383
Yes	281 (78.5)	77 (21.5)		
No	101 (74.8)	34 (25.2)		
Spinal cord impairment (<i>n</i> = 493)			0.011	0.918
Yes	40 (76.9)	12 (23.1)		
No	342 (77.6)	99 (22.4)		
Other nervous system impairments (<i>n</i> = 493)			8.672	0.003
Yes	35 (97.2)	1 (2.8)		
No	347 (75.9)	110 (24.1)		
Accompanied with another disability (<i>n</i> = 453)			0.489	0.484
Yes	52 (80.0)	93 (20.0)		
No	295 (76.0)	93 (24.0)		
Disability level (<i>n</i> = 494)			2.086	0.352
Mild	202 (75.1)	67 (24.9)		
Moderate	127 (78.9)	34 (21.1)		
Severe or Profound	53 (82.8)	11 (17.2)		
Household monthly income (<i>n</i> = 442)			4.375	0.036
<NT 39,999	221 (79.5)	57 (20.5)		
≥NT 40,000	116 (70.7)	48 (29.3)		

^a Perception level, low: 0–7, high: 8–10.

educational level (OR = 2.88, 95%CI = 1.51–5.53), and familiarity with Pap smear resources (OR = 5.31, 95%CI = 2.82–9.98) can significantly predict a high perception level of cervical cancer screening among women with physical disabilities.

4. Discussion

Unlike many other cancers, cervical cancer is mostly preventable through screening programs designed to identify and treat precancerous lesions (Alliance for Cervical Cancer Prevention, 2004). Although people with physical disabilities may have impaired mobility, their lifespans are similar to age-matched population controls. They therefore need standard preventive services to prevent early mortality (Cheng et al., 2001). Research is needed to better understand how cognitive and environmental barriers, both physical and social, interact to predict screening behaviors among this population of women (Thierry, 2000). In the present study, we aim to explore the understanding of the concept of cervical cancer, awareness of cervical cancer prevention services, and feelings about screening and the service system based on individual perspectives of women with physical disabilities living in the community. The results revealed that those women with

Table 5
Relationship between screening awareness and health experience of women with physical disabilities according to Chi-squared tests.

Variable	Perception level		χ^2	p Value
	Low, n (%)	High, n (%)		
Hysterectomy (n = 485)			0.473	0.491
Yes	39 (73.6)	14 (26.4)		
No	336 (77.8)	96 (22.2)		
Tubal ligation (n = 467)			2.622	0.105
Yes	93 (72.7)	35 (27.3)		
No	270 (79.6)	69 (20.4)		
Use of Pap smear (n = 487)			6.588	0.010
Yes	261 (74.8)	88 (25.2)		
No	118 (85.5)	20 (14.5)		
Familiarity with Pap smear resources (n = 468)			53.309	<0.001
Low (score \leq 3)	204 (91.9)	18 (8.1)		
High (score >3)	156 (63.4)	90 (36.6)		
Willing level to use Pap smear as improving medical resources (n = 489)			3.010	0.083
Low (score \leq 3)	127 (81.9)	28 (18.1)		
High (score >3)	250 (74.9)	84 (25.1)		
Quality of hospital services (n = 410)			4.933	0.026
Low (score \leq 3)	91 (85.0)	16 (15.0)		
High (score >3)	226 (74.6)	77 (25.4)		

Table 6
Factors that affect the level of screening awareness among women with physical disabilities in the logistic regression analysis (n = 345).

Variable (reference)	Model I	Model II	Model III
	OR (95%CI)	OR (95%CI)	OR (95%CI)
Predisposing factors			
Marital status (unmarried)			
Married	3.75 (1.67–8.42)*	4.0 (1.54–10.42)*	3.30 (1.25–8.71)
Education level (junior high school or less)			
Senior high school or more	3.33 (1.84–6.40)*	3.07 (1.66–5.70)	2.88 (1.51–5.53)*
Other nervous system Impairments (No)			
Yes	0.17 (0.02–1.32)	0.19 (0.23–1.46)	0.17 (0.02–1.42)
Enabling factors			
Average monthly household income (<NT 39,999)			
\geq NT 40,000		1.27 (0.75–2.16)	1.11 (0.63–1.96)
Use of Pap smear (No)			
Yes		0.97 (0.45–2.08)	0.87 (0.39–1.92)
Quality of hospital services (low)			
High		1.92 (0.99–3.72)	1.49 (0.74–3.0)
Need factors			
Familiarity with the Pap smear test resources (low)			
High			5.31 (2.82–9.98)*

* $p < 0.05$.

disabilities had inadequate understanding and awareness of cervical cancer and screening in general. In the long run, we should adopt the suggestion of WHO (2006), which stated that “health education should be an integral part of comprehensive cervical cancer control”, to increase the health awareness in this group of people.

The logistic regression model of perception of the Pap smear test in the study indicated that the factors “marital status”, “educational level” and “familiarity with Pap smear resources” can significantly predict the perception level among women with physical disabilities. In Taiwan, Chen et al. (2009) found that women with disabilities were at higher risk of lower compliance with Pap smear recommendations than women without disabilities. Liao, Wang, Lin, Hsieh, and Sung (2006) also revealed that, in addition to marital status, cancer awareness was the most significant factor associated with screening compliance in their multivariate logistic regression analysis. They suggested that women in Taiwan should be targeted for interventions to promote cancer awareness and screening compliance.

Another study by Nosek et al. (1995) found that knowledge, beliefs, psychological factors, and medical experiences have a strong influence on the reproductive health maintenance behaviors of women with physical disabilities. Cooper and Yoshida (2007) found the most common barriers to the cervical cancer screening tests were “not being sexually active,” “my doctor told me I do not need one,” and “the exam table is too high/narrow”. They suggested that women with physical disabilities need further education on the necessity and benefits of regular cancer screening, especially among those who may not be sexually active. Furthermore, Agurto, Bishop, Sánchez, Betancourt, and Robles (2004) reported that the main barriers to cervical cancer screening in five Latin American countries are the limited accessibility and availability of quality services, the lack of facilities that comfortable and private, high costs, and the lack of courtesy from providers. All of these factors contribute to poor service delivery. Our previous study found that healthcare settings experienced in Pap smear tests for

women with intellectual disabilities were more likely to be in public healthcare settings. They were also more confident in providing screening tests and more likely to have a rapid screening program and a follow-up reminder system in place (Lin, Sung, et al., 2010). Lin, Lin, et al. (2010) found that marital status and a history of tubal ligation surgery were two factors that predicted Pap smear test use by women with intellectual disabilities in a logistic regression analysis.

Our findings also revealed that only one third of women were aware that HPV could lead to cervical cancer. Studies have shown that HPV infections may lead to the development of precancer and that cancer- and HPV DNA-based screening can begin after 30 years of age (WHO, 2006). HPV testing can identify high-grade cervical intraepithelial neoplasias earlier than Pap smears with acceptable rates of specificity (Lowy, Solomon, Hildesheim, Schiller, & Schiffman, 2008).

According to WHO (2006), there are still many barriers to the effective control of cervical cancer, including political barriers, community and individual barriers, economic barriers (lack of resources), and technical and organizational barriers caused by poorly organized health systems and weak infrastructures. In Germany, Schenck and von Karsa (2000) stated that improvements in the quality of the cervical cancer screening program management are necessary to ensure the effectiveness of the program. Therefore, to decrease the disease burden of cervical cancer, the involved parties should form partnerships to align disability policies with women's health policies, to increase public awareness, to create an effective communication strategy and to improve resource allocation to reduce the barriers to cervical cancer screening experienced by women with disabilities (Armour, Thierry, & Wolf, 2009; Giordano et al., 2008).

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