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ORIGINAL ARTICLE

Determinants of cervical cancer screening among migrants in the Northern district of Yangon, Myanmar

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Abstract

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A cross-sectional study was designed to identify factors affecting cervical cancer screening of migrant women aged 30-49 years in the Northern district of Yangon. Multi-stage cluster sampling was used to randomly select 666 respondents. They were face to face interviewed by six trained interviewers after obtaining informed consent during April and May 2015. Chi–square tests and multiple logistic regression were used to examine associations between independent variables and cervical cancer screening.

The prevalence of cervical cancer screening among migrants in the previous 3 year was 19.1%. Cervical cancer screening was found to be significantly associated with marital status, family history of cervical cancer, knowledge, affordability for extra pay to get screening, providers' rapid response, waiting time, sources of information and encouraging support, and perception regarding perceived threats, benefits, barriers and cues to actions. After adjusting for age, family history of cervical cancer, and other factors in the model, perceived barriers (Adj OR = 2.42, 95% CI = 1. 45-4.04) and knowledge levels (Adj OR = 2.21, 95% CI = 1.40-3.47) remained significant predictors of cervical cancer screening uptake. Migrants with positive perceived barriers for cervical cancer screening were 2.42 times more likely to uptake screening than those with negative perception. Migrants with good knowledge about cervical cancer screening were 2.21 times more likely to have cervical cancer screening than those with poor knowledge.

The findings of this study suggested that free of charge for VIA testing should be promoted for the whole country. Health education programs should be provided to migrants to increase knowledge and positive perception about cervical cancer screening services which will lead to a greater uptake in screening.

Keywords: cervical cancer screening, migrant women, knowledge, perception, Myanmar

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ปัจจัยที่มีความสัมพันธ์กับการคัดกรองมะเร็งปากมดลูกของผู้อพยพในอำเภอทางเหนือของย่างกุ้ง ประเทศพม่า

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บทคัดย่อ

ชอ ซู นานดาร์ จิราพร ชมพิกุล และอรพินท์ เล่าซี้
ปัจจัยที่มีความสัมพันธ์กับการคัดกรองมะเร็งปากมดลูกของผู้อพยพในอำเภอทางเหนือของย่างกุ้ง ประเทศพม่า
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การวิจัยครั้งนี้เป็นการศึกษาแบบภาคตัดขวางเพื่อสำรวจปัจจัยที่มีความสัมพันธ์กับการคัดกรองมะเร็งปากมดลูกของผู้อพยพหญิงอายุ 30-49 ปีในอำเภอทางเหนือของย่างกุ้ง ประเทศพม่า โดยใช้แผนการสุ่มตัวอย่างแบบแบ่งกลุ่มหลายขั้นตอนในการสุ่มเลือกผู้อพยพหญิงจำนวน 666 คน เก็บข้อมูลด้วยวิธีการสัมภาษณ์แบบมีเค้าโครงเมื่อได้รับความยินยอมจากกลุ่มตัวอย่างแล้ว โดยผู้สัมภาษณ์ที่ได้รับการอบรมจำนวน 6 คน ทำการเก็บรวบรวมข้อมูลช่วงเดือนเมษายนถึงพฤษภาคม พ.ศ.2558 วิเคราะห์ข้อมูลโดยใช้การทดสอบไคกำลังสองและการถดถอยลอจิสติคเพื่อค้นหาปัจจัยที่มีความสัมพันธ์กับการคัดกรองมะเร็งปากมดลูก

ผลการศึกษาพบว่าร้อยละ 19.1 ของผู้อพยพหญิงเคยไปรับการคัดกรองมะเร็งปากมดลูกเมื่อ 3 ปีที่ผ่านมา การทดสอบด้วยไคกำลังสองพบว่าปัจจัยที่มีความสัมพันธ์กับการรับการคัดกรองมะเร็งปากมดลูกของผู้อพยพหญิงอย่างมีนัยสำคัญทางสถิติ ได้แก่ สถานภาพสมรส ประวัติครอบครัวเกี่ยวกับการเป็นมะเร็งปากมดลูก ความรู้ ความสามารถในการจ่ายเงินเพิ่มเพื่อรับการคัดกรองมะเร็งปากมดลูก การบริการที่รวดเร็ว ระยะเวลารอคอย แหล่งที่ให้ข้อมูลและกำลังใจเกี่ยวกับการไปรับการคัดกรองมะเร็งปากมดลูก การรับรู้โอกาสเสี่ยงของการเป็นโรคและความรุนแรงของโรค การรับรู้ถึงประโยชน์ของการรักษาและป้องกันโรค การรับรู้ต่ออุปสรรค สิ่งชักนำให้ไปรับการคัดกรองมะเร็งปากมดลูก เมื่อวิเคราะห์ข้อมูลด้วยการถดถอยลอจิสติกพหุคูณพบว่าปัจจัยที่ยังคงมีความสัมพันธ์กับการไปคัดกรองมะเร็งปากมดลูกในผู้อพยพหญิง ได้แก่ การรับรู้ต่ออุปสรรค (Adj OR = 2.42, 95% CI = 1.45-4.04) และความรู้ (Adj OR = 2.21, 95% CI = 1.40-3.47) ทั้งนี้ได้ปรับอิทธิพลของอายุ ประวัติครอบครัวเกี่ยวกับการเป็นมะเร็งปากมดลูก และปัจจัยอื่นๆที่อยู่ในตัวแบบ ผู้อพยพหญิงที่มีการรับรู้เชิงบวกต่ออุปสรรคในการไปรับการคัดกรองมะเร็งปากมดลูกมีแนวโน้ม 2.42 เท่าที่จะรับการคัดกรองมะเร็งปากมดลูกเมื่อเปรียบเทียบกับผู้อพยพหญิงที่มีการรับรู้เชิงลบ ผู้อพยพหญิงที่มีความรู้เกี่ยวกับการคัดกรองมะเร็งปากมดลูกมีแนวโน้ม 2.21 เท่า ที่จะรับการคัดกรองมะเร็งปากมดลูกเมื่อเปรียบเทียบกับผู้อพยพหญิงที่มีความรู้น้อย

ข้อเสนอแนะจากผลการวิจัยนี้ ควรส่งเสริมให้ตรวจฟรีด้วย VIA test ทั่วประเทศ ควรจัดโปรแกรมสุขศึกษาให้ผู้อพยพหญิงเพื่อให้มีความรู้เพิ่มและเสริมสร้างการรับรู้เชิงบวกเพื่อให้การคัดกรองมะเร็งปากมดลูกเพิ่มขึ้น

คำสำคัญ: การคัดกรองมะเร็งปากมดลูก ผู้อพยพหญิง ความรู้ การรับรู้ ประเทศพม่า

Introduction

Cervical cancer is the third most commonly diagnosed cancer and the fourth leading cause of cancer death in female worldwide, accounting for 9% (529,800) of the total new cancer cases and 8% (275,100) of the total cancer deaths among females in 2008. More than 85% of these cases and deaths occur in developing countries[1]. The highest incidence rates of cervical cancer all around the world are from developing countries like Eastern, Western, and Southern Africa, South-Central Asia and South America. The incidence rate of cervical cancer are lowest in developed countries like Western Asia, Australia/New Zealand, and North America.[1]

According to the ICO (Information Center for HPV and cancer), in Myanmar nearly 20.82 million women aged 15 years and older are at risk of developing cervical cancer. Moreover, current estimates indicate that every year 5,286 women are diagnosed with cervical cancer and 2,998 die from the disease. In Myanmar, the occurrence of cervical cancer become first most frequent cancer within the women aged between 15 to 44 years of age[2]. The impact of cervical cancer is nowadays become major public health problem especially in developing countries because cervical cancer incidence is mostly found in poor socio economic status of women and the effect of cancer is not only the patients but also the family members on their financial, social, and others[3].

Infection with human papillomavirus (HPV), the virus that causes cervical cancer, is preventable through vaccination, but the vaccine should be given prior to get infection, which often occurs within a few years of sexual contact. For those women already infected, development of cervical cancer is preventable using relatively simple, low-cost screening and treatment approaches that can be implemented not only at the district level but also in the primary health level[4].

The most frequent method for cervical cancer screening in Myanmar is cytology, and there are alternative methods such as HPV DNA tests and Visual inspection with acetic acid (VIA).VIA is an alternative to cytology-based screening in low-resource settings[5]. In Myanmar, compared with WHO recommended screening coverage for developing countries (80%) cervical cancer screening coverage for the women aged 18-69 years screened last 3years percentage was only 0.9%[2]. Therefore the coverage was very limited amount according to WHO recommendation. The standard age for women for having cervical cancer screening according to the national programed is women who are between 30–49 years old. The screening interval should not be less than 5 years and it depend on the type of testing[6].

The study conducted among Chinese immigrants in Seattle, Washington socio-demographic factors such as marital status and time of migration were independently associated with cervical cancer screening and only 60% having cervical screening and lower than general population[7]. The population based survey in Rivas, Nicaragua, showed prevalence of cervical cancer screening was 41.1% and were considered to be adequate screened[8]. The study done in Malaysian urban women, 56% of women got screening[9].

A cross-sectional survey of 2112 health care providers in Ramathibodi hospital in Thailand, the screening of cervical cancer associated with socio-demographic factors such as age, careers and marital status even all of the respondents were health

care providers and they had knowledge of cervical cancer[10]. A study in Colombian women, socioeconomic status such as household income, occupation, education and number of children were significantly associated with cervical cancer screening[11]. A study conducted in Southern Ghana found the screening rate was only 0.8% and over 90% of women had no knowledge about risk factors, prevention of cervical cancer and treatment of cancer. Knowledge was significantly associated with cervical cancer screening utilization[12]. The study done in Zaria, Nigeria among market women, the rate of screening was only 15.4%. The main factors associated with low screening practice were high cost of screening and lack of health personnel at the screening centers[13]. The study in Elmina, southern Ghana, and fear of cancer is one of the barriers for screening in this study and only 0.8% of women undergo screening[12]. There was relationship between fear of received for bad results, no complaint, shy and only 28.5% of them undergo Pap smear[14].

Moreover reinforcing factors such as family and social support are also important factors for having screening. Another important factor is perception of women regarding for getting screening. Health belief Model and the Precede-Proceed model were used as a concept for constructing conceptual framework[15-18]. The area where conducting this study was Haling Thar Yar township, Yangon where there is the highest population of migrant women, until now, little has been known about health problems in migrant women. The reason for choosing the migrants is that there is no previous research for migrant in related to cervical cancer screening. Regarding the accessible to health services such perinatal care and immunization they are still faced many barriers because they are mobile population[19]. Migration from rural to urban even in the same country, who are unable to regularize their household registration in their new township of residence and due to lack of household profile, find themselves facing ongoing constraints to labor market participation as well as to their access to services and legal protection[20]. Therefore, the aim of this study was to explore the prevalence and the determinants of cervical cancer screening in migrants in Northern district of Yangon, Myanmar.

Methods

This cross sectional study was conducted in the Northern district of Yangon. The target population was migrants aged 30-49 years old who have been living in the Northern district of Yangon, Myanmar for at least six months. The sample size was estimated using a confidence interval of 99%, an acceptance error of 3%, and a proportion of cervical cancer screening uptake of 0.09^2. Ten percent of the estimated sample size was added to prevent insufficient respondents. Therefore, the required sample size was at least 666. The multi-stage cluster sampling was used to draw a sample. Among the 4 districts of Yangon, Northern district where the highest population of migrants lived was purposively selected. In this district, there are 7 townships, Hlaing Thar Yar Township was purposively selected because targeted population of migrant women were living there. In this township, 16 wards is randomly selected from overall 20 wards and from each ward 42 migrants were randomly selected by using the migrant household profile from the township administrative office.

The study was approved by the Ethics Committee of Mahidol University (COA. No.2015/168.0605). The permissions from Ministry of Health, Myanmar and the director of regional health department was obtained before collecting the data. Volunteer health workers from the township was selected and trained on how to interview migrants. A face to face interview was conducted at respondent's houses from April to May 2015.

The questionnaire consisting of five parts and socio demographic factors, knowledge, enabling factors, reinforcing factors and perceptions of migrant women for cervical cancer screening. The reliability of questionnaire was measured by Kuder-Richardson formula 20 (KR20) which was 0.642 for the knowledge part. The Cronbach's Alpha coefficient for the perceived threat was 0.597, 0.900 for perceived barriers, 0.870 for perceived benefits, 0.840 for perceived cues to actions.

The socio-demographic part of this study included 8 items such as age, time of migration, marital status, education level, occupation, and family income, number of children and family history of cervical cancer. Income of the family refers to the daily income of all family members presented by Myanmar currency (kyats) and then presented with US dollar after calculating with estimated exchange rate (1 UD dollar = 1000 kyats). The knowledge part was composed of information for risk factors, prevention and usefulness of screening. There are 13 multiple-choice questions for accessing the knowledge of screening. The total score could be 13 and classified into three categories "poor" if the score was <60%, "moderate" if the score between 60%-80% and "high" if the score was >80% according to the Bloom's criteria.

For the part of enabling factors for cervical cancer screening contained 5 questions about the accessibility of screening services and communication with health care providers and in the table only presented for the 3 questions which were significantly associated with uptake of cervical cancer screening. Regarding for the reinforcing factors for cervical cancer screening, this part was originally divided into 3 parts, social support, family support, material support. The questions were asked about social support that the respondents received from volunteer health workers, doctors, nurses, health personal, friends, neighbors and training organized by hospital in terms of information and encouragement. The questions were about support from within the family such as from husbands and relatives in terms of information, encouragement that the respondents received. The questions were asked about material support such as resource for the cervical cancer screening information such as posters, brochures, internet, magazines, Television, radio and newspapers. Total 25 questions were constructed with Yes/ No questions and they can answer more than one answer.

For the perception, the questionnaire were constructed with 30 questions about the perception of migrant women regarding cervical cancer screening. Questions were related with perceived threats perceived benefits perceived barriers and perceived cues to actions for the respondents. It was adapted from the factors and corresponding items in beliefs 28 items Questionnaire (CCP -28 Questionnaire)[21, 22]. A 4-point rating scale was used to prevent the human nature of always choosing the middle in every situation. The mean score was classified into 2 categories by using the median as the cut of point.

The Chi-square test was used to examine associations between each independent variable and utilization of cervical cancer screening. Finally, multiple logistic regression was performed to determine significant predictors for the utilization of cervical cancer screening.

Results

A total of 666 migrant women participated in this study. The prevalence of cervical cancer screening within the previous 3 years was 19.1% (Table 1). Sixty-four percent of the respondents were between 30 and 39 years old and 85.6 % were married. Almost 81% finished primary and middle school and 66.2% were dependent (no income). Women who had more than 3 children were 27.6% in this study. Only 5.4% of women had family history of cervical cancer (Table 2).

Table 3-6 presents the factors significantly associated with cervical cancer screening were marital status, family history of cervical cancer, knowledge, perceived threats, perceived benefits, perceived barriers and perceived cues to actions, enabling factors such as affordability for extra pay to get screening, providers' rapid response for screening services, waiting time at the clinics. Reinforcing factors such as information and encouragement for village health volunteers, nurses, public health personnel, family members and relatives also information from TV and radios, magazines, internet were also significant factors. On the other hand, the following factors were not associated with cervical cancer screening: age group, time of migration, education levels, occupation, income and number of children, travelling time to the clinics, information from friends, neighbors and husband, encouragement from doctors, friends, neighbors, husband and sources of information from books and posters.

After adjusting for age, family history of cervical cancer and, all the significant variables in the Chi-square test were entered to formulate the multiple logistic regression. Perceived barriers (Adj OR = 2.42, 95% CI = 1.45-4.04) and knowledge levels (Adj OR = 2.21, 95% CI = 1.40-3.47) remained significant predictors of cervical cancer screening uptake (Table 7). Migrants who had positive perceptions toward perceived barriers were 2.42 times more likely to have screening than those who had negative perceptions. Migrants with higher level of knowledge were 2.21 times more likely to have cervical cancer screening than those with low level.

Discussion

In this study, the prevalence of cervical cancer screening of women aged between 30 to 49 years who had at least one time of screening within the previous 3 years with Pap smear or VIA method of screening was19.1%. This result was lower than some previous studies. For example, the study done among Swedish immigrant women in Sweden, their cervical cancer screening rate was 49%[19]. Another study done for specific population of Hispanic origin, the overall screening rate was 75% in past 3 year[20]. A cross-sectional survey in 2012 healthcare providers in one of the hospital in Thailand revealed 36.6% have had Pap smear test[10]. The result of this study may be lower than reality because the nature of the migrants were unstable and even though they were already having screening, those women might be moved to others area. Another reason for lower

screening utilization may be due to uneven distribution of screening services centers in Myanmar.

In this study, the women with older age group (40-49 year) were 1.27 times more likely to get cervical cancer screening. However the cohort study done in Germen showed that females of the oldest and middle birth cohort were less likely to be screened compared to the youngest birth cohort. For marital status, married women had four times higher uptake of screening which was higher than this study. This might be due to women aged 30-39 years did not know which age was the standard criteria for having cervical cancer screening, so awareness raising should implement for this age group of women to get cervical cancer screening.

This study showed that women with family history of cervical cancer were 2.23 times more likely to have cervical cancer screening. A study among Japanese women revealed that family history of uterine and breast cancer was associated with uptake of cervical cancer screening regardless of age and life style behaviors[23]. Women who had family history of cervical cancer might have gain experience, knowledge and awareness about cervical cancer. This led to increase uptake of cervical cancer screening than others.

Regarding affordability for extra pay to get screening, migrants who were willingness to pay screening charges were 4.45 times more likely to have screening. The study done in Zaria, Nigeria among market women, the rate of screening was only 15.4%. The main factors associated with low screening practice were high cost of screening and lack of personnel at the screening centers[13]. Cervical cancer screening services should be made affordable cost so that women can easily access to the screening services[24].

Women who were encouraged by the nurses were about 2 times more likely to undergo screening in this study. A study done in rural area of Mexico revealed that increased utilization of screening was associated with social support by community health workers[25]. Emotional social support was associated with cervical cancer screening in Argentinean women from rural population[26]. Advice from the relation, friends in the past was also associated with cervical cancer screening according from the study in Zaria, Nigeria[13].

Migrants who had positive perceptions toward perceived barriers were 2.42 times more likely to have screening than those who had negative perceptions. For the women in Jamaica, the screening of cervical was rely on the perceived barriers that they did not know where to go for getting screening services[27]. The study in Elmina, southern Ghana, showed fear of cancer is one of the barriers for screening and only 0.8% of women undergo screening[12]. The barriers for undergoing cervical cancer screening in this study were lack of knowledge on the age and frequency of screening, place of screening and embarrassed to have genital examination.

The migrants with higher level of knowledge were 2.21 times more likely to have cervical cancer screening than those with poor knowledge level. The similar study done in Southern Ghana showing knowledge for cervical cancer is association with screening and knowledge was directly effect on the women's desire to get screening that women with poor knowledge had not undergone screening[12]. Lack of knowledge on cervical cancer risk factors, sign and

symptoms and also lack of knowledge for screening were main factors for women not using cervical cancer services. For Chinese women's motivation to receive future screening, there was no significant association with the knowledge and future intention for screening[28]. Therefore, to increase the knowledge on cervical cancer, we need to promote the health education programs to the migrant population.

Migrants who had positive perceptions toward perceived threats were 1.57 times more likely to have screening than those who had negative perceptions. However, this association was not significant which contrasted to one of the studies for Malaysian women concerning about their perceptions for susceptibility, benefits and barriers which was done in outpatient clinics. In this study, association was found between perceived susceptibility an uptake of cervical screening[9]. This may be due to low public awareness of cervical cancer in Myanmar. And also there is a need to educate women about the consequences of not having cervical cancer screening. Intervention programs should focus on women's misconceptions and fear about cervical cancer screening.

This study had some limitation. Study design was cross sectional, therefore, the cause and effect could not be find due to time difference. Moreover, there might be recalled bias due to nature of the study. In this study, migrants were not categorized according to the place of origin by states and divisions.

Recommendations

This study proved that there was low prevalence of cervical cancer screening among immigrants in the Northern district of Yangon, Myanmar. Based on the findings, the some recommendations can be made to promote screening among migrants. By understanding the determinants and factors influencing the screening, effective measures to the migrants would be applied. Health education and promotion programs should be organized for migrants to increase uptake of cervical cancer screening. Awareness raising campaign and health education sessions become important to reduce the negative barriers among women.

The information for the place of screening should be easily addressed with simple information provision. Opening hours for cervical cancer screening centers should be flexible and convenient including evening and weekends for working migrants to uptake cervical cancer screening services

The findings from this study indicate that cervical cancer screening programs should be multi-sectorial approaches. Collaboration between governments sectors, NGO sectors and public sectors along with coordination and planning of capacity- building, education, training and communication among women, medical professionals and authorities. Communication with culturally appropriate messages that address women's concerns and correction of misconceptions about cervical cancer screening. Reproductive health education about cervical cancer, risk factors and screening effectiveness should be conducted among the migrant to increase knowledge of cervical cancer. The primary health care providers such as nurses should be included in an important role of any intervention programs which aimed to promote cervical cancer screening. Opportunistic screening in health facilities should be encouraged by the health care providers especially in migrant population. The government should provide the screening test free of charges for VIA testing for the whole country and subsidize Pap smear which can easily afford by the women.

Table 1 Prevalence of cervical cancer screening among migrants

Having screening	Number	Percent
Yes	127	19.1
No	539	80.9

Table 2 Distribution of respondents by socio-demographic factors

Socio – demographic factors	Number	Percent
Age group (years)	**657**	
30-39	421	64.1
40-49	236	35.9
Marital status	**663**	
Single, Divorced, Widow, separated	95	14.4
Married	568	85.6
Income per day (US$)	**663**	
<5	518	80.6
≥5	145	19.4
Education levels	**647**	
Primary, Middle school	523	80.9
High school, university, Bachelor degree and above	124	19.1
Occupation	**656**	
Dependent	434	66.2
Working	222	33.8
Number of Children	**663**	
0-3	480	72.4
>3 and above	183	27.6
Family history of cervical cancer	**665**	
Yes	36	5.4
No	629	94.6

Table 3 Association between study factors and cervical cancer screening

Variables	Having screening in previous 3 years				
	n	Yes %	No %	Crude OR (95% CI)	P-value
Marital status					**0.043***
Single, Divorced, Widow, separated	95	11.6	88.4	1	
Married	568	20.4	79.6	1.94(1.00-3.76)	**0.049***
Family history of cervical cancer					**0.025***
Yes	36	33.3	66.7	2.23(1.08-4.60)	**0.029***
No	629	18.3	81.7	1	
Affordability for extra pay to get screening					**<0.001***
Yes	97	43.3	56.7	4.45(2.79-7.08)	**<0.001***
No	560	14.6	85.4	1	
Provider's rapid response					**0.009***
Yes	379	22.2	77.8	1.77(1.14-2.74)	**0.010***
No	246	13.8	86.2	1	
Waiting time					**0.013***
< 1hr	449	21.6	78.4	1.85(1.13-3.03)	**0.014***
>1 hr	178	12.9	87.1	1	

* P-value <0.05

Table 4 Association between knowledge, perception and cervical cancer screening

Variables	Having screening in previous 3 years				
	n	Yes %	No %	Crude OR (95% CI)	P-value
Knowledge Level					**<0.001***
Poor	243	13.7	86.3	1	
Good	423	28.4	71.6	2.49(1.68-3.69)	**<0.001***
Perceived threats					**0.008***
Negative	301	14.6	85.4	1	
Positive	365	22.7	77.3	1.71(1.14-2.57)	**0.008***
Perceived benefits					**0.006***
Negative	334	15.1	84.9	1	
Positive	319	23.5	76.5	1.72(1.16-2.55)	**0.006***
Perceived barriers					**<0.001***
Negative	330	13.0	87.0	1	
Positive	336	25.0	75.0	2.22(1.48-3.33)	**<0.001***
Perceived cues to actions					**0.035***
Negative	396	16.4	83.6	1	
Positive	270	23.0	77.0	1.51(1.02-2.23)	**0.035***

* P-value <0.05

Table 5 Association between sources of information and cervical cancer screening

Sources of information	Cervical cancer screening within 3 years				
	n	Yes (%)	No (%)	Crude OR (95% CI)	P-value
Village health volunteers					**0.004***
Yes	463	16.2	83.8	0.56(0.37-0.83)	**0.005***
No	203	25.6	74.4	1	
Nurses					**0.001***
Yes	123	29.3	70.7	2.05(1.31-3.22)	**0.002***
No	543	16.8	83.2	1	
Public health personnel					**0.006***
Yes	100	29.0	71.0	1.95(1.20-3.16)	**0.007***
No	566	17.3	82.7	1	
Family members					**0.002***
Yes	47	36.2	63.8	2.62(1.39-4.92)	**0.003***
No	619	17.8	82.2	1	
Information from relatives					**0.014***
Yes	38	34.2	65.8	2.34(1.16-4.72)	**0.017***
No	628	18.2	81.8	1	
Information from internet					**<0.001***
Yes	38	42.1	57.9	3.46(1.76-6.82)	**<0.001***
No	623	17.3	82.7	1	
Information from magazines					**0.043***
Yes	51	29.4	70.6	1.91(1.01-3.62)	**0.046***
No	610	17.9	82.1	1	
Information from TV and radio					**<0.001***
Yes	400	13.8	86.2	0.44(0.29-0.65)	**<0.001***
No	261	26.4	73.6	1	

* P-value <0.05

Table 6 Association between sources of encouragement and cervical cancer screening

Sources of encouragement	Cervical cancer screening within 3 years.				
	n	Yes (%)	No (%)	Crude OR (95% CI)	P-value
Village health volunteers					**0.002***
Yes	446	15.7	84.3	0.53(0.35-0.79)	**0.002***
No	220	25.9	74.1	1	
Nurses					**0.003***
Yes	144	27.8	72.2	1.92(1.24-2.96)	**0.003***
No	522	16.7	83.3	1	
Public health personnel					**<0.001***
Yes	97	33.0	67.0	2.45(1.52-3.95)	**<0.001***
No	569	16.7	83.3	1	
Family members					**0.001***
Yes	39	38.5	61.5	2.87(1.46-5.65)	**0.002***
No	627	17.9	82.1	1	
Relatives					**0.003***
Yes	37	37.8	62.2	2.78(1.38-5.56)	**0.004***
No	629	18.0	82.0	1	

* P-value <0.05

Table 7 Final model of multiple logistic regression for cervical cancer screening uptake

Sources of encouragement	Cervical cancer screening within 3 years[r]	
	Adj. OR (95% CI)	P-value
Age group (years)		
30-39	1	
40-49	1.90 (1.19-3.03)	**0.007***
Family History of Cervical cancer		
Yes	2.89 (1.29-6.48)	**0.010***
No	1	
Affordability for extra pay to get screening		
Yes	4.60 (2.72-7.77)	**<0.001***
No	1	
Encouraging from nurses		
Yes	2.64 (1.53-4.56)	**<0.001***
No	1	
Perceived threats		
Negative	1	
Positive	1.57 (0.94-2.65)	0.085
Perceived barriers		
Negative	1	
Positive	2.42 (1.45-4.04)	**0.001***
Knowledge level		
Poor	1	
Good	2.21 (1.40-3.47)	**0.001***

* P-value <0.05

[r] The non-uptake cervical cancer screening group is the reference.

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