Prevalence and Predictors of Pap-Smear Screening for Cervical Cancer among Married Women in Urban of Mandalay, Myanmar

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Authors' contributions

This work was carried out in collaboration between all authors. Author CPPH designed the study, managed literature search and managed for data collection. Author HHKS performed the statistical analysis and wrote the initial draft of the manuscript. Authors HL and NNT managed literature search and advised for initial draft of the manuscript. Author SM wrote final draft of the manuscript. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: To determine the prevalence of Pap-smear screening, to assess the knowledge regarding cervical cancer and Pap-smear test and to identify the predictors of practice of Pap-smear screening among married women in urban of Mandalay, Myanmar.
Study Design: Cross-sectional study.
Place and Duration of Study: This study was done in urban townships in Mandalay, Myanmar from February–March, 2012.
Methodology: 230 married women were selected using multistage sampling. Interviews were conducted using structured questionnaire by five research assistants. Questionnaire consisted socio-demographic characteristics, past Pap-smear practice, knowledge and perception towards cervical cancer. Practice of Pap-smear screening was defined as ever had a test in life time.

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Results: Of 230 married women, only 38 (16.5%) had reported history of Pap-smear test in their life time of whom 71.1% had the test within last 1 year and 5.2% had within last 3 years. Logistic regression analysis shows that the likelihood to perform Pap-smear screening test was higher in woman age between 36-45 years (adjusted OR = 34.79; 95% CI = 7.1 – 170.2) and woman more than 45 year of age (adjusted OR = 10.1; 95% CI = 1.9 – 51.8). Woman who got married at 20-25 year-old (adjusted OR = 16.4; 95% CI = 1.9 – 142.6) and more than 25 year-old (adjusted OR = 9.5; 95%CI = 1.2 – 75.2) are more likely to have screening compared to woman got married at age of under 20 years. Women having good perception (adjusted OR = 14.5; 95% CI = 3.9 – 53.9) and whose husband were aware about cervical cancer and Pap-smear screening test (adjusted OR = 46.1; 95%CI = 9.7 – 219.6) were significant predictors of having Pap-smear test.
Conclusion: Poor knowledge for cervical cancer and lack of self-care knowledge are immediate concerns to reduce the morbidity as well as mortality of cervical cancer among Myanmar married women.

1. INTRODUCTION

Cancer afflicts all communities worldwide. By 2030, it is expected that 27 million new cancer cases and 17.5 million cancer deaths. Globally cervical cancer is the fourth-most common cancer affecting women and the fourth-leading cause of cancer death in women [1]. The burden of cervical cancer is distributed unequally between developed and developing countries [1] as more than 85% of cervical cancer deaths occurred in low- and middle-income countries [2]. Myanmar is one of the South-East Asia countries and located on Western edge of Indo-China peninsular. In Myanmar, 18.94 million of 15 years and older aged women are at risk of developing cervical cancer [3]. The annual number of new cases of cervical cancer was 5286 and number of death was 2998. The crude incidence rates of cervical cancer was 21.4 per 100,000 and the crude mortality rate is 12.1 per 100,000 women whereas age-standardized cervical cancer incidence rate was 20.6 and mortality rate was 12.3 per 100,000 women [4]. Cervical cancer contributes 12.7% of cancer death among women and it is ranked as the second most common cancer among 15-44 years women [3,4]. In developing countries as Myanmar, most women who died from cervical cancer are in the prime of their life and they may be caring their children and family, and also contributing to their societies. Their death is a tragedy and unnecessary loss to the family as well as to the community. Cervical cancer is one of the most preventable and treatable forms of cancer, as long as it is detected early and managed effectively [5]. Cervical cancer incidence and mortality rates have been declining since the 1960s in many developed countries due to widespread screening and intervention. Regular screening with the Papanicolaou (Pap) test may reduce cervical cancer mortality by as much as 65% [1]. In developed countries, 63% of the women have been screened for cervical cancer, however, only 19% of women in the developing world where Bangladesh, Ethiopia and Myanmar, less than one per cent of women had undergone any form of screening for cervical cancer [6]. Cervical cancer screening and treatment is one of the components of reproductive health services [7] and Department of Health has implemented nationwide education programs using a variety of media, including radio, television, printed posters and pamphlets to raise awareness of prevention and early detection [8]. In 2001-2002, cervical cancer screening coverage in Myanmar was 0.9% in women of aged 18-69 years, whereas in urban area and rural area, screening coverage 1.9% and 0.4% respectively [9]. As knowledge regarding cervical cancer is crucial for increasing uptake of cervical cancer screening, it is important to study the knowledge regarding cervical cancer and its screening among married women living in urban township. Moreover, the data on prevalence of cervical cancer screening among Myanmar married women is sparse. Hence, this study aimed to determine the prevalence of Pap-smear screening, to assess the knowledge regarding cervical cancer and Pap-smear test and to identify the predictors of practice of Pap-smear for cervical cancer screening among married women in urban of Mandalay, Myanmar.

2. MATERIALS AND METHODS

A cross-sectional study was carried out in Mandalay, Myanmar in February–March, 2012. Mandalay city is the second largest city of Myanmar and the estimated population is 1.7

million. Female comprises of 51.2% of total population of whom 57.7% are married. Majority of the population is Buddhist and they are working as own account workers, government employee as well as for private organization [10]. There are 7 townships in urban Mandalay and each township has township hospital where the Pap-smear test is available. This study was conducted in two purposively selected townships (Township A and B) which were overcrowded area.

Sample size calculated was 209 by using formula to estimate single population proportion with 99% confidence interval, estimated prevalence 2%, and error allowance 0.025. 10% of the calculated sample size was added for missing and incomplete responses. A total of 230 married women were selected and multistage sampling was employed in this study. Two townships (A and B) were selected purposively in first stage. Then simple random sampling was used to select one ward from each township. After that each ward was divided into blocks and one block was randomly chosen from each ward. From each block, a random sample of 115 married women were selected using computer generated random table. Women who were age between 25-65 years, mentally sound and willing to give informed consent were included; however, the married women who had total hysterectomy were excluded from this study. When there was more than one woman who met inclusion criteria in the selected household, only one woman was randomly selected. When the selected woman was not available at the time of visit, the research assistant made one more attempt to contact the woman on next day.

Interviews were conducted using structured questionnaire by five research assistants. The research assistants were medical doctors, and were trained and explained about study objectives, methodology and questionnaires prior to data collection. The questionnaire was developed in English and then translated to Burmese language. Pretest was done to check for reliability and validity. Regarding reliability, Cronbach's alpha coefficient was calculated for knowledge and perception items. Cronbach's alpha coefficient for knowledge was 0.84 and Cronbach's alpha coefficient for perception was 0.78. Face validity and content validity were also checked with experts. Questionnaire consisted four parts including socio-demographic characteristics, past Pap-smear practice, knowledge and perception towards cervical

cancer and Pap-smear test. Practice of Pap-smear screening was defined as ever had a test in life time. Knowledge part consisted of 12 items and the correct response was scored 1 and wrong answer or don't know were scored as 0. Perception consisted 21 items, responses were coded on 3 point scales from agree to disagree; the score was given 3 for agree in positive statement and score 3 was given for disagree in negative statement. Regarding knowledge and perception, scores were computed by taking the sum, and scores lower than 80% of total score were considered as low and scores more than 80% were considered as high.

Data was analyzed using SPSS 17.0 version [11]. Descriptive statistic such as frequency, percentage, mean and standard deviation were calculated. In bivariate analysis, Chi-square test was used. The variables with p-value less than 0.1 in bivariate analysis were entered into multivariate logistic regression model to identify the predictors of practice of Pap-smear test. Backward elimination method was used in logistic regression analysis. P value, adjusted odds ratio (OR) and its 95% confidence interval (95% CI) were calculated. All tests were two-sided and the level of significance was set at 0.05.

As the participant's right to self-determination and autonomy was respected, participation is strictly voluntary and informed consent was obtained from each respondent in this study. Confidentiality was maintained and anonymity of responses was ensured. Data was kept secure and made available only to the statistician. All the study procedures were approved by Ethical Review Committee for Research Involving Human Research Subjects, Health Sciences Group, Chulalongkorn University, Bangkok, Thailand.

3. RESULTS

A total of 230 married women between 25 to 62 years of age participated in this study. The mean age was 38.83 years (SD = 9.52) and majority of the women (74.7%) were age under 45 years. More than half of them (53.5%) had high school or university education, though 58.3% of the participants were housewife. The average family income per month ranged from 50 to 1,500 USD when 66.5% of the women had average family income 100 – 300 USD per month. Age of the women when they got married was ranged from 14 years to 34 years. 24.3% of them got married

at age of less than 20 years while 75.7% got married at 20 years or older. Regarding parity, 92.6% of the women reported one or more deliveries (Table 1).

Table 1. Socioeconomic characteristics of respondents (n = 230)

Variables	Number (%)
Age	
25 – 35	96 (41.7)
36 – 45	76 (33.0)
> 45	58 (25.3)
Education	
Read & write + Primary education	52 (22.6)
Middle education	55 (23.9)
High school + University	123 (53.5)
Occupation	
Housewife/Dependent	134 (58.3)
Working women	96 (41.7)
Average family income per month (USD)	
< 100	14 (6.1)
100 – 300	153 (66.5)
> 300	63 (27.4)
Age at marriage	
< 20	56 (24.3)
20 – 25	103 (44.8)
> 25	71 (30.9)
Parity	
None	17 (7.4)
1 – 3	178 (77.4)
>3	35 (15.2)

Of 230 married women, only 38 (16.5%) had reported history of Pap-smear test in their life time, and 27 (71.1%) of them had the test within last 1 year, 2 (5.2%) had within last 3 years while 9 (23.7%) of them forgot the time when they took Pap-smear test. Among them, 30 (78.9%) women had Pap-smear test at private hospital or private clinic, 6 (15.8%) women had Pap-smear test at government hospital while only 2 of them (5.3%) had the screening test at Myanmar Medical Research (Table 2).

In regards to knowledge, all the study participants were asked whether or not they have ever heard of cervical cancer, Pap-smear screening test and additional 12 questions to evaluate the level of knowledge. All of the respondents had heard about cervical cancer and Pap-smear test (data not shown), but only 20.4% had good knowledge and the rest (79.6%) had poor knowledge regarding cervical cancer and Pap-smear screening test. However, 59.1% of the women reported that their husband were

aware about cervical cancer and Pap-smear test. Only 37.8% of the women had health talk about cervical cancer and Pap-smear test by health professional in their life time. The main source of information were television and radio (83.9%) followed by magazine and newspaper (49.1%), health professionals (doctors, nurses, and other health staffs) (37.8%) and family members and friends (31.7%) (Table 3).

Table 2. Practice of Pap-smear test among married women (n = 230)

Variables	Number (%)
Ever had Pap smear test	
Yes	38 (16.5)
No	192 (83.5)
Past Pap-smear test (n = 38)	
Within last 1 year	27 (71.1)
Within last 3 years	2 (5.2)
Forgot the time	9 (23.7)
Place at which Pap-smear test was taken (n = 38)	
Government hospital	6 (15.8)
Private hospital	19 (50.0)
Private clinic	11 (28.9)
Others (Myanmar Medical Research)	2 (5.3)

All the women were asked to answer 20 questions about perception including perceived susceptibility, perceived severity, perceived barrier and perceived benefit to determine the level of perception. Similar to knowledge, 23.9% of the women had good perception and 76.1% had poor perception on cervical cancer and Pap-smear screening test (Table 3).

Tables 4 and 5 show bivariate analysis and multivariate logistic regression analysis revealing the predictors of practice of Pap-smear test among married women. In bivariate analysis, age of the woman, education, age at marriage, knowledge and perception of the women, husband's awareness of cervical cancer and Pap-smear test, having health talk by health professionals were significantly associated with practice of Pap-smear test (Table 4).

The variables which had *P* value <0.1 were entered into multivariate logistic regression model to identify the predictors of practice of Pap-smear test. Table 5 displays the multivariate logistic regression analysis revealing adjusted odds ratio (adjusted OR) and corresponding 95% CI for practice of Pap-smear test after adjusting

other covariates. The likelihood to perform Pap-smear screening test was significantly higher among woman in the 36-45 age category (adjusted OR = 34.79; 95% CI = 7.1 – 170.2) and older woman of above 45 years (adjusted OR = 10.1; 95% CI = 1.9 – 51.8) compared to those in 25-35 age range. Similarly, woman who got married at older age are more likely to use screening as marital age at 20-25 years (adjusted OR = 16.4; 95% CI = 1.9 – 142.6) and more than 25 years (adjusted OR = 9.5; 95% CI = 1.2 – 75.2) compared to woman got married at younger age of under 20 years. Moreover, women having good perception (adjusted OR = 14.5; 95% CI = 3.9 – 53.9) and whose husband was aware about cervical cancer and Pap-smear screening test (adjusted OR = 46.1; 95% CI = 9.7 – 219.6) were significant predictors of having Pap-smear test. Education, average monthly family income, women's knowledge of cervical cancer and Pap-smear test and having health talk by health professionals were not significantly associated with practice of Pap-smear screening test (Table 5).

Table 3. Knowledge and perception regarding cervical cancer and Pap-smear test among married women (n = 230)

Variables	N (%)
Knowledge of cervical cancer and Pap-smear test	
Poor	183 (79.6)
Good	47 (20.4)
Husband's awareness on Cervical cancer and Pap-smear test	
Yes	136 (59.1)
No	94 (40.9)
Have health talk about cervical cancer and Pap-smear test by health professionals	
Yes	87 (37.8)
No	143 (62.2)
Source of information[#]	
Family / Friends	73(31.7)
Television / Radio program	193 (83.9)
Magazine / Newspaper	113 (49.1)
Health professionals	87 (37.8)
Perception of cervical cancer and Pap-smear test	
Poor	175 (76.1)
Good	55 (23.9)

 # Multiple responses answer

4. DISCUSSION

This study was conducted in an urban area in Mandalay which is located in central Myanmar to determine the prevalence, knowledge, perception and factors that influenced Pap smear screening test for cervical cancer among married women. In 2001-2002, cervical cancer screening coverage in Myanmar was 0.9% in women of aged 18-69 years, whereas in urban area and rural area, screening coverage 1.9% and 0.4% respectively [9]. In 2003, the prevalence for effective cervical cancer screening was approximately 1% while the crude coverage rate for pelvic examination was about 45% in Myanmar [12]. In Myanmar, population based cervical cancer screening programmes are difficult to be implemented due to limited resources, lack of infrastructure and poverty [13]. The community-based screening programme using visual inspection with acetic acid (VIA) was conducted in Kungyangon Township in Yangon Region and it showed that the screening coverage was 8.97% among married women [13]. Our study found the prevalence of Pap-smear screening test was 16.5% in the woman's life time of whom 71.1% had the test within last 1 year and 5.2% had within last 3 years, which was lower compared to other developing countries in which crude and effective cervical cancer screening coverage were 45% and 19% respectively [12]. In 2015, the cross-sectional study was conducted among rural to urban migrant women in Myanmar which revealed the prevalence of cervical cancer screening in the previous 3 years was 19.1% [14]. The awareness about cervical cancer was low among the public in Myanmar and the majority of women do not have routine health checkup including cervical cancer screening [15]. In this study, we found that 15.8% had their Pap smear screening test in Government facilities while 78.9% had their Pap smear screening test in the private sectors such as private hospitals or specialist clinics. In Myanmar, most of the people rely on private health-care providers due to waiting times, inadequate supplies of essential medicine and equipment and shortage of health staffs, and perceived quality of care [16].

This study also showed that women's age, age at marriage, perception towards cervical cancer and screening test and husband awareness upon disease and screening are the significant factors for practice of Pap smear screening among married women after adjusting covariates. The likelihood to have Pap smear screening test was

significantly higher in older age group of 36-45 years and more than 45 years compared to younger women. The Pap smear test coverage was highest among women of age between 36-45 years which is similar to the study done among Thai women [17]. Other studies also indicated that middle aged and older women were more likely to take cervical cancer screening [14,18,19]. Similarly cervical cancer screening was highest among women who got married after 25 years old and they are significantly more likely to take screening than who married at younger age. When people get older, health supervision becomes important priority and they make more visits for check-ups, investigation and management of acute and chronic health problems [20].

Table 4. Bivariate analysis for determinants of practice of Pap-smear test

Variable	Ever had Pap-smear test		X^2	*P* value
	Yes	**No**		
Age (years) †				
25 – 35	9 (9.4)	87 (90.6)	10.670	0.005
36 – 45	21 (27.6)	55 (72.4)		
> 45	8 (13.8)	50 (86.2)		
Education†				
Read & write + Primary education	8 (15.4)	44 (84.6)	7.562	0.023
Middle education	3 (5.5)	52 (94.5)		
High school + University	27 (22.0)	96 (78.0)		
Occupation				
Housewife/Dependent	19 (14.2)	115 (85.8)	1.28	0.28
Working women	19 (19.8)	77 (80.2)		
Income†				
≤ 300 USD	23 (13.8)	144 (86.2)	3.34	0.07
>300 USD	15 (23.8)	48 (76.2)		
Age at marriage†				
< 20	2 (3.6)	54 (96.4)	9.922	0.007
20 – 25	19 (18.4)	84 (81.6)		
> 25	17 (23.9)	54 (76.1)		
Parity				
0	0 (0)	17 (100)	3.648	0.16
1 – 3	32 (18.0)	146 (82.0)		
>3	6 (17.1)	29 (82.9)		
Knowledge†				
Poor knowledge	23 (12.6)	160 (87.4)	10.15	0.003
Good knowledge	15 (31.9)	32 (68.1)		
Perception†				
Poor perception	22 (12.6)	153 (87.4)	8.28	0.006
Good perception	16 (29.1)	39 (70.9)		
Husband's awareness on Cervical cancer and Pap-smear test†				
No	5 (5.3)	89 (94.7)	14.47	<0.001
Yes	33 (24.3)	103 (75.7)		
Have health talk about cervical cancer and Pap-smear test by health professionals†				
No	6 (16.5)	137 (95.8)	41.644	<0.001
Yes	32 (36.8)	55 (63.2)		

† Variables included in multivariate logistic regression analysis due to bivariate p-value <0.1

Table 5. Logistic regression analysis for predictors of practice of Pap-smear test

Variable	Ever had Pap-smear test		Adjusted OR (95% CI)	*P* value
	Yes	No		
Age (years)				
25 – 35	9 (9.4)	87 (90.6)	1 (reference)	
36 – 45	21 (27.6)	55 (72.4)	34.79 (7.1 – 170.2)	<0.001
> 45	8 (13.8)	50 (86.2)	10.1 (1.9 – 51.8)	0.005
Education				
Read & write + Primary education	8 (15.4)	44 (84.6)	1 (Reference)	
Middle education	3 (5.5)	52 (94.5)	1.1 (0.2 – 7.3)	0.93
High school + University	27 (22.0)	96 (78.0)	2.3 (0.6 – 8.3)	0.19
Income				
≤ 300 USD	23 (13.8)	144 (86.2)	1 (Reference)	
>300 USD	15 (23.8)	48 (76.2)	0.8 (0.3 – 2.3)	0.71
Age at marriage				
< 20	2 (3.6)	54 (96.4)	1 (Reference)	
20 – 25	19 (18.4)	84 (81.6)	16.4 (1.9 – 142.6)	0.011
> 25	17 (23.9)	54 (76.1)	9.5 (1.2 – 75.2)	0.033
Knowledge				
Poor knowledge	23 (12.6)	160 (87.4)	1 (Reference)	
Good knowledge	15 (31.9)	32 (68.1)	0.5 (0.2 – 1.6)	0.27
Perception				
Poor perception	22 (12.6)	153 (87.4)	1 (Reference)	
Good perception	16 (29.1)	39 (70.9)	14.5 (3.9 – 53.9)	<0.001
Husband's awareness on cervical cancer and Pap-smear test				
No	5 (5.3)	89 (94.7)	1 (Reference)	
Yes	33 (24.3)	103 (75.7)	46.1 (9.7 – 219.6)	<0.001
Have health talk about cervical cancer and Pap-smear test by health professionals				
No	6 (16.5)	137 (95.8)	1 (Reference)	
Yes	32 (36.8)	55 (63.2)	2.6 (0.6 – 11.3)	0.19

OR; Odds Ratio. 95% CI; 95% Confidence Interval

In this study, more than half of the participants finished high school or university education. Educational attainment is linked with health as it can lead to increase health knowledge, healthy promoting behaviors and better decision making in health-related options for healthy life [21]. Though there was no significant association between women's education and practice of Pap smear test, the proportion of women who practice Pap smear test was highest among those finish high school or university education which is similar to other studies [18,19,22,23]. Generally person with higher educational attainment has better jobs and higher income which can enable the individual to access health care for prevention and management of diseases [21]. In our study 23.8% of women who had income of >300USD had Pap smear test compared to 13.8% of lower income women.

In this study, there was no significant association between knowledge of the women and practice of Pap smear screening. However, the study done among rural to urban migrant women in Myanmar found the knowledge was significant determinant of cervical cancer screening [14] as in other studies [23,24]. We found that more than three-fourth of the women had poor knowledge of disease and screening which was similar to the other study in which 86.3% of Myanmar women had poor knowledge [14]. The finding highlighted the knowledge deficits among married women regardless of educational attainment. The need for providing adequate information about cervical

cancer and screening test is the priority issue among women. Our study found that about 60% of the husbands of respondents were aware of the disease and benefits of cervical cancer screening test. Women were more likely to have Pap smear screening if their husband were aware of disease and screening test which was similar to the other study which showed that the significant association between family member's awareness and women's uptake of cervical cancer screening test [14].

Perception such as perceived susceptibility, severity, benefits and barriers were important predictors to utilize screening services [18,25,26,27]. This study found that the women with good perception towards cervical cancer and Pap smear screening were significantly more likely to have Pap smear test as in the other study [14]. In general, it is believed that individuals will take action to screen for, or to control an ill-health condition if they regard themselves as susceptible to the condition, if they believe that a course of action available to them would be beneficial in reducing either their susceptibility to or the severity of the condition, and if they believe that the anticipated barriers to (or costs of) taking the action are outweighed by its benefits [28].

Health education is needed to promote health behaviour and the proper use of these services [29]. Though it is not significant, women who had health talk about cervical cancer and screening test from health professionals such as doctors, nurses and other health care persons were more likely to access to Pap smear screening test. Being personal and direct, it is more persuasive and effective and it is particularly important in influencing the decisions of undecided persons [30]. However, communicating people with electronic mass media can play an important role in educating the community. In this study, majority of the women had information regarding the disease and screening programme through media channels.

This study relied on self-reported practice of screening and we were unable to check or link the medical records, therefore, the rates might be different from actual rates of cervical cancer screening. In this study, we did not assess women's knowledge on HPV and HPV vaccination which has an important role in cervical cancer. Moreover, this study is done among the married women who were living in urban area of large city, the results cannot be generalized for all married women in Myanmar.

5. CONCLUSION

This study provides the prevalence and predictors of cervical cancer screening among married women residing in urban township in Myanmar. In this study, 16.5% of the women had Pap-smear test in their life time of whom 71.1% had the test within last 1 year and 5.2% had within last 3 years which was lower compared to effective cervical cancer screening rate in neighboring countries and other developing countries. Moreover, more than three-fourth of the women in this study had poor knowledge of disease and screening test It was also shown that woman's perception towards cervical cancer and husband's awareness on disease and screening test were significant predictors for uptake of screening test. This study highlighted that not only appropriate channels for providing health education regards to cervical cancer screening, but also implementation of accessible and affordable screening program is the essential for increasing screening utilization which will lead to reducing morbidity, mortality and better quality of life among Myanmar women.

CONSENT

All authors declare that written informed consent was obtained from all participants.

ETHICAL APPROVAL

Approval to conduct the study was obtained from Ethical Review Committee For Research Involving Human Research Subjects, Health Sciences Group, Chulalongkorn University, Bangkok, Thailand.

ACKNOWLEDGEMENTS

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. American Cancer Society. Global cancer facts & figures. 3rd Ed. Atlanta: GA; 2007.
2. World Health Organization. Human papillomavirus (HPV) and cervical cancer. Fact sheet.
   (Accessed 28 June 2016).
   Available:http://www.who.int/mediacentre/factsheets/fs380/en/
3. World Health Organization. Cancer country profiles 2014: Myanmar.
   (Accessed 6 June 2016).
   Available:http://www.who.int/cancer/country-profiles/en/
4. Institut Català d'Oncologia HPV information centre. Myanmar, Human Papillomavirus and Related Cancers, Fact Sheet; 2016.
5. World Health Organization. A guide to essential practice: Comprehensive cervical cancer control. Switzerland. WHO; 2006.
6. Campbell C. Lack of cervical cancer screening 'putting women at risk'; 2008.
   (Accessed 6 June 2016).
   Available:http://www.scidev.net/en/news/lack-of-cervical-cancer-screening-putting-women-at-1.html
7. World Health Organization, Myanmar. Child, adolescent and reproductive health.
   (Accessed 5 July 2009).
   Available:http://www.whomyanmar.org/EN/Section3_62.htm
8. Phyu KH. Early diagnosis, proper care essential for cure of cancer. The Myanmar Times. 2005;14:267.
9. Thida M, Thina KM, Thein ZM, Sein YY, Nyunt T, Sanda. Effectiveness, safety and accepatability of the method of visual inspection with acetic acide (VIA) and cryotherapy based single-visit approach to cervical cancer prevention (CCP) in Kungyangon Township, Yangon Region, Myanmar. Myanmar Medical Journal. 2015;57(3):48-56.
10. Department of Population, Ministry of Immigration and Population. The 2014 Myanmar Population and Housing Census. Mandalay Region: Census report volume 3-1; 2015.
    (Accessed 15 August 2016).
    Available:http://www.dop.gov.mm/moip/index.php?route=product/category&path=54_49
11. SPSS Inc. Released. SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc; 2008.
12. Gakidou E, Nordhagen, Obermeyer Z. Coverage of cervical cancer screening in 57 countries: Low average levels and large inequalities. PLoS Medicine. 2008;5(6):e132.
13. Denny L, Quinn M, Sankaranarayanan R. Chapter 8: Screening for cervical cancer in developing countries. Vaccine. 2006; 24(S3):S371-S3/77.
14. Nandar CS, Chompuku J, Laosee O. Determinants of cervical cancer screening among migrants in Nothern district of Yangon, Myanmar. Journal of Public Health and Development. 2015;13(2):17-31.
15. American Society of Clinical Oncology. Researcher spotlight on conquer cancer foundation interational innovation grant recipient Mya Thida, MBBS; 2015.
    (Accessed 15 August 2016).
    Available:http://www.ascopost.com/issues/april-25-2015/researcher-spotlight-on-conquer-cancer-foundation-international-innovation-grant-recipient-mya-thida-mbbs/
16. Myint P, Sein TT, Cassels A. What are the challenges facing Myanmar in progressing towards universal health coverage? Policy Note #1: Myanmar health systems in transition policy notes series. Asia Pacific Observatory on Health Systems and Policies.
    (Accessed 16 August 2016).
    Available:www.wpro.who.int/asia_pacific.../myanmar_pns1_en.pdf
17. Swaddiwudhipong W, Nguntra P, Mahasakpan P, Chaovakiratipong C, Tatip Y. Coverage and use of cervical cancer screening among women Maesot, Tak province. Journal of Health Science. 1998; 7(1):20-25.
18. Bessler P, Aung M, Jolly P. Factors affecting uptake of cervical cancer screening among clinic attendees in Trelawny, Jamaica. Cancer Control. 2007; 14(4):396-404.

19. Damiani G, Federic B, Basso D, Ronconi A, Bianchi CBNA, Anzellotti GM, Nasi G, Sassi F, Ricciardi W. Socioeconomic disparities in the uptake of breast and cervical cancer screening in Italy: A cross sectional study. BMC Public Health. 2012; 12:99.

20. Yaffe MJ, Stewart MA. The problems and concerns of middle age. CAN. FAM. Physician. 1984;30:1089-1093.

21. Robert Wood Johnson Foundation. Commision to build a healthier America. Issue brief 6: Education and Health; 2009.

22. Nguye TT, McPhee SJ, Nguyen T, Lam T, Mock J. Predictors of cervical pap smear screening awareness, intention, and receipt among Vietnamese-American women. Am J Prev Med. 2002;23(3):207–214.

23. Leung SSK, Leung I. Cervical cancer screening: Knowledge, health perception and attendance rate among Hong Kong Chinese women. International Journal of Women's Health. 2010;2:221-228.

24. Lyimo FS, Beran TN. Demographic, knowledge, attitudinal and accessibility factors associated with uptake of cervical cancer screening among women in a rural district of Tanzania: Three public policy implications. BMC Public Health. 2012; 12:22.

25. Kim SE, Pérez-Stable EJ, Wong S, Gregorich S, Sawaya GF, Walsh JME, Kaplan CP. Association between cancer risk perception and screening behavior among diverse women. Arch Intern Med. 2008;168(7):728-734.
DOI: 10.1001/archinte.168.7.728

26. Lerman C, Daly M, Sandds C, Balshem A, Lustbader E, Heggan T, Goldstein L, James L, Engstrom P. Mammography adherence and psychological distress among women at risk for breast cancer. J Natl Cancer Inst. 1993;85(13):1074-1080.

27. Calvocoressi L, Kasl SV, Lee CH, Stolar M, Claus EB, Jones BA. A prospective study of perceived susceptibility to breast cancer and nonadherence to mammography screening guidelines in African American and white women ages 40 to 79 years. Cancer Epidemiol Biomarkers Prev. 2004;13(12):2096-2105.

28. Glanz K, Lewis FM, Rimer BK. Health behavior and health education, Theory, Research, and Practice. 2nd ed. San Francisco, CA: Jossey-Bass; 1997.

29. World Health Organization. Education for health: Manual on health education in primary health care. Geneva: WHO; 1978.

30. Park K. Park's textbook of preventive and social medicine. 18th ed. Jabalpur, India: M/s Banarsidias Bhanot Publishers; 2005.

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