

Factors Associated with Utilization of Uterine Cervical Cancer Screening Services by Korean Women using the Andersen Behavioral Model

Hyejin Park

Department of International Medical Management, Catholic University of Daegu, Kyungbuk 712-702, Republic of Korea.

hjpark@cu.ac.kr

Abstract: Utilization of cervical cancer screening is an important step to management, prevention, and treatment of cervical cancer. The aim of this study was to examine the association between utilization of cervical cancer screening with predisposing, enabling, and need factors in a population-based sample of Korean women. In the cross-sectional study using data from 3129 participants aged 18 and older, utilization of cervical cancer screening was associated with predisposing factors including age, education level, and marital status. In addition, need factors including self-perceived health were also associated with utilization. However, enabling factors such as income and place of residence were not associated with utilization of screening. This study found a statistically significant association between determinants of health service use and utilization of cervical cancer screening among Korean women.

[Park H. **Factors Associated with Utilization of Uterine Cervical Cancer Screening Services by Korean Women using the Andersen Behavioral Model.** *Life Sci J* 2014;11(3):250-253]. (ISSN:1097-8135). <http://www.lifesciencesite.com>. 36

Keywords: Cervical cancer; screening; Anderson's model; predisposing factor; enabling factor; need factor

1. Introduction

Cervical cancer is one of the most common malignancy among women worldwide. It is diagnosed in almost half a million women each year and half as many die from it annually (Duarte-Franco and Franco, 2004). In Korea, cervical cancer is the eighth leading cause of cancer-related deaths (MOHW, 2010). However, the incidence of cervical cancer has decreased in many countries (Boulanger and Naepels, 2001; Bray et al., 2005). In most of these countries, the decline in the occurrence of cervical cancer is associated with the implementation of cervical cancer screening programs (Lawson et al., 2000; Valdespino and Valdespino, 2006). Reduced incidence of cervical cancer or implementation of cervical cancer screening is related to multiple factors such as age, place of residence, income, and socioeconomic status (Dietrich et al., 2006; Ng et al., 2004; Yabroff et al., 2005). Indeed, there is growing evidence linking factors such as socioeconomic status and utilization of cancer screening programs (Krieger et al., 1999).

Andersen's model of health care utilization has been widely used to identify priority areas of intervention for improving the use of cancer screening. In this model, use of services is defined as a function of 3 main elements: predisposing, enabling, and need factors. Predisposing factors include demographic variables, socioeconomic status, attitudes, and beliefs. Need factors include the self-perceived health status, restricted activity, and activities of daily living. Finally, enabling factors

include items such as the individual's income and access to a source of regular care (Garfield et al., 1976; Jahangir et al., 2012; Levkoff et al., 1987; Wolinsky, 1978).

Under this theoretical framework, the purpose of this study was to investigate factors associated with cervical cancer screening among Korean women using data from the 2009 Korea National Health and Nutrition Examination Survey (KNHANES), a nationally representative survey conducted in the Republic of Korea.

2. Material and Methods

2.1. Study population. This study was based on data from the 2009 KNHANES, provided by the Korea Centers for Disease Control and Prevention. The sample for KNHANES was selected using a stratified, multistage, cluster-sampling design with proportional allocation based on the National Census Registry. Detailed information on survey design and sampling procedures has been reported elsewhere (Chin et al., 2013). In total, 3129 women aged 18 years and older who had no missing response on the questionnaire were included.

2.2. Data collection. KNHANES included well-established questions to determine demographic and socioeconomic characteristics of the subjects. These included questions on age, gender, education level, marital status, income, place of residence, and perceived health status. Education level was categorized as less than a middle school graduate, middle school graduate, high school graduate, and

college or higher. Income was calculated by dividing the square root of household size by the monthly household income, according to the method of the Organization for Economic Cooperation and Development (OECD, 2009). Then, income was categorized by quartiles based on the income of the participant's age group. Information on cervical cancer screening was obtained by a self-administered questionnaire. The study protocol was approved by the Korean Ministry of Health and Welfare and was conducted in accordance with the Ethical Principles for Medical Research Involving Human Subjects, as defined by the Helsinki Declaration. All study participants provided written informed consent.

2.3. Statistical analysis. The frequency and percentage were calculated for demographic characteristics to describe the sample population according to determinants of cervical cancer screening. Logistic regression models were used to estimate the odds ratio (OR) and 95% confidence intervals (CIs) for cervical cancer screening among participants who had different predisposing, enabling, and need factors. All statistical analyses were conducted using SAS software (ver. 9.3; SAS Institute, Cary, NC, USA). Statistical analyses accounted for the survey design, and appropriate procedures in SAS such as `surveyfreq` and `surveylogistic` were used with weighted data.

3. Results

This study included 3129 women aged 18–95 years; their prevalence of predisposing, enabling, and need factors among study participants are presented in Table 1. The mean age of the study participants was 50.1 years and 1732 (55.4%) participants underwent cervical cancer screening. Table 2 shows the ORs for the association between predisposing, enabling, and need factors with receiving cervical cancer screening. Compared with participants aged 18–34, the ORs were 6.09 (95% CI 4.72–7.86) among those aged 35–49, 7.13 (95% CI 5.29 – 9.60) among those aged 50 – 64, and 2.48 (95% CI 1.91 – 3.22) among those aged ≥ 65 . The ORs for cervical cancer screening were negatively correlated with increased educational level (p for trend = 0.003). Compared with participants with lower educational attainment (< middle school), the ORs were 1.08 (95% CI 0.78–1.47) among those had a middle school diploma, 0.73 (95% CI 0.59–0.92) among those had a high school diploma, and 0.70 (95% CI 0.54–0.91) among those who reach the level of college graduate or higher. In marital status, “other than married” status significantly lowered OR for cervical cancer screening compared with married status (OR 0.04, 95% CI 0.02–0.05).

The trends in ORs with general perceived health were associated with cervical cancer screening (p for trend = 0.006). Compared with participants with excellent perceived health status, the ORs were 1.28 (95% CI 1.03–1.57) among those with good perceived health status, and 1.38 (95% CI 1.13–1.69) among those with bad perceived health status. On the other hand, enabling factors such as income and place of residence had no significant effect on the utilization of cervical cancer screening.

Table 1. Prevalence of predisposing, enabling, and need factors among study population

Characteristics	N	%
Predisposing factors		
Age (years)		
18–34	755	24.1
35–49	776	24.8
50–64	752	24.0
≥ 65	846	27.1
Education		
< Middle school	1234	39.5
Middle school	331	10.6
High school	940	30.0
> High school	624	19.9
Marital status		
Married	2620	83.7
Other	509	16.3
Enabling factors		
Personal income		
1 quartile (lowest)	834	26.7
2 quartile	790	25.2
3 quartile	776	24.8
4 quartile (highest)	729	23.3
Place of residence		
Urban	2290	73.2
Rural	839	26.8
Need factors		
General perceived health		
Bad	974	31.1
Good	957	30.6
Excellent	1198	38.3
Limitation of activity within 2 weeks		
No	2029	64.8
Yes	1100	35.2

Table 2. Odds ratios and 95% confidence intervals for cervical cancer screening by predisposing, enabling, and need factors

Characteristics	OR (95% CI)	p for trend
Predisposing factors		
Age (years)		<0.001
18–34	1.00 (reference)	
35–49	6.09 (4.72–7.86)	
50–64	7.13 (5.29–9.60)	
≥65	2.48 (1.91–3.22)	
Education		0.003
< Middle school	1.00 (reference)	
Middle school	1.08 (0.78–1.49)	
High school	0.73 (0.59–0.92)	
> High school	0.70 (0.54–0.91)	
Marital status		<0.001
Married	1.00 (reference)	
Other	0.04 (0.02–0.05)	
Enabling factors		
Personal income		0.228
1 quartile (lowest)	1.00 (reference)	
2 quartile	1.24 (1.00–1.53)	
3 quartile	1.13 (0.92–1.40)	
4 quartile (highest)	1.18 (0.94–1.49)	
Place of residence		0.281
Urban	1.00 (reference)	
Rural	1.15 (0.89–1.50)	
Need factors		
General perceived health		0.006
Bad	1.38 (1.13–1.69)	
Good	1.28 (1.03–1.57)	
Excellent	1.00 (reference)	
Limitation of activity within 2 weeks		0.057
No	1.00 (reference)	
Yes	1.17 (1.00–1.37)	

4. Discussions

In this study we explored the determinants of utilization to cervical cancer screening among Korean women using the Andersen's model of health care utilization. Using data from the 2009 KNHANES, we have demonstrated that predisposing and need factors are significantly associated with utilization to cervical cancer screening. Amongst predisposing determinants, increasing age and a married status had the largest associations with utilization. While it may be natural that older individuals will seek regular medical screening, it is notable that middle-aged adults (age 35–64) appear to undergo cervical cancer screening most frequently.

In this study, need factors were also associated with utilization of cervical cancer screening. This implies that individuals who have a poor perception of their own health may seek medical care more frequently. However, the relationship between enabling factors including income and utilization of cervical cancer screening was not evident among Korean women. Since most of Korean is insured by national health insurance, personal income may not be an important barrier to utilization (Pagan et al., 2007; Salinas et al., 2010).

The present study has several limitations. Using self-reported responses may lead to information bias and some of important factors involved in the utilization of cervical cancer screening may not be included in this study. Additionally, as a result of the cross-sectional design, the results only demonstrated associations and could not be used to determine causality. Future studies investigating the causation are required to confirm and extend the results of this study.

Acknowledgements:

This work was supported by research grants from Catholic University of Daegu in 2013.

Corresponding Author:

Dr. Hyejin Park
Department of International Medical Management
Catholic University of Daegu
Kyungbuk 712-702, Republic of Korea
E-mail: hjpark@cu.ac.kr

References

- Duarte-Franco E, Franco EL. Cancer of the uterine cervix. *BMC Womens Health* 2004;4(suppl 1):S13.
- Korea Ministry of Health & Welfare (MOHW). Cancer facts & figures 2010 in the Republic of Korea. Seoul (Korea), Ministry of Health & Welfare, Seoul, Korea, 2010.

3. Boulanger JC, Naepels P. Screening and diagnosis of cervical cancer. *Rev. Prat.* 2001;51:1426–1431.
4. Bray F, Carstensen B, Møller H, Zappa M, Zakelj MP, Lawrence G, Hakama M, Weiderpass E. Incidence trends of adenocarcinoma of the cervix in 13 European countries. *Cancer Epidemiol. Biomarkers Prev.* 2005;14:2191–2199.
5. Lawson HW, Henson R, Bobo JK, Kaeser MK. Implementing recommendations for the early detection of breast and cervical cancer among low-income women. *MMWR Recomm. Rep.* 2000;49:37–55.
6. Valdespino VM, Valdespino VE. Cervical cancer screening: state of the art. *Curr. Opin. Obstet. Gynecol.* 2006;18:35–40.
7. Dietrich AJ, Tobin JN, Cassells A, Robinson CM, Greene MA, Sox CH, Beach ML, DuHamel KN, Younge RG. Telephone care management to improve cancer screening among low-income women: a randomized, controlled trial. *Ann. Intern. Med.* 2006;144:563–571.
8. Ng E, Wilkins R, Fung MF, Berthelot JM. Cervical cancer mortality by neighbourhood income in urban Canada from 1971 to 1996. *CMAJ* 2004;170:1545–1549.
9. Yabroff KR, Lawrence WF, King JC, Mangan P, Washington KS, Yi B, Kerner JF, Mandelblatt JS. Geographic disparities in cervical cancer mortality: what are the roles of risk factor prevalence, screening, and use of recommended treatment? *J. Rural Health* 2005;21:149–157.
10. Krieger N, Quesenberry C Jr, Peng T, Horn-Ross P, Stewart S, Brown S, Swallen K, Guillermo T, Suh D, Alvarez-Martinez L, Ward F. Social class, race/ethnicity, and incidence of breast, cervix, colon, lung, and prostate cancer among Asian, black, Hispanic, and white residents of the San Francisco Bay Area, 1988–92. *Cancer Causes Control* 1999;10:525–537.
11. Garfield SR, Collen MF, Feldman R, Soghikian K, Richart RH, Duncan JH. Evaluation of an ambulatory medical-care delivery system. *N. Engl. J. Med.* 1976;294:426–431.
12. Jahangir E, Irazola V, Rubinstein A. Need, enabling, predisposing, and behavioral determinants of access to preventative care in Argentina: analysis of the national survey of risk factors. *PLoS One.* 2012;7:e45053.
13. Levkoff SE, Cleary PD, Wetle T. Differences in determinants of physician use between aged and middle-aged persons. *Med. Care* 1987;25:1148–1160.
14. Wolinsky FD. Assessing the effects of predisposing, enabling, and illness-morbidity characteristics on health service utilization. *J. Health Soc. Behav.* 1978;19:384–396.
15. Chin SO, Rhee SY, Chon S, Hwang YC, Jeong IK, Oh S, Ahn KJ, Chung HY, Woo JT, Kim SW, Kim JW, Kim YS, Ahn HY: Sarcopenia is independently associated with cardiovascular disease in older Korean adults: the Korea National Health and Nutrition Examination Survey (KNHANES) from 2009. *PLoS One* 2013;8:e60119.
16. OECD. What are equivalence scales? Paris, France, 2009.
17. Pagan JA, Puig A, Soldo BJ. Health insurance coverage and the use of preventive services by Mexican adults. *Health Econ.* 2007;16:1359–1369.
18. Salinas JJ, Al Snih S, Markides K, Ray LA, Angel RJ. The rural-urban divide: health services utilization among older Mexicans in Mexico. *J. Rural Health* 2010;26:333–341. Duarte-Franco E, Franco EL. Cancer of the uterine cervix. *BMC Womens Health* 2004;4(suppl 1):S13.

2/8/2014