Factors associated with cervical cancer screening behaviors among young married female (aged 20-29) immigrants in South Korea

Sae Mi Park, MD[1], Joo Won Lee, MD[1], Yunhee Lee, MPH[2], Jun-Pyo Myong, MD, PhD[3],
Ha Kyun Chang, MD, PhD[1], Kyung-Jin Min, MD, PhD[1], Nak Woo Lee, MD, PhD[1]

[1]Department of Obstetrics and Gynecology, Korea University Ansan Hospital, Korea University College of Medicine, Ansan, Departments of [2]Urology, [3]Occupational & Environmental Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea

Objective

To identify factors that affect the participation of female immigrants in their 20s in the national cervical cancer screening programs.

Methods

Data were obtained from the National Health Insurance Services from 2016 to 2017. A total of 17,730 women who agreed to undergo cervical cancer screening during 2016-2017 were included in the study.

Results

Of the 17,730 women, 8,149 (46%) participated in cervical cancer screening, whereas, 9,581 (54%) did not. Logistic regression analysis of factors related to cervical cancer screening showed that the odds ratio (OR) of screening was higher in short duration of stay (OR, 1.18; 95% confidence interval [CI], 1.03-1.35), Chinese nationality (OR, 1.43; 95% CI, 1.28-1.59), unemployment (OR, 1; 95% CI, reference), participation in general health screening (OR, 4.16; 95% CI, 3.24-5.33), and comorbidities (OR, 1.16; 95% CI, 1.09-1.24) when compared to the other populations. The highest OR was associated with participation in general health screening.

Conclusion

Appropriate programs should be developed to increase participation of socially vulnerable groups in cervical cancer screening. Such programs will improve awareness regarding cervical cancer screening and reduce disparities in healthcare.

Keywords: Cervical cancer; Screening; Immigrants; Healthcare disparities

Introduction

The number of female immigrants living in South Korea with Korean husbands has been increasing over the past 4-5 years [1]. In particular, marriages between South Korean men and foreign nationals are increasing; therefore, the number of female immigrants in South Korea is also increasing. Of all marriages to South Korean men, the proportion of those to foreign nationals increased from 4.95% in 2015 to 7.58% in 2020 [2]. This may be due to several factors, such as sex imbalance and reluctance to marry. Most married female immigrants belong to a low socioeconomic status and encounter cultural and environmental challenges [3,4]. They face prob-

Obstetrics & Gynecology Science

Sae Mi Park, et al. Cervical cancer screening among female immigrants in South Korea

lems obtaining information regarding the public healthcare system and communicating with the local community, which makes it difficult to access appropriate healthcare services. Therefore, special attention should be paid to married female immigrants to improve their access to appropriate healthcare services.

Cervical cancer is the second most common cancer in women and the third leading cause of cancer-related deaths in women, after breast and lung cancers. Worldwide, a woman dies from cervical cancer every 2 minutes; in Korea, three women die from cervical cancer each day [5,6]. Approximately 80% of women with cervical cancer belong to developing countries in Asia, South America, and Africa [7]. In South Korea, the incidence of cervical cancer is decreasing annually owing to screening and prophylactic vaccination. Cervical cancer remains an extremely important disease in developing countries. Most married immigrant women are from developing countries; therefore, screening is crucial for preventing cervical cancer.

The South Korean National Cancer Screening Program (NCSP) aims to increase the treatment rate of cancer and reduce cancer-related deaths by early detection and treatment. The cervical cancer screening programs in Korea include the NCSP and National Health Insurance Service Cancer Screening Program [8,9]. Since 2016, these programs have provided biennial cervical cancer screening for all South Korean women aged >20 years (before 2016, only women aged >30 years were screened). The papanicolaou smear test is used to screen for cervical cancer.

Female immigrants married to Korean husbands can get the F-6 type visa, which allows them to gain South Korean nationality. However, these women have low participation rates in cervical cancer screening programs, which necessitates special measures. Thus, it is important to identify factors that influence participation rates in this population. Previous studies have evaluated these factors among married female immigrants aged >30 years; however, in 2016, the age limit was lowered to 20 years. Therefore, these factors should be re-evaluated in married female immigrants aged >20 years.

In this study, we investigated factors related to participation in national cervical cancer screening programs among female immigrants in their 20s married to South Korean husbands. The results could help in designing strategies to increase the participation rate in cervical cancer screening programs.

Materials and methods

1. Study population

The present study followed the methods described in a previous study [10]. Marital status was confirmed using the F-6 type visa, which is issued to immigrants with Korean spouses. We requested that the National Health Insurance Services (NHIS) provide data for immigrants in their 20s with the F-6 type visa (REQ202103473-005). The NHIS provided data from the cervical cancer screening database under the NCSP. The details of NCSP and cervical cancer screening have been described elsewhere [10].

In total, 18,922,919 Korean females were eligible for cervical cancer screening between 2016 and 2017 (9,335,760 in 2016 and 9,587,159 in 2017). We excluded women who did not have an F-6 type visas (n=18,871,786), age ≥30 years (n=32,924), or those with missing information on socioeconomic status or immigration (e.g., nationality and immigration date) (n=479). A total of 17,730 married immigrant females in their 20s were enrolled in this study.

2. Definition of variables

The NCSP performs biannual cervical cancer screening and covers the entire eligible Korean population. Since 2016, females in their 20s have been screened for cervical cancer via the NCSP; therefore, the study population was enrolled from 2016 to 2017.

The duration of stay was calculated as the calendar year from the immigration date to the participation date in cervical cancer screening, or the last date of the eligible year for those who did not participate in screening. Duration was classified as <2 years, 2-4 years, and ≥5 years. Nationality was recorded as Chinese or other countries. Residential areas were categorized as Seoul (capital city), urban city, and rural city. Socioeconomic status was determined using the class of insurance premium grades; grades 1-20 were classified as quartiles from the lowest (1st; grades 1-5) to highest (4th; grades 16-20). Occupation was validated based on participants' jobs (yes or no). Comorbidities were determined using Charlson Comorbidity Index (CCI), which is described elsewhere; CCI was classified as ≥1 or no comorbidity. Eligibility for general health examination by the NHIS is an important factor that may affect participation in cancer screening. General health examination eligibility and participation were classified as participated, did not participate, and not eligible.

3. Statistical analysis

SAS 9.4 (SAS Institute Inc., Cary, NC, USA) was used for statistical analyses. Student's *t*-test and chi-square test were performed to evaluate differences in continuous and categorical variables, respectively. After adjusting for age, duration of stay, nationality, residence, economic status, occupation, and comorbidity, multiple logistic regression analysis was performed to estimate the effects of the associated factors on participation in cervical cancer screening among married immigrant females in their 20s. To control for the potential effect of the general health examination, an additional multiple logistic analysis was performed among study participants who were not eligible for it.

Table 1. Descriptive statistics of married, immigrant, female participants in the cervical cancer screening program (2016-2017)

Variable	Cervical cancer participation			*P*-value[a]
	Yes (n=8,149)	No (n=9,581)	Total (n=17,730)	
Duration of stay (yr)				
<2 years	2,458 (48.8)	2,578 (51.2)	5,036 (28.4)	<0.0001
2-4 years	5,214 (45.0)	6,383 (55.0)	11,597 (65.4)	
≥5 years	477 (43.5)	620 (56.5)	1,097 (6.2)	
Nationality				
China	805 (52.2)	373 (47.8)	1,542 (8.7)	<0.0001
Other[b]	7,344 (45.4)	8,844 (54.6)	16,188 (91.3)	
Residence				
Capital city	932 (49.0)	967 (51.0)	1,899 (10.7)	<0.0001
Urban city	2,076 (49.9)	2,083 (50.1)	4,159 (23.5)	
Rural city	5,141 (44.1)	6,531 (55.9)	11,672 (65.8)	
Economic status[c]				
Q1 (lowest)	1,597 (44.3)	2,008 (55.7)	3,605 (20.3)	0.0133
Q2	2,451 (46.2)	2,859 (53.8)	5,310 (30.0)	
Q3	2,856 (47.4)	3,173 (52.6)	6,029 (34.0)	
Q4 (highest)	1,245 (44.7)	1,541 (55.3)	2,786 (15.7)	
Occupation				
No	7,513 (46.6)	8,606 (53.4)	16,119 (90.9)	<0.0001
Yes	636 (39.5)	975 (60.5)	1,611 (9.1)	
General health screening				
Participated	662 (48.3)	709 (51.7)	1,371 (7.7)	<0.0001
Not participated	97 (19.5)	400 (80.5)	497 (2.8)	
Not eligible subject	7,390 (46.6)	8,472 (53.4)	15,862 (89.5)	
Comorbidity[d]				
No	5,660 (45.1)	6,901 (54.9)	12,561 (70.9)	0.0002
Yes	2,489 (48.2)	2,680 (51.8)	5,169 (29.1)	

Values are presented as number (%).

Descriptive statistics of married, immigrant, female participants in the cervical cancer screening program (2016-2017).

[a]The *t*-test and chi-squared test were used to assess the significance of differences in continuous and categorical variables, respectively.

[b]Q1 (lowest): 1-5th income class; Q2: 6-10th income class; Q3: 11-15th income class; Q4 (highest): 16-20th income class; derived from the NIHS equation using the subject's asset profiles.

[c]Charlson Comorbidity Index (CCI) weight 1 (dementia, connective tissue disease, ulcer disease, myocardial infarction, congestive heart failure, chronic pulmonary disease, peripheral vascular disease, cerebrovascular disease, diabetes mellitus, mild liver disease).

[d]Defined as comorbidity=yes when the CCI score shown in the medical examination data is 1 or higher.

Obstetrics & Gynecology Science

Sae Mi Park, et al. Cervical cancer screening among female immigrants in South Korea

Table 2. Association between participation in the cervical cancer screening program and related factors (2016-2017)

Variable	Univariate OR (95% CI)	Multivariate OR (95% CI)[a]
Age[b]	0.96 (0.95-0.98)	
Duration of stay (yr)		
<2 years	1.24 (1.09-1.41)	1.18 (1.03-1.35)
2-4 years	1.06 (0.94-1.20)	1.03 (0.91-1.17)
≥5 years	1 (reference)	1 (reference)
Nationality		
China	1.32 (1.19-1.46)	1.43 (1.28-1.59)
Other[c]	1 (reference)	1 (reference)
Residence		
Capital city	1 (reference)	1 (reference)
Urban city	1.04 (0.93-1.16)	1.02 (0.92-1.14)
Rural city	0.82 (0.74-0.90)	0.81 (0.73-0.89)
Economic status[d]		
Q1 (lowest)	1 (reference)	1 (reference)
Q2	1.08 (0.99-1.17)	0.96 (0.88-1.05)
Q3	1.13 (1.04-1.23)	0.99 (0.91-1.09)
Q4 (highest)	1.02 (0.92-1.13)	0.89 (0.80-0.99)
Occupation		
No	1 (reference)	1 (reference)
Yes	0.75 (0.68-0.83)	0.76 (0.67-0.85)
General health screening		
Participated	3.92 (3.07-5.01)	4.16 (3.24-5.33)
Not participated	1 (reference)	1 (reference)
Not eligible subject	3.64 (2.91-4.55)	3.33 (2.65-4.18)
Comorbidity[e]		
No	1 (reference)	1 (reference)
Yes	1.14 (1.07-1.22)	1.16 (1.09-1.24)

Values are presented as odds ratio (95% confidence interval).

Association between participation in the cervical cancer screening program and related factors (2016-2017).

OR, odds ratio; CI, confidence interval.

[a]Adjusted for age, duration of stay, nationality, residence, economic status, occupation, general health examination, and comorbidity were performed for multiple logistic regression.

[b]Age of eligible subjects at the time of cervical cancer screening.

[c]Q1 (lowest): 1-5th income class; Q2: 6-10th income class; Q3: 11-15th income class; Q4 (highest): 16-20th income class; derived from the National Institute of Health Sciences equation using the subject's asset profiles.

[d]Charlson Comorbidity Index (CCI) weight 1 (dementia, connective tissue disease, ulcer disease, myocardial infarction, congestive heart failure, chronic pulmonary disease, peripheral vascular disease, cerebrovascular disease, diabetes mellitus, mild liver disease).

[e]Defined as comorbidity=yes when the CCI score shown in the medical examination data is 1 or higher.

Table 3. Association between participation in the cervical cancer screening program and related factors among women not eligible for general health examination

Variable	Multivariate OR (95% CI)[a]
Age[b]	0.96 (0.95-0.97)
Duration of stay (yr)	
<2 years	1.19 (1.03-1.38)
2-4 years	1.02 (0.89-1.17)
≥5 years	1 (reference)
Nationality	
China	1.37 (1.22-1.53)
Other[c]	1 (reference)
Residence	
Capital city	1 (reference)
Urban city	1.03 (0.92-1.16)
Rural city	0.82 (0.74-0.91)
Economic status[d]	
Q1 (lowest)	1 (reference)
Q2	0.98 (0.89-1.08)
Q3	1.02 (0.92-1.12)
Q4 (highest)	0.90 (0.80-1.00)
Occupation	
No	1 (reference)
Yes	0.74 (0.64-0.87)
Comorbidity[e]	
No	1 (reference)
Yes	1.15 (1.07-1.23)

Values are presented as odds ratio (95% confidence interval).

Association between participation in the cervical cancer screening program and related factors among women not eligible for general health examination.

OR, odds ratio; CI, confidence interval.

[a]Adjusted for age, duration of stay, nationality, residence, economic status, occupation, and comorbidity were performed for multiple logistic regression.

[b]Age of eligible subjects at the time of cervical cancer screening.

[c]Q1 (lowest): 1-5th income class; Q2: 6-10th income class; Q3: 11-15th income class; Q4 (highest): 16-20th income class; derived from the National Institute of Health Sciences equation with subject's asset profiles.

[d]Charlson Comorbidity Index (CCI) weight 1 (dementia, connective tissue disease, ulcer disease, myocardial infarction, congestive heart failure, chronic pulmonary disease, peripheral vascular disease, cerebrovascular disease, diabetes mellitus, mild liver disease).

[e]Defined as comorbidity=yes when the CCI score shown in the medical examination data is 1 or higher.

4. Ethics statement

The present study was approved by the Institutional Review Board of Korea University Ansan Hospital (No.: 2021AS0011).

Results

1. General characteristics of participants

The general characteristics of the study population are summarized in Table 1. In total, 17,730 women were eligible for the study, of which 8,149 (46%) participated in the cervical cancer screening and 9,581 (54%) did not. All the participants were females. Participants with a shorter duration of stay were more likely to participate in cervical cancer screening than those who stayed longer. Women from China were more likely to participate in cervical cancer screening than those from other countries.

2. Logistic regression analysis of factors affecting cervical cancer screening behavior

Table 2 presents the results of the logistic regression analysis of factors related to cervical cancer screening. Multiple logistic regression analysis was conducted after adjusting for age, duration of stay, nationality, residence, economic status, occupation, participation in general health screening, and comorbidities. The multiple logistic regression analysis showed that compared to the other participants, the odds ratio (OR) was increased for patients with short duration of stay (OR, 1.18; 95% confidence interval [CI], 1.03-1.35), Chinese nationality (OR, 1.43; 95% CI, 1.28-1.59), participation in general health screening (OR, 4.16; 95% CI, 3.24-5.33), and presence of comorbidity (OR, 1.16; 95% CI, 1.09-1.24). The OR increased with shorter duration of stay in South Korea. Employed women had a lower OR than unemployed women (OR, 0.76; 95% CI, 0.67-0.85). Women who participated in general health screening had the highest OR compared with those with other factors. Therefore, the duration of stay, nationality, occupation, participation in general health screening, and comorbidities were significantly associated with participation in cervical cancer screening.

Obstetrics & Gynecology Science

Sae Mi Park, et al. Cervical cancer screening among female immigrants in South Korea

3. Association between participation in cervical cancer screening and related factors stratified by eligibility for participation in general health screening

Women who did not participate (97/497 women, 19.5%) or were not eligible for participation (7,390/8,472 women, 46.6%) in the general health screening had lower participation in the cervical cancer screening than women who were eligible or participated in the general health screening (Table 1). Variables related to participation in cervical cancer screening were stratified based on eligibility for participation in the general health examination (Table 3). Among women who were not eligible for general health examination and participated in the cervical cancer screening, the OR was significantly lower in employed women (OR, 0.74; 95% CI, 0.64-0.87) than in unemployed women, and significantly higher in Chinese woman (OR, 1.37; 95% CI, 1.22-1.53) than in women of other nationalities.

Discussion

A previous study evaluated the factors associated with cervical cancer screening among female immigrants aged ≥30 years who were married to South Korean men [10]. However, in 2016, the age limit for cervical cancer screening was lowered to 20 years, which necessitated the re-evaluation of factors associated with cervical cancer screening among female immigrants in their 20s. To the best of our knowledge, the present study is the first to evaluate factors associated with the participation of 20-30-year-old female immigrants, married to Korean men, in national cervical cancer screening.

Of 17,730 women, 8,149 (46%) participated in cervical cancer screening and 9,581 (54%) did not. The exact participation rate of women in their 20s remains unknown. However, we estimated a participation rate of 46%, which is significantly higher than that in women ≤40 years old (29%) [11]. Many factors may explain the higher participation rate of immigrants, including the high interest of married female immigrants in their health.

Logistic regression analysis indicated that the duration of stay, nationality, occupation, general health screening, and comorbidity were related to the participation of married immigrant females in cervical cancer screening.

An interesting finding was that employed women in their 20s had low participation rates. Many previous studies have reported that employed women have high participation rates in the screening [12-14]. In a previous study [10], employed married female immigrants aged ≥30 years had a high participation rate. Employers are mandated to sponsor health checkups of their employees, failing which the Ministry of Employment and Labor imposes penalties in accordance with Article 72 of the Industrial safety and health act [15]. Employers encourage employees to participate in screening. Although the reason for the low participation rate of employed women in their 20s in the screening program is unclear, there are several explanations. First, the employment rate among women in their 20s was very low (<10%), which may have affected the participation rate. In addition, most young women in their 20s may not pay attention to medical checkups because of commitments to their job or social life.

A higher proportion of employed women did not undergo cervical cancer screening than unemployed women. Although the national general health examination is mandatory for employees, it does not include cervical cancer screening; therefore, workers should be advised to undergo such screening.

In the present study, duration of stay in South Korea was a significant predictor of participation in screening. Previous studies have shown that longer duration of stay is associated with a higher screening rate [13,16,17]. In contrast, in our study, a shorter duration of stay was associated with a higher screening rate, whereas, a longer duration of stay was a barrier to participation in the program. Women with a long duration of stay in South Korea may be less likely to participate in cervical cancer screening, which is in contrast to the findings of previous studies, possibly because most Chinese female immigrants stay for a shorter duration than those from other countries.

Previous studies have reported that women from China are most likely to participate in general health care screening [18,19]. In our study, women from China had a higher rate of participation in the screening program. The Chinese population has a high immigration rate worldwide, including to South Korea, which is one of the closest countries. Chinese immigrant groups share various types of information, including those related to healthcare, with each other to help adapt to the new country. In addition, Chinese immigrants have good family support, which positively affects their participation rate in general healthcare screening.

Therefore, non-Chinese immigrants should be encouraged to share similar information among their own groups. In addition, specialized and individualized cervical cancer screening programs for immigrants adapted to the social and cultural characteristics of different countries should be considered.

According to a study, general health screening aims to improve public health and reduce medical expenses by the early detection and prevention of diseases [10]. However, it does not include cervical cancer screening. In our study, only 20% of the people who did not participate in general health screening underwent cervical cancer screening. Women who underwent general health examinations had a higher cervical cancer screening rate than those who did undergo general health examination. In a previous study [10], we found similar results, which may be because women who undergo general health examinations are more interested in health and are more informed about healthcare-related information than other women. A high rate of participation in general health screening is likely to have a significant effect on cervical cancer screening because such people are more likely to be interested in health checkups [20]. Therefore, participation in general health screening may be an important predictor of cervical cancer screening.

In the present study, women with comorbidities had a greater participation rate than those with no comorbidities, which may be because of their greater interest in their health.

This study had several limitations. First, because we used the NHIS database to obtain information on comorbidities and participant eligibility, we were unable to examine all potential variables of interest, such as educational level, satisfaction with immigration, family history, and smoking and alcohol use. Second, we selected participants based on marriage visas at the time of screening; therefore, women who had their visa status changed later, acquired South Korean nationality, or were married to non-South Korean husbands were excluded. Third, certain clinical and demographic variables (e.g., smoking status, educational level, health insurance type, and marital status) that may influence participation in screening were not evaluated. Despite these limitations, this is the first study to analyze the factors that affect participation in cervical cancer screening among female immigrants in their 20s married to Korean husbands and living in South Korea.

Appropriate programs to promote cervical cancer screening, such as a media campaign through TV programs and public advertisements, particularly among socially vulnerable groups, should be implemented to improve awareness of the importance of cervical cancer screening and reduce disparities in healthcare. Additional efforts are needed to improve screening among young female immigrants in their 20s.

Conflict of interest

None of the authors have any conflicts of interest to report.

Ethical approval

Research complied with all relevant national regulations and institutional policies and is by the tenets of the Helsinki Declaration (as revised in 2013), and has been approved by the Institutional Review Board of Korea University Ansan Hospital (IRB No. 2021AS0011).

Patient consent

Patient consent was not necessary for this research.

Funding information

Author contributions

Sae Mi Park, Ha Kyun Chang, Yunhee Lee, and Jun-Pyo Myong conceived and designed the research, performed the statistical analyses, and interpreted the results. Sae Mi Park, Joo Won Lee, Ha Kyun Chang, Kyung-Jin Min, and Nak Woo Lee contributed to writing the paper and critically revised the manuscript. All authors read and approved the manuscript.

Obstetrics & Gynecology Science

Sae Mi Park, et al. Cervical cancer screening among female immigrants in South Korea

References

1. Lee SL, Kim HJ. Health barriers for female marriage migrants in Korea and health policy recommendations 2011. 1st ed. Ilsan: IOM Migration Research & Training Centre; 2010.

2. Jung HW. Health status of multicultural families. 1st ed. Seoul: Bakmunsa; 2009.

3. Llácer A, Zunzunegui MV, del Amo J, Mazarrasa L, Bolumar F. The contribution of a gender perspective to the understanding of migrants' health. J Epidemiol Community Health 2007;61 Suppl 2(Suppl 2):ii4-10.

4. Almeida LM, Caldas JP, Ayres-de-Campos D, Dias S. Assessing maternal healthcare inequities among migrants: a qualitative study. Cad Saude Publica 2014;30:333-40.

5. National Cancer Information Center. National Cancer registration statistics 2018. Goyang: National Cancer Information Center; 2020.

6. Ha HI, Chang HK, Park SJ, Lim J, Won YJ, Lim MC. The incidence and survival of cervical, ovarian, and endometrial cancer in Korea, 1999-2017: Korea Central Cancer Registry. Obstet Gynecol Sci 2021;64:444-53.

7. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, et al. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. Lancet Glob Health 2020;8:e191-203.

8. Kim Y, Jun JK, Choi KS, Lee HY, Park EC. Overview of the national cancer screening programme and the cancer screening status in Korea. Asian Pac J Cancer Prev 2011;12:725-30.

9. Lee YH, Choi KS, Lee HY, Jun JK. Current status of the national cancer screening program for cervical cancer in Korea, 2009. J Gynecol Oncol 2012;23:16-21.

10. Chang HK, Seo SS, Myong JP, Koo JW, Jeong J. Factors associated with cervical cancer screening among married female immigrants with Korean husbands in South Korea. Int J Environ Res Public Health 2018;15:2528.

11. Chang HK, Myong JP, Byun SW, Lee SJ, Lee YS, Lee HN, et al. Factors associated with participation in cervical cancer screening among young Koreans: a nationwide cross-sectional study. BMJ Open 2017;7:e013868.

12. Leinonen MK, Campbell S, Ursin G, Tropé A, Nygård M. Barriers to cervical cancer screening faced by immigrants: a registry-based study of 1.4 million women in Norway. Eur J Public Health 2017;27:873-9.

13. Lofters AK, Moineddin R, Hwang SW, Glazier RH. Predictors of low cervical cancer screening among immigrant women in Ontario, Canada. BMC Womens Health 2011;11:20.

14. Rondet C, Lapostolle A, Soler M, Grillo F, Parizot I, Chauvin P. Are immigrants and nationals born to immigrants at higher risk for delayed or no lifetime breast and cervical cancer screening? The results from a population-based survey in Paris metropolitan area in 2010. PLoS One 2014;9:e87046.

15. The Ministry of Employment and Labor Article 72 of the Occupational Safety and Health Act [Internet]. Sejong: Korea Ministry of Government Legislation; c2021 [cited 2021 Sep 30]. Available from: http://www.law.go.kr.

16. Woltman KJ, Newbold KB. Immigrant women and cervical cancer screening uptake: a multilevel analysis. Can J Public Health 2007;98:470-5.

17. Grandahl M, Tydén T, Gottvall M, Westerling R, Oscarsson M. Immigrant women's experiences and views on the prevention of cervical cancer: a qualitative study. Health Expect 2015;18:344-54.

18. Kim EH, Kim EJ, Kim MJ, Park DY, LEE SH. Effects of an educational program of pregnancy and delivery on pregnancy related knowledge, newborn care knowledge, and postpartum care self-efficacy of marriage immigrant women. J Korean Acad Nurs 2010;40:78-87.

19. Lee S, Chen L, Jung MY, Baezconde-Garbanati L, Juon HS. Acculturation and cancer screening among Asian Americans: role of health insurance and having a regular physician. J Community Health 2014;39:201-12.

20. Sung NY, Park EC, Shin HR, Choi KS. Participation rate and related socio-demographic factors in the national cancer screening program. J Prev Med Public Health 2005;38:93-100.