

RESEARCH COMMUNICATION

Knowledge, Attitude and Practice (KAP) Concerning Cervical Cancer and Screening among Rural and Urban Female Healthcare Practitioners in the Democratic People's Republic of Korea

Nguyen Toan Tran^{1,2,*}, Richard Taylor², Song Il Choe³, Hae Suk Pyo⁴, Ok Suk Kim⁴, Hyon Chol So³

Abstract

Background and Objective: Little is known about cervical cancer (CC) in the Democratic People's Republic of Korea (DPRK). This study examines the knowledge, attitudes and practices (KAP) concerning CC and screening among female health care practitioners (HCPs), and whether differences exist between rural and urban HCPs. **Method:** In a descriptive cross-sectional study, a purposive sample of 200 women HCPs from 128 health care centers in 6 provinces of DPRK was interviewed using a standardized questionnaire. **Results:** 98% of HCPs were aware of CC. Awareness of the national CC policy was significantly lower in rural (44%) than urban (62%) respondents ($p < 0.05$). Fewer rural (71%) than urban (89%) HCPs knew of cervical cytology ($p < 0.05$). Around 30% of HCPs were aware of the association between CC and human papillomavirus infection. Only 13% of HCPs had ever had a cervical cytology smear. Only 4% of rural and 21% of urban practitioners ($p < 0.05$) provided cytology; all used unaided visual inspection of the cervix without staining to determine whether cytology testing was indicated. For all, screening intervals depended on presence of symptoms. **Conclusion:** Misconceptions and ineffective clinical practices regarding screening need to be urgently addressed among both rural and urban HCPs. There are no major differences between rural and urban HCPs regarding their KAP.

Key words: cervical cancer - KAP - low-resource setting - North Korea

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Introduction

For many developing countries, cervical cancer is the most common cancer among women (Ferlay et al., 2011) and it is in these countries that 85% of the estimated 530,000 new cases and 275,000 deaths have occurred worldwide (2008). There are limited data on the Democratic People's Republic of Korea (DPRK) in peer-reviewed medical journals, and little information on women's health or cervical cancer. Most information available on DPRK is found in United Nations publications and reports. Incidence and mortality rates of cervical cancer in DPRK, according to the International Agency for Research on Cancer (IARC), were 6.6 and 3.3 per 100,000 in 2008 (Ferlay et al., 2011). Cervical cancer is caused mainly by infection with certain strains of human papillomavirus (HPV), a predominantly

sexually transmitted virus that infects the epithelial cells of the cervix uteri and can result in precancerous lesions and invasive cancer (Cogliano et al., 2005). Most cervical lesions do not progress to cancer, and those which do, progress slowly, making cervical cancer largely preventable through effective screening (IARC, 2004). Marked decreases in cervical cancer incidence and mortality have been achieved by systematic population-based cytology screening programs in developed nations from as early as the 1960s (Johannesson et al., 1978; Parkin et al., 2002). In the Southeast Asian and Pacific region, a number of developed countries, autonomous territories and certain cities have experienced similar reductions (Wang et al., 2003; Yang et al., 2003; Taylor et al., 2006; Ferlay et al., 2011). This has not been possible in most low-resource settings, including DPRK, due to the lack of screening or ineffective cytology

¹International Planned Parenthood Association, East Southeast Asia and Oceania Regional Office (IPPF ESEAOR), Kuala Lumpur, Malaysia, ²School of Public Health and Community Medicine, University of New South Wales, Sydney, Australia, ³Korean Family Planning and Maternal and Child Health Association (KFP&MCHA), ⁴Women's Health Department, Pyongyang Maternity Hospital, Pyongyang, DPR Korea *For correspondence: ttran@ippf.org

screening programs (Sankaranarayanan *et al.*, 2001). The population of DPRK is racially homogeneous (Minority Rights Group, 2007) estimated to be 24.1 million in 2008 (United Nations Population Fund & Government of DPRK, 2008) of which 63% live in urban areas (United Nations Population Fund, 2008). DPRK has a national public health system that provides health care services at no direct cost to the patient (United Nations Children’s Fund, 2006). In 2004, health expenditure represented 6.3% of DPRK’s gross domestic product (World Health Organization Regional Office for South-East Asia, 2007). Among developing countries, DPRK’s health care system has ranked well in different United Nations health assessments (Macfarlane *et al.*, 2000). The general level of education of the population is high and adequate access to health care exists in remote areas (Aklimunnessa *et al.*, 2006). However, healthcare providers in rural areas do not have the same opportunities for continuous clinical education and refresher training which may influence the type and quality of services offered to the population. The key problems of the health care system stem from a lack of resources and outdated principles and techniques (Davies *et al.*, 2000) and these are exemplified in current practices in cervical cancer screening. According to the Korean policy on cervical cancer prevention and control, “regular preventive screening” should take place “once a year for women aged 30 to 60 years”. Doctors, midwives and nurses have the responsibility to carry out these services, but there is no published information on how this policy is implemented.

The objectives of this study are to assess: (i) the knowledge of female health care practitioners (HCPs) concerning cervical cancer and their attitudes and practices towards cervical screening; and (ii) whether there is a difference in cancer knowledge, attitudes and practice (KAP) between rural and urban health care practitioners. The study findings and resulting recommendations will help inform policy change where warranted and the design and provision of future training and refresher courses on cervical cancer for HCPs in DPRK.

Materials and Methods

As sexual and reproductive health services in DPRK are mainly provided by female HCPs, a cross-sectional survey of 200 female nurses, midwives and doctors using structured interviews was conducted. The sampling of participants and locations had the objective of interviewing an approximately equal number of urban and rural HCPs. Although sampling was purposive, the survey nevertheless was conducted across 128 health care facilities in both rural and urban areas from six of the nine provinces in DPRK. No more than three HCPs were sampled from each health care facility. All eligible respondents had to be delivering clinical services related to sexual and reproductive health, including performing cervical cancer screening. For this reason, the collection

and analysis of the data did not disaggregate doctors from nurses and midwives.

Based on a literature review and selection of published KAP materials, a questionnaire was designed for health care practitioners working in low-resource settings and with populations having little or no access to cervical cancer screening. Included were questions on visual inspection using acetic acid (VIA) and visual inspection using Lugol’s iodine (VILI), which are screening methods shown to be safe and effective in resource-constrained settings (Mandelblatt *et al.*, 2002; Goldie *et al.*, 2005; Sankaranarayanan *et al.*, 2007) and which could play a central role in future programming on cervical cancer control in DPRK (the HPV vaccine currently remains out of reach of many resource-constrained settings, including DPRK). In any case, the vaccine does not cover all oncogenic HPV types and does not prevent carcinogenic effects in women already infected with HPV. Therefore, screening for precancer will still be required (World Health Organization, 2009).

The structured questionnaire was first validated and field tested among a limited number of HCP. To avoid gender barriers and facilitate the communication process, 11 female interviewers were recruited among staff and volunteers of the Korean Family Planning and Maternal and Child Health Association (KFP&MCHA), a Member Association of the International Planned Parenthood Federation (IPPF). The interviewers had professional backgrounds in nursing, medicine and teaching. To minimize interviewer bias, they received in-depth training on how to conduct the survey.

The interviews were carried out between November 2008 and January 2009. Information was collected on questionnaire forms. Data were entered and analyzed using Epi Info, Version 3.3.2. χ^2 or Fisher’s exact tests, as appropriate, were used to analyze categorical data and the t-test for testing for urban versus rural differences in continuous variables. The level of statistical significance was defined as a two-sided p-value of <0.05.

The study received ethics and administrative approval

Table 1. Characteristics of Rural vs. Urban Women Health Care Practitioners, DPRK, 2009^s

Characteristic	Rural (n = 96)	Urban (n = 104)
Age, years		
Mean	34.6	37.9
Range	20-55	21-60
Married, % (n)	70.8(68)	82.7(86)
Profession, % (n)		
Obstetrician-gynecologist	22.9(22)	21.2(22)
General practitioner	35.4(34)	53.8(56)
Nurse/midwife	41.7(40)	25.0(26)
Length of practice, years (n)		
Less than 5 years	29.2(28)	18.3(19)
5-10 years	30.2(29)	22.1(23)
More than 10 years	40.6(39)	59.6(62)

^sp>0.05 for all results

Table 2. Proportions (%) with Knowledge of Cervical Cancer among Rural vs Urban Women Health Care Practitioners, DPRK, 2009

Knowledge item	Rural (n=96)		Urban (n=104)	
	%	n	%	n
Knowledge of cervical cancer	97.9	94	98.1	102
Source of information (n=94 rural, n=102 urban)				
Medical/nursing/midwifery school	96.8	91	97.1	99
Textbooks	80.9	76	84.3	86
Colleagues *	56.4	53	93.1	95
Media *	48.9	46	80.4	82
Continuing medical education *	46.8	44	71.6	73
Medical articles	28.7	27	39.2	40
Cervical cancer is the most common cancer of the reproductive tract	72.9	70	79.8	83
All women are at risk of cervical cancer	81.3	78	79.8	83
Majority of cervical cancers develop through series of gradual, well-defined pre-cancer lesions	79.2	76	76.9	80
Symptoms of cervical cancer include				
Abnormal vaginal discharge	79.2	76	65.4	68
Vaginal bleeding	72.9	70	69.2	72
Bleeding after sexual intercourse	68.8	66	70.2	73
Bleeding after menopause	53.1	51	62.5	65
Abdominal pain	61.5	59	60.6	63
HPV infection is associated with cervical cancer	32.3	31	28.8	30
Cervical cancer is the result of a STI	29.2	28	26.9	28
A women's risk of developing cervical cancer increases if:				
She has a family history of cervical cancer	84.4	81	78.8	82
She has a sexually transmitted infection	76	73	71.2	74
She smokes *	74	71	94.2	98
She had 2 or more sexual partners	69.8	67	75	78
She started sexual intercourse before the age of 20 years	36.5	35	39.4	41
She is HIV positive *	28.1	27	10.6	11

*p<0.05

by the Korean Ministry of Public Health.

Results

Of 228 female HCPs from rural and urban settings approached to participate in the study, 200 (88%) accepted. Out of the 200 HCPs interviewed for the study, 48% (96) were from rural and 52% (104) from urban areas. There were no statistically significant difference in the demographic characteristics of the rural and urban groups (Table 1). Their combined mean age was 36.3 years, ranging from 20 to 60, and more than two thirds were married (71% rural, 83% urban, $p>0.05$). Nurses and midwives represented 33% (66) of all respondents, while 66% (134) were medical doctors, including general practitioners and obstetricians-gynecologists.

Knowledge

Almost all respondents knew of cervical cancer (Table 2). The main sources of information were their medical, nursing or midwifery schools and textbooks. Significantly higher proportions of urban practitioners compared to their rural counterparts reported having access to information through colleagues (93% vs. 56%, $p<0.05$), the media (80% vs. 49%, $p<0.05$) and to continuing medical education (72% vs. 47%, $p<0.05$). The majority knew that cervical cancer is the most common cancer of the reproductive tract (77%), that all women are at risk (81%), and that the majority of

cervical cancers develop through a series of gradual, well-defined precancerous lesions (78%). More than half in both groups knew about cervical cancer symptoms. However, with regard to its main cause, many were not aware of the association between cervical cancer and HPV infection (31%), nor did many know that in almost all cases cervical cancer is the result of a sexually transmitted infection (28%). As for cervical cancer risk factors, a majority knew of its association with smoking (74% rural, 94% urban, $p<0.05$), and multiple sexual partners (73%). Few knew that risk factors for cervical cancer also include age of first sexual intercourse below 20 years (38%) and HIV infection (28% rural, 11% urban, $p<0.05$).

Most respondents (79%) considered that cervical cancer can be prevented (Table 3), which is congruent with the level of importance given to regular gynecological examinations. However, somewhat unexpectedly, only 39% of urban participants agreed that screening can detect precancerous lesions of the cervix, compared with 67% of their rural counterparts ($p<0.001$). With regard to screening tests, the cervical cytology smear is more widely known (70.8% rural, 88.5% urban, $p<0.05$) than VIA (25%). Among those who were aware of these tests, there was, however, poor knowledge of their exact indications. 39% of respondents believed that cervical cytology is used for both screening and treatment, and 24% thought that it is used for treatment alone. Among

Table 3. Proportions (%) with Knowledge of Cervical Cancer Prevention among Rural vs. Urban Women Health Care Practitioners, DPRK, 2009

Knowledge item	Rural (n=96)		Urban (n=104)	
	%	n	%	n
Cervical cancer can be prevented	79.2	76	78.8	82
Regular women examination is very important	90.6	87	86.5	90
Screening can detect pre-/cancer lesions **	66.7	64	39.4	41
Know of cervical cytology testing *	70.8	68	88.5	92
If so, it is used for (n=68 rural, n=92 urban):				
Treatment of cervical cancer	22.1	15	26.1	24
Screening of cervical cancer	47.1	32	29.3	27
Both screening and treatment	30.9	21	44.6	41
Aware of visual inspection using acetic acid (VIA)	24	23	25	26
If so, it is used for (n=23 rural/ n=26 urban):				
Treatment of cervical cancer	0	0	0	0
Screening of cervical cancer *	56.5	13	88.5	23
Both screening and treatment	43.5	10	11.5	3
Age to start screening				
After becoming sexually active	14.6	14	19.2	20
After 30 years old	63.5	61	67.3	70
After 40 years old	21.9	21	13.5	14
Screening necessary in menopause	70.9	68	71.2	74
Early detection of pre-cancer increases women's survival	85.4	82	79.8	83
Cervical cancer can be cured	96.9	93	98.1	102
During early stage	92.7	89	89.4	93
During later stage	11.5	11	11.5	12
Aware of national guidelines on cervical cancer *	44.2	42	61.5	64

*p<0.05; **p<0.001

Table 4. Attitudes and Practices of Rural vs. Urban Women Health Care Practitioners on Cervical Cancer, DPRK, 2009*

Attitude/practice item	Rural	Urban
Ever received cervical cytology smear	10.4	15.4
Reasons for not getting cervical cytology smear (n=86 rural, n=88 urban)		
No symptoms	39.5	50.0
Dislike of pelvic exams	29.1	39.8
Long travel distance to service delivery points **	30.2	0
Gender of the service provider influences willingness to get a pelvic exam	66.3	56.7
If so, would prefer female service provider (n=63 rural, n=57 urban)	100.0	96.6
Consider cervical cancer screening a priority health care service for community	80.2	81.7
Routinely educate patients on cervical cancer	67.7	74.0
Perform cervical cancer screening	100.0	100.0
Methods used		
Unaided visual inspection	100.0	100.0
Cervical cytology smear **	4.2	21.2
VIA/VILI	0.0	0.0
Screening interval depends of woman's symptoms	100.0	100.0
Barriers to effective screening services		
Insufficient training of staff	45.8	54.8
Insufficient materials	44.2	40.6
Inadequate laboratory facility	43.8	45.2
Inadequate follow-up system	0.0	0.0
Inadequate referral system	0.0	0.0

*Percentage data; **p<0.001

those who knew of VIA, a significantly higher proportion of urban practitioners were aware of its exact indication (89% urban vs. 57% rural, p<0.05). The majority of participants (66%) were aware of the appropriate age to initiate cervical screening in low-resource settings (after 30 years of age), and knew that screening is still necessary after menopause (71%), in line with the national guideline on cervical cancer prevention and treatment, which recommends screening until the age of 60. However, this guideline is not broadly known and significantly less so among rural respondents (44% rural, 62% urban, p<0.05).

As for the treatment of cervical cancer, most practitioners (83%) knew that early detection of cervical precancerous lesions increases a woman's survival rate, and both groups associated the higher curability of cervical cancer with its detection at an early stage (91%).

Attitudes and practices

A low proportion of interviewees had ever received a cervical cytology smear themselves (13%) (Table 4). All the tests were obtained at a provincial hospital. Among the reasons for not obtaining a cervical cytology smear, nearly half of these respondents stated the absence of symptoms (45%). 34% cited their dislike of pelvic examinations, while a significant proportion of rural respondents mentioned the long travel distance to the service delivery point (30.2% rural, 0.0% urban, p<0.001). The gender of the service provider influenced the willingness to obtain a pelvic examination for almost two thirds of all participants (62%). Among these, a

female service provider was preferred (98%).

Most practitioners considered cervical cancer screening a priority health care program for their community (81%). This is reflected in the fact that many of them routinely educate patients on the subject (71%) and that all of them offer screening services for cervical cancer at their health facility. Despite a very low overall proportion, a significantly higher proportion of urban (21%) than rural (4%) practitioners provided cervical cytology smears ($p < 0.05$). The screening method most commonly used was unaided visual inspection of the cervix without staining, and smear taking was performed if the cervix appeared abnormal. None of the practitioners provided VIA or VILI. The screening interval depended on the presence of symptoms in women.

Among the barriers to effective cervical screening in the current health care services, issues mentioned were: inadequate training of staff (51%), insufficient supplies (43%) and inadequate laboratory facilities (45%). Patient follow-up and referral systems were not reported as barriers.

Discussion

While a majority of participants knew of cervical cancer and considered its prevention and control a public health issue in their community, the present study has identified a number of critical gaps with regard to health care practitioner awareness of cervical cancer, as well as to their personal and clinical practices regarding cervical cancer screening.

The majority of respondents were not aware of the HPV etiology of cervical cancer. Worldwide awareness of this causality has widely increased thanks to the discovery and clinical application of HPV vaccines over the past years (Schiffman et al., 2007).

As for clinical practice, interviewees routinely educate their patients on cervical cancer and all of them perform cervical cancer screening at their health facilities. A majority agreed that cervical cancer screening should start after 30 years of age and extend into the menopausal period. But there were important limitations with regard to the practitioners' knowledge and utilization of screening methods. Only a small proportion of (mainly urban) respondents knew of VIA. Cervical cytology smear was the most widely known method. However, the majority thought that it could be used for treating cervical cancer, which is not correct. A statistically significantly higher proportion of urban practitioners used cervical cytology smears, but the overall proportion, in both rural and urban groups, remained very low. In contrast, all respondents reported using unaided visual inspection without cervical staining, which is an ineffective screening method as most precancerous lesions appear normal without appropriate cervical staining. While the national policy on cervical cancer stresses regular screening, the clinical practice of obtaining a cervical smear only in case of

an abnormal looking cervix constitutes in fact a form of opportunistic screening and/or case finding. With regard to screening intervals, all stated that it depends of a woman's symptoms, even though this does not constitute good practice as precancerous lesions are largely asymptomatic.

This misconception of screening based on the presence of symptoms may be one of the reasons why only 13% of practitioners had ever had a cervical cytology smear. This low level of uptake of cervical cytology testing is consistent with findings in other low-income countries, where less than 20% of female health workers reported ever having undergone such test (Gharoro et al., 2006; Mutyaba et al., 2006). In our study, the absence of symptoms was the most common reason reported by the respondents for not screening, which illustrates how cervical screening is conceptualised and understood. Only rural interviewees mentioned the long travel distance to the service delivery points as another reason for not obtaining a cervical cytology smear, indicating that accessibility needs to be taken into account in the planning of screening services. Respondents also identified barriers to screening services, including insufficient staff training and clinical supplies, and inadequate laboratory facilities. In general, this study shows little difference between the rural and urban practitioners in terms of their knowledge of cervical cancer and attitudes and practices concerning cervical screening. However, it is notable also that a significantly lower proportion of urban versus rural respondents were aware that cervical cancer screening can detect potentially pre-cancerous lesions.

In their planning for an effective cervical cancer screening program, health authorities need to consider the findings highlighted above. The lack of appropriate clinical supplies and laboratory facilities, as identified by respondents, can be addressed by introducing VIA at health care facilities, including those at the primary health care level, as this technique requires minimum but widely available, and affordable, supplies of acetic acid. Treatment of VIA positive lesions can be accomplished at selected referral centers using cryotherapy using compressed CO₂ gas which is locally available in DPRK. Neither VIA nor cryotherapy require systemic electricity supply. However, the cost of cryotherapy guns remains a limiting factor for on-the-spot treatment of positive VIA findings in a single screen-and-treat visit approach.

The findings of this study are descriptive. Further research is needed, in particular to explore health care professionals' understanding of the notion of screening, and to explain the very low uptake of cervical cytology smears by health care practitioners themselves, despite good knowledge of the problem and direct access to screening facilities. Health care practitioners need to be targeted first for cervical cancer screening because of their essential role in the implementation of any future screening programs and in their educative role with patients.

This KAP survey reveals that cervical cancer is on the agenda of health care practitioners in both rural and urban settings in DPRK. There is, however, a pressing need to: address misconceptions and incorrect clinical practices; integrate correct information and clinical standards into policy, guidelines and curricula of health sciences schools; and to disseminate such information and standards to health care practitioners, so that the national health care services can offer DPRK women quality and effective cervical cancer screening services.

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