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Melisa Paolino[a]; Silvina Arrossi[b]
[a] Centro de Estudios de Estado y Sociedad (CEDES)/Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Buenos Aires, Argentina [b] Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)/Centro de Estudios de Estado y Sociedad (CEDES), Buenos Aires, Argentina

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Women's Knowledge About Cervical Cancer, Pap Smear and Human Papillomavirus and Its Relation to Screening in Argentina

MELISA PAOLINO, MA
Centro de Estudios de Estado y Sociedad (CEDES)/Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Buenos Aires, Argentina

SILVINA ARROSSI, PhD
Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)/Centro de Estudios de Estado y Sociedad (CEDES), Buenos Aires, Argentina

The purpose of this study was to evaluate women's knowledge about cervical cancer, Pap smears, and human papilloma virus in relation to their cervical cancer screening behavior. This hospital-based study was conducted with a sample of 200 women: 100 women screened in the last three years and 100 non-screened women who attended a hospital located in the metropolitan area of Buenos Aires, between September 2008 and February 2009. Women at the hospital were surveyed using a structured questionnaire. Multiple logistic regression models were used to evaluate the relation of women's knowledge about Pap smears to screening behavior, controlling for socio-demographic characteristics. Of the women who had been screened, 49% compared to 73% of those not screened had inadequate knowledge about Pap smears (P = 0.001), and 47% of screened and 30% of non-screened women reported that they had ever heard about human papilloma virus (P = 0.013). In multivariate analysis, having adequate knowledge about Pap smears (odds ratio: 2.6 or 95%, confidence interval:

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Address correspondence to Melisa Paolino, MA, Centro de Estudios de Estado y Sociedad (CEDES)/Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Sánchez de Bustamante 27, Buenos Aires (C1173AAA), Argentina. E-mail: melisa@cedes.org

1.4–4.8) having health insurance (odds ratio: 2.6 or 95%, confidence interval: 1.1–6.4) and being married (odds ratio: 1.8 or 95%, confidence interval: 1.1–3.4) were the factors related to being screened in the previous three years. Knowledge was related to screening. Comprehensive educational approaches may enhance screening for cervical cancer prevention.

KEYWORDS cervical cancer, Pap smears, knowledge, human papilloma virus, Argentina

INTRODUCTION

Assuring high levels of screening is essential for effective cervical cancer prevention (IARC, 2005). One main reason of the effectiveness of screening programs in developed countries has been their high Pap smear coverage. However, reaching high levels of coverage in developing countries has been a much more difficult task, due to the lack of call/recall systems and the difficulty in contacting women for screening (i.e., sending letters of invitation) (Sankaranarayanan, Budukh, & Rajkumar, 2001).

Key determinants of women's participation in screening are knowledge and beliefs about cervical cancer and preventive strategies (Lazcano–Ponce et al., 1997, 2002; Valenzuela and Miranda, 2001; Aguilar–Perez et al., 2003; Bradley, Risi, & Denny, 2004; Tacken et al., 2007). In Argentina, an analysis of the National Survey on Risk Factors conducted in 2005 revealed that 44% of women with no health insurance had never had a Pap smear (Arrossi et al., 2008). However, despite this low coverage level, little research has analyzed what women know about cervical cancer and Pap smears.

In recent years, the scientific recognition of the causative relationship between the human papilloma virus (HPV) infection and cervical cancer has encouraged the development of new screening techniques (such as the HPV DNA test). Due to the high sensitivity of the HPV testing, its introduction in cervical cancer prevention programs has been proposed as an important technological contribution to overcome the organizational complexity linked to the Pap smear testing (Mayrand et al., 2007; Ogilvie et al., 2010). A screening algorithm, with HPV testing as the primary screening test, followed by cytology or visual inspection of HPV positives for triage to decide treatment, has been proposed (Herrero et al., 2008; Cuzick et al., 2008; Gage & Castle, 2010). However, even in settings in which HPV testing is used as the primary screening test, high screening coverage will have to be assured. Therefore, understanding whether knowledge is related to screening will provide important information about the link between knowledge and a preventive practice that can be used to plan introduction of screening tests. In addition, in the new scenario of HPV DNA-based techniques, it is

important to measure what women know about HPV and its causative role in cervical cancer. This knowledge will also provide input for the design of education strategies and materials that facilitate informed decision making for women about participation in screening programs.

The aims of the present study were to describe women's knowledge about cervical cancer, Pap smears, and HPV and to evaluate how knowledge of Pap smears was related to participating in cervical cancer screening in Argentina. These data will provide important information for the development of appropriate health promotion strategies to increase women's participation in cervical cancer screening, especially among those who are under-screened.

METHODS

Study Participants

This hospital-based study was carried out at the Eva Peron Hospital, in San Martin, a district in the metropolitan area of Buenos Aires (AMBA). The study included 200 women aged 18 years old and older, contacted from September 2008 to February 2009. The study was designed to have 90% power to detect a 25% difference in knowledge about Pap smears between screened and non-screened women, at a 5% level of significance. Assuming that the expected proportion of women in the comparison group (non-screened women) who had adequate knowledge about Pap smears was 0.40, a sample size of 90 participants was required in each arm. Sample size calculations did not include adjustment for confounding factors.

We included 100 women who reported having had a Pap smear in the previous three years (screened women) and 100 women who reported not having had a Pap smear in the previous three years or ever (non-screened women). A quota sample was used to assure the inclusion of sufficient number of women in each age group (age groups: 18–34 [33 screened and 33 non-screened women], 35–64 [40 screened and 40 non-screened women], 65+ years [27 screened and 27 non-screened women]).

All interviews were performed by one interviewer (the primary author). A consecutive sample of women in waiting rooms adjacent to the hospital ambulatory services were recruited. The first woman approached was the one seated next to the doctor's office and then, women were approached in the order they were seated to the right hand of the first woman. All women in the waiting room were approached by the interviewer, until the desired sample size in each age group was achieved, and asked about their age, reason for the visit to the clinic, and time since last Pap smear to decide if they were eligible. If a woman was eligible, she was invited to participate in the study. All eligible women agreed to participate in the study. Women

younger than 18 years old and women attending gynecologic services were excluded from the study. No information about cervical cancer screening is provided at these ambulatory services.

The study protocol and questionnaire were approved by the Eva Peron Hospital Ethical Committee. Signed informed consent was obtained from all participants.

Procedures

A structured questionnaire was constructed after review of questionnaires used in previous studies (Ramos & Pantelides, 1990; Pitts & Clarke, 2002; Moreira et al., 2006). The questionnaire was divided into five sections: (1) socio-demographic data; (2) use of health services; (3) knowledge about Pap smears; (4) knowledge about cervical cancer, and (5) knowledge about HPV.

The outcome was measured through two questions: "Have you ever had a Pap smear?" and "Have you had a Pap smear in the last three years?"

Socio-demographic variables were: age (18–34, 35–64, 65+ years); marital status (married/live together; single/divorced/widowed); education level (tertiary, secondary, never gone to school/primary); employment status (employed, unemployed, housewife, retired), type of dwelling (adequate, inadequate—dwelling fulfilled at least one of the following conditions: without piped in water, without indoor water closet, earth floor) and overcrowding (a dwelling with more than three persons per room, excluding kitchen and bathroom, according to the National Institute for Statistics and Census) (INDEC, 2010).

Variables included to measure use of health services were: health insurance (yes/no); current use of contraceptive methods (yes: oral contraceptives, contraceptive injection, male condom, female condom, vaginal spermicidal, diaphragm intrauterine device, withdrawal, rhythm, sterilization/no) and number of pregnancies (0, 1–3, 4–6, 7+).

Knowledge about Pap smears was measured through two open-ended questions: (a) "what do you believe the purpose of a Pap smear is?" and (b) "what part of the body is examined with the Pap smear?" Knowledge about Pap smears was categorized using the classification developed by Ramos and Pantelides (1990). Women who clearly described the purpose of the Pap smear (e.g., *"to detect changes in the cells of the cervix"*) were considered to have a high level of knowledge; women who mentioned that the Pap smear is to detect cervical cancer or cancer and mentioned cervix or uterus (e.g., *"to prevent cervical cancer"*) were considered to have a medium level of knowledge; women who mentioned cancer or precancerous lesions but did not mention cervix or uterus or mentioned cervix or uterus but did not mention cancer or precancerous lesions (e.g., *"to prevent ovarian cancer"*) were considered to have a low level of knowledge; women who did not mention cancer or precancerous lesions or cervix or uterus (e.g., "*to look*

if there is something wrong") were considered to have inaccurate knowledge; and lastly, women who reported no knowledge were categorized as do not know. Knowledge about Pap smears was dichotomized as adequate (high and medium knowledge) or inadequate (low, inaccurate, and do not know).

Knowledge about cervical cancer was measured through three questions: "Do you know what may lead to cervical cancer?" (yes/no); "Is cervical cancer preventable?" (yes/no); and "Can cervical cancer be cured?" (yes/no).

To measure knowledge about HPV, women were asked if they had ever heard of human papilloma virus or HPV. If a woman responded "no", she was not asked further questions about HPV knowledge. Knowledge of HPV was assessed with questions adapted from previous studies (Pitts & Clarke, 2002; Moreira et al., 2006; Tiro et al., 2007).

Analysis

Descriptive statistics included computation of frequencies for all variables. Chi-square tests were used to measure associations between sociodemographics characteristics and knowledge and screening. Univariate and multivariate logistic regressions were used to evaluate the relation of women's knowledge about Pap smears to screening. Crude and adjusted odds ratios (ORs) and 95% confidence intervals (95% CI) were calculated for each variable in univariate analysis and, after testing co-linearity variables included in the model were those showing a significance of $P < 0.05$ without co-linearity. The stepwise multivariate model used an entry criterion for potential confounding variables of $P = 0.050$ and removal criterion of $P = 0.051$. The analysis did not include evaluation of interactions. The final model included marital status, health insurance, and knowledge about Pap smears. The Pearson Chi-square test was used to test for the goodness of fit. It was not significant (P-value = 0.368); hence, the null hypothesis that the model fit the data could not be rejected.

RESULTS

Study Sample

No differences were found between women who were screened and not screened regarding educational level, employment status, type of dwelling and overcrowding (Table 1). Significant differences were observed for health insurance and marital status: 22% of screened women but only 8% of non-screened women had health insurance ($P = 0.006$), and 72% of screened women and only 56% of non-screened women were married ($P = 0.010$). The reasons for attending the hospital the day of the interview reported

TABLE 1 Characteristics of Screened and Non-Screened Women

	Pap < 3 years		
	Screened women %	Non-screened women %	*P*-value
	$n = 100$	$n = 100$	
Age in years (mean/SD)	(45/17.2)	(47/18.3)	
18–34	33.0	33.0	1
35–64	40.0	40.0	
65+	27.0	27.0	
Total	100.0	100.0	
Education level			
Never gone to school/Primary	58.0	60.0	0.947
Secondary	33.0	32.0	
Tertiary	9.0	8.0	
Total	100.0	100.0	
Marital status			
Married/live together	72.0	56.0	0.010
Single/divorced/widowed	28.0	44.0	
Total	100.0	100.0	
Employment status			
Employed	31.0	32.0	0.417
Unemployed	19.0	12.0	
Housewife	35.0	34.0	
Retired	15.0	22.0	
Total	100.0	100.0	
Overcrowding[1]			
No	88.0	88.0	1
Yes	12.0	12.0	
Total	100.0	100.0	
Type of dwelling[2]			
Adequate	73.0	63.0	0.130
Inadequate	27.0	37.0	
Total	100.0	100.0	
Health insurance			
Yes	22.0	8.0	0.006
No	78.0	92.0	
Total	100.0	100.0	
Reasons to be at the hospital			
Accompanying a family member	35.0	34.0	0.422
Routine health checks	27.0	25.0	
Pain/disease	20.0	20.0	
Make an appointment with a physician	11.0	8.0	
Other reason[3]	7.0	13.0	
Total	100.0	100.0	
Contraception use[4]			
Yes	27.0	22.0	0.411
No	73.0	78.0	
Total	100.0	100.0	
Number of pregnancies			
0	17.0	16.0	0.667
1–3	52.0	46.0	
4–6	25.0	28.0	
7+	6.0	10.0	
Total	100.0	100.0	

Location of the study: San Martin District (AMBA), Argentina. Date of the study: September 2008–February 2009.
[1]Overcrowding: a dwelling with more than three persons-per-room, excluding kitchen and bathroom, according to the National Institute for Statistics and Census (INDEC 2010).
[2]Type of dwelling was categorized as adequate/inadequate. An inadequate dwelling fulfilled at least one of the following conditions: without pipe water, without water closet, earth floor.
[3]Other reasons included: lab testing, vaccination, and x-rays.
[4]Contraception use included: oral contraceptives, contraceptive injection, male condom, female condom, vaginal spermicidal, diaphragm intrauterine device, withdrawal, rhythm, and sterilization.

by women were: "accompanying a family member" (35% of screened women and 34% of non-screened women), "routine health checks" (27% of screened women and 25% of non-screened women), "pain/disease" (20% of screened and 20% of non-screened women), "make an appointment with a physician" (11% of screened women and 8% of non-screened women) and "other reason" (7% of screened women and 13% of non-screened women) (Table 1).

Knowledge About Pap Smears and Cervical Cancer

Significant differences were found between the groups about the purpose of Pap smears (Table 2) with 13% of screened women and 31% of non-screened women reporting that they did not know the purpose of Pap smears ($P = 0.001$); 49% of screened women and 73% of non-screened women had inadequate knowledge of Pap smears ($P = 0.001$); 37% of screened and 56% of non-screened women did not know the meaning of an abnormal Pap smear; and 35% of screened and 28% of non-screened women provided inaccurate answers about the meaning of an abnormal Pap smear (e.g.,"*Disease"*). The study also found that 33% of screened women and 19% of non-screened women knew risk factors for cervical cancer (Table 2), and 38% of screened women and 37% of those not screened said that cervical cancer is curable if it is early detected.

Knowledge About HPV

Among screened women 47% reported that they had ever heard about HPV; this figure was 30% among non-screened women (Table 3). Among all women who had heard of HPV ($n = 77$), only 11 women (14%) knew that HPV causes cervical cancer (all screened women); 68% of screened women and 47% of non-screened women knew that HPV is a sexually transmitted infection (STI). Only 17 (36%) screened women and three (10%) non-screened women had heard about HPV vaccination.

Knowledge and Screening

In the univariate and multivariate analyses, knowledge about Pap smears, health insurance, and marital status were the factors related to being screened in the previous three years (Table 4). In multivariate analysis, screened women were 2.6 (95% CI: 1.4–4.8) times as likely to have adequate knowledge about the purpose of Pap smears than were non-screened women. Screened women were 2.6 (95% CI: 1.1–6.4) times as likely to have health insurance than were non-screened women. In addition, screened women were 1.8 times as likely to be married (95% CI: 1.1–3.4).

TABLE 2 Comparison of Knowledge About Pap Smears and Cervical Cancer Among Screened and Non-Screened Women

	Pap < 3 years		
	Screened women %	Non-screened women %	*P*-value
	$n = 100$	$n = 100$	
Knowledge of purpose of Pap smears[1]			
Do not know	13.0	31.0	0.001
Inaccurate	4.0	12.0	
Low	32.0	30.0	
Medium	40.0	23.0	
High	11.0	4.0	
Total	100.0	100.0	
Knowledge of purpose of Pap smears (dichotomous)[2]			
Adequate	51.0	27.0	0.001
Inadequate	49.0	73.0	
Total	100.0	100.0	
What is the recommended frequency for Pap smear?[3]			
Annually	63.0	63.0	0.001
Every six months	28.0	10.0	
Do not know	8.0	25.0	
Every 2 years	1.0	2.0	
Total	100.0	100.0	
What do you think an abnormal Pap smear result might mean?			
Do not know	37.0	56.0	0.336
Disease	35.0	28.0	
Infection/vaginal discharge	9.0	9.0	
Cervix disease	9.0	2.0	
Cancer	4.0	4.0	
Other	6.0	1.0	
Total	100.0	100.0	
Do you know what may lead to cervical cancer?			
Yes	33.0	19.0	0.024
No	67.0	81.0	
Total	100.0	100.0	
Is cervical cancer preventable?			
Yes	87.0	77.0	0.150
No	4.0	3.0	
Do not know	9.0	19.0	
Missing	—	1.0	
Total	100.0	100.0	
Can cervical cancer be cured?			
Yes	29.0	25.0	0.797
No	12.0	15.0	
Yes, but it is early detected	37.0	38.0	
Do not know	22.0	21.0	
Missing	—	1.0	
Total	100.0	100.0	

Location of the study: San Martin District (AMBA), Argentina. Date of the study: September 2008–February 2009.
[1]Level of knowledge about Pap smears: high (women who have clearly described the purpose of the Pap smear); medium (women who have mentioned that the Pap smear is to detect cervical cancer or cancer and have mentioned cervix or uterus); low (women who have mentioned cancer or precancerous lesions but have not mentioned cervix or uterus or have mentioned cervix or uterus but have not mentioned cancer or precancerous lesions); inaccurate: women who have not mentioned cancer or precancerous lesions and have not mentioned cervix or uterus) and do not know.
[2]Knowledge about Pap smear was dichotomized in adequate (high and medium) or inadequate (low, inaccurate, and do not know).
[3]The National Programme on Cervical Cancer prevention recommends screening every three year after two annual negative tests, in agreement with international scientific recommendations (Ministry of Health, 2010).

TABLE 3 Comparison of Knowledge of HPV Among Screened and Non-Screened Women*

	Pap < 3 years		
	Screened women %	Non-screened women %	*P*-value
	$n = 47$	$n = 30$	
Is HPV an infection which affects ...			
Both men and women	68.1	46.7	0.039
Only women	12.9	16.7	
Only men	—	3.3	
Do not know	19.0	33.3	
Total	100.0	100.0	
How HPV is contracted?			
Sexual contact	79.0	63.4	0.037
Saliva	—	3.3	
Do not know	21.0	33.3	
Total	100.0	100.0	
Do you think HPV produces symptoms?			
Yes	25.5	30.0	0.077
No	25.5	13.3	
Do not know	49.0	56.7	
Total	100.0	100.0	
What are the long term effects of HPV?			
Cancer	19.2	30.0	0.006
Cervical cancer	23.3	—	
Death	10.6	6.7	
Do not know	38.3	63.3	
Other long term effect	8.6	0.0	
Total	100.0	100.0	
Is HPV preventable?			
Yes	68.0	63.3	0.069
No	2.0	—	
Do not know	30.0	36.7	
Total	100.0	100.0	
Have you ever heard about HPV vaccine?			
Yes	36.2	10.0	0.003
No	59.6	90.0	
Missing	4.2	—	
Total	100.0	100.0	

Location of the study: San Martin District (AMBA), Argentina. Date of the study: September 2008–February 2009.

*Questions about HPV knowledge were only asked among 47 screened and 30 non-screened women who reported having heard of HPV.

DISCUSSION

Participation in cervical screening is related by a variety of social and individual factors including socio-demographic characteristics, knowledge, and beliefs, as well as aspects related to health status and access to care (Zapka et al., 2010). This study analyzed the relation between knowledge and screen-

TABLE 4 Factors Related to Having Pap Smear in the Last Three Years. Univariate and Multivariate Logistic Regression Analysis

	Pap < 3 years		Univariate analysis			Multivariate analysis		
	Screened	Non-screened	OR	95 % IC	*P*-value	OR*	95 % IC	*P*-value
Age (continuous per year)	100%	100%	1			1		
Education level								
Never gone to school/primary	49.1	50.9	1					
Secondary	50.8	49.2	1.1	(0.6–1.9)	0.834			
Tertiary	52.9	47.1	1.2	(0.4–3.2)	0.770			
Marital status								
Single/divorce/widowed	38.9	61.1	1			1		
Married/live together	56.3	43.7	2.0	(1.1–3.6)	0.019	1.8	(1.1–3.4)	0.040
Employment status								
Employed	49.2	50.8	1					
Unemployed	61.3	38.7	1.6	(0.7–3.9)	0.271			
Housewife	51.0	49.0	1.0	(0.5–2.0)	0.928			
Retired	40.5	59.6	0.7	(0.3–1.9)	0.402			
Overcrowding[1]								
Yes	50.0	50.0	1					
No	50.0	50.0	1.0	(0.4–2.3)	1			
Type of dwelling[2]								
Inadequate	42.2	57.8	1					
Adequate	53.7	46.3	1.6	(0.9–2.9)	0.131			
Health insurance								
No	45.9	54.1	1			1		
Yes	73.3	26.7	3.2	(1.4–7.7)	0.008	2.6	(1.1–6.4)	0.030
Contraception use[3]								
No	48.3	51.7	1					
Yes	55.1	44.9	1.3	(0.7–2.5)	0.412			
Pregnancies								
None	51.5	48.5	1					
Any	49.7	50.3	1.1	(0.5–2.3)	0.849			
Knowledge about Pap smears[4]								
Inadequate	40.2	59.8	1			1		
Adequate	65.4	34.6	2.8	(1.6–5.1)	0.001	2.6	(1.4–4.8)	0.002

Location of the study: San Martin District (AMBA), Argentina. Date of the study: September 2008–February 2009.
*Odds ratio adjusted for age, health coverage, marital status, and knowledge about Pap smears.
[1]Overcrowding: a dwelling with more than three persons-per-room, excluding kitchen and bathroom, according to the National Institute for Statistics and Census (INDEC 2010).
[2]Type of dwelling was categorized as adequate/inadequate. An inadequate dwelling fulfilled at least one of the following conditions: without pipe water, without water closet, earth floor.
[3]Contraception use included: oral contraceptives, contraceptive injection, male condom, female condom, vaginal spermicidal, diaphragm intrauterine device, withdrawal, rhythm, and sterilization.
[4]Knowledge about Pap smear was dichotomized in adequate (high and medium) or inadequate (low, inaccurate and do not know): high (women who have clearly described the purpose of the Pap smear); medium (women who have mentioned that the Pap smear is to detect cervical cancer or cancer and have mentioned cervix or uterus); low (women who have mentioned cancer or precancerous lesions but have not mentioned cervix or uterus or have mentioned cervix or uterus but have not mentioned cancer or precancerous lesions); inaccurate: women who have not mentioned cancer or precancerous lesions and have not mentioned cervix or uterus) and do not know.

ing and found significant differences in knowledge about Pap smears between screened and non-screened women. Screened women were almost three times as likely to have adequate knowledge about the purpose of Pap smears than were non-screened women. Our results are consistent with previous studies (Lazcano–Ponce et al., 2002; Aguilar–Perez et al., 2003). A population-based study of 3197 women in Morelos, Mexico, showed that women who were aware of the purpose of the Pap smear were three times as likely to use screening than women who did not know the purpose

(Lazcano–Ponce et al., 2002). A cross-sectional study carried out in Mexico City reported that women who knew the benefits of Pap smears were six times as likely to participate in screening programs (Aguilar–Perez et al., 2003). The findings of this study indicate that in Argentina lack of knowledge was associated with not being screened; therefore, increasing women's knowledge about cervical screening may be a key first step of any strategy to increase coverage among women who are under-screened.

In Argentina, the National Survey on Use of and Spending in Health Services showed that 75% of women had had at least one contact with the health system in the year previous to the study (Ministry of Health, 2005). This indicates that opportunities are missed within health services to encourage women to have cervical screening. A study in United States showed that 56% of cases of cervical cancer occurred in women who had not been screened in the past three years or ever, and among them, 63% had at least three outpatient visits in the same period (Leyden et al., 2005). The implementation of strategies aimed at promoting identification of under-screened women among health providers could be an effective tool to enhance opportunistic screening through curative services and increase coverage in Argentina.

This study also shows that 73% of non-screened women had inadequate knowledge about the purpose of Pap smears. This is believed to be the first study in Argentina to assess what non-screened women know about Pap smears and cervical cancer prevention. Few studies have analyzed knowledge among women who had been screened or among women from the general population (Petracci, Romero, & Ramos, 2002; Petracci, 2004, CEDES, 2005; Gamarra, Araujo–Paz, & Griep, 2005). For example, a hospital survey performed among women after having had a gynaecology visit in Buenos Aires suggested that women knew the purpose of the Pap smear (Petracci, Romero, & Ramos, 2002; Petracci, 2004). A survey of 200 women in the province of Misiones, Argentina, showed that 92% of women surveyed had ever heard about Pap smear, but only 49% had adequate knowledge about it (Gamarra, Araujo–Paz, & Griep, 2005). Studies from other countries have suggested that under-screened women have low levels of knowledge about Pap smears (Wellensiek et al., 2002; Lazcano–Ponce et al., 1999, Wong et al., 2009). A study in South Africa found that 54% of gynecological patients who had not had a Pap smear had never heard of Pap smears or had insufficient information about it (Wellensiek et al., 2002). Qualitative studies have also indicated that reasons women give for not participating in cervical cancer screening include lack of knowledge about the Pap smear (Lazcano–Ponce et al., 1999, Wong et al., 2009). These data underscore the importance of targeting non-screened women with specific strategies, including educational sessions, community events and audio-visual material, to contribute to increased screening (Paskett et al., 1999).

Our results showed that many screened and non-screened women did not know the meaning of an abnormal Pap smear result. This inadequate

knowledge might affect screening, follow up, and treatment adherence. Qualitative studies have showed that women express fear of knowing the results and that this feeling affects the decision to have a Pap smear (Agurto et al., 2004; Oscarsson, Wijma, & Benzein, 2008). To get an abnormal result may cause anxiety because the diagnosis can be alarming and confusing (Kavanagh & Broom, 1997). In many cases, anxiety and confusion are barriers to comply with the process of follow up and treatment (Sharpe, Brandt, & McCree, 2005). High levels of fear and anxiety may originate in a lack of understanding of the meaning of cervical abnormalities (Kavanagh & Broom, 1997; Zapka et al., 2004). Thus, it is important that health providers explain test results and their implications and take time to answer questions before and after screening. In addition, educational materials containing information on the meaning of abnormal results can contribute to reduce anxiety during the waiting period between being tested and receiving the test results, and during follow up and treatment.

This study is believed to be the first to describe women's knowledge about HPV in Argentina and found that only 47% of screened women and 30% of non-screened women had ever heard about HPV. In addition, women who had heard about HPV knew very little about the virus and its link with cervical cancer. Similar results were found in studies from developed and developing countries (Pitts & Clarke, 2002; Moreira et al., 2006; Tiro et al., 2007; Marlow, Waller, & Wardle, 2007; Hanisch et al., 2008). Low levels of knowledge about HPV might result in high anxiety levels among women HPV positive (Waller et al., 2005) and may affect uptake of HPV testing and acceptance of future HPV vaccination. In the new scenario of cervical cancer prevention it becomes even more necessary to provide women with accurate information about cervical cancer and HPV to allow them make informed decisions about the use of new techniques and to minimize anxiety associated with uncertainty or confusion.

The study also found that women screened with Pap smears were more likely to have health insurance than non-screened women. This relationship has been found in several studies worldwide (Hsia et al., 2000; Nene et al., 2007; Cabeza et al., 2007). In Argentina, an analysis of The National Survey of Risk Factors showed that women with no health insurance were less likely to have been screened in the last two years (Arrossi et al., 2008). This fact might be linked to deficiencies in infrastructure and organization in some public health centers in Argentina (Arrossi & Paolino, 2008). This is an important issue to be considered in the new horizon of cervical cancer prevention. If an efficient organization of all services involved in screening is not ensured, the introduction of new technologies will probably not result in a decrease of the burden of disease. Furthermore, it might result in widening social and health inequalities, with high socio-economic level women having access to the new technologies, and poor women continuing to be underserved. Organizational changes to facilitate women access to screening (i.e., strategies to facilitating

appointment scheduling, reducing waiting times, and limiting the number of steps during screening process) could potentially increase screening rates (Anhang–Price et al., 2010) and should be implemented in health services in Argentina before the introduction of new technologies.

Study Limitations

Limitations to be considered when interpreting the present results include that the results were based on self-reported information. Evidence has shown that women tend to underestimate the time since their last screening (Caplan et al., 2003). This fact could have produced misclassification, potentially resulting in an overestimate of the association between knowledge and screening. Secondly, this was a hospital-based study, therefore due to the potential for selection bias introduced by this method of selecting the study sample, the results cannot be extrapolated to the general population. Further, the sample size may have been too small to provide adequate statistical power to detect meaningful differences when controlling for multiple confounding factors or examining interactions, so that a larger study of a more representative sample should be undertaken. Finally, the study design did not permit conclusions to be drawn about the temporal direction of the relationship between screening and knowledge. Higher knowledge among screened women might be due to information received at the time of screening.

CONCLUSION

Even though knowledge is not the only factor determining women's participation in cervical cancer screening, the study shows that it is related to screening. In the new era of cervical cancer prevention, no matter which screening test is chosen, health providers will still have to assure women's participation in screening and women will still have the right to receive clear information. Comprehensive approaches combing facilitating access to screening services and providing accurate and culturally adapted information on cervical cancer, HPV, and screening can contribute to enhance the right of all women to have access to cervical cancer prevention.

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