

## RESEARCH ARTICLE

## Factors Associated with Cervical Cancer Screening Amongst Women of Reproductive Age from Yucatan, Mexico

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### Abstract

This study aimed to analyse the participation of women of reproductive age in a cancer screening program, and survey reasons for non-screening in a region from Mexico with high cervical cancer mortality. A total of 281 obstetric patients from a previous HPV study in a social security hospital during 2008-2009 were included. Reasons for not participating in the screening were directly asked. HPV positive patients were invited to participate in an informative workshop, and they filled in a knowledge questionnaire. The women ranged in age from 14-47 years; 123 (43.8%) had never participated in screening, of which 97 (78.9%) had their first sexual intercourse 2 to 10 years ago, resulting in 25% HPV positive. Screening history was strongly associated with 2 or more gestations (OR= 10.07, p=0.00) and older age (OR=6.69 p=0.00). When 197 women were contacted and interviewed, reasons referred for non-screening were ignorance, lack of interest or time, recent sexual onset, shame and fear. More than 50% of the workshop participants showed knowledge of HPV, while 38.9% and 25% knew about Pap smear and cervical cancer. A high percentage of women of reproductive age have never had a Pap smear. Promoting the screening program in medical facilities seems to be important in this population. New approaches to inform vulnerable individuals on the benefits of screening need to be implemented, especially for young women.

**Keywords:** Young women - Pap test - cervical cancer prevention - human papillomavirus - Mexico

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### Introduction

Cervical carcinoma (CC) is the second most frequent malignancy on women in the world; according to most recent WHO statistics, it was the cause of 276,961 deaths on year 2008 (WHO, 2008). Human papillomavirus (HPV) infection is a necessary cause of CC and precancerous cervical epithelial neoplasias (Walboomers et al., 1999). Regular screening allows the detection of early lesions that can be treated before developing into invasive cancer. Pap smear screenings have shown convincingly to decrease CC mortality (Yang et al., 2008), however low income populations have lower screening rates mostly because of the lack of proper information and the difficulties related to the lack of a good screening opportunity (Margolis et al., 1998).

In Mexico, CC is the second cause of malignancy-associated death in women at reproductive age. <http://www.sinais.salud.gob.mx/mortalidad/> This is in spite of the efforts of the National Cervical Cancer Screening Program (NCCSP), which freely offers the test since 1974 to all women independently of whether they belong to a social security system or not. The official Norm NOM-014-SSA2-1994 defines a woman at risk to all at the age between 25 and 64, it also recommends the Pap smear

annually, and every 3 years after two normal cytology tests (Secretaria, 1994). The low effectiveness of the NCCSP due to difficulties to assess a high quality Pap sample/read, inadequate sampling and low coverage has been previously analysed (Lazcano et al., 1997).

As a developing country, coverage can be limited by infrastructure costs, limited resources, and accessibility to screening. Importantly, although preventive screening is offered cost-free, sociocultural issues have a high impact on coverage. Regarding the willingness of women to participate in the program, Aguilar-Perez et al reported that the most important predisposing factors to the utilization of the Pap smear in Mexico were knowledge of its benefits, the use of birth control methods, history of vaginal infection and sexual partner approval (Aguilar-Pérez et al., 2003).

In addition to increasing coverage and quality, it had been urged to guarantee proper treatment and follow up of patients with an abnormal result, in order to ensure the success of the NCCSP (Lazcano et al., 1999a)

In South Mexico, the mortality rates due to CC are higher than in the central region. Recently it has been estimated that women living in southern Mexico have a higher risk of dying from CC than those living in the North (Lazcano et al., 2008). Particularly in Yucatan, mortality

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is amongst the highest, with a rate of 11.9/100,000 female habitants (age adjusted) in comparison to the national mean of 9.1. <http://www.sinais.salud.gob.mx/mortalidad/>

Therefore, this work aims to describe the participation in CC screening and the associated factors in a group of women at reproductive age attending to Social Security facilities in Southeast Mexico. Also, we surveyed the knowledge about CC and related topics amongst a group of HPV positive women.

## Materials and Methods

### Population studied

This report is part of a cross-sectional study accomplished to describe the epidemiology of HPV infection in a group of women receiving obstetric care at Centro Médico Nacional “Ignacio García Téllez” from Instituto Mexicano del Seguro Social (IMSS) in Merida, Yucatan, Mexico, during 2008-2009 (unpublished). Women are low to medium-income native Mexican, of urban or suburban origin. The study generated a database including files from 281 women at reproductive age attending for obstetric care for delivery at term, or for spontaneous pregnancy loss at the first or second trimester of gestation, and who accepted to participate in the aforementioned project.

### Database analyses

We analyzed a database in SPSS program, including sociodemographic (age, address, telephone, marital status, education, occupation), sexual and reproductive health information (gestations, parity, miscarriages, hormonal contraceptives use, history of STDs), and participation in the NCCSP from the 281 women.

Also, the results of HPV DNA detection at the time of enrolment from 277 of them were analysed (4 were not available). This detection was performed on cervical cell samples, using reported molecular methodologies (Manos et al., 1989).

Chi-square test and Crude Odds ratios were calculated to identify any association of Pap smear history with the following variables: gestations, hormonal contraceptive use, marital status, education and history of sexually transmitted diseases, using Epiinfo 2000 and SPSS software. Linear regression analyses were performed to all variables that resulted significant in the bivariate tests.

### Direct interviews

Contact information was obtained from each patient’s file. An experienced social worker conducted telephonic interviews to identify the possible reasons for non-attending to NCCSP. Patients unable to be reached by telephone were searched in their home address. From all 281 participants, a total of 197 (70.1%) were contacted, 191 by telephone, 6 in their home address; 84 could not be located after several attempts.

### Workshop on CC and HPV knowledge

HPV positive women were identified from the original 281 participants; and were invited to participate in a workshop about HPV and CC which took place at the Universidad Autonoma de Yucatán (UADY) facilities. Upon registration, they were asked to answer the following questions about general knowledge on HPV, Pap smear and CC: 1) Have you heard about human papillomavirus HPV? If someone ask you what HPV is, what would you say? 2) Have you heard about the Papanicolaou smear (Pap)? If someone asked you what the Pap is, what would you say? 3) If you have or had a partner, have you talked about these topics? 4) Have you heard about cervical cancer (CC)? If someone asked you what CC is, what would you say? 5) If you could ask and expert about HPV, CC or Pap smear, what would you ask? 6) Are you willing to have a follow up test (second sample)? 7) If you had the opportunity would you like to participate in other informative workshops? 8) If you answered yes, what are your particular needs about place and schedule?

Afterwards, they were given an informative talk which included basic information on HPV, CC and Pap smear as preventive measure; they worked in small groups, and the discussions were guided by a M.D, a Psychologist and a Social worker.

### Ethical considerations

This study is part of a protocol reviewed and approved by the Bioethics Board of UADY and IMSS. All women signed an informed consent to participate in the project, and in the workshop.

## Results

The 281 participants were between 14 and 47 years of

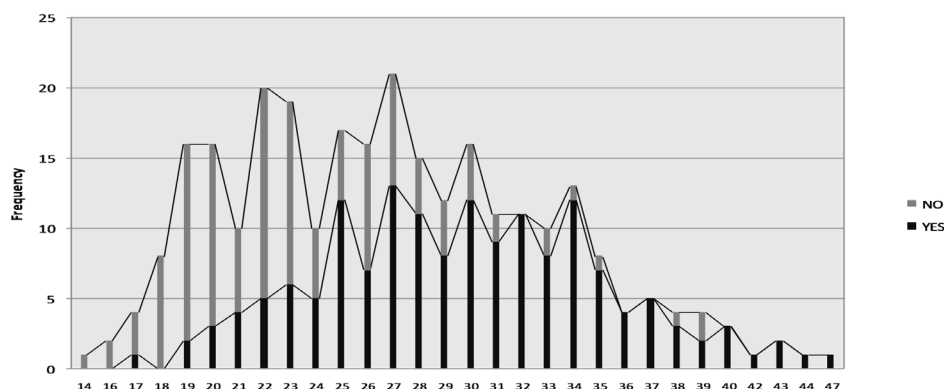


Figure 1. Age Distribution and Participation in the National Cervical Cancer Screening Program (NCCSP) from 281 Obstetric Care Patients

age (mean 27), with the following distribution: 14-19 years old 11%; 20-25 years old 32.7%; 26-31 years old 32.4%; 32-37 years old 18.1%; 38 years old or older (5.7%).

#### Referred Pap history

From all women, 56.2% referred Pap smear history, therefore 158 have ever participated in the NCCSP and 43.8% (123) have not.

The mean age of the 123 women who had never been screened was 23.4 years old (age range 14-39 years); while the mean age of women who had ever had a Pap smear was 29.8 years old (age range 17-47 years) (Figure 1). Women who referred Pap history were housewives (77), employees or independent workers (81).

From the 123 women who have never had a Pap smear, 97 (78.9%) started their sexual life more than 2 years ago.

**Table 1. Analysis of variables and its association to participation in the NCCSP**

Variables	Pap Smear		Crude Odds Ratio (OR)	P value
	Ever n=158	Never n=123		
Live children				
Yes	135	90	<b>2.15 (1.14-4.08)</b>	<b>P=0.01</b>
No (Ref)	23	33	1	
Gestations				
≥2	138	50	<b>10.07 (5.37-19.05)</b>	<b>P=0.00</b>
1 (Ref)	20	73	1	
Hormonal contraceptives use				
Any	36	18	1.72 (0.89-3.37)	P=0.08
None (Ref)	122	105	1	
Marital status				
Married	131	86	<b>2.09 (1.14-3.82)</b>	<b>P=0.00</b>
Not married* (Ref)	27	37	1	
Education				P=0.07
≥6 years	134	113	0.49 (0.21-1.14)	
≤6 years (Ref)	24	10	1	
History of STDs				
Ever	7	0	Not estimated	P=0.01
Never	151	123		
Age				
≥35	29	4	<b>6.69 (2.15-23.16)</b>	<b>P=0.00</b>
≤34 (Ref)	129	119	1	
Occupation				
Worker or other**	81	62	1.03 (0.63-1.70)	P=0.88
Housewife (Ref)	77	61	1	

Bold font indicates significant values, \*Not married marital status includes: single, divorced, widow and cohabitation, \*\* Includes employees and independent workers; professionals and students.

**Table 2. HPV Testing Results and History of Pap Smear Screening by Age Range**

Age Range (Years)	HPV			P Value (CI)	Pap Smear		P Value (CI)
	+	-	ND		Ever	Never	
≤19	3	28	0	0.2045 (0.09-1.45*)	3	28	<b>0.000</b> (0.02-0.24*)
20-25	25	66	1	<b>0.0262</b> (1.03-3.76)	35	57	<b>0.000</b> (0.19-0.58)
26-31	13	76	2	0.1318 (0.28-1.23)	59	32	0.036 (1.00-3.00)
32-37	10	40	1	0.9774 (0.44-2.30)	47	4	<b>0.000</b> (4.24-43.4*)
≥38	4	12	0	0.8347 (0.36-4.85*)	13	3	0.648 (0.94-16.5*)
Total	55	222	4		157 124		

\*Yates corrected, CI: confidence interval, ND: not determined/missing data, p values are shown in boldface (p<0.05),

Furthermore, 16 of these patients (13%) had their first sexual intercourse 10 or more years ago.

Amongst the 157 women who have ever been screened, 10% (29 women) reported they had the last Pap smear more than 24 months ago; 19% (54 women), 13-24 months ago; 18% (51 women), 7-12 months ago; and 9% (24 women) 6 months ago.

In crude tests participation in screening was strongly associated with having 2 or more gestations and to being older in age, with having live children and with being married (marginally with having a stable partner, although not significant); educational level higher than elementary school was not associated to screening (Table 1).

Screening was significantly associated with age; it was less frequently reported in age range less than 25 years of age; and more frequently reported in age range 32-37 years (Table 2). Moreover, significant association to participation was found when the last two age ranges were analysed together (p=0.000) (Table 2)

Linear regression analyses showed significance for the following independent variables: age (p=0.000), gestations (p=0.001) and marital status (p=0.021). Number of children did not show significance (p=0.759).

#### HPV infection

Data concerning HPV tests from 277 patients were available. HPV infection was found with a prevalence of 19.85% (55/277). However, amongst women who had never participated in the NCCSP the prevalence was 25.2% (31/123), being higher than in women who had ever participated 15.6% (24/154) (p=0.0461559). The Pap smear showed a marginally protective effect OR=0.55 (0.29-1.04) although not significant. HPV infection was significantly associated with age range 20-25 (Table 2).

#### Direct Interviews

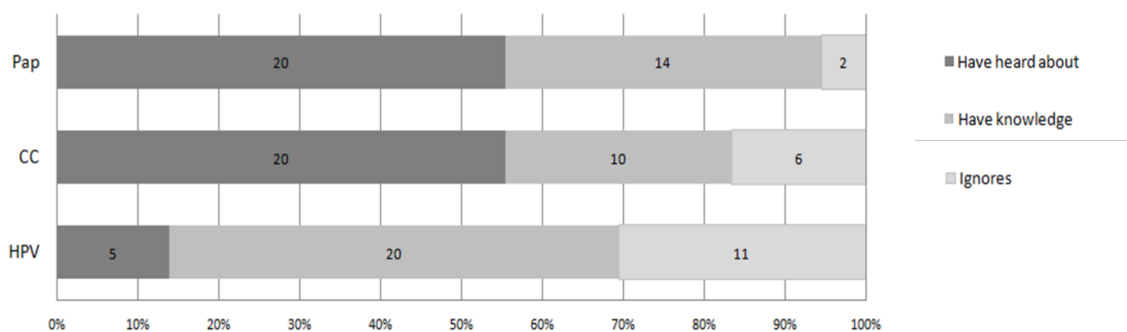
Women which have never participated in the NCCSP were tracked by telephone and were asked on the reasons; from them, 67.5% (83/123) were located. The main reasons referred for non-screening were: ignorance 24.1% (20/83), lack of interest for self-care 20.5% (17/83) and having started their sexual life recently 19.3% (16/83). Other reasons referred were lack of time to attend 12% (10/83), inadequate information 10.8% (9/83), shame 8.4% (7/83), and fear of the procedure 4.8% (4/83).

#### Participation in an informative workshop on CC and HPV

The workshop was addressed to HPV positive women (55 out of 281 original population); 47 of them were located and invited to attend the workshop; only 66% of these women attended (31/47). Additionally, 5 accompanying women were included, making a total of 36 attendees who answered the questionnaire.

The participants' age was distributed as follow: 14-19 years old 8.3% (3); 20-25 years old 41.7% (15); age groups 26-31 and 32-37 years old were 16.7% (6) each; 38-43 years old 11.1% (4) and ≥44 years old 5.5% (2). From these, 38.9% (14/36) have ever had a Pap smear, 47.2% (17/36) have not, and 13.9% (5/36) unknown.

The results from the questionnaire showed that



**Figure 2. Knowledge about CC, HPV and Pap Smear from 36 Women Who Participated on the Informative Workshop**

55.5% of these women expressed knowledge on HPV, in contrast to 38.9% and 25% who expressed knowledge on Pap screen and CC respectively. The results of the questionnaire are summarized in Figure 2.

### Discussion

CC is a disease both physically and emotionally draining, thus preventive culture has an important impact on society by reducing morbidity and mortality of risk populations.

The studied population is considered at risk, because they are all sexually active and a high percentage have never had a cytology test. In this population we found women who had never been screened for CC and who tested positive for HPV infection, being at a higher risk for developing lesions.

Low coverage and access have been described amongst the most important problems of the NCCSP in Mexico (Lazcano et al., 1997; 1999; 2008). Aguilar-Perez (2003) reported participation in the NCCSP in Mexico City of 50% in 1998 and 45% in 2003.

Factors influencing participation may vary from populations. In an extensive research carried out in India that included more than 100,000 women, participation in screening was found to be higher among women with higher levels of education, who were married and have used contraception (Nene et al., 2007); in our study these last two factors were also present; however the last did not reach significance. In addition, the same study reports that nulliparous women were found to have the lowest rate of participation; in our study population, gestations and parity were strongly associated with the participation in screening. Although older age was associated to participation, and is directly related to gestations and parity, our observations might indicate the influence of receiving medical attention, due to obstetric reasons, including prenatal care, or for family planning. These visits to hospital facilities are important opportunities to inform the patients, and have previously been described in Mexico as a predictor of Pap smear history (Hernandez-Avila et al., 1998; Aguilar-Pérez et al., 2003; Wall et al., 2010).

Educational level has been described as a factor associated to screening, in other regions from Mexico (Lazcano et al., 1999b; Leyva et al., 2006). A similar scenario was described in Chile where a lower educational level was associated to a negative or indifferent attitude

towards taking the Pap test (Huamani et al., 2008) In contrast, in our study, educational level was not associated to screening; therefore other variables might be involved.

Participation can be influenced by socio-psychological issues. A review performed to identify factors influencing participation on screening amongst Hispanic women, showed that the most common barriers are fear of cancer, embarrassment and language barriers (Austin et al., 2002; Wall et al., 2010). Other reports have also described fear and shame amongst the barriers for screening (Byrd et al., 2004). This was observed in our population, because some women reported being afraid or embarrassed of the procedure, although the main barriers found were ignorance and lack of interest. We identified in open interviews that many women do not give priority to their own health, even if they acknowledge the importance of the screening. It would be of importance to analyse these cases to determine whether if the barrier for screening is indeed lack of interest or priority, or if it is merely a reflect of a perceived low susceptibility, seriousness or benefits. This situation have been described elsewhere, as it has been shown that Hispanic women commonly feel less susceptible to cancer; and perceive Pap smears as an unnecessary or diagnostic procedure rather than a preventive practice (Austin et al., 2002; Flores and Bencomo, 2009).

Spousal or partner disapproval has been described as an important sociocultural barrier towards screening (Wall et al., 2010). Interestingly, this was not expressed by our studied population in open interviews, and being married was associated to screening. Moreover, in the workshop addressed to HPV positive participants, 67.7% referred having discussed CC related topics with their current or previous partner; indicating the involvement of the partner in sexual health related issues.

HPV is the most frequent sexually transmitted infection. According to Mexico’s Health Ministry report in 2009, the highest incidence of HPV is within the age ranges from 25-44 years old (94.19/100,000 female habitants) corresponding to an age with a high reproductive potential. [www.dgepi.salud.gob.mx/anuario/html/anuarios.html](http://www.dgepi.salud.gob.mx/anuario/html/anuarios.html)

The HPV prevalence observed in our study was close to 20%, this is very high in comparison to other studies in Mexico, carried out using the same methodology for detection and in women without cervical lesions. In northern and central Mexico reported the prevalence is 2.15% and 9.2% (Rodríguez et al., 2003; Carrillo et

al., 2004). Previous reports from our region in southeast Mexico showed a prevalence of 6% (Gonzalez-Losa et al., 2006a). However, in our studied population the status of a possible cervical pathology is unknown, given that a high percentage of these women have never had a Pap smear. This is a limitation of our study that could be related to the high HPV prevalence found.

One of the most important factors influencing participation in screening is knowledge of the significance of the test, as reported for women from Latin-America, (Lazcano et al., 1999; Huamani et al., 2008) for Latina Population from the United States (Flores and Bencomo 2009). In our study, we organized a workshop addressed to HPV positive women; a high percentage of the participants had heard about CC and Pap, but only 27.8% demonstrated a real knowledge on CC. A high percentage reported knowledge on HPV (55%); a possibility is that they were exposed to information through television and other massive media because of the high promotion of the HPV vaccine during this project. Hispanic women have been described as more receptive to media messages than other ethnic groups (Austin et al., 2002) and therefore an increase of promotion of the NCCSP on massive media should be considered.

In 2003, the recommendation to start the screening within 3 years of sexual onset was released in the United State (revised by Noller 2005). Similarly, within the Institution where sampling was performed the most recent version of the clinical guideline indicates the Pap smear to: all sexually active women from age 21 or younger who had been sexually active for three years; and to everyone requesting it. However, most patients, and some health workers, do not consider sexual activity as indicator for the screening. We found 97 (34.5%) women who started their sexual life from more than 2 years ago, to over 10 ago, but who have never had a Pap smear. Interviews revealed that 9 patients did attend to the hospital requesting the test, but were informed by the personnel that they had not reached the minimal age of 25 years old, although they had been sexually active for years or even had children. Other patients reported believing that Pap smears should be performed time after giving birth to the first child, independently of the sexual onset or miscarriages. Therefore, guidelines could be confusing to the health worker. Furthermore, knowledge about etiology and prevention of CC have been reported to be low amongst family physicians from a similar background in Mexico, and the need for an adequate training have been urged (Gonzalez-Losa et al., 2006b).

Screening at young age is controversial. While some studies in developed countries recommend screening from age 20, others have confirmed cervical screening in women aged 20-34 is less effective than in older women (Rieck et al., 2006; Sasieni et al., 2009). Controversy is founded mainly on the anxiety of an abnormal test, unnecessary treatment to low grade lesions that might regress spontaneously, and on reports that have associated preterm delivery on pregnancies after treatment of lesions (Kyrgiou et al., 2006). In our study, 76.1% of women were under 32 years old, being 43.7% 25 years old or younger. Although HPV infections at these ages are very frequent

and are usually transient, some studies have shown a high incidence of high grade lesions shortly after HPV infection and an increase in mortality from CC in young women (Woodman et al., 2001; Yang et al., 2009) therefore, screening at young age should not be discarded. The usefulness and cost-effectiveness of screening in young women remain to be evaluated in Mexican populations; however, recent statistics showed that 5.8% of incident cases of severe dysplasia during 2010 were in women between 15 and 24 years of age, represented by 341 reported cases nationwide, which is a non-depreciable number [www.dgepi.salud.gob.mx/anuario/html/anuarios.html](http://www.dgepi.salud.gob.mx/anuario/html/anuarios.html). On the other hand, our results confirm that in Mexico screening is mostly opportunistically offered (Hernandez-Avila et al., 1998; Aguilar-Pérez et al., 2003). Therefore, encouraging young women to start screening before they have completed childbearing is important because at older age (when women are at a higher risk), they are unlikely to access family planning aid or obstetric care.

In the studied population, amongst the main reasons referred for non-screening were ignorance and inadequate information. This was unexpected because IMSS has a complex network involved in CC screening promotion, in all levels of attention, including educative sessions addressed to encourage screening at the end of gestation. However, interviews suggested that self-health care is not often considered a priority, as many women reported not having time to go for the screening, due to family or work related duties. The last one is important to be noticed, because a high percentage of women attending Social Security facilities are employees. Similarly, a recent publication on barriers to CC screening in Mexican working women, reported that non-users were more likely to perceive not having sufficient time to take the test than Pap users (Wall et al., 2010). Additionally, employers have to give permission to the worker to attend, and usually the day salary is deducted, which is an important socioeconomic barrier for screening (Flores and Bencomo 2009). Therefore, the employers should consider the promotion of preventive health practices amongst their employees as part of the routine human resources development schedule.

In conclusion, pap smears are not indicated during pregnancy, but the opportunistic enrolment of these women throughout information about the NCCSP and its importance, either at the time of visit for prenatal care or for delivery, should be reinforced in health care. This in order to warrant the participation during reproductive age, before childbearing ends.

Although our data are limited, it gives a picture of the participation in the NCCSP in this group of women, which we consider vulnerable due to its characteristics, and it sets the basis for further investigations in larger populations.

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