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Determinants of cervical cancer screening in a poor area: results of a population-based survey in Rivas, Nicaragua

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Summary

OBJECTIVE To obtain baseline information for designing a community-based intervention programme aimed at increasing the cervical cancer screening coverage of women most at risk.
METHODS A population-based survey, using proportional stratified two-stage cluster sampling in Rivas, one of the 16 Departments of Nicaragua. The individuals selected were interviewed at home by one of 26 interviewers, using a structured questionnaire. The questionnaire was designed to elicit (1) knowledge, attitudes and practices concerning sexual and reproductive health and behaviour, (2) risk factors for cervical cancer and (3) the use of health and cervical cancer screening services.
RESULTS A total of 612 men and 634 women participated in the survey. Of the women who had been sexually active at least 3 years, only 41.1% had undergone screening within that period and were considered adequately screened. Correlates of inadequate screening status included low educational level, exclusive use of public health facilities and lack of knowledge about prevention and symptoms of cervical cancer. Negligence, absence of medical problems, fear, lack of knowledge and economic reasons were the main reasons given for not being screened. Reluctance to be screened in the future was related to lack of knowledge of the disease, inadequate screening status, older age and low educational level.
CONCLUSIONS The current screening programme is not effective in reaching the majority of the population. Complementary activities such as education and information, as well as a more pro-active approach to invite women for screening are necessary.

keywords cervical cancer, determinants, population-based survey

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Introduction

Each year, an estimated 371 000 new cases of invasive cervical cancer occur worldwide, representing nearly 10% of all cancers in women. In 1990, the estimated age standardized incidence rate in Central America was 44.4/100 000, which is the highest in the world and three times higher than in the industrialized world (Parkin *et al*. 1999).

Cervical cancer is among the few cancers that can be prevented. In Western countries, the decline in cervical cancer incidence and mortality has been attributed to extensive screening programmes (Hakama 1985; Laara *et al*. 1987). However, in most developing countries, cervical cancer screening is not widespread, and comprehensive screening services are rare. Current screening programmes face obstacles such as inadequate equipment and supplies, inadequate provider training, limited cytology services and difficulties in patient follow-up and treatment (Bishop *et al*. 1995). As a substantial proportion of women at risk has never been screened, low coverage is the most important deficiency.

In Nicaragua, screening services are provided through the public health system, where Papanicolaou (PAP) smear taking is integrated into the women's health clinics. Screening is opportunistic: women attending the services and requesting a PAP smear are screened, whatever their age or date of last screening. Private practitioners and non-governmental organization (NGO) clinics also offer cervical cancer screening services. Despite improved access to health services since the 1980s, fertility surveys have shown

that only 35% of the women have had at least one PAP smear by the age of 35 (PAHO 1998).

We wanted to obtain baseline information for designing a community-based intervention programme to increase the cervical cancer screening coverage of women at risk. The first step in this process was the description of the population in terms of both demographic and socio-economic status and reproductive and sexual behaviour. We also examined the perceptions of both men and women regarding cervical cancer and screening. To establish determinants of cervical cancer screening, we distinguished between the current screening status and the intention to be screened in the future. In order to design feasible interventions, information on the perception and use of health services was collected. As community volunteers and outreach personnel can successfully increase the coverage of cervical cancer screening programmes, we assessed the extent to which the population was aware of the existence and role of *brigadistas de salud* (Bird *et al.* 1998; Marcus & Crane 1998).

Method

Study design and sampling

The study design is a face-to-face interview survey in a population-based proportional stratified two-stage cluster sample of adolescents and adults. The total population was the population of the Department of Rivas, one of the 16 Departments of Nicaragua, with 153 000 inhabitants. Stratification criteria were geographical area and urban or rural setting. Primary sampling units were neighbourhoods and secondary sampling units were individual adolescents aged 15 years and older, and adults.

The sample frame for the first stage was developed using data from the 1995 electoral survey, which includes the entire population aged 16 or over, living in Rivas at that time. The Department was first divided into six geographical areas, each with an urban and a rural zone, resulting in 12 strata. We then listed the number of neighbourhoods and inhabitants in each stratum, taking into account an estimated 15% population increase. The planned sample size was set at 1200 : 600 men and 600 women, 300 urban and 300 rural, respectively. The number of people to be interviewed in each stratum was proportional to the size of the stratum.

Two neighbourhoods were then randomly selected in each stratum, with the exception of urban Rivas, where three neighbourhoods were included, and urban Tola, where only one was included because of the size of the respective strata. We censused the total population of those neighbourhoods by house-to-house visits. All men and women aged 15 years and older were listed. The individuals to be interviewed, proportional in number to the size of the neighbourhood and including an additional 7–8% to allow for refusals, were then selected randomly. For each neighbourhood, a randomly selected reserve list of 20% of the sample size was made to substitute for subjects who could not be located.

Instruments

The interview was held using a structured questionnaire. The questionnaire was designed to characterize people in terms of knowledge, attitudes and practices concerning sexual and reproductive health, reproductive and sexual behaviour, risk factors for cervical cancer, and use of health services in general and of cervical cancer screening services in particular.

The questionnaire included questions assessing knowledge and preferences concerning PAP testing. Women were asked extensively about their history, current use and intention to use cervical cancer screening services. Men were asked about their attitudes towards and preferences concerning screening services. Barriers and facilitating factors for cervical cancer screening were identified using both closed and semi-open questions. These data were completed by questions on demographics, socio-economic status, knowledge and practices concerning family planning, STD services and AIDS.

Procedure

The 26 interviewers (20 females, six males) consisted of members of the various communities with at least secondary educational level, and medical students from the Universidad Nacional de Nicaragua. All received a 1-day training in the correct use of the questionnaire. All the persons selected were visited at home and interviewed individually. If absent, they were visited again, and if not found then, replaced by other subjects. Participants were asked about their willingness to participate at the start of the questionnaire to get informed consent. Ethical approval for the study was obtained from the ethical committee of the Universidad Nacional Autonóma de Nicaragua, Managua.

Analysis

Data were entered in Epi-info version 6.04.b, and analysed with SPSS 9.0 for Windows (SPSS Inc., Chicago, IL, USA). Proportions were compared using the chi-square test and mean values by the Student's *t*-test. The association between current screening status and intention to be screened, respectively, and independent variables (including

socio-demographic characteristics, accessibility and use of health services, knowledge of cervical cancer and screening history) was assessed in univariate analysis using the chi-square test, and summarized with odds ratios (OR) and their respective 95% confidence intervals (CI). For this purpose various continuous variables (age, income, distance from health centre) were grouped in categories. To adjust for multiple determinants of current screening status and intention to be screened, multivariate logistic regression using a forward stepwise model was performed. Only determinants significant in univariate analysis were included in the model, and in the same form. All tests of hypothesis were two-tailed with a type I error rate fixed at 5%.

Results

A total of 1298 people, 646 men and 652 women, were selected for the interview and visited by the interviewers between 3 and 15 April 2000. Of those selected, 239 men and 127 women were not at home during the first visit and were visited a second time. Seventy-six (12%) men and 43 (6%) women could not be located and were replaced by subjects from the reserve list. Thirty-four men and 18 women refused to answer the questionnaire (5 and 3%, respectively, of those present), resulting in 612 men and 634 women participating in the survey.

Characteristics of the population

The mean age of the interviewed population was 35.5 years (range 15–90). Nearly 18% was younger than 19 years. Half of the population lived in rural areas. About 59.8% of men and 57.6% of women were married or living with a partner. The educational level was similar for men and women, 12.2% being illiterate and 5.3% having a higher education. About 42% of men were farmers and 73.4% of the women housewives. Two-thirds of the families had an income of <1000 Cordoba per month

Table 1 Characteristics of the population

	Men *n* or mean (% or SD)	Women *n* or mean (% or SD)	*P*-value
Total population (*n* = 1246)	*n* = 612	*n* = 634	
Age (years)	35.6 (17.5)	35.3 (16.6)	0.81
Sexual experience			
Yes	546 (89.2)	532 (83.9)	0.006
No	66 (10.8)	102 (16.1)	
Sexually active population (*n* = 1078)	*n* = 546	*n* = 532	
Mean starting age (years)	15.8 (3.0)	17.7 (3.3)	< 0.001
Number of sex partners lifetime*			
1.00	100 (20.4)	323 (61.4)	< 0.001
2–10	262 (53.6)	199 (37.8)	
> 10	127 (26.0)	4 (0.8)	
Having children†			
With one partner	246 (67.6)	344 (70.8)	0.316
With different partners	118 (32.4)	142 (29.2)	
Trust partner to be faithful‡			
Yes	271 (81.6)	159 (46.8)	< 0.001
No	61 (18.4)	181 (53.2)	
Adolescents 15–18 years (*n* = 220)	*n* = 115	*n* = 105	
Civil status			
Single	104 (90.4)	80 (76.2)	0.004
Married/accompanied	11 (9.6)	25 (23.8)	
Sexual experience			
Yes	64 (55.7)	39 (37.1)	0.006
No	51 (44.3)	66 (62.9)	
Having children			
Yes	7 (6.1)	21 (20.0)	0.002
No	108 (93.9)	84 (80.0)	

* Fifty-seven missing values in men, six in women.

† Analysis limited to 377 men and 490 women reporting children, 13 missing values in men, four in women.

‡ Analysis limited to 341 men and 344 women living in stable relationship, nine missing values in men, four in women.

(75 US$). The mean parity of the women was 4.1 (SD 3.3, range 0–16) and more than half had at least three children. Nearly 40% of women and 79.6% of men had had more than one sexual partner. Just under half of the women believed their partner to be faithful, but only 3.3% of the men admitted having more than one sexual partner at the time of the interview. Adolescent boys were more likely than their female counterparts to be sexually active by the age of 18, but they were less likely to have a stable relationship and children. An overview of the reproductive and sexual behaviour is given in Table 1. The reports were independent of the sex of the interviewers.

Accessibility, perception and use of health services

Nearly 80% of the population had access to a public health facility within 5 km or one accessible within less than half an hour. This was more than 95% in urban areas and 60.5% for rural people. Four-fifths of the population reported having attended a public health service the last time they had health problems, mainly because the public services were nearby and cheap. Nearly 20% of people in urban and less than 10% of people in rural areas attended private practitioners, mainly because of a perceived higher quality of service delivery. There were no major differences in the perception between males and females, or between different age categories.

Questioned about community health workers, only 36.7% of the population knew that there was a *brigadista de salud* in their neighbourhood or community. Health promoters were better known in rural than in urban areas: 42.6% *vs.* 30.8% ($P < 0.001$).

Perception and practices regarding cervical cancer screening

Only 433 women (68.3%) and 348 men (56.9%) said they knew some basic facts about cervical cancer, yet 94.3% and 89.2%, respectively, knew that women could be examined to detect the illness. Women more often than men (59.1% *vs.* 44.4%, $P < 0.001$) referred to the PAP test as a means of preventing cervical cancer. Only 19.6% of women and 14% of men could give at least one symptom of cervical cancer. Symptoms most cited were abdominal pain (13.2%), bleeding (9.1%) and vaginal discharge (2.6%).

As more than 50% of responders without sexual experience (mainly adolescents) were not able to reply to the questions, we limited the analysis of attitudes to cervical screening to the 546 men and 532 women who were sexually active. In general, people were favourably inclined towards screening: 89.2% of men and 80.3% of women thought it was good for women to be screened. Nearly 80% of both sexes considered the medical doctor best placed to perform the screening and significantly more women than men preferred a female health worker (70.3% *vs.* 38.5%, $P < 0.001$). For 25% of men and 56.4% of women the screening should preferably be offered through private services, but one quarter of men and 37.2% of women were not able or willing to pay 10 Cordoba (0.75 US$) for a PAP smear.

Screening practices and predictors of inadequate screening status

Because we considered women to be adequately screened if they had a screening test within the last 3 years, we limited this analysis to the 489 women who had been sexually active for at least 3 years. Of these women, 201 (41.1%) were adequately screened and 288 (58.9%) inadequately; of them, 205 (41.9%) had never been screened and the remaining 83 (17.0%) had had their last PAP smears more than 3 years ago. Of the women screened, 57.8% had the test performed in a public centre, 34.5% in the private sector and the rest in NGO clinics.

Several variables related to socio-demographic status, accessibility and use of health services, and knowledge were significantly related to screening status. In multivariate analysis, predictors of inadequate screening were low educational level, exclusive use of public health services and lack of knowledge (Table 2). The reasons given for not being screened were negligence (23.6%), absence of medical problems (22.1%), fear of the examination (21.1%), ignorance (15.1%) and economic reasons (8%). Less than 10% declared that they had been unwilling to undergo screening tests.

Determinants of future screening planning

This analysis is limited to the 483 women who were sexually active for at least 3 years, excluding those who had a hysterectomy. A total of 135 (28.0%) women expressed reluctance to future screening. Nearly half of the women never screened were unwilling to attend screening programmes in the future.

In univariate analysis, age >45 years, lower educational level, monthly income <1000 Cordoba, ignorance of symptoms and prevention of cervical cancer, and inadequate screening status were significantly related to unwillingness to be screened in the future. In multivariate analysis, including all significant variables, the main determinants of unwillingness to be screened in the future were lack of knowledge, inadequate screening status, age >45 years and low educational level, with adjusted odds

Table 2 Determinants of inadequate screening status°

		Proportion women inadequately screened			
		$n = 489$*	%	OR (95% CI)	AOR (95% CI)**
Socio-demographic variables					
Area	urban	126/232	54.3	1	
	rural	162/257	63.0	1.44 (1.00–2.06)	
Age	≤ 45 years	179/336	53.3	1	
	> 45 years	109/153	71.2	2.17 (1.44–3.28)	
Educational level	≥ secondary level	63/142	44.4	1	
	≤ primary level	220/341	64.5	2.28 (1.53–3.40)	1.74 (1.07–2.83)
Income	> 1000 Cordoba (> 75$)	37/87	42.5	1	
	≤ 1000 Cordoba (≤ 75$)	143/241	59.3	1.97 (1.20–3.24)	
Accessibility and use of health services					
Distance from health facility	≤ 5 km	204/373	54.7	1	
	> 5 km	81/113	71.7	2.10 (1.33–3.32)	
Use of private services	Sometimes/ever	32/71	45.1	1	
	Never	252/413	61.0	1.91 (1.15–3.17)	1.95 (1.03–3.68)
Knowledge					
Knows cervical cancer can be prevented	Yes	230/419	54.9	1	
	No	57/69	82.6	3.90 (2.03–7.49)	2.42 (1.09–5.37)
Able to mention at least one symptom	Yes	51/113	45.1	1	
	No	237/376	63.0	2.07 (1.35–3.17)	1.79 (1.06–3.03)

° Analysis limited to women at least 3 years sexual active.
* Missing values: 6 for educational level, 161 for income, 3 for distance, 5 for use of private services, 1 for knowledge on prevention.
** Logistic regression using forward stepwise model, adjusting for all variables included in univariate analysis. Only educational level, use of private services and factors related to knowledge were withheld in the equation.
OR: Odds ratio: AOR: Adjusted odds ratio; CI: Confidence interval.

ratios of 4.96 (CI 2.41–10.05); 5.13 (CI 2.033–11.30); 4.12 (CI 2.18–7.80) and 2.89 (CI 1.28–6.52), respectively. Nearly half of the women attributed their reluctance to absence of medical problems; fear of the test, lack of knowledge, advanced age and economic problems accounted for the other half.

Discussion

Previous data collected in Nicaragua have shown a relatively high prevalence of dysplasia, with abnormal smears found in 7.7% of patients attending health services (Claeys *et al.* 2002). The aim of the current survey was to collect data on determinants of cervical cancer screening, applicable to the population living in a district preparing for an improved screening programme. The face-to-face interview was chosen to give people the opportunity to express themselves in a confidential way. In practice, it was often impossible to interview people in private. Men as well as women were often surrounded by family and friends, and this could have biased some of the answers, especially in relation to sexual behaviour. This was mainly reflected in non-response to some of the questions. However, as the collected data are in line with the results from other surveys, we are confident that the information received is representative for the population.

The high incidence and mortality rates of cervical cancer in Latin America are ascribed to both the high frequency of risk factors for the disease and low screening coverage (Eluf-Neto & Nascimento 2001). Studies in the region identified multiple sex partners (of both men and women) and early age at first intercourse as the main risk factors, as well as high parity, low socio-economic status and low educational level (Brinton *et al.* 1989; Herrero *et al.* 1990). In the population under study here, several of these risk factors are present, and people inadequately screened are most likely to be exposed to these factors.

Early age at first sexual intercourse is, as in most Latin American countries, most pronounced in men. Reported sexual activity started at a mean age of 15–16 years in boys, 2 years earlier than in girls. These results coincide with other published national data (Zelaya *et al.* 1997; INEC 1998). Fifteen years seems to be a strong normative age for sexual initiation in boys; these relations are often casual or with a sex worker (Montoya 2001). Men are also more promiscuous than women. Women are well aware of the promiscuous behaviour of their spouses; more than half suspect their partner of having other contacts. This social

pattern of initiation and male promiscuity may be an important factor in the transmission of human papillomavirus.

As cervical cancer screening programmes are offered within health services, it is important that these services are used by the target population. Therefore, they have to be affordable, accessible, and considered appropriate by the women they serve (Hoffman *et al.* 1997). Within our survey, we assessed some of these aspects. In general, geographical accessibility did not seem to be a major problem, as only 20% of the population live more than 5 km from a health facility. Most people think well of the public health sector, which they use for convenience, as the services are nearby and cheap. Private services are perceived as providing services of higher quality, but only a minority have the means to use them. This is reflected in the use of private facilities for screening: more than half of the women consider private services optimal for PAP tests, yet only one-third had the PAP test performed in a private clinic.

High coverage of women at risk of cervical cancer is a key element in achieving a successful screening programme (Miller 1992). To attend the programme, people have to be aware both of the disease and of the means of early detection and prevention. Whereas most of the interviewed people knew cervical cancer could be detected, only 50% referred to the PAP test as a means to prevent it and <20% were able to mention at least one symptom. A substantial part of the population still lacks sufficient knowledge about cervical cancer in general and the means to prevent it. We identified this gap in knowledge as one of the most important determinants of inadequate screening status.

Men are less knowledgeable than women, but they seem to have a more positive attitude towards screening. This should be exploited by targeting not only women but also men in education and information campaigns. As men have an important decision-making role in the family, they can help motivate their partner to attend the programme.

In general, the coverage of the current screening programme is low: 58% of women sexually active for at least 3 years had had a PAP test, but only 41% had had a test within the last 3 years and can be considered as adequately screened. This coverage is similar to neighbouring Honduras, but in Costa Rica coverage of 83.5% has been reported (Irwin *et al.* 1991). Costa Rica, however, has an overall higher economic status and a highly developed health system delivering care to most inhabitants (Herrero *et al.* 1993).

Of even more concern is that nearly one-third of the target population is reluctant to attend screening programmes in the future. This is especially the case for women inadequately screened, the population most at risk for cervical cancer. Lack of knowledge and factors related to low socio-economic status and educational level were the main barriers to screening, which is consistent with reports from other countries (Hislop *et al.* 1996; Branoff *et al.* 1997; Wood *et al.* 1997). Most of the perceived barriers such as fear of the test, negligence, and the belief that screening is unnecessary in the absence of symptoms, could be overcome by providing correct information to women and by inviting them directly in order to motivate them. Educational messages should focus on the preventive nature of a PAP smear, to counter the idea that medical care is only necessary in the presence of symptoms.

Although many seem to be willing to pay for a PAP test, availability of screening services free of charge is important for reaching people for whom financial problems are an obstacle to screening. Where possible, screening services should be provided by female health workers, as two-thirds of the women prefer a female health worker.

Conclusions

This survey provides useful information for the design of a screening programme adapted to the needs of the population. The current programme, based on opportunistic screening, is not effective in reaching the majority of the population. Complementary activities, including education and information of both men and women, are necessary, as well as a more pro-active approach to invite women to attend the programme. At least in rural areas, where they are best known and most active, the community health workers can be involved (Bender & Pitkin 1987). To ensure affordability, services should be integrated in existing public primary health care centres, or provided free of charge or at low cost by NGOs, and preferably provided by female health workers.

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