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CLINICAL ARTICLE

Awareness and prevalence of cervical cancer screening among women in Nepal

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ABSTRACT

Objective: To estimate awareness and prevalence of cervical smear testing among women in Nepal. **Methods:** A secondary analysis of data obtained as part of a nationwide household survey between May 25 and June 14, 2015, was undertaken. Information obtained from women aged 21–65 years was included. Multiple regression analyses were performed to identify factors associated with having undergone cervical smear testing. **Results:** A total of 829 women were included. Among 816 women who answered the relevant survey question, 710 (87.0%) had no knowledge of cervical smear tests. Only 39 (4.7%) of the 829 women had ever undergone a cervical smear. In multivariate analysis, having undergone a cervical smear was associated with literacy (adjusted odds ratio [aOR] 3.26, 95% confidence interval [CI] 1.25–8.51; $P=0.016$) and living in rural areas (aOR 0.48, 95% CI 0.24–0.96; $P=0.038$). **Conclusion:** Nepali women rarely undergo cervical smear screening, with the lowest prevalence recorded among the illiterate and those living in rural areas. To boost screening rates, educational campaigns and rural outreach are needed.

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1. Introduction

Worldwide, more than 270 000 women die from cervical cancer annually, with the disease being the second most common cancer in women [1]. In 2008, 86% of new cases and 88% of deaths from cervical cancer occurred in low- and middle-income countries [2]. A routine cervical smear test—a well-known and widely implemented screening technique to identify women with precancerous cervical lesions—has been shown to be beneficial in many high-income countries, and has significantly reduced the incidence, morbidity, and mortality of cervical cancer [3]. In the USA, current guidelines [4] recommend that all women aged 21–29 years undergo cervical cancer screening every 3 years and women aged 30–65 years should undergo a cervical test every 5 years coupled with HPV testing, provided that all results are normal. Nevertheless, for women in low-income countries, access to

cervical cancer screening is limited; it is estimated that 95% have never been screened [5].

In Nepal, cervical cancer is thought to be the leading cause of cancer-related deaths among women aged 15–44 years, with 9.65 million women at risk [6]. Estimates suggest that, in 2008, there were 10,000 new cases of invasive cervical cancer and 26 000–45 000 women who had a precancerous lesion in Nepal [7]. Nepali national cervical cancer screening guidelines recommend that all women aged 30–65 years be screened for cervical cancer [8], but because of poor awareness, scarce screening resources, inadequate access to health care, and difficult geographic terrain [9,10], most women never undergo screening, and most often present for care at a very late stage of the disease. This lack of screening meant that only 2332 Nepali women were diagnosed with cervical cancer in 2013 [7].

Despite the great need, few programs in Nepal raise awareness of the necessity of cervical cancer screening or provide cervical smear tests or HPV vaccinations [8]. To adequately assist program managers and policymakers in the design and implementation of programs and in the provision of resources to increase cervical cancer screening, an understanding of the baseline requirements is essential. However, population-based data on cervical cancer screening rates in the Nepali

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context or on cervical cancer awareness and attitudes to screening among Nepali women remain limited. Thus, the aim of the present study was to estimate the awareness and prevalence of cervical smear testing among Nepali women eligible for cervical cancer screening.

2. Materials and methods

A secondary analysis of data obtained through a previous survey-based study was undertaken. Full methods of the previous study have been reported previously [11]. Briefly, between May 25 and June 12, 2014, 1397 randomly selected households from 15 randomly selected districts in Nepal were visited. In each district, three clusters—two urban and one rural—were randomly chosen in proportion to the population for a total of 45 clusters [12]. In each cluster, trained interviewers chose an agreed central geographic location and sampled every fifth household, sampling a total of 30 households per cluster. For each household visited, two members were chosen using a randomization calculator and interviewed. Only individuals with an intellectual disability were excluded. For the present analysis, only data for women aged 21–65 years—i.e. those eligible for cervical smear testing—were included. Ethical approval for the study was obtained from the Institutional Review Board of Nationwide Children's Hospital, Columbus, OH, USA, and the Nepal Health Research Council, Kathmandu, Nepal.

The Surgeons Overseas Assessment of Surgical Need (SOSAS) survey—which was developed by an international group of experts and used in Sierra Leone and Rwanda to determine the prevalence of conditions needing surgical care and the percentage of deaths possibly averted through adequate access to such care [13]—was used. The SOSAS survey is composed of a head-of-household interview to determine household demographics and a head-to-toe verbal examination of two, randomly chosen household members. Previous studies have documented the method in detail [11,13–15].

The tool was slightly modified for the Nepali context to include a visual examination and additional questions on women's health needs [13,16]. To assess knowledge of cervical cancer, female participants were asked if they were aware of what a cervical smear test was and if they had ever had one. To assess for gynecologic comorbidities, females were questioned about leucorrhoea, urinary incontinence, and symptoms of uterine prolapse.

The required sample size was estimated to be 753 women aged 21–65 years to detect a previously documented prevalence of 2% uptake of cervical smear tests for cervical cancer screening [7], with a 95% confidence interval and absolute precision of 1%.

Univariate analysis (logistic regression) and χ^2 tests were performed using Stata version 13.2 (StataCorp, College Station, TX, USA) to test the association between the dependent variable (history of cervical test) and independent variables such as age, area of residence (urban/rural), occupation, literacy, and travel time to or costs for treatment at primary, secondary, and/or tertiary health centers. Women with any comorbid condition such as prolapse, incontinence, or leucorrhoea were categorized into a comorbid condition group and this category was used in a multiple regression model. The Student *t* test was performed to assess the associations between age, travel time to health center, cost of travel, and the dependent variable. A logistic regression analysis adjusted for variables, accounting for clustering, was performed along with forward and backward selection of the variables. Co-linearity between the variables was examined using variance inflation factors. $P < 0.05$ was considered significant for all statistical tests.

3. Results

The response rate among the 1397 households randomized for the survey was 96.6%, with 1350 households participating. Among 2695 individuals interviewed, 1261 (46.8%) were female. Of the female interviewees, 829 (65.7%) were aged 21–65 years and were eligible for inclusion in the present analysis.

Table 1 shows the demographic characteristics of the included women. The mean age was 38.12 ± 12.20 years, with most women aged 21–49 years. Almost half the women had never received any formal education, although almost 60% were literate. More than half had no employment, most were married, and two-thirds were from rural areas of Nepal.

Among 816 women for whom relevant information was available, 710 (87.0%) reported no awareness of cervical smear tests. Among the 106 women who had some knowledge of these tests, 67 (63.2%) had never undergone a cervical smear test. Indeed, only 39 (4.7%) women included in the survey had ever undergone a cervical test. There were significant differences between women who had and had not undergone a cervical smear test in literacy, employment, and area of residence ($P < 0.05$ for all) (Table 2).

In univariate analysis, literacy, employment, and rural area of residence were associated with ever having had a cervical smear test ($P \leq 0.011$ for all) (Table 3). In multiple logistic regression analysis, with adjustment for other variables, literacy and rural area of residence

Table 1
Demographic characteristics.

Characteristics	Value ^a
Age, y (n = 829)	
21–49	648 (78.2)
50–65	181 (21.8)
Education (n = 828)	
None	365 (44.1)
Primary school	148 (17.9)
Secondary school	188 (22.7)
Tertiary level	111 (13.4)
Graduate degree	16 (1.9)
Literacy (n = 828)	
Illiterate	332 (40.1)
Literate	496 (59.9)
Occupation (n = 828)	
Unemployed	92 (11.1)
Homemaker	479 (57.9)
Domestic helpers	16 (1.9)
Farmers	76 (9.2)
Self-employed	124 (15.0)
Government employee	21 (2.5)
Non-government employee	20 (2.4)
Employment (n = 828)	
No	571 (69.0)
Yes	257 (31.0)
Good general health (n = 829)	
Yes	715 (86.2)
No	114 (13.8)
Village type (n = 829)	
Urban	286 (34.5)
Rural	543 (65.5)
Marital status (n = 816)	
Married	704 (86.3)
Unmarried	66 (8.1)
Divorced	4 (0.5)
Widow	42 (5.1)
Knowledge of cervical smear (n = 816)	
No	710 (87.0)
Yes	106 (13.0)
Travel time to health facility, min	
Primary health center	46.46 ± 304.44
Secondary health center	173.75 ± 434.75
Tertiary health center	340.34 ± 1151.77
Cost of travel to health facility, NPR ^b	
Primary health center	27.44 ± 134.25
Secondary health center	623.01 ± 3025.81
Tertiary health center	1895.68 ± 6197.28
Other comorbid conditions	
Symptoms of prolapse (n = 814)	42 (5.2)
White discharge (n = 791)	53 (6.7)
Incontinence (n = 789)	46 (5.8)

^a Values are given as number (percentage) or mean ± SD.

^b 1 Nepalese rupee = US\$0.01.

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