

## ORIGINAL RESEARCH ARTICLE

# Cervical cancer risk factors and screening preferences among Muslim women in Monrovia, Liberia

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## Abstract

Cervical cancer is the most common cancer in reproductive aged women in Liberia. Lack of awareness and screening capacity are both major contributors to the prevalence of this disease. The minority Muslim population in this country is largely unscreened. The objective of the study was to assess cervical cancer risk factors and screening preferences among Muslim women living in Monrovia, Liberia and to offer self-screening with HPV testing. A multiple step implementation strategy was devised in order to outreach to the Muslim population with the engagement of community and religious leaders, about an upcoming screening program and informational session at a local clinic. Over 150 Muslim women attended the session, 120 completed the HPV screening, and 55 women completed the questionnaires. Questionnaire data revealed overall low risk factors for cervical cancer, but also low use of family planning as well as low knowledge about cervical cancer and HPV. Participants showed an interest in screening and a majority preferred self-collected tests. These preferences should be incorporated in future programming. To engage minority populations in screening programs, there may be success with targeted messages, involvement of community religious leaders, and eliciting feedback to incorporate preferred strategies and improve participation and programming. (*Afr J Reprod Health* 2020; 24[3]: 101-107).

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**Keywords:** HPV screening, Muslim, cervical cancer

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## Résumé

Le cancer du col de l'utérus est le cancer le plus courant chez les femmes en âge de procréer au Libéria. Le manque de sensibilisation et de capacité de dépistage sont tous deux des facteurs majeurs de la prévalence de cette maladie. La population musulmane minoritaire de ce pays est largement non filtrée. L'objectif de l'étude était d'évaluer les facteurs de risque de cancer du col de l'utérus et les préférences en matière de dépistage chez les femmes musulmanes vivant à Monrovia, au Libéria, et de proposer un auto-dépistage avec des tests HPV. Une stratégie de mise en œuvre en plusieurs étapes a été élaborée afin de sensibiliser la population musulmane avec l'engagement des chefs communautaires et religieux, sur un programme de dépistage à venir et une séance d'information dans une clinique locale. Plus de 150 femmes musulmanes ont assisté à la session, 120 ont terminé le dépistage du VPH et 55 femmes ont rempli les questionnaires. Les données du questionnaire ont révélé des facteurs de risque globalement faibles pour le cancer du col de l'utérus, mais aussi une faible utilisation de la planification familiale ainsi qu'une faible connaissance du cancer du col de l'utérus et du VPH. Les participants ont montré un intérêt pour le dépistage et une majorité préféraient les tests auto-collectés. Ces préférences devraient être incorporées dans la programmation future. Pour impliquer les populations minoritaires dans les programmes de dépistage, il peut y avoir du succès avec des messages ciblés, la participation des chefs religieux de la communauté et l'obtention de commentaires pour intégrer les stratégies préférées et améliorer la participation et la programmation. (*Afr J Reprod Health* 2020; 24[3]: 101-107).

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**Mots-clés:** Dépistage du VPH chez les femmes musulmanes Libéria

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## Introduction

Cervical cancer is the fourth most common malignancy diagnosed in women worldwide, resulting in more than one quarter of a million deaths per year<sup>1</sup>. Approximately 85% of the worldwide deaths from cervical cancer occur in

underdeveloped or developing countries, and the death rate is 18 times higher in low-income and middle-income countries compared with wealthier countries with developed screening programs<sup>1</sup>. There has been a steady increase in the incidence of this disease, with 75,000 new cases in sub-Saharan Africa and close to 50,000 deaths a year<sup>2</sup>.

According to the World Health Organization, by the year 2030 it is projected that cervical cancer will kill more than 443,000 women per year, nearly 90 % of which will be in sub-Saharan Africa<sup>2</sup>.

In Liberia, cervical cancer is the most common cause of cancer related death among women, and lack of awareness and screening capacity are major contributors to both morbidity and mortality from this disease<sup>3</sup>. Liberia has a population of 1.30 million women ages 15 years and older who are at risk of developing cervical cancer<sup>4</sup>. Current estimates indicate that every year 548 women are diagnosed with cervical cancer in the country and 449 die from the disease<sup>4</sup>. Nevertheless, cervical cancer is a potentially preventable disease that can be avoided by addressing the highly oncogenic human papilloma virus (HPV) infections. HPV infections are responsible for 7.7 % of cancers in developing countries, and nearly all cases of cervical cancer<sup>2</sup>. Data is not yet available on the HPV burden in the general population of Liberia. However, in Western Africa, about 4.3% of women in the general population at any given time are estimated to be infected with cervical HPV types 16 or 18, the types most responsible for cervical cancer. Over 55% of invasive cervical cancers in the region are attributed to HPVs 16 or 18<sup>4</sup>. Prevention options for cervical cancer include screening for HPV to identify women at risk, treatment of early precancerous lesions, and vaccination against the HPV virus as a form of primary prevention<sup>1,2</sup>.

Screening is an important secondary prevention strategy. The long process of carcinogenic transformation from HPV infection to invasive cancer provides much opportunity to detect the disease at an earlier stage when treatment is highly effective<sup>5</sup>. The World Health Organization recommends screening women at least once in a lifetime between 30 and 49 years of age and ensuring effective treatment of the detected abnormalities<sup>5</sup>. To detect the disease in asymptomatic individuals, screening should be a public health initiative that involves mobilizing the eligible populations to undergo testing at a regular interval, administering a suitable test to detect the disease, organizing further assessment of the

screen-positive individuals and ensuring treatment and follow-up of those with confirmed disease. Successful implementation of screening requires a reasonably well-organized health system to provide quality-assured services with equity and access to the entire target population<sup>5</sup>.

In Liberia, the health infrastructure is, as of yet, limited in providing widespread screening. This is further complicated by the divisions of religious factions and access to care. The majority of Liberia's population identify as Christian as their primary religion, while about 12% of the population identify as Muslim<sup>6</sup>. In the first cervical cancer-screening program conducted in Liberia in 2012, only 3% of the almost 900 participants were Muslim, despite an open call to all women in the region<sup>7</sup>. Research is limited on the Muslim community in Liberia and the challenges that exist in health care access and utilization. The objective of the study was to assess cervical cancer risk factors and screening preferences among Muslim women living in Monrovia, Liberia, and to evaluate barriers to successful implementation of cervical cancer screening among this community, in order to inform appropriate future cervical cancer interventions.

## Methods

A program was designed with first an innovative implementation strategy, and second with a cross-sectional study of accessed participants with quantitative data. For the first portion of this program, the following steps were devised to more effectively access the Muslim community in the urban center of Monrovia, Liberia, and surrounding townships: First, religious leaders, Imams, who consented to participate were identified as community and cultural guides for the population; and influential in group actions and decision, including healthcare. Thereafter, rapport was developed with an Imam who showed interested in participating to help garner awareness in cervical cancer programming. Second, a radio station was identified as a means for widespread dissemination of information in this particular community. With approval and facilitation of the Imam, targeted radio messaging to Muslim women was designed, involving a popular radio

personality to disseminate the message. Third, a newly established community clinic, within a Muslim neighborhood serving a predominately Muslim population, was engaged in partnership by an influential community leader to plan for an open-call for cervical cancer screening. Fourth, the streamlined radio announcements were broadcasted regarding the upcoming screening and educational programs with specific dates coinciding with clinic outreach efforts. Fifth, a pre-screening orientation to the study was conducted among women who presented to the clinic for the information session and screening program. Informed consent was obtained from all participants, including assent from parents for participants below 18 years of age. The program was approved by Institutional Review Board in Liberia and the Icahn School of Medicine at Mount Sinai in the United States. Inclusion criteria for participants included all women who presented for cervical cancer screening who were offered participation in HPV screening and the questionnaire. Exclusion criteria included men who presented for the informational session, and women who presented for the informational session but chose not to participate in the screening program. The information session was then conducted, followed by the HPV screening program with plans confirmed for treatment and follow-up as needed.

The second portion of the program consisted of a self-administered/ provider assisted questionnaire given to participants after the pre-screening informational session at the clinic. The questionnaire was created by the researchers and was previously reviewed and revised by local clinic staff to ensure culturally appropriate language and comprehension. Quantitative data was gathered and analyzed to obtain demographics, risk factors, gynecologic history, knowledge and attitudes about cervical cancer, and preferences regarding screening modality.

The third portion of the program consisted of sample collection and analysis. Participants were trained how to perform self-HPV screening by the nursing staff in the clinic and given the opportunity to self-collect their samples. Samples were processed using Quiagen's *careHPV* system which detects the presence of the high-risk

carcinogenic HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 and 68 using full genome probes complementary to HPV DNA, specific antibodies, signal amplification and chemiluminescent detection. After collection, the samples were all collected and transported collectively by the researchers to a collaborating lab with the available HPV system and where the samples were processed. Results were reported back to the clinic so that patients with positive screening tests could be contacted and recalled for further testing and treatment.

## Results

Over 150 women attended the information session, 120 completed the self-collection HPV screening tests. 110 samples were able to be analyzed and 10 samples did not yield a result. Of those analyzed, 20% (N=22) were found to be positive for high risk HPV (Table 1). Only 55 of the 150 women who attended the information session returned questionnaires, of which 45 participant data were analyzed; 10 of the questionnaires were largely incomplete and therefore were excluded from analysis. Participants ranged in age from 17 years old to 73 years old and 97.8% of participants identified as Muslim (Table 2).

Overall, risk factors for cervical cancer were low among this population, regarding age of first sex, tobacco use, and partner circumcision, though contraception was not widely and consistently used (Table 3).

The mean age of first sex was 17.7 years, 30.9% currently used family planning and only 3.6% had a family member with history of cervical cancer. Among those surveyed cervical cancer knowledge was low: 18.2% reported "hearing" of a Pap smear previously, and 100% of participants did not report knowing that an infectious agent (HPV) can cause cervical cancer. However, all though knowledge was low, 82% of participants believed that, if discovered early, cervical cancer can be successfully treated; when asked hypothetically, 84.4% stated that they would allow their child to receive the HPV vaccine in order to help prevent cervical cancer. Finally, when asked about the mode of HPV collection preference, a majority (66.7%) preferred self-collection while

**Table 1:** Self-collected HPV screening tests (N=110)

	N	%
Positive	22	20
Negative	88	80

**Table 2:** Socio-demographic characteristics of Muslim women in Monrovia, Liberia (N=45)

	N	%
Age (years)		
Mean	39.5	
Range	17-73	
Marital Status:		
Married	29	64.4
Single	5	11.1
Unanswered	10	22.2
Living Setting:		
Rural	15	33.3
Urban	14	31.1
Unanswered	16	35.6
Religion:		
Islam	44	97.8
Christianity	1	2.2
Employment:		
Yes	14	31.1
No	31	68.9
Education:		
None	26	57.8
Primary School	3	6.7
Secondary School	4	8.9
High School	9	20.0
Post High School	0	0
How many pregnancies have you had?		
Mean	4.8	
Range	0-12	
How many living children do you have?		
Mean	3.4	
Range	0-8	

31.1% stated they would prefer a health professional to perform screening at a clinic (Table 4).

## Discussion

To our knowledge, this is the first report assessing cervical cancer screening, risk factors, and preferences, among Muslim women in Liberia. We believe there is an opportunity for increased health education and targeted programming for communities of specific religious backgrounds that may have disparities in health care compared to the broader population. In general, women in this studied population had low knowledge of cervical

cancer. Though few risk factors for cervical cancer were present, there was still a 20% HPV positive rate showing the need for screening and follow up treatment. And overall, there was a general positive attitude towards screening and testing. Of note, the majority of women stated in the questionnaire they would prefer self-collection over provider collection. HPV detection tests can be self-collected which is a major advantage over the traditional Pap smear which is difficult to implement in low resource settings. Women can collect upper vaginal samples themselves for testing (self-collected samples) in the privacy of their home<sup>8</sup>, and there is no need for a pathology lab or personnel in order to read the specimen. In a pooled analysis of 36 studies involving 154,556 women, both sensitivity and specificity of self-collected samples to detect CIN 2+ were just slightly inferior to the sensitivity and specificity of HPV testing on clinician-collected samples (ratio of sensitivity 0.88; ratio of specificity 0.96)<sup>8</sup>. However, the high acceptability, lower logistic requirements and practicability of reaching the hard-to-reach population are the major advantages of self-sampling that can compensate for the lower sensitivity and specificity<sup>8</sup>. Systematic reviews have indicated that the screening participation rates doubled when the self-sampling kits were sent to the homes of the women noncompliant to routine screening, compared with an invitation to visit the clinician's office<sup>9</sup>.

Across most previous studies, the acceptability of HPV self-sampling was high. Some attractive features of self-sampling are cost (free in these studies), convenience (home-based), less discomfort (swab vs speculum exam), and privacy. Women who participated in self-sampling for HPV testing reported less embarrassment, pain, anxiety, or discomfort. Across many countries and age groups, women were able to carry out the test alone with simple written instructions. When unsupervised self-collected samples were compared with physician-collected samples, there was comparable sensitivity and concordance for identifying high-risk HPV<sup>10</sup>. Immigrant Muslim women in Canada were studied to explore acceptability of HPV self-sampling, and the majority of women reported that they would be willing to try HPV self-sampling, and more than

**Table 3:** Reproductive Health Risk Factors to HPV (N=45)

	N	%
Age at first intercourse:		
Mean	18.3	
Range	15-22	
Partner circumcised:		
Yes	28	62.2
No	7	15.6
Unanswered	10	22.2
Current use of family planning:		
Yes	15	33.3
No	29	64.4
Unanswered	1	2.2
Previous use of family planning:		
Yes	13	28.9
No	32	71.1
Unanswered	0	0
Types of family planning used:		
Pills	9	60
Injection	2	13.3
Intrauterine device	0	0
Implant	0	0
Rhythm	0	0
Tubal ligation	0	0
Other	0	0
Unanswered	4	26.6
Condom use:		
Yes	6	13.3
No	38	84.4
Unanswered	1	2.2
Reason for condom use:		
Prevent pregnancy	3	50
Prevent infection	0	0
Both	3	50
Currently perform oral sex on partner:		
Yes	1	2.2
No	28	62.2
Unanswered	16	35.6
Currently have oral sex performed on you by partner:		
Yes	0	0
No	28	62.2
Unanswered	17	37.8
Currently have anal sex:		
Yes	0	0
No	17	37.8
Unanswered	28	62.2

half would prefer this method to provider-administered sampling methods<sup>11</sup>. A similar comparison in this willingness can be made with our study population. A noted barrier to self-testing was confidence in performing the test, which can be balanced against the convenience and privacy with performing self-testing.

**Table 4:** Screening/ testing preferences for HPV and cervical cancer (N=45)

	N	%
Ever tested for HIV		
Yes	15	33.3
No	30	66.7
Unanswered	0	0
Ever tested for HPV:		
Yes	0	0
No	43	95.6
Unanswered	2	4.4
HPV test: choice between self-collection or no test:		
Home	25	55.6
None	5	11.1
Unanswered	15	33.3
Collector Preference:		
Self	30	66.7
Provider	14	31.1
Unanswered	1	2.2
Reasons for self-preference:		
More convenient	21	72.4
Feel more freedom at home	5	17.2
Embarrassed at clinic	2	6.9
Less painful	0	0
Other	1	3.5
Reasons for provider-preference:		
Do a better job		
More comfortable in a medical surrounding	11	78.6
Less painful	3	21.4
Unanswered	0	0

Our study population, although in a developing area of health infrastructure, also showed acceptability to this method in combination with education on screening in general.

Education and counseling is paramount to implementing and continuing a screening and treatment program. In insular religious communities, especially in terms of gynecological care, beliefs may represent some unique challenges to care. In Nigeria, a study looked at barriers to cervical cancer screening, in which participants mentioned religious and cultural obligations of modesty, gender of healthcare providers, fear of disclosure of results, fear of nosocomial infections, lack of awareness, discrimination at hospitals, and need for spousal approval all as barriers to uptake of screening<sup>12</sup>. We found many of the similar challenges reported among our population.

Interventions to increase cervical cancer awareness and screening uptake in multicultural and multi-religious communities need to take into

consideration the varying cultural and religious beliefs in order to design and implement effective cervical cancer screening intervention programmes<sup>12</sup>. Through previous studies and our current research we have found that faith-based messaging helps promote health literacy and action. In Somalia, an Imam was partnered with one study to develop messaging to address concerns of modesty and predetermination in order to promote breast and cervical cancer screening. There was a largely positive response by both Somali women and men to the faith-based messages. The faith-based messages appeared to reinforce the views of those who were already inclined to see screening positively, with participants describing increased confidence to engage in screening because of the advocacy and promotion by religious and community leaders<sup>13</sup>. Hard to reach women, or women reluctant to come to a medical facility for care, may reveal particular utility of HPV self-sampling to increase participation in screening programs. The convenience, ease of use, and modesty associated with HPV self-testing are motivating forces in the emerging role of this modality of cervical cancer screening in select populations. Key barriers to participation could be addressed by overcoming disparities in HPV-related knowledge and perceptions about cervical cancer screening<sup>10</sup>. Future programming should incorporate these preferences and provide more education about cervical cancer screening, prevention, and treatment to further increase public understanding.

## Conclusion

Cervical cancer knowledge among Muslim women in Liberia was low. Barriers to attendance at screening clinics may include the use of non-focused messaging and preference of self-collection over provider collection of samples. To engage minority populations in cervical cancer screening in Liberia, we found that messages must be targeted, involving community religious leaders and already established clinics or community centers, and with local feedback in order to increase participation and ownership. By incorporating these preferred strategies increased screening among Muslim women can occur.

Currently, our screening and treatment program of Muslim women in Liberia is ongoing.

## Contribution of Authors

All authors listed took part in conceiving and designing the study and well as in preparation of manuscript. Omara Afzal and Sayeeda Chowdhury collected the data. All authors took part in analyzing the data. All authors mentioned approved the manuscript.

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