

**Original Article**

**Cervical cancer screening coverage and the availability of healthcare resources for public health midwives in the Jaffna district**

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**Abstract**

Effective cervical cancer screening requires high rates of service coverage. Very little is known about the determinants of cervical cancer screening coverage in Sri Lanka. This study aims to describe the association between the availability of resources for public health midwives (PHM), sociodemographic and work-related factors, and cervical cancer screening coverage in the Jaffna district in northern Sri Lanka. A descriptive cross-sectional study was carried out among field PHMs working in Jaffna District in 2019. Data were collected with a pre-tested, self-administered questionnaire at the monthly Medical Officer of Health conferences. Data were analysed with SPSS (v21). Frequencies, percentages and the Chi Squared test were used in the analysis. The critical level was set at 0.05.

A total of 131 (of 144) field PHMs working in Jaffna district participated in the study (response rate 91%). Over half (n=67, 51%) had >10 years' work experience, 44% (n=58) covered an additional PHM area and 48% (n=63) reported having received training in organising cervical cancer screening. In the sample, 49% (n=64) of PHMs reported having all essential facilities for cervical cancer screening and 48 (75%) achieved  $\geq 50\%$  coverage. Although 11 PHMs (8%) achieved 100% coverage, less than half the sample (n=54, 41%) achieved the Ministry of Health target of  $\geq 70\%$  coverage. Achieving 50% coverage was significantly associated with the availability of all essential facilities (p=0.01) and work experience (p=0.03), but not with having received training in organising cervical cancer screening (p=0.73). None of the selected sociodemographic and work-related factors were associated with having achieved the target of  $\geq 70\%$  coverage.

Public health facilities and human resources are essential for improving cervical cancer screening coverage in Jaffna and elsewhere in Sri Lanka.

**Keywords**

Cervical cancer screening, public health midwife, healthcare coverage, Jaffna District.

**Introduction**

Cervical cancer is the fourth most common cancer among women worldwide, with an estimated 604 000 new cases and 342 000 deaths in 2020 (1). Cervical cancer is preventable and can be detected early by screening at the precancerous stage. Early detection of invasive cancer leads to a 5-year survival rate of about 92% and dramatically reduces cervical cancer mortality (2).

Cervical cancer screening may be undertaken by several methods such as cytology-based screening, visual inspection of the cervix and HPV DNA testing (3). Cervical cancer screening coverage refers to the percentage of eligible women in a specific population who receive screening within a specific period (4). Low coverage has been identified as the most critical reason for failure of screening programmes (5). Wide coverage requires a functional health system with an adequate supply of motivated health care workers with sufficient resources and appropriate training to perform cervical screening (6, 7).

In Sri Lanka, cervical cancer ranks as the second most common cancer among women; in 2018, 1367 new cervical cancer cases and 643 deaths from cervical cancer were reported in the country (8). Pap test or cervical cytology is the conventional screening method practiced in Sri Lanka (9) where cervical cancer screening is established as a national programme and is provided free-of-charge through a network of preventive and curative healthcare facilities.

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Pap test screening has been available in all Medical Officer of Health (MOH) areas during the past two decades. Around 1000 Well Women Clinics (WWC) are conducted island wide by public health teams comprising the MOH, public health nursing sister (PHNS) and public health midwives (PHM). The PHMs duties include creating awareness within the community regarding cervical cancer and organising screening programmes in their respective PHM areas, under supervision of the supervising PHM and PHNS (10).

The target population for cervical cancer screening is females in the 35- and 45-year cohorts. The Ministry of Health Sri Lanka has set a target of achieving 70% coverage of this population (11). Although pap tests are offered free-of-charge by the MOH at the community level, the coverage is far below the recommended 70%. In 2019, the 35-year age cohort coverage for pap testing was 54%, while that in Jaffna was 37% (12).

Jaffna district is divided into 14 MOH areas, namely Chankanai, Chavakachcheri, Tellippalai, Point Pedro, Karaveddy, Kopay, Nallur, Jaffna, Sandilipay, Uduvil, Velanai, Maruthankerney, Karainagar and Kayts. These MOH areas are further divided into 219 PHM areas. In total, 144 field PHMs serve in the district with many covering more than one area.

Lack of infrastructure, basic materials and suitably qualified staff are known to be associated with poor cervical cancer screening coverage in other settings (13). In Sri Lanka too, it is reported that cervical cancer screening coverage is patchy with inequitable distribution of trained healthcare staff and other resources, resulting in low coverage (14). This study aims to describe the association between the availability of resources for public health midwives (PHM), sociodemographic and work-related factors, and cervical cancer screening coverage in the Jaffna district in northern Sri Lanka.

## Methods

This descriptive cross-sectional study was carried out among all 144 field PHMs attached to the MOH offices in Jaffna district between September to November 2019. A questionnaire was developed by the research team and translated into Tamil; it included a list of essential equipment and facilities developed with input from experts in public health. The questionnaire was pre-

tested on 10 field PHMs working in the Kilinochchi district and amended accordingly.

PHMs in Jaffna district were approached by the researchers at their respective MOH monthly conferences and invited to participate in the study. Sociodemographic and work-related data and information on the availability of healthcare resources were collected through the self-administered questionnaire. Data on cervical screening coverage in each PHM area for 2018 were obtained from the Office of the Regional Director for Health Service Jaffna (RDHS-Jaffna).

Data were analysed with the help of Statistical Package for Social Sciences (SPSSV21). Frequencies and percentages were used to describe the data and the Chi Square test was used in inferential analysis.

Ethics approval was obtained from the Ethics Review Committee, Faculty of Medicine, University of Jaffna.

## Results

In total, 131 PHM participated in the study giving a response rate of 94%. Thirteen PHMs were on leave on the date of data collection.

The majority of the sample was between 30 and 40 years (73%, n=96) and married (92%, n=120). When considering their level of education, 128 PHM (98%) were A/L qualified and had a diploma in midwifery. Over half (51%, n=67) had work experience of more than 10 years and less than half (48%, n=63) had received training on organising cervical cancer screening. Notably, 58 (44%) midwives functioned as acting midwives in other PHM areas (Table 1).

Table 1: Characteristics of PHMs (n=131)

Sociodemographic and work related factors	Frequency	Percentage %
Age		
20-29	9	6.9
30-39	96	73.3
40-49	13	9.9
≥50	13	9.9
Educational qualifications		
O/L qualified	3	2.3
A/L qualified and diploma in midwifery	128	97.7

Work experience		
<5 years	11	8.4
5-10 years	53	40.5
>10 years	67	51.1
Covering more than one PHM area		
Yes	58	44.3
No	73	55.7
Mode of transport		
Walk	1	0.8
Bus	3	2.3
Bicycle	7	5.3
Motorbike	120	91.6
Received training on organising cervical cancer screening		
Yes	63	48.0
No	68	52.0

According to RDHS data, 41% (n=54) of the PHM areas achieved over 70% coverage (Figure 1) with 11 areas achieving 100% coverage, namely Pannakam, Valveddithurai-I, Alvai West, Thunnalai East, Pointpedro East, Siruppiddy, Sandilipay North, Manipay East, Kondavil North, Suthumalai and Manipay West. However, the majority of PHM areas did not achieve the Ministry of Health target of at least 70%, and 4 areas achieved less than 20% coverage (Maruthankerny, Karampan, Kopay South and Ariyalai Centre).

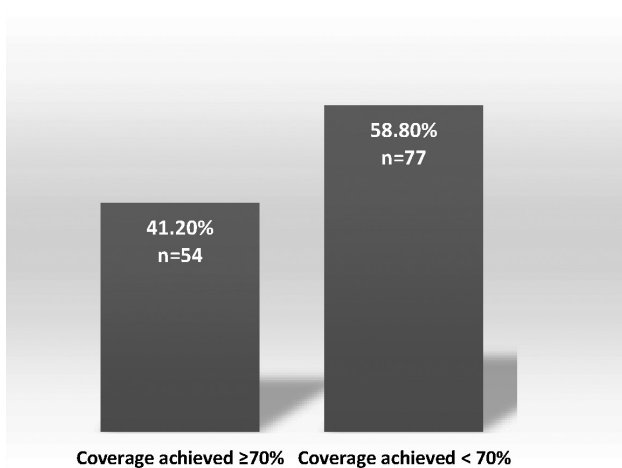


Figure 1: PHM areas in Jaffna District by achievement of target coverage (70%) (2018)

The availability of healthcare resources, including essential equipment and infrastructure facilities, required by PHM to organise cervical cancer screening is depicted in Table 2. Notably, 30% of the sample

reported not having a metal speculum, while 29%, 26% and 25% did not have spatula, glass slides and examination gloves, respectively. The proportion of PHM who had alcohol and fixatives was 68% and 55%, respectively, although an additional 2% and 13% responded that they did not know whether they had this equipment. Among the PHMs, 29%, 28% and 24% reported lacking sanitary, water and electricity facilities, respectively, in their places of work, while 24% could not provide adequate privacy for cervical cancer screening.

Table 2: Availability of essential medical equipment and infrastructure facilities for PHMs (n=131)

Facilities	Category	Frequency	Percentage (%)
Essential Equipment			
Metal Speculum	Yes	92	70.2
	No	39	29.8
Spatula	Yes	93	71.0
	No	38	29.0
Examination gloves	Yes	98	74.8
	No	33	25.2
Glass slides	Yes	97	74.0
	No	34	26.0
Fixative	Yes	72	55.0
	No	42	32.1
	I don't know	17	13.0
Alcohol	Yes	89	67.9
	No	39	29.8
	I don't know	3	2.3
Basic Infrastructure			
Privacy	Yes	100	76.6
	No	31	23.7
Water	Yes	94	71.8
	No	37	28.2
Sanitary facilities	Yes	93	71.0
	No	38	29.0
Electricity	Yes	99	75.6
	No	32	24.4

<sup>a</sup> "I don't know" option was included for all variables; results are shown where participants responded.

There is no significant association between achieving target coverage (70%) and the availability of all essential equipment ( $p=0.58$ ), all infrastructure facilities ( $p=0.26$ ), all essential equipment and infrastructure facilities ( $p=0.35$ ), having received training ( $p=0.73$ ) or work experience ( $p=0.08$ ) at the critical level of 0.05. As there was no evidence of significant associations between achieving 70% coverage and the availability

of healthcare resources, we also assessed the association between achieving 50% coverage and the availability of healthcare resources. There was a significant association between the availability of all essential equipment ( $p=0.05$ ), all essential equipment and infrastructure facilities ( $p=0.01$ ), work experience ( $p=0.03$ ) and achieving a cervical cancer screening coverage of 50% by PHMs (Table 3).

Table 3: Association of healthcare resources, training received and work experience with achieving 70% and 50% coverage of cervical screening in Jaffna district (n=131)

		Coverage $\geq 70\%$ n (%)	Coverage <70% n (%)	$\chi^2$ p df	Coverage $\geq 50\%$ n (%)	Coverage <50% n (%)	$\chi^2$ p df
Essential Equipment	Yes	30 (43.5)	39 (56.5)	$\chi^2=0.30$ $p=0.58$ df=1	50 (72.5) 35 (56.5)	19 (27.5) 27 (43.5)	$\chi^2=3.67$ $p=0.05$ df=1
	No	24 (38.7)	38 (61.3)				
Infrastructure facilities	Yes	40(44.4)	50(55.6)	$\chi^2=1.23$ $p=0.26$ df=1	65 (72.2) 20 (48.8)	25 (27.8) 21 (51.2)	$\chi^2=6.79$ $p=0.09$ df=1
	No	14(34.1)	27 (65.9)				
All Essential facilities	Yes	29 (45.3)	35 (54.7)	$\chi^2=0.86$ $p=0.35$ df=1	48 (75.0) 37 (55.2)	16 (25) 30 (44.8)	$\chi^2=5.61$ $p=0.01$ df=1
	No	25 (37.3)	42 (62.7)				
Trained on organising screening	Yes	25 (39.7)	38 (60.3)	$\chi^2=0.11$ $p=0.73$ df=1	38 (60.3) 47 (69.1)	25 (39.7) 21 (30.9)	$\chi^2=1.11$ $p=0.29$ df=1
	No	29 (42.6)	39 (57.4)				
Work experience (years)	<5	8 (72.7)	3 (27.3)	$\chi^2=4.96$ $p=0.08$ df=2	11 (100) 34 (64.2) 40 (59.7)	0 (0) 19 (35.8) 27 (40.3)	$\chi^2=6.75$ $p=0.03$ df=2
	5-10	20 (37.7)	33 (62.3)				
	>10	26 (38.8)	41 (61.2)				

## Discussion

This study set out to determine the association between the availability of resources for PHMs, socio demographic and work-related factors, and cervical cancer screening coverage in the Jaffna district in Northern Sri Lanka.

More than three-quarters of the sample were less than 40 years of age and a large majority had a diploma in midwifery and travelled by motorbike. However, 44% reported covering more than one PHM area and over half

(52%) had not received training in organising cervical cancer screening

The study found that only 41% of the PHM areas had achieved the Ministry of Health's target of 70% coverage. In terms of essential equipment and infrastructure facilities, 20% or more of PHMs reported not having each of the specified items/facilities; fixative and alcohol were the most commonly reported missing items, at 55% and 67% respectively, but it should be noted that 13% and 2% did not know whether they had these two items. With respect to associations, while the



availability of none of the identified healthcare resources were associated with achieving target coverage (70%), we found that availability of all essential equipment, availability of all essential equipment and infrastructure facilities and the PHM's work experience were associated with achieving 50% coverage.

The poor levels of coverage are likely to be multifactorial. Although the field PHM workforce is comparatively young and well-qualified, with more than three-quarters of the sample less than 40 years of age and the vast majority with a diploma in midwifery, a substantial proportion (44%) reported covering more than one PHM area and over half (52%) had not received training in organising cervical cancer screening. Cervical cancer screening may be compromised by the added workload of covering more than one PHM area. The vacant cadre positions in Jaffna district also indicate the declining popularity of midwifery as a career among the younger generation. In the sample, only 8% of PHMs were less than 30 years of age. According to health authorities, A/L qualified school-leavers in Jaffna are reluctant to enrol in midwifery programmes due to low salaries, lacking opportunities for career advancement and the undervaluing of care work in the society. Noteworthy is that the requirement for A/L qualification makes O/L qualified women ineligible to apply to the national diploma programme in midwifery.

The lack of essential healthcare resources is a second reason for low coverage. A study done in India reports that cervical cancer screening in some primary care facilities was hindered by a lack of a room and other basic resources such as electricity. Frequent stock outs of basic equipment were also identified as a problem, while in other cases, screening equipment was available but there was no trained staff to use it, which illustrates that the capacity dimensions of infrastructure and workforce are interlinked (15). As observed in the present study, 30% of the PHMs in the sample did not have a speculum or even spatulas, while 30-40% lacked alcohol and fixative. Although these items could be shared across PHM areas through the MOH office, unavailability of essential infrastructure such as water, sanitation, and electricity make the delivery of

services difficult. Declining funding for public health programmes and human resource shortages contribute to these problems (Ministry of Health, 2018; Ministry of Health, 2015). Apart from the vacant PHM cadre positions in Jaffna district, there is also a shortfall of PHNS, who are the main service providers in relation to Pap testing in preventive health units.

Given the absence of an association of healthcare resources with achieving target coverage, we assessed their association with achieving 50% of coverage of cervical cancer screening. The availability of all essential equipment and infrastructure facilities were found to be associated with achieving 50% coverage. While the availability of healthcare resources may account for a certain proportion of the coverage, the remainder may be accounted for by sociocultural factors at the household and community level, such as reluctance to undergo Pap testing and the unavailability of female service providers (16). In the present study, almost a quarter of PHMs did not have the facilities to guarantee privacy, which may, at least partly, explain the low levels of service utilisation.

Work experience was inversely associated with achieving 50% coverage, where PHMs with less work experience were more likely to achieve 50% coverage. This result may be confounded by other factors such as age and improved training through the national midwifery diploma programme. On the other hand, younger PHM may be less burdened with family and other commitments, giving them more time to commit to accomplishing their duties.

This study has several limitations. We relied on two separate sources for coverage data (RDHS Jaffna) and data related to the availability of healthcare resources. Unfortunately, data on resource availability by PHM area were not available at the RDHS Office. Further, the study's validity is compromised by the reliance on self-reported data from PHMs. They should ideally have been obtained through direct observation.

## **Conclusions and recommendations**

The coverage of cervical cancer screening in Jaffna district leaves much room for improvement. The

reasons for the low levels of coverage are likely to be multifactorial, with the lack of essential equipment, infrastructure and healthcare workers playing a critical role. The Ministry of Health needs to ensure the availability of the required facilities, including human resources, to improve coverage. While providing fixatives, alcohol and other missing items should be prioritised, closer supervision may also be helpful in the immediate term. To increase the availability of health cadres in Jaffna district, midwifery programmes could be further developed with opportunities for career advancement through, for instance, lateral entry into degree programmes. The possibility of expanding the entry criteria to the diploma programme in midwifery to include O/L qualified candidates could be explored. As some PHM areas achieved 100% coverage, research is needed to scale up such achievements. Achieving at least the target coverage of 70% will reduce the cervical cancer burden among women and will also advance progress towards universal health coverage.

#### Author Declarations

*Competing interests:* The authors declare that they have no competing interests.

*Ethics approval and consent to participate:* This is an undergraduate research project. Ethics approval was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Jaffna, Sri Lanka, through the Head, Department of Community and Family Medicine, Faculty of Medicine, University of Jaffna.

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*Author contributions:*

Hetharany M, Santhirakanth S, Wijeweera PGSK: Conceptualisation/study design, data collection, analysis, write up.

Surenthirakumaran R, Rajeev G: Conceptualisation/study design, supervision, review and edits.

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