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Association between demographic variables and cervical cancer staging in elderly women: a retrospective study

Associação entre variáveis demográficas e estadiamento de câncer cervical em idosas: estudo retrospectivo

Asociación entre variables demográficas y estadificación del cáncer de cuello uterino en mujeres ancianas: un estudio retrospectivo

Ana Hélia de Lima Sardinha[1]
ORCID: 0000-0002-8720-6348
Pabline Medeiros Verzaro[1]
ORCID: 0000-0003-1449-1990
Nívya Carla de Oliveira Pereira Rolim[1]
ORCID: 0000-0001-6701-5213
Sara Maria Ferreira de Sousa[1]
ORCID: 0000-0003-4183-3861
Aida Patricia da Fonseca Dias Silva[1]
ORCID: 0000-0003-0138-8505
Alynne Radoyk Silva Lopes[1]
ORCID: 0000-0002-6661-1555

1 Federal University of Maranhão

Editor: Ana Carla Dantas Cavalcanti
ORCID:0000-0003-3531-4694

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ABSTRACT
Objective: To associate the sociodemographic variables of elderly women with cervical cancer and staging of an oncology reference hospital. **Method**: An observational, retrospective analytical study of 559 elderly women. **Results:** The variables that presented a statistically significant correlation with cervical cancer staging were: married elderly women, histopathological squamous cell carcinoma, radiotherapy + chemotherapy as the first treatment received in the hospital, complete remission of the disease at the end of the first treatment, without deaths from cancer and never having smoked. **Conclusion:** Although some characteristics are related to higher prevalence, they were not associated with staging, such as older ages. Early treatment was also an aspect associated with less late staging. Thus, the study reaffirms the importance of knowing the epidemiological characteristics of these women, as it favors the planning and evaluation of effective programs in the control of cervical cancer.
KEYWORDS: Cancers of the cervix; Aging; Women's health.

RESUMO
Objetivo: Associar as variáveis sociodemográficas de idosas com câncer cervical e estadiamento de um hospital de referência oncológica. **Método**: Estudo observacional, retrospectivo e analítico de 559 idosas. **Resultados:** As variáveis que apresentaram correlação estatística significativa com o estadiamento do câncer do colo do útero foram: idosas casadas, o tipo histopatológico carcinoma de células escamosas, radioterapia + quimioterapia como primeiro tratamento recebido no hospital, remissão completa da doença ao final do primeiro tratamento, sem óbitos por câncer e nunca haver fumado. **Conclusão:** Embora algumas características estarem relacionadas à maior prevalência, não estavam associadas ao estadiamento, como idades mais avançadas. Tratamento precoce também foi um aspecto associado a estádios menos tardios. Desta forma o estudo reafirma a importância em conhecer as características epidemiológicas dessas idosas, pois favorece o planejamento e avaliação de programas efetivos no controle do câncer do colo do útero.
DESCRITORES: Neoplasias do colo do útero; Envelhecimento; Saúde da mulher.

RESUMEN
Objetivo: Asociar las variables sociodemográficas de mujeres ancianas con cáncer de cuello uterino y la estadificación de un hospital oncológico de referencia.**Método**: Estudio observacional, retrospectivo y analítico de 559 mujeres mayores. **Resultados:** Las variables que mostraron correlación estadísticamente significativa con la estadificación del cáncer de cuello uterino fueron: ancianas casadas, tipo histopatológico de carcinoma epidermoide, radioterapia + quimioterapia como primer tratamiento recibido en el hospital, remisión completa de la enfermedad al finalizar el primer tratamiento , sin muertes por cáncer y sin haber fumado nunca. **Conclusión:** Aunque algunas características están relacionadas con una mayor prevalencia, no se asociaron con la estadificación, como la edad avanzada. El tratamiento temprano también fue un aspecto asociado con etapas menos tardías. Así, el estudio reafirma la importancia de conocer las características epidemiológicas de estas ancianas, ya que favorece la planificación y evaluación de programas efectivos en el control del cáncer cervicouterino.
DESCRIPTORES: Neoplasias cervicales; Envejecimiento; La salud de la mujer.

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INTRODUCTION

The process of population aging is accelerating rapidly around the world, it is one of humanity's greatest triumphs and also one of the great challenges to be faced by society, however, the aging process, most often comes accompanied by the appearance of chronic non-communicable diseases, such as cancer. Elderly people represent the majority of new cases and deaths due to the disease, indicating the need for specific attention to this group and its particularities[1]. With the favoring of sexuality of this age group due to modern discoveries that increase sexual desire, there were changes in the old conception that the elderly were asexual people, however, some elderly women do not possess information about safe sex, disregarding the use of condoms because they can no longer become pregnant, and it is up to the health professional to identify this gap in view of the risk for the development of cancer[2].

Cervical cancer is considered a public health problem in Brazil, although it is preventable when low-grade lesions are identified early, yet it has high mortality, contributing significantly to the burden of the disease in women, being considered the fourth most common type of cancer in this population[3].

About 85% of cases of cervical cancer occur in less developed countries[4], being associated with poverty and low education levels. Recurrent infection by the human papilloma virus (HPV) virus is considered the main cause for the development of this type of cancer[5,6], transmitted mainly through unprotected sexual contact.

The early identification and treatment of early-stage lesions contribute to the good prognosis of the disease. The strategies for early detection/screening of CC (Cervical Cancer) are the collection of material for cervical-vaginal cytopathological examinations, being recommended for women between 25 and 64 years of age, who have already started their sexual life, with annual periodicity, initially, and after two consecutive negative tests, periodicity should be every three years[4].

In view of the above, knowing the most prevalent staging of this tumor and the variables that have a significant correlation with it, contributes with information to strengthen practices and policies to improve control actions for cervical cancer, aiming to minimize the incidence of cases. Thus, the aim of the present study is to associate the sociodemographic variables of cervical cancer victims and the staging in an oncology reference hospital.

METHOD

This is an observational, retrospective and analytical study. The data came from the Aldenora Bello Cancer Hospital, a philanthropic institution and reference for cancer treatment, located in São Luís, the capital of Maranhão State. The institution's Health Information System of Hospital Records (SIS-RHC) was used as a data source, by means of the Tumor Registration Forms. A total of 553 elderly women were sampled, corresponding to 100% of the cases of cervical cancer treated by the institution from January 1, 2009 to December 31, 2013, and the temporal cut-off of these data refers to those that were available at the time they were collected, due to a discrepancy

in the hospital registry, justified by the lack of professionals responsible for this work.

We included women diagnosed with cervical cancer, aged 60 years or older, who were registered and performing treatment at the institution. Those who started treatment in another institution or who lived in other States of the Federation were excluded.

Demographic variables were analyzed: age, race, education, occupation, origin, neighborhood, city, marital status, alcoholism, tobaccoism, family history; clinical and treatment characteristics, such as the location of the primary tumor, histopathological type, NMD, staging, location of distant metastasis, clinic at the beginning of treatment, main reason for not performing treatment, first treatment received in the hospital, stage of the disease at the end of the first treatment and death from cancer. The variables of risk factors (coitarche, age at first Papanicolaou examination, smoking and family history) could not be evaluated due to the low completeness of the data.

The data were input in Excel and exposed in descriptive tables for better visualization of them. For the statistical calculation, the statistical program SPSS v. 19 was used, considering a significance level of 0.05. To perform the staging analyses, two groups were formed using the variable staging as a parameter, where the cases diagnosed in stage 0, I, and II formed the "Early Staging Group" and the cases diagnosed in staging III and IV formed the "Late Staging Group".

Possible associations between staging and sociodemographic and clinical variables were tested using the Chi-square test. The variables that presented probability values lower than 0.05 were used in the Binary Logistic Regression model, calculating the odds ratio values for each category within the variables. Regarding the adjustment of the regression model, late-staging type was adopted as a reference in all possible associations.

The research is part of a project entitled: "Men and women with cancer: meanings, perceptions and implications", approved by the Ethics Committee on Research with Human Beings of the *Presidente Dutra* University Unit University Hospital (HUUPD) with opinion No. 1,749,940. The research followed all the recommendations of resolution number 466 of December 12, 2012 of the National Health Council - Ministry of Health for Scientific Research in Human Beings.

RESULTS

According to the p values presented in Table 1 of the sociodemographic, variables correlated with staging, a statistically significant difference was found ($p < 0.05$) in the race variable. However, according to the regression model, "race" and "smoking" were not independently associated with staging ($p > 0.05$), as shown in Table 3.

The age group from 65 to 70 years was more prevalent in the total population (n=167; 30.2%) and in the late stage group (n=77; 32.1%). For the "Marital Status", married women were prevalent in both early and late staging (n = 236; 42.7% of the total). In the variable occupation, the elderly female farmers were the most frequent in both groups.

Table 1 – Association between staging and sociodemographic variables of the victims with cervical cancer, from 2009 to 2013 in an oncology referral hospital.

Variable			Staging			p-value*
			Early	late	Total	
			No. 313; 56.6%	No. 240; 434%	No. 553; 100%	
Age group n (%)		60 - 64	95 (30.4)	67 (27.9)	162 (29.3)	0.289
		65 - 70	90 (28.8)	77 (32.1)	167 (30.2)	
		71 - 74	58 (18.5)	42 (17.5)	100 (18.1)	
		76 - 79	32 (10.2)	23 (9.6)	55 (9.9)	
		80 - 84	30 (9.6)	16 (6.7)	46 (8.3)	
		85 - 89	4 (13)	10 (4.2)	14 (2.5)	
		≥ 90	4 (1.3)	5 (2.1)	9 (1.6)	
Race n (%)		white	44 (14.1)	46 (19.2)	90 (16.3)	0.030
		Black	19 (6.1)	16 (6.7)	35 (6.3)	
		yellow	72 (23.0)	39 (16.3)	111 (20.1)	
		Brown	151 (48.2)	104 (43.3)	255 (46.1)	
		indigenous	0 (0.0)	2 (0.8)	2 (0.4)	
		No information	27 (8.6)	33 (13.8)	60 (10.8)	
Education n (%)		No	61 (19.5)	54 (22.5)	115 (20.8)	0.123
		Incomplete fundamental	140 (44.7)	96 (40.0)	236 (42.7)	
		Complete fundamental	39 (12.5)	20 (8.3)	59 (10.7)	
		Medium level	38 (12.1)	26 (10.8)	64 (11.6)	
		Full top level	3 (1.0)	3 (1.3)	6 (1.1)	
		No information	32 (10.2)	41 (17.1)	73 (13.2)	
Marital status n (%)		single	75 (24.0)	56 (23.3)	131 (23.7)	0.232
		married	151 (48.2)	101 (42.1)	252 (45.6)	
		widower	73 (23.3)	70 (29.2)	143 (25.9)	
		Judicially separated	8 (2.6)	11 (4.6)	19 (3.4)	
		Consensual union	1 (0.3)	1 (0.4)	2 (0.4)	
		No information	5 (1.6)	1 (0.4)	6 (1.1)	
O cc :		Physician (61)	1 (0.3)	1 (0.4)	2 (0.4)	

Prof. Ens. Superior (139)	0 (0.0)	1 (0.4)	1 (0.2)	
Professor Ens. preschool (143)	0 (0.0)	1 (0.4)	1 (0.2)	
Professor (149)	5 (1.6)	2 (0.8)	7 (1.3)	
Adm. Agents (319)	1 (0.3)	4 (1.7)	5 (0.9)	
Sellers (451)	0 (0.0)	2 (0.8)	2 (0.4)	
Domestic (540)	12 (3.8)	5 (2.1)	17 (3.1)	
Serv. cons./limp. (552)	1 (0.3)	3 (1.3)	4 (0.7)	
Washer (560)	0 (0.0)	1 (0.4)	1 (0.2)	0.512
Farmer (621)	99 (31.6)	74 (30.8)	173 (31.3)	
Farmer (639)	0 (0.0)	1 (0.4)	1 (0.2)	
Extractivists (654)	0 (0.0)	2 (0.8)	2 (0.4)	
Fishermen (669)	1 (0.3)	2 (0.8)	3 (0.5)	
Seamstress (795)	2 (0.6)	4 (1.7)	6 (1.1)	
Worker (969)	1 (0.3)	0 (0,0)	1 (0.2)	
Unrated (999)	68 (21.7)	51 (21.3)	119 (21.5)	
Does not apply (888)	59 (18.8)	40 (16.7)	99 (17.9)	
No information (9999)	63 (20.1)	46 (19.2)	109 (19.7)	

Source: Data collected by the researcher, São Luís, 2018.

Regarding the p values presented in Table 2 of association between staging and clinical variables, statistically significant differences were found in the following variables ($p < 0.05$): histological type, first treatment received at the hospital, disease stage at the end of the first treatment. In the other variables, no associations with staging were detected.

Regarding the variable Histopathological type, squamous cell carcinoma was the most prevalent in both groups, representing 80.8% (n=447), the category "other" was considered as a reference value, and patients with grade 3 cervical intraepithelial cancer (CIN 3) have 0.06 times lower chance of being associated with late staging when compared to patients of other types (OR = 0.06; p = 0.02).

Table 2 – Association between staging and clinical variables of elderly women with cervical cancer, from 2009 to 2013 in an oncology referral hospital.

	Staging

Variable		Early	Late	Total	
		No.	**No.**	**No.**	**p-**
		313	**240**	**553**	**value***
		56,6%	**43,4%**	**100%**	
Histopathological type	Squamous cell carcinoma	239	208	447	
N (%)		(76.4)	(86.7)	(80.8)	
	Cervical intraepithelial neoplasia grade	37	1 (0.4)	38	0.024
	3 - CIN 3	(11.8)		(6.9)	
	Adenocarcinoma	27	22 (9.2)	49	
		(8.6)		(8.9)	
	other	10	9 (3.8)	19	
		(3.2)		(3.4)	
Family history of cancer	yes	68	54	122	
n(%)		(21.7)	(22.5)	(22.1)	0.335
	No	82	75	157	
		(26.2)	(31.3)	(28.4)	
	No information	163	111	274	
		(52.1)	(46.3)	(49.5)	
	never	184	141	325	
Alcoholism		(58.8)	(58.8)	(58.8)	
n (%)	Ex-consumer	14	10 (4.2)	24	0.089
		(4.5)		(4.3)	
	yes	11	20 (8.3)	31	
		(3.5)		(5.6)	
	Not rated	104	69	173	
		(33.2)	(28.7)	(25.5)	
	never	117	103	220	
Tobaccoism		(37.4)	(42.9)	(39.8)	
n (%)	Ex-consumer	76	42	118	0.021
		(24.3)	(17.5)	(21.3)	
	yes	32	42	74	

		(10.2)	(17.5)	(13.4)	
	Not rated	88	53	141	
		(28.1)	(22.1)	(25.5)	
	none	14	29	43	
		(4.5)	(12.1)	(7.8)	
	surgery	65	9 (3.8)	74	
First treatment		(20.8)		(13.4)	
received in hospital	Surgery + Radiotherapy	19	1 (0.4)	20	
n (%)		(6.1)		(3.6)	0.000
	Surgery + Radiotherapy +	12	14 (5.8)	26	
	Chemotherapy	(3,8)		(4.7)	
	Surgery + Chemotherapy	3 (1,0)	4 (1.7)	7 (1.3)	
	Surgery + Chemotherapy + Hormone	1 (0,3)	0 (0.0)		
	Therapy			1 (0.2)	
	radiotherapy	27	42	69	
		(8,6)	(17.5)	(12.5)	
	Radiation Therapy + Chemotherapy	162	134	296	
		(51,8)	(55.8)	(53.5)	
	chemotherapy	7 (2,2)	6 (2.5)	13	
				(2.4)	
	Hormonotherapy + Radiotherapy	1 (0,3)	0 (0.0)	1 (0.2)	
	other	2 (0.6)	1 (0.4)	3 (0.5)	
	No evidence of disease (complete	188	56	244	
Disease stage at the	remission)	(60.1)	(23.3)	(44.1)	
end of the first	Partial remission	22	29	51	
treatment		(7.0)	(12.1)	(9.2)	0.000
n (%)	Stable disease	42	47	89	
		(13.4)	(19.6)	(16.1)	
	Disease in progress	9 (2.9)	25	34	
			(10.4)	(6.1)	
	Oncologic therapeutic support	2 (0.6)	10 (4.2)	12	

				(2.2)	
	Death	12	28	40	
		(3.8)	(11.7)	(7.2)	
	Does not apply	38	45	83	
		(12.1)	(18.8)	(15.0)	
	Clinical examination and clinical pathology + Pathological anatomy	50 (16.0)	33 (13.8)	83 (15.0)	
	Clinical examination and clinical pathology + Imaging + Tumor markers	0 (0.0)	1 (0.4)	1 (0.2)	
Relevant exams n (%)	Clinical examination and clinical pathology + Imaging + Pathological anatomy	262 (83.7)	206 (85.8)	468 (84.6)	0.508
	Clinical examination and clinical pathology + Imaging + Endoscopy and exploratory surgery + Pathological anatomy	1 (0.3)	0 (0.0)	1 (0.2)	

*Chi-Square Test; Source: Data collected by the researcher, São Luís, 2018.

The variable "First treatment received in the hospital", Radiotherapy + Chemotherapy was the most frequent in both groups 53.5% (n=296), but patients who underwent "surgery" and "surgery + radiotherapy" and "chemotherapy" were less likely to be associated with late staging when compared to those who did not undergo any type of treatment (OR = 0.13; p = 0.001/ OR = 0.04; p = 0.005/ OR = 0.14; p = 0.013; respectively) , the variable "none" was the reference variable, as shown in Table 3.

The variable "Disease stage at the end of the first treatment" presented a higher prevalence of complete remission in both groups 44.1% (n=244). It was the reference category. The groups of "partial remission" (OR = 3.27; p = 0.001), "stable disease" (OR = 3.62; p = 0.000), "disease in progression" (OR = 8.69; p = 0.000), "oncologic therapeutic support (OR = 15.04; p = 0.001), "death" (OR = 8.22; p = 0.000) and "does not apply" (OR = 2.28; p = 0.046) had higher chances of association with late staging compared to patients with complete remission. Oncologic therapeutic support was the category that most demonstrated chances of relationships with late staging (OR = 15.04), as shown in Table 3.

Table 3 – Predictors of late staging of the victims with cervical cancer from 2009 to 2013 in an oncology referral hospital.

Variable		Staging Early No. 313	late No. 240	RC	IC (95%)	p-value
Histopathological type n (%)	Squamous cell carcinoma	239	208	0.61	0.22 - 1.74	0.358
	Cervical intraepithelial neoplasia grade 3 - CIN 3	37	1	0.06	0.01 - 0.64	0.020*
	Adenocarcinoma	27	22	0.78	0.23 - 2.66	0.685
	other	10	9	REF	-	-
	none	14	29	REF	-	-
First treatment received in hospital n (%)	surgery	65	9	0.13	0.04 - 0.47	0.001*
	Surgery + Radiotherapy	19	1	0.04	0.004 - 0.38	0.005*
	Surgery + Radiotherapy + Chemotherapy	12	14	0.56	0.15 - 2.14	0.395
	Surgery + Chemotherapy	3	4	0.33	0.04 - 2.53	0.287
	Surgery + Chemotherapy + Hormone Therapy	1	0	0	0	1.000
	radiotherapy	27	42	0.79	0.27 - 2.35	0.671
	Radiation Therapy + Chemotherapy	162	134	0.36	0.13 - 1.02	0.054
	chemotherapy	7	6	0.14	0.03 - 0.66	0.013*
	Hormoniotherapy +	1	0	0	0	1.000

	Radiotherapy						
	other	2	1		0.01	-	0.126
				0.13	1.78		
	No evidence of disease	188	56		-		-
Disease statge at	(complete remission)			REF			
the end of the	Partial remission	22	29		1.68	-	0.001*
first treatment				3.27	6.39		
n (%)	Stable disease	42	47		2.08	-	0.000*
				3.62	6.30		
	Disease in progress	9	25		3.54	-	0.000*
				8.69	21.30		
	Oncologic therapeutic support	2	10		2.84	-	0.001*
				15.04	79.56		
	Death	12	28		3.63	-	0.000*
				8.22	18.60		
	Does not apply	38	45		1.02	-	0.046*
				2.28	5.11		
	white	44	46	REF	-		-
Race	Black	19	16		0.28	-	0.453
n (%)				0.70	1.78		
	yellow	72	39		0.49	-	0.875
				0.95	1.84		
	Brown	151	104		0.45	-	0.392
				0.79	1.37		
	indigenous	0	2	9.94	-		0.999
	No information	27	33		0.66	-	0.372
				1.41	3.02		
	never	117	103	REF	-		-
Tobaccoism	Ex-consumer	76	42		0.42	-	0.194
n (%)				0.71	1.20		
	yes	32	42	1.19	0.65	-	0.568

					2.19	
Not rated	88	53			0.55	- 0.945
				0.98	1.73	

Source: Data collected by the researcher, São Luís, 2018.

DISCUSSION

The results show a higher prevalence for the age group from 65 to 70 years (30.2%). Age was not associated with late staging, although the literature indicates that in developed countries, older women are diagnosed more frequently in advanced stages than younger women, where each additional year in age the chance of having the diagnosis in the late stage increases by 3 %[7].

In this study, low education levels were more prevalent, which corroborates with other studies[8,4]. Women with a low level of education have a higher risk of developing cervical cancer and a higher chance of being diagnosed in advanced stages III and IV [9], suggesting that these women may not have the necessary knowledge to seek screening/treatment and not recognize the importance of performing the preventive examination[4].

Regarding marital status, married elderly women formed the group with the highest prevalence, although not associated with late staging, as well as other studies in the literature[10]. It is assumed that married women have only one sexual partner, reducing exposure to sexually transmitted infections, while single women may have a greater number of partners having more contact with sexual carcinogens, such as HPV, Human Immunodeficiency Virus (HIV), chlamydia, among others [11]. Despite the multiplicity of partners being an important risk factor for the development of CC, marriage does not constitute immunity, therefore the relationship between and the disease and marital status are more related to sexual behavior[10].

The variable never smoked in relation to smoking habits was the most prevalent in both groups, although it is considered a risk factor for the development of any type of cancer. The risk for developing cervical cancer increases proportionally to the number of cigarettes smoked per day, especially when this habit is started early[5].

Regarding the histopathological type, this study demonstrates that women with grade 3 - CIN 3 cervical intraepithelial cancer, are 6 times less likely to be associated with late staging. This data is justified because cervical cancer usually begins as low-grade intraepithelial lesions (LSIL), a preinvasive condition limited to the cervical epithelium, and is less likely to progress to invasive carcinoma, unlike high-grade intraepithelial lesions (HSIL). These are predominantly caused by oncogenic HPV types, having precursor lesion behavior of invasive carcinoma. This data reinforces the need for real quality control practice in screening programs for cervical cancer, since the curability in this phase of the disease can

reach 100%, often being solved even at the outpatient level[12].

Invasive squamous cells cancers of the uterine cervix are preceded by a long phase of cervical intraepithelial neoplasia. In this study, this data is perceived by the high prevalence of squamous cell carcinoma (SCC), corroborating findings from the literature, which shows that these are responsible for approximately 70% of cases of cervical cancer, while adenocarcinomas represent 15% to 35% of cases[5].

The delay in diagnosis leads to more aggressive and less effective treatments, increases hospitalization costs and mortality[13] and the survival rate is slightly higher in women diagnosed with CPB[14].

The treatment "surgery" and "surgery + radiotherapy" and "chemotherapy" were less likely to be associated with late staging, given this fully justifiable, because for locally advanced disease there is no indication for surgical treatment and the standard treatment is the association of chemo-radiotherapy (teletherapy concomitant with chemotherapy followed by brachytherapy)[15], although this factor is directly related to social and economic factors because many patients do not have access to basic resources for cancer treatment[16].

The elderly women in this study obtained complete remission of the disease, although this is not the reality in the northeast region that has one of the highest mortality due to cervical cancer according to studies. Therefore, it is necessary to maintain the follow-up of these elderly women even after complete remission for the prevention of recurrences, or if the case is the early diagnosis of relapses[17].

This study has limitations such as the discrepancy of the database, the lack of information in the medical records related to important variables of risk factors, as well as the possibility of an information bias related to the clinical staging of cases.

CONCLUSION

The results of the study reaffirm the need to improve the knowledge of women, especially in the case of those at older ages who were identified in a greater proportion, demonstrating that these women when diagnosed were already in more advanced stages. The data also infers that early diagnosis decreases the range of later stages due to the treatment having positive results. The lack of information from the female population and the resistance to preventive examination of cervical cancer are one of the main causes for the evolution of the disease. Therefore, knowing the epidemiological characteristics of these women becomes significant for to support the planning and evaluation of effective programs in the control of cervical cancer. Thus, it is concluded that health education is the best strategy to be used in order to reach this population highlighted with encouragement to perform the cytopathological examination. The need to intensify campaigns and proposals aimed at minimizing the morbidity and mortality of this cancer in the state of Maranhão as well as in Brazil is also perceived, in addition to improving the structuring of the cervical cancer screening program, in order to ensure

early access to both consultations and diagnosis, thus providing a reduction in the high percentages of advanced cases.

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