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Socioeconomic Disparities in Cervical Cancer Screening: A Comparative Study of Urban Buea and rural Doukoula, Cameroon

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Abstract

Background: Cervical cancer continues to be a significant health challenge in sub-Saharan Africa, with high morbidity and mortality despite its preventable nature. This comparative study examines the socioeconomic factors influencing cervical cancer screening in two distinct communities: Buea, a low-resource urban setting in the South West Region, and Doukoula, a more impoverished rural community in the Far North Region. Barriers such as limited education, healthcare access, and cultural norms hinder effective screening and early detection. This study explores the socioeconomic factors influencing the uptake of cervical cancer screening (CCS) in these communities.

Aim: The aim of this study was to identify the socioeconomic and cultural determinants that affect cervical cancer screening participation among women in Buea and Doukoula, Cameroon.

Methodology: A community-based cross-sectional study was conducted through a one-day free screening campaign in Buea and a six-day survey of women in Doukoula. Data were collected using structured questionnaires, which included questions on demographics, health behaviors, and screening uptake. The analysis was performed using descriptive and inferential statistics to identify significant associations between socioeconomic factors and CCS participation.

Results: Both studies identified key socio-economic determinants influencing cervical cancer screening uptake. In Buea, age, education level, occupation, marital status, and sexual behaviors, such as age at first sexual intercourse and, number of sexual partners, were significant factors. Similarly, in Doukoula, factors such as low education levels, poverty, early sexual activity, and cultural beliefs were prominent barriers to screening. However, Doukoula also highlighted the pivotal role of local leadership and community mobilization in overcoming these challenges. Education, in particular, was found to be a strong determinant of awareness and health-seeking behavior in both regions.

Conclusion: The findings underscore the complex interplay of socioeconomic and cultural factors that influence cervical cancer screening in both Buea and Doukoula. Efforts to improve education, raise awareness, and address socioeconomic barriers are critical to increasing screening uptake and reducing cervical cancer morbidity and mortality in these communities.

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Keywords: Cervical Cancer; Socioeconomic Factors; Education; Cultural Beliefs; Screening; Cameroon

1. Introduction

1.1. Buea, South West Region of Cameroon (Low-Resource Community)

Buea is the capital of the South West Region of Cameroon, an area classified as "low-resource" in terms of healthcare infrastructure and economy [1,2]. While it is an urban setting compared to Doukoula, it still faces significant challenges due to limited health resources [3,4,5]. The socioeconomic factors influencing cervical cancer screening participation in Buea include education, marital status, and reproductive history. Higher levels of education are positively correlated with an increased likelihood of women seeking cervical cancer screening, with educated women showing greater health literacy and awareness of available services [1,6]. This is important, as early detection through screening can significantly reduce cervical cancer morbidity and mortality [7].

However, even with this education, barriers remain. Despite Buea being more urbanized than Doukoula, the region still faces constraints such as inadequate healthcare facilities, insufficient trained medical staff, and a lack of financial resources for widespread cancer screening programs. Limited access to specialized treatment options, along with a fragile healthcare system, often leaves women unable to pursue timely interventions [3,8]. Socio-cultural factors, including misconceptions about cancer, also hinder screening uptake [3]. Women in Buea may fear the stigma attached to cervical cancer or may believe that screening is unnecessary if they are asymptomatic, despite the fact that early-stage cervical cancer shows no symptoms. Furthermore, traditional and religious beliefs about women's bodies and health care practices in the community may influence how women perceive the need for modern medical intervention like cancer screening [9].

1.2. Doukoula, Far North Region (Very Poor Community)

Doukoula, located in the Far North Region of Cameroon, is a predominantly rural area with some of the highest poverty rates in the country [4,10]. It is one of the most economically disadvantaged regions in Cameroon, and the socio-economic conditions here are far more severe than those in Buea. The Far North region has long faced challenges such as natural disasters (floods and droughts), limited access to basic amenities (clean water, sanitation, and electricity), and ongoing insecurity due to the Boko Haram insurgency. These challenges significantly impact the ability of local women to access cervical cancer screening and healthcare services [3,11,12,13].

In Doukoula, socio-economic barriers like poverty, illiteracy, and a lack of education have a much stronger negative impact on health-seeking behaviors. Many women in this region are unaware of cervical cancer or its preventive measures due to their limited education, with a high percentage of the population having little to no formal schooling [3,14,15,16]. This lack of awareness is compounded by cultural beliefs and reliance on traditional healing practices, which can delay or prevent women from seeking medical help. Furthermore, the healthcare infrastructure in Doukoula is inadequate, with healthcare facilities often understaffed, underfunded, and lacking essential equipment for diagnosis and treatment [3,17,18]. In the rural areas, access to these facilities is further restricted by poor road conditions and flooding during the rainy season, which severely hinders the movement of people and goods [19,20].

The region's extreme poverty is a significant barrier, with many women unable to afford the costs associated with screening or treatment. Additionally, the ongoing conflict with Boko Haram has further strained resources, limiting the effectiveness of public health campaigns [3,21,22]. Cultural beliefs about women's health, combined with the region's high illiteracy rates and poverty, contribute to a lack of trust in modern medical systems and reluctance to seek preventive care [23,24]. Women in Doukoula are also more likely to engage in traditional health practices, prioritizing this over clinical care, which delays early detection and treatment of cervical cancer [3,25]

While both Buea and Doukoula struggle with socio-economic factors that affect cervical cancer screening uptake, the severity and nature of these challenges differ significantly.

In Buea, the socio-economic determinants of screening participation, such as age, education level, and reproductive history, reflect a pattern that is more common in urban low-resource settings [1,26]. Despite being more urbanized and having relatively better healthcare access than Doukoula, Buea faces obstacles in addressing cervical cancer prevention due to the persistent lack of comprehensive awareness campaigns, inadequate resources, and cultural resistance to modern medical practices [1]. The availability of screening programs exists, but uptake is often hindered by economic constraints (e.g., cost of transportation, treatment, and consultations) and cultural misconceptions about cancer screening [9,27].

In contrast, Doukoula's situation is direr due to extreme poverty and systemic underdevelopment. The poverty rate in Doukoula is alarmingly high, with more than 70% of the population living below the poverty line [3,28] This region suffers from severe healthcare infrastructure deficits, making it one of the most challenging areas to implement effective cervical cancer prevention and screening programs. The lack of clean water, electricity, and healthcare facilities, combined with cultural barriers, makes it even more difficult for women in Doukoula to access cervical cancer screening [3,29]. The widespread illiteracy and lack of basic health education in Doukoula further exacerbate the situation, as women often do not know about the existence or importance of cervical cancer screening. Moreover, women in Doukoula are more likely to experience multiple socio-economic vulnerabilities, including low income, lack of social security, and high reliance on subsistence farming, which limits their ability to prioritize health needs [3,30,31].

The differences in the socio-economic contexts of the two communities are crucial in understanding the barriers to cervical cancer screening. While Buea's challenges are primarily related to resource constraints, awareness, and cultural factors, Doukoula faces compounded difficulties that are exacerbated by extreme poverty, conflict, and a lack of basic healthcare services [1,3,32]. The high illiteracy rates, lack of education, and deep-rooted traditional beliefs in Doukoula present greater barriers to cervical cancer prevention, making it more difficult to change health-seeking behaviors [3,33,34]. Addressing these issues requires context-specific interventions: in Buea, improving awareness and access to screening services may be sufficient, whereas in Doukoula, there is an urgent need for broader health system reforms, education initiatives, and cultural shifts to improve cervical cancer prevention [1,9,24].

Both regions require targeted interventions to reduce cervical cancer morbidity and mortality, but Doukoula's extreme poverty and socio-cultural dynamics necessitate a more comprehensive, multi-faceted approach to addressing these barriers. In both areas, empowering women with education, improving healthcare infrastructure, and addressing cultural misconceptions about cancer are key factors for improving screening rates and reducing cervical cancer-related deaths [1,3,24].

2. Materials and methods

2.1. Study Design and Setting

This was a comparative community-based cross-sectional study conducted to explore the determinants of cervical cancer screening uptake among women of reproductive age in two distinct regions of Cameroon: Buea and Doukoula. The study in Buea was hospital-based and took place in November 2019 at the Buea Regional Hospital, a state-owned hospital with about 40,000 inhabitants in the South West Region. On the other hand, the Doukoula study, conducted between November 3rd and 9th, 2021, was community-based and included women from Doukoula and its surrounding areas, with an estimated population of 26,624. Both studies aimed to investigate the socio-economic factors influencing cervical cancer screening (CCS) uptake in their respective locations [1,3].

The Buea study targeted women visiting the hospital during a free cervical cancer screening campaign, while the Doukoula study recruited women aged 16 to 80 years from the community, with peer educators administering structured questionnaires. The inclusion criteria for both studies were women of reproductive age and above [1,3].

2.2. Sample Size Determination

The sample size for Buea was calculated using the CDC-Epi Info™ 7.2.3.1 StatCalc software based on an estimated population of 40,000 inhabitants, with an expected cervical cancer prevalence of 13.8% and an accepted error margin of 5%. The final sample size was 168 women, selected consecutively. For Doukoula, a similar calculation was performed using CDC Epi Info™ 7.2.5.0, considering a population of 42,963. A minimum sample size of 182 was adjusted by 10% to account for non-responses, resulting in a final sample size of 201 women [1,3].

2.3. Data Collection and Variables

Both studies used structured, pre-tested questionnaires to collect data. In Buea, the questionnaire covered socio-economic variables such as age, marital status, level of education, occupation, and sexual history. In Doukoula, similar variables were included, such as age, age at first sexual intercourse, marital status, occupation, and education, with an additional focus on women's prior knowledge of cervical cancer. Both studies aimed to assess the primary outcome of CCS uptake through a series of questions regarding prior screening and treatment for cervical cancer.

In Buea, the dependent variable was the previous uptake of cervical cancer screening, while in Doukoula, CCS uptake was categorized based on responses to specific questions regarding prior screening, treatment for cervical cancer, and awareness of breast cancer [1,3].

2.4. Statistical Analysis

Data from both studies were analyzed using CDC Epi Info™ 7.2.5.0 for Doukoula and IBM-SPSS Statistics 21.0 for Buea. Descriptive statistics, including counts and percentages, were used to summarize demographic characteristics, while Pearson's Chi-square (χ^2) test was employed to evaluate associations between socioeconomic variables and CCS uptake. Multinomial logistic regression was used in Buea to identify significant correlates of CCS uptake, including socio-economic determinants with p-values ≤ 0.05. The significance level for both studies was set at 0.05[1,3].

2.5. Ethical Considerations

Both studies were approved by their respective ethical review boards: The University of Buea Faculty of Health Sciences for Buea, and the Institutional Review Board of the Atlantic Medical Foundation Hospital Mutengebe for Doukoula. Informed consent was obtained from all participants in both studies, ensuring that they understood the voluntary nature of participation and the confidentiality of their responses [1,3].

2.6. Limitations and Strengths

One limitation common to both studies was the reliance on self-reported data, which could introduce bias in the responses. In Buea, socio-political tensions affected the sample size and turnout, while in Doukoula, data collection occurred within a one-week timeframe, which may have affected the representativeness of the sample. However, both studies benefited from well-trained peer educators and nurses administering the questionnaires, enhancing the reliability of the data collected

3. Results

3.1. Buea

Table 1 Socio-economic determinants influencing cervical cancer screening [1]

VARIABLE	DV: Uptake of cervical cancer screening				
Age groups (Years)	**Yes (%)**	**No (%)**	**Total (%)**	**p-value**	**O.R (95% C.I)**
≤ 30 (16 – 30)	5 (13.2)	56 (55.4)	61 (43.9)	0.050*	7.9 (1.0 – 63.5) †
31 – 40	6 (15.8)	20 (19.8)	26 (18.7)	0.031*	7.8 (1.2 – 50.4) †
41 – 50	15 (39.5)	16 (15.8)	31 (22.3)	0.25	2.5 (0.5 – 12.4)
> 50 (51 – 66)	12 (31.6)	9 (8.9)	21 (15.1)	Ref	1.0
Education					
Primary	6 (15.8)	8 (8.1)	14 (10.2)	0.261	3.2 (0.4 – 24.7)
Secondary	13 (34.2)	21 (21.2)	34 (24.8)	0.047*	0.3 (0.1 – 1.0)
Tertiary	19 (50.0)	70 (70.7)	89 (65.0)	Ref	1.0
Locality					
Rural	7 (18.4)	22 (21.8)	29 (20.9)	0.886	1.1 (0.3 – 4.5)
Semi urban	10 (26.3)	23 (22.8)	33 (23.7)	0.419	1.6 (0.5 – 5.6)
Urban	21 (55.3)	56 (55.4)	77 (55.4)	Ref	1.0
Occupation					
Skilled	24 (63.2)	39 (39.0)	63 (45.7)	0.601	0.6 (0.1 – 4.2)
Business	6 (15.8)	6 (6.0)	12 (8.7)	0.114	0.1 (0.0 – 1.6)
Unskilled/ Unemployed	5 (13.2)	10 (10.0)	15 (10.9)	0.966	1.0 (0.1 – 11.3)
Student	3 (7.9)	45 (45.0)	48 (34.8)	Ref	1.0
Marital status					

Unmarried	19 (51.4)	70 (70.7)	89 (65.4)	0.526	0.7 (0.2 – 2.2)
Married	18 (48.6)	29 (28.9)	47 (34.6)	Ref	1.0
Age of first sex					
< 20 years	21 (61.8)	49 (57.0)	70 (58.3)	0.334	0.6 (0.2 – 1.7)
≥ 20 years	13 (38.2)	37 (43.0)	50 (41.7)	Ref	1.0
Number of sex partners					
> 1 partner	8 (22.2)	48 (54.5)	56 (45.2)	0.027*	4.9 (1.2 – 20.7) †
0 – 1 partner	28 (77.8)	40 (45.5)	68 (54.8)	Ref	1.0

*p-values with statistical significance, O.R: Odds Ratio, Ref: Reference, DV: Dependent variable, 95% C.I: 95% Confidence interval, † O.R with more likelihood of occurrence.

3.2. DOUKOULA

Table 2 Association between Socio-Economic Characteristics and Probable Uptake of CCS [3] Dependent Variable: Uptake of CCS (n = 89)

S/N	Variable	Poor (%)	Good (%)	Total (%)	p-value	χ^2
1	Age Groups (Years)				0.528	3.177
	≤ 20	9 (5.6)	2 (2.3)	11 (4.4)		
	21 – 30	57 (35.4)	32 (35.9)	89 (35.6)		
	31 – 40	36 (22.4)	24 (26.9)	60 (24.0)		
	41 – 50	41 (25.5)	18 (20.2)	59 (23.6)		
	> 50	18 (11.2)	13 (14.6)	31 (12.4)		
2	Locality				0.016	5.766
	Out of Doukoula	99 (83.2)	70 (95.9)	169 (88.0)		
	Doukoula	20 (16.8)	3 (4.1)	23 (12.0)		
3	Occupation				0.899	0.016
	Unemployed	122 (81.9)	65 (80.3)	187 (81.3)		
	Employed	27 (18.1)	16 (19.7)	43 (18.7)		
4	Marital Status				0.686	0.752
	Married	111 (68.9)	62 (69.7)	173 (69.2)		
	Not Married	31 (19.3)	13 (14.6)	32 (12.8)		
	Widow	19 (11.8)	13 (14.6)	32 (12.8)		
5	Age of First Sex				0.025	7.364
	< 20 years	92 (88.5)	74 (85.1)	166 (86.9)		
	21 - 25 years	4 (3.8)	11 (12.6)	15 (7.8)		
	> 25 years	8 (7.7)	2 (2.3)	10 (5.2)		
6	Number of Sex Partners				0.045	4.004
	0 – 1 Partner	80 (98.8)	76 (90.5)	156 (94.5)		
	> 1 Partner	1 (1.2)	8 (9.5)	9 (5.5)		
7	Number of Pregnancies				0.629	0.233

	0 – 4 Pregnancies	68 (48.2)	31 (43.7)	99 (46.7)		
	≥ 5 Pregnancies	73 (51.8)	40 (56.3)	113 (53.3)		
8	Number of Deliveries				0.498	0.459
	0 – 3 Deliveries	68 (48.2)	30 (42.2)	98 (46.2)		
	4 – 8 Deliveries	73 (51.8)	41 (57.8)	114 (53.8)		
9	Education				0.0004	18.156
	NFE	42 (26.1)	20 (22.5)	62 (24.8)		
	Primary	86 (53.4)	31 (34.8)	117 (46.8)		
	Secondary	28 (17.4)	25 (28.1)	53 (21.2)		
	Tertiary	5 (3.1)	13 (14.6)	18 (7.2)		

Bolded p-values indicate statistical significance. χ^2: Pearson Chi-Square, DV: Dependent Variable

In this study, cervical cancer screening (CCS) uptake is the dependent variable, and the other factors are treated as independent variables. The goal was to examine the association between the independent variables and the dependent variable.

A low p-value ($p \leq 0.05$) suggests a significant relationship, meaning the variables are not independent. This implies that the observed outcomes are unlikely to have occurred by chance, offering evidence of a genuine effect or relationship within the data.

Regarding significance, education had the smallest p-value, highlighting its importance in the study: Education ($p = 0.0004$).

3.3. Demographic and Socioeconomic Differences

3.3.1. Age Distribution

Buea: People between 21-30 years, and 31-40 years represent respectively 43.9% and 18.7%. Buea has a large percentage of its population in the young adult age range (21-30 years). This can be attributed to its status as a university city, attracting many students. The concentration of young adults suggests a vibrant, youthful population.

In Doukoula , these respective figures are 35.6% and 24%. Doukoula has a lower percentage of people in the 21-30 age range compared to Buea. However, it has a higher percentage of people in the 31-40 age range, which could indicate a slightly older population on average, possibly due to migration patterns, larger family sizes, or a more rural demographic where youth may not migrate as much for education or work opportunities.

Buea has a younger population, possibly due to the presence of universities and a more urbanized setting, which typically attracts younger individuals. Doukoula's demographic suggests an older population, perhaps due to lower levels of migration for educational or employment opportunities, which could be tied to the region's socio-economic limitations

3.3.2. Education

In Buea, Elementary and No Formal Education (NFE), Secondary, and Tertiary education represent respectively 10%, 24.8% and 65%. Buea is a well-educated city, with a significant portion of the population having access to tertiary education. This is likely due to the presence of various universities and institutions of higher learning, which makes higher education more accessible and attractive.

Conversely, Doukoula has 71.6% for Elementary and No Formal Education, 21.2% for Secondary education, and 7.2% for Tertiary education. Doukoula has a much lower level of educational attainment. A large portion of the population has no formal education or only completed elementary school. Access to education, especially higher education, is limited in this region due to factors like geographic isolation, poverty, and limited infrastructure. Buea has a highly educated population, with a large proportion completing tertiary education. In contrast, Doukoula has very low levels of formal education, reflecting the challenges of accessing quality education in remote and impoverished areas.

3.3.3. Locality

Urban and rural settlements in Buea represent respectively 79.1% and 20.9%. As an urban area and the capital of the South West region, Buea is predominantly urban. This urban setting is typically associated with better infrastructure, access to services, and economic opportunities.

For Doukoula, urban and rural dwellers represent respectively 12% and 88%. Doukoula is predominantly rural, with 88% of the population living in rural areas. The challenges associated with rural living, such as limited access to healthcare, education, and employment opportunities, are more pronounced here compared to Buea. Buea is highly urbanized, offering more opportunities for development, while Doukoula remains largely rural, which impacts the availability of services, infrastructure, and economic opportunities.

3.3.4. Age at First Sex

58.3% of girls in Buea engage into sexual activities at below 20 years, and 41.7% do so as from 20 years upward. In Buea, more than half of the population has their first sexual experience before the age of 20, which may reflect a relatively liberal or open social environment, possibly due to the influence of youth culture in the urban area.

These respective figures for Doukoula are 86.9% and 13%.Doukoula shows a strikingly higher percentage of people having sex before 20, suggesting that in more rural and impoverished settings, early marriage and childbearing may be more common due to cultural norms, economic pressures, or lack of access to education on sexual and reproductive health.
Buea has a lower percentage of individuals having their first sexual experience before 20, possibly due to more access to education, awareness, and social restrictions in the urban setting. Doukoula's higher rate may reflect traditional cultural practices, limited sexual education, and economic pressures in rural areas.

3.3.5. Number of Sex Partners

Women with more than one sexual partner represent 45.2%, and those with 1 or no sexual partner represent 54.8% in Buea. In Buea, nearly half of the population reports having more than one sex partner, which may indicate a more open and diverse social structure, possibly influenced by the student population and more liberal social norms associated with urban living. Whereas in Doukoula these figures are respectively 5.5 and 94.5%. Doukoula, with a much lower percentage of people having multiple sex partners, suggests more conservative and traditional attitudes toward relationships. This could also be linked to the lower levels of sexual education and limited exposure to broader social influences in the rural setting.

Buea has a higher percentage of people with multiple sex partners, reflecting more liberal attitudes in the urban setting. In contrast, Doukoula's very low percentage indicates more conservative social norms and potentially a lack of awareness or education on sexual health in the rural community.

3.3.6. Occupation

Employed persons in Buea represent 89.1% (including 34.8% students), 10.9% represented the unemployed figugure. For Doukoula, these respective figures were 18.7% and 81.3%. Buea has a high employment rate, with a large percentage working, including students who are often part-time employees. This reflects the urban economy's vibrancy, with various opportunities in education, business, and services. Doukoula has a very high unemployment rate, with most of the population not engaged in formal employment. The poverty level, rural nature, and lack of infrastructure contribute to the low employment rate.

Buea offers more job opportunities, reflecting its urban status and better economic infrastructure. Doukoula, on the other hand, suffers from a lack of employment, with a high unemployment rate due to limited economic opportunities in the rural setting.

3.3.7. Marital Status

Married participants in this study represented 34.6% and the unmarried 65.4% in Buea. These figures were 69.2% and 12.2% in Doukoula.

Buea has a relatively low marriage rate, which is typical for urban areas with a younger population where education and career take precedence over early marriage. The high proportion of unmarried individuals could also be related to the presence of a large student population in Buea. Doukoula has a significantly higher marriage rate, reflecting the

traditional norms of rural areas, where early marriage is more common, and marriage is seen as an essential part of adulthood and social life.

Buea has a higher percentage of unmarried individuals, likely due to urbanization, higher education, and delayed marriage. Doukoula, in contrast, has a much higher marriage rate, reflecting the cultural and traditional norms typical of rural, less economically developed areas.

Buea and Doukoula are strikingly different in terms of socio-economic characteristics. Buea, as an urban center with educational institutions and better infrastructure, shows a younger, more educated, and more employed population with relatively liberal attitudes. Doukoula, a rural and impoverished settlement, faces challenges like high unemployment, low education levels, and traditional norms, resulting in a very different demographic profile. These differences underscore the significant impact of urbanization, education, infrastructure, and socio-economic conditions on the lives of individuals in each community.

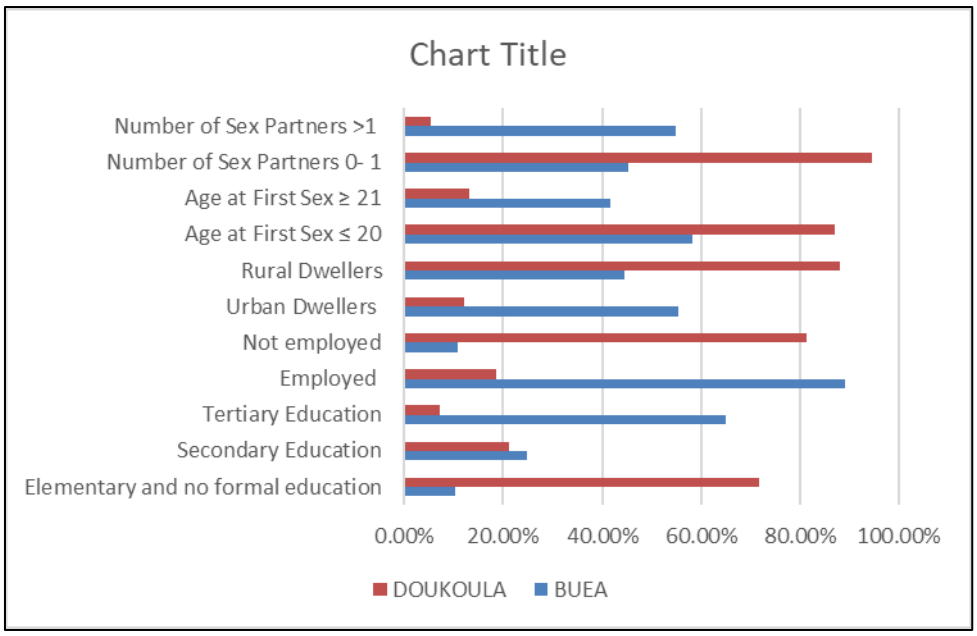

Figure 1 Comparative analysis of socio-economic and demographic factors influencing cervical cancer screening uptake in Buea (urban) and Doukoula (rural), Cameroon. The figure illustrates key differences in variables such as education level, employment status, marital status, locality, age at first sex, and number of sexual partners, highlighting the contrasting urban and rural contexts

4. Discussion

This study offers a comparative analysis of the socioeconomic factors in Buea, an urbanized area, and Doukoula, a rural settlement in Cameroon. Our results highlight notable differences in educational attainment, employment, marital status, and other factors, which are consistent with existing research on urban-rural disparities, socioeconomic development, and demographic trends.

4.1. Age and Education

Our findings suggest that Buea, a university city, has a notably younger and more educated population, with 65% of individuals having attained tertiary education. This aligns with the research by Mbaku [35], who pointed out that urban centers like Buea attract younger individuals due to the availability of educational opportunities. Similarly, studies by Tchouaket et al. [36] have shown that urban areas in sub-Saharan Africa generally exhibit higher levels of educational attainment, owing to better access to schools and universities. In contrast, Doukoula has a significant proportion of the population with little or no formal education, reflecting trends seen in rural areas across Cameroon and other African nations. Manda et al. [37] argue that rural communities often face challenges in accessing quality education, primarily due to poverty, geographic isolation, and limited infrastructure, which contributes to lower levels of educational attainment.

Women with a strong educational background tend to have a greater awareness of health issues, including cervical cancer and the importance of screening. They are more likely to understand the benefits of early detection and preventive measures, which results in higher participation rates in screening programs. This group of women is health literate, enabling them to comprehend medical information more effectively. Additionally, their access to the healthcare system is typically better than that of less educated individuals, facilitating a more proactive approach to health through regular check-ups. Education also plays a crucial role in determining employment and income, empowering women to make informed health decisions due to financial independence. Our study reveals that 71.6% of women in Doukoula have only attained an elementary education, indicating that education remains a significant barrier to effective cervical cancer prevention in that community. These findings are consistent with those of several other authors [38,39,40].

4.2. Locality and Urbanization

Buea is predominantly urban (79.1%), while Doukoula remains largely rural (88%). This urban-rural divide is a key theme in socio-economic research. Studies by Bello et al. [41]and Makinde [42] have shown that urban areas generally offer better access to services, infrastructure, and economic opportunities, which explains why Buea's higher urbanization rate is associated with greater employment and educational prospects. In contrast, Doukoula's rural nature imposes significant constraints on its inhabitants. Rural areas in sub-Saharan Africa often face limited access to healthcare, poor road networks, and insufficient infrastructure [43], factors that are reflected in Doukoula's lower employment rates and educational levels.

However, our study contrasts with the common view that cervical cancer screening uptake is higher in urban areas compared to rural areas for various reasons [44,45]. Our findings indicate that rural communities showed statistically significant uptake of cervical cancer screening. This can be attributed to the mobilization of local leadership, including chiefs, quarter heads, pastors, imams, resource persons, town criers, and medical personnel. Additionally, the availability of affordable care, including free screening and treatment aimed at low-income populations, likely contributed to higher participation rates despite the overall poverty in these areas [46,47].

4.3. Age at First Sex

In Buea, 58.3% of individuals engage in sexual activity before the age of 20, reflecting a more liberal social environment. This trend aligns with observations in urban settings, where increased exposure to sexual education and media may contribute to earlier sexual activity [48]. In contrast, 86.9% of individuals in Doukoula engage in sexual activity before the age of 20, a pattern commonly seen in rural areas in sub-Saharan Africa where early marriage and childbearing are more prevalent. Sossen et al. noted that early sexual initiation is closely tied to traditional practices, socio-economic pressures, and limited access to sexual and reproductive health education in rural areas of Cameroon[49].

4.4. Number of Sexual Partners

In Buea, 45.2% of individuals report having multiple sexual partners, which suggests a more liberal attitude toward sexual relationships, likely influenced by the youthful and urban nature of the city. This is consistent with studies on urban youth in African cities, where exposure to diverse social environments often leads to more liberal sexual practices [50]. On the other hand, Doukoula's low percentage (5.5%) of individuals with multiple sexual partners reflects rural, conservative social norms that emphasize monogamy, particularly in the context of early marriage and traditional practices [51] emphasized that rural communities in sub-Saharan Africa often prioritize marital fidelity and traditional family structures, which influence sexual behavior patterns.

4.5. Occupation and Employment

The employment rate in Buea (89.1%) is significantly higher than in Doukoula (18.7%). This disparity reflects the urban-rural employment gap. Urban centers typically offer more job opportunities across diverse sectors such as services, education, and business, whereas rural areas like Doukoula often lack such opportunities. Studies by the World Bank [52] and Tchouaket et al. [36] highlight that rural areas in Cameroon face high unemployment rates, mainly due to limited access to markets, technology, and business infrastructure. Additionally, the high employment rate among students in Buea underscores the city's dynamic labor market, contrasting with Doukoula's high unemployment, which is driven by limited economic diversification and infrastructure [42].

4.6. Marital Status

Buea's relatively low marriage rate (34.6%) reflects a common trend in urbanized areas across Africa, where delayed marriage is becoming more common due to educational and career pursuits. Charlotte Vampo [53] suggested that urbanization leads to delayed marriages as individuals prioritize personal and career development. In contrast,

Doukoula exhibits a much higher proportion of married individuals (69.2%), which aligns with rural traditions where early marriage is often seen as an essential part of adulthood. Ntozi [51] and Kofi et al. (2021) [54] argue that in rural communities, marriage is considered a cultural milestone, leading to higher rates of early marriage compared to urban areas.

5. Conclusion

The situation in Doukoula, located in the far northern region of Cameroon, highlights the crucial intersection of socio-economic factors and health outcomes, particularly in relation to cervical cancer screening. The disparities between Buea and Doukoula illustrate the broader socioeconomic divides between urban and rural areas in Cameroon. Our findings are consistent with the literature on urban-rural differences in sub-Saharan Africa, where urbanization is linked to better educational and employment outcomes, while rural areas face significant challenges in accessing services, infrastructure, and socioeconomic opportunities. These disparities underscore the need for policy interventions that improve access to education, healthcare, and employment opportunities in rural areas like Doukoula, while also addressing the unique needs of urban populations such as those in Buea.

Compliance with ethical standards

Disclosure of conflict of interest.

The authors declare that they have no conflict of interest.

Statement of ethical approval

Both studies were approved by their respective ethical review boards: The University of Buea Faculty of Health Sciences for Buea, and the Institutional Review Board of the Atlantic Medical Foundation Hospital Mutengebe for Doukoula.

Statement of informed consent

Informed consent was obtained from all participants in both studies, ensuring that they understood the voluntary nature of participation and the confidentiality of their responses [1,3].

References

[1] Celestina Neh Fru and Andrew Tassang et Al. Socio-economic Determinants Influencing Cervical Cancer Screening in Buea: A Cross-Sectional Study. IJTDH, 41(11): 14-22, 2020; Article no.IJTDH.59891

[2] Nsagha, D. S., Pokam, B. T., Assob, J. C., Njunda, A. L., Kibu, O. D., Tanue, E. A., . . . Weledji, P. E. (2015). HAART, DOTS and renal disease of patients co-infected with HIV/AIDS and TB in the South West Region of Cameroon. BMC Public Health, 15, 1040. doi:10.1186/s12889-015-2331-z

[3] Celestina Neh Fru, Andrew Tassang, et.al., (2024). Socioeconomic Challenges to Cervical Cancer Screening in Underserved Communities: Doukoula, Extreme North -Cameroon. Journal of Clinical Oncology Reports. 3(2); DOI: 10.58489/2836-5062/023

[4] "Tendances, profil et déterminants de la pauvreté au Cameroun entre 2001 et 2014", Rapport quatrième enquête camerounaise auprès des ménages, Institut National de la Statistique, December 2015.

[5] Issa Saibou, "Effets économiques et sociaux des attaques de Boko Haram dans l'Extrême-Nord du Cameroun", Kaliao, special edition November 2014, p. 156;

[6] Tassang Andrew, Celestina Neh Fru et al. Vaccination Hesitancy: The Case of Cervical Cancer Vaccination in Fako Division, Cameroon. IJTDH, 42(8): 32-43, 2021; Article no.IJTDH.68298

[7] Tassang Andrew et al. Cervical Cancer Screening in a Low–Resource Setting: Buea-Cameroon. IRJO, 3(3): 47-55, 2020; Article no.IRJO.61096

[8] Machikou Nadine, Claude Mbowou, "Economie politique de la violence dans l'Extrême-Nord", Rapport national Cameroun, United Nations Development Programme (UNDP), October 2015].

[9] Tassang, A., Fru, C. N., Brady, M. R., Cho, F. N., Thierry, T., Paulette, N. F., Gracious, T., & Renald, T. (2021). Knowledge and Risk Factors of Cervical Cancer among Women in Towns of Fako Division, Cameroon. Journal of

Advances in Medicine and Medical Research, 33(16), 81-91. https://doi.org/10.9734/jammr/2021/v33i1631103

[10] NIS (National Institute of Statistics). Quatrième Enquête Camerounaise auprès des Ménages: ECAM 4. Yaoundé, Cameroun: Institut National de la Statistique; 2014

[11] ReliefWeb. "Cameroon: Humanitarian Needs Overview 2023." March 2023. Accessed September 1, 2024. https://reliefweb.int/report/cameroon/cameroon-humanitarian-needs-overview-2023-march-2023#:~:text=An%20estimated%2037.5%20per%20cent,per%20cent%20in%20some%20regions.

[12] The Borgen Project. "Facts About Poverty in Cameroon." Accessed September 1, 2024. https://borgenproject.org/facts-about-poverty-in-cameroon/.

[13] ReliefWeb. "Cameroon: Humanitarian Needs Overview 2023." March 2023. Accessed September 1, 2024. https://reliefweb.int/report/cameroon/cameroon-humanitarian-needs-overview-2023-march-2023#:~:text=An%20estimated%2037.5%20per%20cent,per%20cent%20in%20some%20regions

[14] Issa Saibou, "Effets économiques et sociaux des attaques de Boko Haram dans l'Extrême-Nord du Cameroun", Kaliao, special edition November 2014, p. 156;

[15] World Bank. "Cameroon Overview." Accessed September 1, 2024. https://www.worldbank.org/en/country/cameroon/overview#:~:text=Because%20its%20poverty%20reduction%20rate,56%20%25%20of%20the%20poor%20live

[16] UNICEF. The impact of Boko haram and armed conflict on schooling in Cameroon's far north education sector rapid needs assessment: far north, Cameroon. 2015;(February).

[17] CamerounWeb. "After 18 Years of Creation, Gov't School Pupils Still Study Under Trees." Last modified October 2014. https://www.camerounweb.com/CameroonHomePage/NewsArchive/After-18-years-of-creation-govt-school-pupils-still-study-under-trees-313104.

[18] WHO/UNICEF Joint Monitoring Program. Estimates on the Use of Water Sources and Sanitation Facilities. WHO/UNICEF Joint Monitoring Program; Cameroon, Central Africa: 2015. Google Scholar.

[19] International Federation of Red Cross and Red Crescent Societies. Cameroon Floods in Far North Region: Final Report DREF Operation No. MDRCM029. 2023.

[20] World Food Programme (WFP) Cameroon. Cameroon Flooding Impact Factsheet: Far North Region, September-October 2022. Published November 15, 2022.

[21] National Institute of Statistics (NIS). Quatrième Enquête Camerounaise auprès des Ménages: ECAM 4. Yaoundé, Cameroun: Institut National de la Statistique; 2014.

[22] Castañeda, H., et al. Neighborhood effects on cervical cancer screening in low-income and minority women. American Journal of Public Health, 106(7), 1217-2016. 1223.

[23] Mabeya, H., et al. "Factors influencing the uptake of cervical cancer screening in a low-resource setting." Pan African Medical Journal 2016.

[24] Celestina Neh Fru and Andrew Tassang. Knowledge And Risk Factors For Cervical Cancer In Doukoula, Extreme North Of Cameroon. IQRJ: Volume 003, Issue 03, Mar 2024

[25] Kahesa, C., et al. "Determinants of cervical cancer screening among women in low- and middle-income countries: a systematic review." BMC Women's Health 2017.

[26] Price AJ, Ndom P, Atenquena E, Mambou Nouemssi JP, Ryder RW. Cancer care challenge in developing countries. Cancer. 2010;118(14):3627–35.

[27] Abudukadeer A, Azam S, Mutailipu AZ, Qun L, Guilin G, Mijiti S. Knowledge and attitude of Uyghur women in Xinjiang province of China related to the prevention and early detection of cervical cancer. World J Surg Onc [Internet]. 2015;13(110):1–7. Available from: https://wjso.biomedcentral.com/track/pdf/10.1186/s12957-015-0531-8.pdf pmid:25885660

[28] [Gudrun Broberg et al. Socio-economic and demographic determinants affecting participation in the Swedish cervical screening program: A population-based case-control study. PLoS One. 2018 Jan 10;13(1):e0190171.

[29] Nouetchognou J. Boko Haram Insurgency: Health and Social Implications for Cameroon. Denis & Lenora Foretia Foundation | Catalyzing Africa's Economic Transformation. Available at: [https://www.foretiafoundation.org/]. Accessed September 1, 2024

[30] Thomson, M., Kentikelenis, A., and Stubbs, T. 2017. "Structural Adjustment Programmes Adversely Affect Vulnerable Populations: A Systematic-Narrative Review of Their Effect on Child and Maternal Health." Public Health Reviews 38: Article 13. https://doi.org/10.1186/s40985-017-0059-2.

[31] Fisher, B. J., & McDonald, A. J. The role of health literacy in cervical cancer screening: A systematic review. Journal of Women's Health, 29(2) 2020. 250-259. DOI: 10.1089/jwh.2019.7581.

[32] Aldrich, M. C., et al. Geographic disparities in cervical cancer screening and outcomes in the United States: a review. Journal of Women's Health, 24(10) 2015, 814-821.

[33] National Institute of Statistics (NIS). Enquête par grappes à indicateurs multiples (MICS5), 2014, Rapport Final. Yaoundé, Cameroun: Institut National de la Statistique; 2015.

[34] Gorham TJ, Yoo J, Garabed R, Mouhaman A, Lee J. Water Access, Sanitation, and Hygiene Conditions and Health Outcomes among Two Settlement Types in Rural Far North Cameroon. Int J Environ Res Public Health. 2017 Apr; 14(4):441

[35] Mbaku, J. M. (2000). Urbanization and economic development in Cameroon: The case of Buea. African Economic Review, 10(3), 55-69.

[36] Tchouaket, A. M., Mbuh, S. A., & Ngwa, V. K. (2017). Poverty and educational disparities in rural and urban Cameroon: A comparative study. African Journal of Social Sciences, 12(1), 45-68.

[37] Manda, M. A., Chirwa, E. W., & Kabanda, G. (2015). Rural education in sub-Saharan Africa: The case of Cameroon. Journal of Rural Education and Development, 12(2), 25-40.

[38] Hawkes, D., & Fennell, J. Educational inequalities in cervical cancer screening: a systematic review. BMC Public Health, 19(1), 2019. 1-14.

[39] Fisher, B. J., & McDonald, A. J. The role of health literacy in cervical cancer screening: A systematic review. Journal of Women's Health, 29(2) 2020. 250-259.

[40] Schoenfeld, E. M., & Hoh, L. Barriers to cervical cancer screening among women: a qualitative study. Journal of Health Disparities Research and Practice, 9(1), 2016. 15-27.

[41] Bello, M. O., Adebayo, A. A., & Ogunleye, O. A. (2018). Urbanization and its effects on the socio-economic development in Africa: The case of Nigerian cities. Journal of African Development, 15(2), 123-145.

[42] Makinde, M. (2014). Economic challenges in rural Cameroon: Unemployment and poverty trends in the Far North. African Economic Review, 29(1), 88-103.

[43] Ezeh, A., Oyediran, K. A., & Mberu, B. (2014). The effects of urbanization on fertility and reproductive health outcomes in sub-Saharan Africa: A case study of Cameroon. African Population Studies, 28(2), 92-106.

[44] Aldrich, M. C., et al. Geographic disparities in cervical cancer screening and outcomes in the United States: a review. Journal of Women's Health, 24(10) 2015, 814-821.

[45] Castañeda, H., et al. Neighborhood effects on cervical cancer screening in low-income and minority women. American Journal of Public Health, 106(7), 1217-2016. 1223.

[46] Arrossi, S., & Paolino, M. Impact of a community- based intervention on cervical cancer screening uptake in Argentina: a randomized controlled trial. BMC Public Health, 11, 43. 2011.

[47] World Health Organization (WHO). (2014). Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem

[48] Fischhoff, B., Nelson, W. M., & Johnson, P. B. (2006). Social influences on adolescent sexual behavior: Implications for policy and program design. Population and Development Review, 32(3), 397-419.

[49] Sossen, J. T., Kakoma, A. M., & Gaya, G. (2017). Sexual and reproductive health in the Far North of Cameroon: Early marriage and its implications. Journal of African Reproductive Health, 21(3), 112-129.

[50] Ngianga-Keodjio, F., McNally, M., & Arokiasamy, P. (2013). Sexual behavior and the role of media among youth in urban Africa. International Journal of Population Research, 16(4), 276-289.

[51] Ntozi, J. P. M. (1997). The effects of early marriage on fertility and family structure in rural Africa. Rural Sociological Review, 15(1), 45-58.

[52] World Bank. (2015). Rural poverty and development in sub-Saharan Africa: Challenges and opportunities. World Bank Publications.

[53] Charlotte Vampo, Agnès Adjamagbo, Valérie Delaunay, and Yéniban Madiega.

[54] Life on the Margins of Marriage: Extended Female Singlehood in Lomé (Togo). Population-E, 79 (1), 2024, 109–138 DOI: 10.3917/popu.2401.0111

[55] Kofi, G., Akinyemi, J. O., & Nwakwo, C. S. (2021). Rural marriage patterns in Africa: A socio-cultural and demographic analysis. Journal of Rural Studies, 28(1), 55-67.