



Vaccination against Cervical Cancer: Profile of Accommodating Parents and Some Suggestions to Overcome Hesitancy against Vaccination

Tasang Andrew^{1,2,3*}, G. E. Halle Ekane¹, C. Neh Fru^{3,4*},
Frederick Nchang Cho^{5,6}, Tasang Thierry⁷, T. Palle Ewane³, P. Ngum Fru¹,
Daniel Ndongo³, W. Ndakason³, G. Ncham³ and Tangui Gracious⁸

¹Faculty of Health Sciences, Department of Obstetrics and Gynecology, University of Buea, Cameroon.

²Buea Regional Hospital Annex, Cameroon.

³Atlantic Medical Foundation Hospital – Mutengene, Cameroon.

⁴Faculty of Social and Management Sciences, Department of Sociology and Anthropology, University of Buea, Cameroon.

⁵Faculty of Sciences, Department of Biochemistry and Molecular Biology, University of Buea, Cameroon.

⁶Infectious Disease Laboratory, Faculty of Health Sciences, University of Buea, P.O.Box 63, Buea, Cameroon.

⁷Kumbo Sub Divisional Hospital, Kumbo, Cameroon.

⁸Baptist Hospital Mutengene, Cameroon.

Authors' contributions

This work was carried out in collaboration among all authors. Authors CNF, TA, GEHE and TT designed the study. Authors FNC and PNF performed statistical analysis. Authors CNF, TT, TA and FNC wrote the protocol and wrote the first draft of the manuscript. Authors CNF and TA managed the analyses of the study. Authors CNF, TA, FNC and PNF managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JCTI/2020/v10i430136

Editor(s):

(1) Dr. J.Pandiaraja, Shree Devi Hospital, India.

Reviewers:

(1) Jesse A. Stoff, USA.

(2) Giovanna R. Degaspero, Pontifical Catholic University of Campinas, Brazil.

(3) Marcela Celis Amortegui, El Bosque University, Colombia.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/64049>

Original Research Article

Received 02 November 2020
Accepted 05 January 2021
Published 01 February 2021

ABSTRACT

6 million sexually active women are at risk of developing cervical cancer in Cameroon. About 2000 cases are reported annually with 55% of them being fatal. The fight against this disease is hampered by both poor material and human resources. Methods of prevention are divided into primary, secondary, and tertiary. Vaccination is one of the primary methods of prevention of cervical cancer. Despite the avoidable nature of this disease, there is a growing hesitancy in society to allow girls to be vaccinated.

The objective of this study is to find out the characteristics of parents who allow their daughter(s) to be vaccinated, despite the negative growing opinion about vaccination.

Sensitization on the importance of prevention of cervical cancer by the public authorities, financial empowerment of women, and level of education seem crucial to increase the uptake of vaccination against the Human Papilloma Virus.

Keywords: Prevention; vaccination; cervical cancer; human papilloma virus; hesitancy.

1. INTRODUCTION

Far from being a thunder striking under a serene blue sky, cervical cancer is rather an old diesel lorry climbing a stiff slope at a chameleon's pace, giving ample time to curb the disease at its very beginning. Despite the annual figures of 528.000, with more than 266.000 fatal cases [1], this disease remains essentially preventable [2]. Cancer of the cervix (CC) is the prototype of disease which portrays the gigantic gap which exists between the health systems of the developed countries and those of the developing countries [3,4].

The developing world alone accounts for 85 % of all the cases, with Africa south of the Sahara paying a heavy toll [5]. Human papillomavirus (HPV) infection is a sexually transmissible disease. About 75% of sexually active women at risk of contracting it during their active lifespan [6].

One of the primary preventive method of CC is vaccination. Secondary preventive method is cervical cancer screening and treatment of precancerous lesions.

The risk factors of CC such as early sexual encounter, early marriage, multiple sexual partners for both members of a couple, polygamy, sexually transmissible diseases, nonuse of condoms during sexual intercourse, low educational level, lack of awareness, poor economic status, cigarette smoking, and absence of preventive methods are generally not known to our population [7].

Could the background of African countries account for what is being observed?

1.1 The Economic Background

most low-income countries have limited resources, priorities are elsewhere. Meager resources and less attention are directed towards the fight against cancer [8,9,10,11]. With the lack of funds, many screening exercises are pilot programs [12,13]. Scarce resources are allocated for CC prevention. The disparity in funding between the developed countries and the developing ones is abyssal. 81% of funding to fight against cervical cancer is benefited by the high-income countries with only 16.6 % of the global population [14].

1.2 Social Background

Sociocultural factors also have an impact on the prevention of cervical cancer, resulting in low uptake of vaccines. Preventive services though scarce, are underused because of a lack of awareness and knowledge about CC. This disease carries a stigma because of its anatomic site, stories associated with the disease, and religious beliefs [15].

There exists in the community powerful lobbies against vaccination, questioning the rationale, the safety, and the effectiveness of vaccines [16], making people develop a strong sense of resistance against vaccines [17].

1.3 Prevention of Cervical Cancer

Prevention against cervical cancer is divided into three: primary, secondary, and tertiary. Primary methods are abstinence from sex, fidelity to one partner, male circumcision as it reduces the risk of HPV carried by the male partner, barrier methods, and vaccination [18,19].

Secondary preventive methods are based on screening tests and the immediate treatment of precancerous lesions. They are Pap smear, visual inspection methods (visual inspection with 3-5% acetic acid (VIA) / visual inspection with Lugol iodine (VILI), and HPV DNA rapid results testing. These tests can help curb about 80% of cervical CC cases [20].

The tertiary method of prevention of cervical cancers is made of the treatment of early precancerous lesions. They consist of cryotherapy, loop electrosurgical excision procedure (LEEP), and cold-knife conization [21,22,23,24,25].

1.4 Vaccination against HPV

The role of vaccination is depicted by the fact that, despite the overlapping nature of preventive methods for fighting against STDs and HPV, the transmission of HPV remains high [7]. Furthermore, 75% of sexually active women will be confronted with HPV infection, at some point in their lives [26].

Three types of vaccines are present on the market, namely [27]:

The 9-valent vaccine, known as Gardasil 9® , efficient against HPV types 6,11,16,18,31,33,45,52,and 58 .

The quadrivalent vaccine, commercialized as Gardasil®, efficient against types 6,11,16, and 18 of HPV.

And lastly, the bivalent type bearing the commercial name of Cervarix®, potent against types 16 and 18 of HPV.

99.7 % of cervical cancers are caused by HPV [28] and types 16 and 18, are responsible for 2/3 of premalignant lesions of the cervix [28,29].

WHO recommends vaccination before sexual exposure. The vaccine is administered to girls aged between 9 to 14 years in two doses. The second dose is given 6 months away from the 1st dose. For girls beyond 15, a 3rd dose is given at 12 months [7].

Not only Cervarix® can prevent more Than 95% of HPV 16 and 18 infections, but it also cross-protects against other types of viruses responsible for anogenital warts; notably types 6 and 11 [30]. Many studies carried out around the

world have proven the efficiency of vaccination against HPV, with a sharp reduction of preinvasive disease [31]. The safety of all the vaccines is assured according to the WHO [32].

Despite the recommendation of WHO, many African countries because of economic reasons, are unable to integrate into their national vaccination programs, vaccination against HPV [33]. Added to this, people not only question the usefulness of HPV vaccines, but they go further to interrogate their safety, and above all, the malignant intentions of these vaccines [34,35,36].

The objective of this study is to have the profile of parents who will allow their children to be vaccinated against HPV infection, despite the antivaccine growing opinion in society.

2. MATERIALS AND METHODS.

2.1 Methodology

This was a hospital-based cross-sectional descriptive study.

2.2 Study Design Setting and Strategy

It was a pilot campaign, with 100 doses of Cervarix®, provided by the Cameroon – Arizona Partnership (CAP) project. The supplementary 1 dose was given by the Baptist hospital in Mutengene.

Parents were invited via social media campaigns, radio announcements, posters, and banners, to bring along for vaccination their daughters aged between 9-14 years. Inclusion criteria were the ages mentioned above, and girls who just turned 15. Exclusion criteria were the commencement of sexual activity and pregnancy.

As the day scheduled for vaccination was getting closer, many hostile messages against vaccination were pasted on various platforms used for the vaccination campaign. We resorted to addressing the peoples' preoccupations, and also, explained the advantages of having their daughters vaccinated. we went further to call on the phone some of the parents, so we could explain the benefits of having their offspring vaccinated. We organized meetings with some available parents, trying to persuade them on the effectiveness and safety of vaccination against HPV. Those we convinced, said they had confidence in the vaccination team. The campaign was ignited in the Buea regional

hospital, which is an intermediate government-owned health facility with a capacity of 120 beds. It serves the 200.000 inhabitants of Buea. It is the referral health structure for Buea and its environs [37].

On Saturday the 6th of May 2019, at the end of the day, only 65 girls were brought for vaccination. The second part of this exercise was taken to a different town, Mutengene some 15 km south of Buea. The Baptist hospital Mutengene which hosted this exercise has a capacity of 151 Beds and is the biggest health structure in that health area with a population of 47.500 Inhabitants. This hospital receives clients from other regions and even from foreign countries [38].

Since the population of this area is predominantly of the Christian faith, we used the next day Sunday, which is a worshipping day to relaunch a new campaign in the main churches of Mutengene. The following day, Monday was still used for sensitization about cervical cancer. On Tuesday, the 37 remaining doses were administered in the Baptist hospital Mutengene.

The second doses of vaccines were administered 6 months later. The 3rd dose for those who had just turned 15, was administered 12 months later.

2.3 Study Population and Procedure

The parents /guardians who accompanied their children were lectured on the advantages of having their daughter (s) vaccinated. An open questions and answers session ensued. The procedure of vaccination was detailedly explained.

2.4 Estimated Target Population

The pyramid of Cameroon's population displays an essentially young population. The statistics of the Cameroon population in 2018 read as follows:

0-14 years: 42.15% (male 5.445.142 /female 5.362.166) [37]

If Cameroon's population is 25.000.000 inhabitants, the estimated population of girls from 0-14 in Buea with a population of 200.000 inhabitants is 42.897 [37].

Furthermore, the number of girls from 9-13 years old is estimated at 1.494.239 for the whole country [39]. With a population growth rate of 2,6

% per year [39], the estimated population for girls aged between 9-13 years is 11.954 and 9.975 respectively for Buea and Mutengene [40].

2.5 Research Instrument and Data Collection

The data instrument was case report forms (CRF). The case report form contained sections to capture the demographic characteristics of participants and their parents/guardians.

2.6 Study Variables

The dependent variables in this study were the general characteristics of parents/guardians and the level of study of the participants. The Independent variable was the parents' age.

2.7 Statistical Analysis

Data was captured into Microsoft Excel Office 2018 (Microsoft Inc) and exported to Statistical Package for Social Scientist (SPSS) version 25.0 for statistical analysis. Categorical variables are presented as frequency tables and numerical variables as descriptive measures expressed as mean \pm standard deviation (SD). The association between parents' age and demographic characteristics was assessed using bivariate and multivariate logistic regression analyses. Odds ratios (O.R) and Chi-square (χ^2) tests were used to compare parents' age with other characteristics and participants' characteristics. P-values \leq 0.05 were considered significant.

3. RESULTS

A total of 101 girls with mean (\pm SD) age 12.22 \pm 2.03 years were consecutively enrolled in this study. Of the 101 participants, 65 (64.4%) and 33 (32.7%) were from Buea and Mutengene respectively. 94.1 % of parents who accompanied their daughters for vaccination were female. Their general characteristics are presented in Table 1.

The majority, 69% of parents who brought their children for vaccination, were aged between 20 to 40 years.

3.1 Graphic Representation of Some Characteristics of Parents

Skilled occupation towers the diagram with 76.2% while the category business trails with a value of 5.9%.

As far as education is concerned, cumulatively, both secondary and tertiary education represents

the crushing majority of 95 % compared with the meager 5 % for primary education.

56% of girls aged between 9 to 14 years were already in secondary school. 21 (20.8 %) incorporated in this study had just 15. 81 (80.2%) completed all the doses of vaccines required.

The occupation of the parents was the independent predictor for showing up for the vaccine.

Skilled occupation and secondary school educational level had statistically significant values. Girls ≤ 14 years, evidently had more odds to be incorporated in our study.

Table 1. Parents' characteristics

Variable	Subclass	Parents' age groups (years)			χ^2	p-value
		20 – 40 (%)	> 40 (%)	Total (%)		
Parents						
Occupation	Skilled	48 (69.6)	29 (90.6)	77 (76.2)	5.416	0.067
	Business	5 (7.2)	1 (3.1)	6 (5.9)		
	Student	16 (23.2)	2 (6.3)	18 (17.8)		
Education	Primary	4 (5.8)	1 (3.1)	5 (5.0)	0.717	0.699
	Secondary	21 (30.4)	12 (37.5)	33 (32.7)		
	University	44 (63.8)	19 (59.4)	63 (62.4)		
Marital status	Unmarried	26 (37.7)	7 (21.9)	33 (32.7)	2.483	0.115
	Married	43 (62.3)	25 (78.1)	68 (67.3)		
Sex	Male	3 (4.3)	3 (9.4)	6 (5.9)	0.989	0.320
	Female	66 (95.7)	29 (90.6)	95 (94.1)		
	Total	69	32	101		

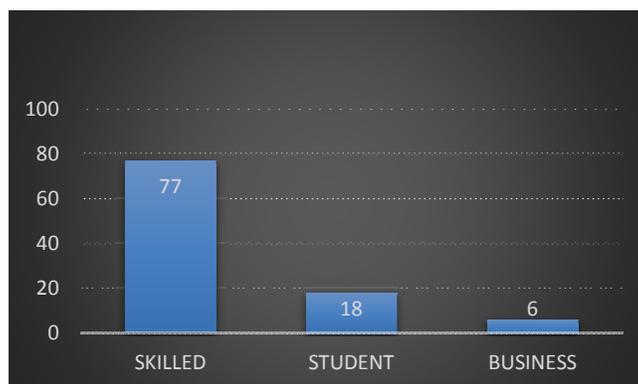


Chart 1. Occupation

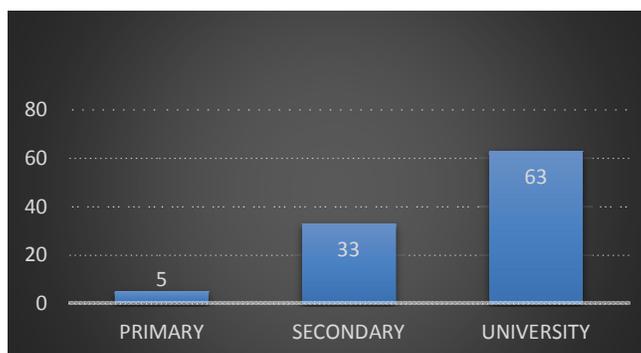


Chart 2. Level of education

Table 2. Association of parent's age with daughters' characteristics

Variable	Subclass	Parent's age groups (years)			χ^2	p-value
		20 – 40 (%)	> 40 (%)	Total (%)		
Daughters						
Education	Primary	32 (46.4)	13 (40.6)	45 (44.6)	0.298	0.588
	Secondary	37 (53.6)	19 (59.4)	56 (55.4)		
Age groups (years)	≤ 14	56 (81.2)	24 (75.0)	80 (72.9)	0.504	0.478
	15	13 (18.8)	8 (25.0)	21 (20.8)		
Cervarix doses	Incomplete	12 (17.4)	8 (25.0)	20 (19.8)	0.797	0.372
	Complete	57 (82.6)	24 (75.0)	81 (80.2)		
	($\bar{x} \pm SD$)	12.12 \pm 2.04	12.44 \pm 2.03	12.22 \pm 2.03	0.545	0.462
	Total	69	32	101		

Table 3. Multinomial logistic regression of parents and participants characteristics in association with parent's age

Variable	Subclass	p-value	χ^2	O.R (95% C.I)
Parents				
Occupation	Skilled	2.75x10 ^{-3*}	12.368	0.1 (0.0 – 0.4)
	Business	0.42		0.3 (0.0 – 5.0)
	Student	Ref		1.0
Education	Primary	0.77	7.892	1.6 (0.1 – 30.1)†
	Secondary	1.06x10 ^{-2*}		0.2 (0.0 – 0.7)
	University	Ref		1.0
Marital status	Unmarried	0.17	1.985	2.1 (0.7 – 6.3)
	Married	Ref		1.0
Sex	Male	0.50	0.469	0.5 (0.1 – 4.0)
	Female	Ref		1.0
Participants				
Education	Primary	0.72	0.129	1.2 (0.5 – 2.9)†
	Secondary	Ref		1.0
Age groups (years)	≤ 14	0.49	0.469	1.4 (0.5 – 4.2)†
	15	Ref		1.0
Cervarix doses	Incomplete	0.315	0.989	0.6 (0.2 – 1.6)
	Complete	Ref		1.0

4. DISCUSSION

The health authorities have an uphill task to reverse the present trend. Hesitancy against Cervical cancer vaccination seems deeply rooted in society [41]. The Ministry of Public Health (MPH) and all its ramifications on the national territory have to engage in profound sensitization of the society about vaccination against HPV. The top to bottom approach should be abandoned. The community leaders, who are, the chiefs of villages and quarters should be co-opted. The leaders of the mainstream religious bodies should be associated. Unorthodox "Men of God" claiming to have mystical powers to cure any disease should be brought to order [42,43,44]. At every Ante-Natal Clinic (ANC), and, Infant Welfare Clinic (IWC), health personnel should be trained to deliver during

Education- Instruction-Communication (EIC) activity, a talk on cervical cancer. Paediatricians should be put at contribution to educating parents on the importance of the vaccine against HPV [45,46,47,48,49,50]. Traditional birth attendants in villages where there are no health units should also join the cohort of educators. Short spots talking about cervical cancer should be broadcasted over national and private radio stations and television channels. Educational authorities should include in school curricula, basic notions about gynaecological cancers [42].

In our study, 20% of the participants did not complete their vaccines. Although a single shot of vaccine gives some degree of protection [51], it is advisable to have the complete doses, that is the initial dose, the second dose 2 months later, and the 3rd dose 6 months later if the participant

is from 15 years upwards [48], for maximum protection. There are also cross-protection benefits against other species derived from administration of the normal doses. There is also protection against genito-anal, and oral diseases caused by HPV [52].

In our study, subclass secondary education is statistically significant. By reviewing many studies, we agree that education has a pivotal role to play in the fight against cervical cancer [42]. People with little or no education have the weakness to believe in myths, folktales, and witchcraft. They drain away from health services that could have been of help to them and instead rely on unscrupulous "Men of God", herbalists, and witch doctors [42]. The higher the level of education, the more cartesian is one's mindset. There is an understanding of the pathology and the means of prevention and treatment. One is not overwhelmed by the "mysticism" hovering sadly around cervical cancer, ferried by the ordinary man in the society [53]. The more educated one is, the more one seeks rational solutions.

Our findings are in line with those of many authors as far as the financial capacitation of the woman is concerned. 77 % of parents who presented themselves with their daughters, had skilled occupations (Doctors, lecturers, lawyers, nurses, teachers, etc.). Although men have an influence on decisions patterning to health issues [42], financial empowerment brought along by the occupation of the woman makes her less dependent if not independent from their spouse. She can take decisions on health issues concerning the family [42,54,55,56,57,58].

94 % of parents who brought their daughters for vaccination were women. Despite their occupation, women seem more empathic, caring, and can allocate time for family health issues. They have protective behaviour towards their offsprings [59,60,61,62].

5. CONCLUSION

Faced with the challenge of a powerful social negative opinion for vaccination against cervical cancer, the health authorities should use all available means of sensitization to create awareness between HPV infection, cervical cancer, and other HPV-related anogenital diseases. Financial empowerment and the level of education play a pivotal role in women taking their daughters for vaccination against HPV.

6. RECOMMENDATIONS

On the heels of these findings, we recommend another study to try to find out some of the reasons why there is hesitancy towards cervical cancer vaccination.

DISCLAIMER

The vaccines used for this research are commonly used in our area of research and country. There is no conflict of interest between the authors and the firms producing the vaccines. We do not intend to use these vaccines as an avenue for any litigation but only for the advancement of knowledge. Also, this research did not benefit from any funding by the aforementioned company, rather it was funded by the personal efforts of the authors.

CONSENT

In the end, each parent had to sign a consent form before the daughter(s) was/were administered the first dose of Cervarix®.

ETHICAL APPROVAL

The ethical clearance was obtained from the review board of the Faculty of Health Sciences of the University of Buea, and the administrative authorizations were obtained from the South West Regional Delegate of Public Health and the director of Buea regional hospital.

ACKNOWLEDGEMENT

We are grateful to the Cameroon- Arizona partnership (CAP) project for the supply of vaccines. Special thanks to Dr. David Greenspan, who worked hard for the donation of vaccines.

We are equally thankful to the Baptist Health Services complex in Mutengene for the storage of vaccines.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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