



Perceptions of Healthcare Workers on the Human Papilloma Virus Vaccines at selected Health Facilities in Nairobi, Kenya

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Summary

Background: Human papilloma virus is a common sexually transmitted viral infection that affects both men and women with an overall prevalence of cytology given as 21.8% for women.

Objective: The main objective of the study was to determine the healthcare worker's perception on the HPV vaccines at Nairobi Women's Hospital and Mbagathi District Hospital in Nairobi, Kenya.

Materials and methods: The study which was carried out in Mbagathi district hospital and Nairobi Women's hospital was a descriptive cross sectional which utilized both quantitative and qualitative techniques. Self-administered questionnaire was done to 107 participants while key informant interviews were conducted amongst the in-charges of the facilities. Data from the questionnaire was entered into a computer using EXCEL and exported to Social Package for Social Sciences (SPSS) for analysis. Comparisons between the two hospitals were done using chi-square (Fishers exact test) for categorical variables. Logistic regression analysis was performed to determine factors influencing perception of healthcare workers on HPV vaccine. The level of statistical significance was 5%. Data from the interviews were manually sorted out based on themes developed from the responses in line with the objectives and are presented verbatim.

Results: Health workers at Nairobi Women were 1.3 times more likely to report knowledge that HPV is sexually transmitted compared to their colleagues at Mbagathi (RR = 1.3, 95% CI 1.1–1.4, p 0.005). 87.7% of health workers in Mbagathi and 97% at Nairobi Women's recognised that HPV was associated with cervical cancer and there was no significant differences in knowledge of the association between HPV infection and cancer at the two hospitals (RR = 1.1, 95% CI 0.99–1.3). Health workers at Nairobi women's predominantly reported that HPV causes cancer of the cervix (RR = 5.0, 95% CI 2.9–8.7, p < 0.001). Those at Nairobi women's were likely to report that HPV predisposes infected individual to cancer of the cervix (RR = 0.1, 95% CI 0.1–0.4, p < 0.001). There were no differences in attitude towards vaccination in terms of recommending HPV to clients (81.8% versus 81.1%) and recommending or receiving vaccine if funding was made available to subsidise HPV vaccine costs (93.9% versus 82.4%).

Conclusions and recommendations: The knowledge, perceptions and the practices of health workers relating to HPV are largely dependent upon the sector (private or public), availability of vaccine, policies and not on their level of education and the professional training thereof. There is need to empower healthcare workers in public health facilities by providing information, prioritizing the availability and the acquisition of the vaccines in an attempt to improve their perception and practices.

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Introduction

Human papilloma virus is a common sexually transmitted virus which affects both men and women with condoms partially effective in preventing infection as any exposed skin can transmit the virus (1). HPV is responsible for other benign genital infections such as recurrent juvenile respiratory papillomatosis and genital warts, both mainly caused by HPV types 6 and 11(2). Human papilloma virus is commonly found in the anogenital tract with or without clinical lesions. The prevalence of HPV increases with severity of the lesion. Majority of the approximately 200 known types of HPV do not cause any symptoms in most people. More than 30 types of HPV are typically transmitted through sexual contact and infect the anogenital region. Some types can cause warts, while others can lead to cancers of the cervix, vulva, vagina and anus in women or cancers of the anus and penis in men.

HPV is a member of the *papillomaviridae* family of viruses. Papillomaviruses are small DNA viruses, approximately 52–55nm in diameter. There are more than 100 types of HPV. Worldwide HPV– 16 and 18 contribute to over 70% of all cancer cases. The most prevalent type of HPV worldwide is type 16 with less variation in geographical distribution than other types (3). Studies done have shown that the overall prevalence of any HPV types in the general population of Sub Saharan Africa for women with normal cytology is 21.8%. The prevalence of HPV types 16 and 18 among ICC cases in SSA range from 43.7 to 90.2%. The overall combined estimated HPV 16 and 18 prevalence among ICC cases in Mozambique was found to be 69% (4), which is consistent with worldwide estimates of 70% (5).

HPV is a risk factor for cervical cancer, however it is not the only one necessary for progression from cervical HPV infection to cancer. Other risk factors include

tobacco smoking, high parity, long-term hormonal contraceptive use, and co-infection with HIV have been identified as established cofactors. Co-infection with *Chlamydia trachomatis* and herpes simplex virus type–2, immunosuppression, and certain dietary deficiencies are other probable cofactors. Genetic and immunological host factors and viral factors other than type, such as variants of type, viral load and viral integration, are likely to be important but have not been clearly identified (6).

A strong association has been found between presence of HPV and the occurrence of cervical cancer (7,8). Among the 15 high-risk oncogenic HPV genotypes that have been identified, HPV 16 and 18 have been associated with most of the HPV-associated cervical cancer cases (9,10). HPV types 16, 18, 31 and 45 are called "high-risk" types because they can lead to cervical, anal, vulvar, penile, and lung cancers.

Cervical cancer is the second leading cause of cancer death in women globally and the first in many developing countries. In sub Saharan Africa cervical cancer is the most common cancer (11). In Kenya, according to the Nairobi cancer registry, cervical cancer accounted for 19.3% of all cancer cases recorded in the period 2003–2006. Accordingly, cervical cancer is the most frequent cancer amongst women with mortality of 2111 lives every year (12).

Cervical cancer cytology screening programmes have been successful in curbing the incidence of cervical cancer in developed countries (13). Screening programmes coverage in Sub-Saharan Africa has been shown to be very low, between 0.4%–20.2% (14). Many women in developing countries still do not get screened with women seeking medical attention when cancer is at an advanced stage, leading to higher mortality as treatment options may not be successful with advanced disease (15).



Routine pap smear tests can be done to detect early lesions of the disease. It is estimated that 70,722 new cases of invasive cervical cancer occur annually in sub-Saharan Africa and it is responsible for one quarter of all female cancers (16). In East Africa the age-standardized incidence rate of cervical cancer is 42.7 per 100,000 women (17). In contrast, the age standardized incidence rates is 12.1 in North America and 11.9 in Europe (12). Each year, approximately 450,000 new cases of invasive cervical cancer have been reported to be diagnosed worldwide, with the rate being highest in regions where there is little cytological cervical cancer screening (18).

HPV vaccines are part of the primary cervical cancer prevention tools. Vaccines targeting high-risk HPV types and other types may be used to create immunity to HPV thus enhancing prevention of cervical cancer (12). This may be an effective tool towards reducing the burden of cervical cancer disease. Commercial vaccines against HPV 16 and HPV 18 have been made available though global variations in HPV type specific prevalence could affect their effectiveness (19). However, the vaccines do not treat existing infections or lesions and so are recommended for young women without known exposure to targeted types of HPV (20). Most countries that have issued official recommendations for immunization recommend immunization of pre-adolescent girls of age 9–13years (21). In the USA, girls aged 11–12years have been reported to be the target for vaccination (22). In Kenya, the guidelines for HPV vaccines are in preparation stage and the vaccines have been made available in limited hospital set-ups.

Kenya became the first country to protect girls in Kitui with free of charge vaccine under The Global Access to Vaccines Initiative (GAVI) supported 'record low price'

in May 2013 to developing countries which included Kenya (23). Under that initiative, girls were given free vaccines. In 2010, the cost of either the quadrivalent HPV vaccine (Gardasil®) or the bivalent HPV vaccine (Cervarix®) was about US\$400 (24). This is out of reach to many young women in Kenya, thus the importance of international agencies to assist with the cost of HPV vaccine or the need for lower-cost vaccines. The vaccines secured by GAVI was costing \$4.50 (about Kshs 5,000) a dose while it cost more than \$100 (about Kshs 10,000) a dose in developed countries (23).

Although that was the situation, a study in Kisumu (25) showed that ninety-five percent (95% CI: 92%, 99%) responded that they were likely to have their daughters immunized if the vaccine protected against cervical cancer, 94% (95% CI: 90%, 98%) were likely to have their daughters immunized if the vaccine protected against genital warts, and 95% (95% CI: 92%, 99%) were likely to have their daughters immunized if the vaccine protected against both cervical cancer and genital warts. This was only if the vaccine was availed and made free of charge.

However, HPV vaccines have been made available in Kenya for clinical use. The uptake and acceptance of the vaccine depends largely upon and whether providers recommend the vaccines to the target population. The introduction of the vaccines has positioned healthcare workers to play an active role in ensuring its successful implementation. Healthcare workers are the first line in promotion of HPV vaccines to parents of target group for vaccines. The positive role of physicians has been acknowledged as important to the acceptability of vaccinations among parents (26). A study done in Italy showed that paediatricians were found to be the providers of most of information on HPV



vaccine (31%) and were perceived as preferred immunization providers (77%) (27). In Canada it was found that 95% of respondents in a survey on health care providers knowledge, attitudes and beliefs about HPV vaccination indicated that the vaccine should be given to girls before onset of sexual activity. Eighty percent of the respondents felt that the best age for vaccination is < 14years (1). The cost of vaccines may affect the clinical staff's attitudes towards recommending the vaccines as shown in a survey where majority of respondents intended to recommend HPV vaccine if they are publicly funded (28).

Healthcare workers interact with patients a lot during patient's clinical care. They are the ones who administer vaccines and so are very important in terms of uptake of HPV vaccines. 85% of respondents on a survey done on nurses' knowledge, attitudes and practices on HPV vaccines acknowledged that they would recommend HPV vaccines to their patients (27). Another study done found that a personal belief in the positive impact of the HPV vaccine and providers feeling comfortable talking with parents about sexual nature of vaccine as the most common factors influencing perceptions (29).

Results

Socio-demographic characteristics of healthcare workers

Table 1 below shows that 30.7% of the healthcare workers were recruited from Nairobi Women's hospital and 69.2% from Mbagathi Hospital. The average age of participants was 28.5 years (sd 7.6). Overall, 37.4% of health workers were aged between 23 and 24 years with this age group being the modal age group both within Mbagathi hospital (33.8%) and Nairobi Women's hospital (45.5%). Female healthcare workers accounted for 67.3% and the percentage of participants

at the two hospitals were not significantly different (63.5% in Mbagathi compared to 75.8% in Nairobi Women's Hospital).

71% healthcare workers held diploma qualifications (Mbagathi Hospital (67.6%) versus (78.8%) in Nairobi Women's hospital). However, there were more healthcare workers who held first degree in Mbagathi Hospital (21.6%) compared to Nairobi Women's hospital (15.2%). There were significant differences in the duration of service (in years) reported at the two hospitals (chi square = 9.8, d.f = 2; P value = 0.008). Most healthcare workers at both sites had been in service for less than 5 years (59.5% versus 66.7%). A higher percentage of staff in Mbagathi hospital compared to Nairobi Women's hospital had served for at least 11 years (29.7% versus 6.1%).



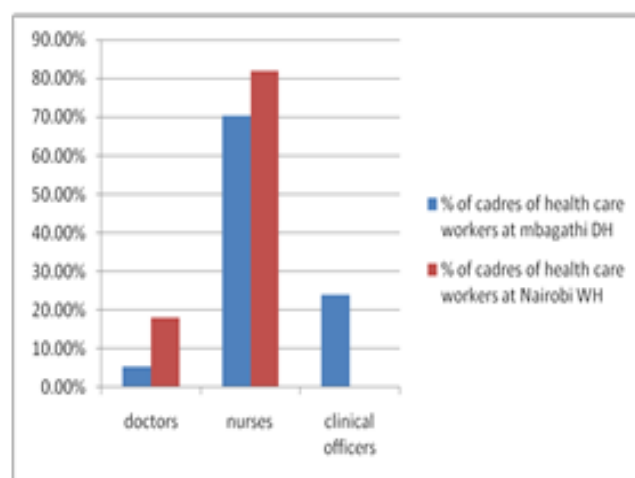
Table 1: Demographic characteristics of health workers

Variable	Hospital		Totaln (%)
	Mbagathi DH-n (%)	Nairobi Women's- n (%)	
Age in years			
23–24	25(33.8)	15(45.5)	40(37.4)
25–29	20(27.0)	11(33.3)	31(29.0)
30–34	7(9.5)	6(18.2)	13(12.2)
35–39	10(13.5)	1(3.0)	11(10.3)
40–44	7(9.5)	0	7(6.5)
45–49	5(6.8)	0	5(4.7)
Sex			
Male	27(36.5)	8(24.2)	35(32.7)
Female	47(63.5)	25(75.8)	72(67.3)
Education qualification			
Diploma	50(67.6)	26(78.8)	76(71.0)
Higher diploma	8(10.8)	1(3.0)	9(8.4)
Bachelors degree	16(21.6)	5(15.2)	21(19.6)
Masters degree	0	1(3.0)	1(1.0)
Duration of service in years			
0–5	44(59.5)	22(66.7)	66(61.7)
6–10	8(10.8)	9(27.3)	17(15.9)
11 and above	22(29.7)	2(6.1)	24(22.4)

Distribution of healthcare workers by cadre

Further, figure 1 below shows that Nairobi Women's hospital had a higher percentage (18.2%) of doctors compared to Mbagathi District hospital (5.4%). It is important to note that whereas Mbagathi had (24.3%) clinical officers, Nairobi Women had no clinical officers. Overall, nurses comprised the majority (73.8%) of healthcare workers, and were also the majority in Mbagathi (70.3%) and Nairobi Women's (81.2%).

Figure 1: Distribution of healthcare workers by cadre





Healthcare workers on HPV Vaccine

Table 2 below shows that all (100%) the healthcare workers at Nairobi Women had heard about the vaccine compared to 71.6% at Mbagathi with 75% and 44.6%, respectively, having heard about them in college/university. Most health workers in Mbagathi (97%) and Nairobi Women (87.8%) recognised that HPV was associated with cervical cancer and there was no significant differences in knowledge of the association between HPV infection and cancer at the two hospitals (RR = 1.1, 95% CI 0.99–1.3). However,

the healthcare workers differed in the perception of the mechanism of HPV association with cancer of the cervix. Healthcare workers at Mbagathi Hospital predominantly reported that HPV causes cancer of the cervix (RR = 5.0, 95% CI 2.9–8.7, $p < 0.001$), compared to their colleagues at Nairobi women's hospital while healthcare workers at Nairobi Women's hospital were likely to report that HPV predisposes infected individual to cancer of the cervix (RR = 0.1, 95% CI 0.1–0.4, $p < 0.001$).

Table 2: Knowledge on HPV vaccine

Knowledge	Hospital		Total n (%)	RR (95% CI)	P value
	Mbagathi n (%)	Nairobi women's n (%)			
Ever heard about HPV vaccine	53(71.6)	33 (100)	86(80.4)	1.4 (1.2–1.6)	0.0001
Heard about vaccine in:					
College/ university	33(44.6)	24(75)	57(69.5)	1.6 (1.2–2.3)	0.007
Workshop/ CME	11(22)	7(21.9)	18(22)	1.4 (0.6–3.4)	0.418
Journal/ Magazine	6(12)	1(3.1)	7(8.6)	0.4 (0.05–2.9)	0.327
Attended CME on HPV	28(37.8)	29(88.9)	57(53.3)	2.3 (1.7 – 3.2)	<0.001
Cervical cancer and HPV					
HPV associated with cervical cancer	32(97)	65(87.8)	97(90.7)	1.1 (0.99–1.3)	0.134
HPV causes cervical cancer	27(83.4)	11(17)	38(39.2)	5.0 (2.9–8.7)	<0.001
HPV predisposes to cervical cancer	5(15.6)	54(83)	59(60.8)	0.2(0.1–0.4)	<0.001

Knowledge on HPV vaccine according to cadre

All the participating doctors (100%) had reported that they had ever heard of HPV vaccine compared to 77.2% and 83.3% of nurses and Clinical Officers, respectively. Doctors were also more likely to have heard about the vaccine during undergraduate training (80%) compared to nurses (48.1%) and Clinical Officers (61.1%). Nurses (48.1%) reported attending

CMEs on HPV more recently than other cadres (27.8%–30%). At least one-half of health workers in each cadre reported that HPV predisposes individuals to cervical cancer with most (77.8%) clinical officers reporting knowledge of HPV predisposing individuals to cervical cancer (Table 3 below).



Table 3: Knowledge on HPV vaccine according to cadre

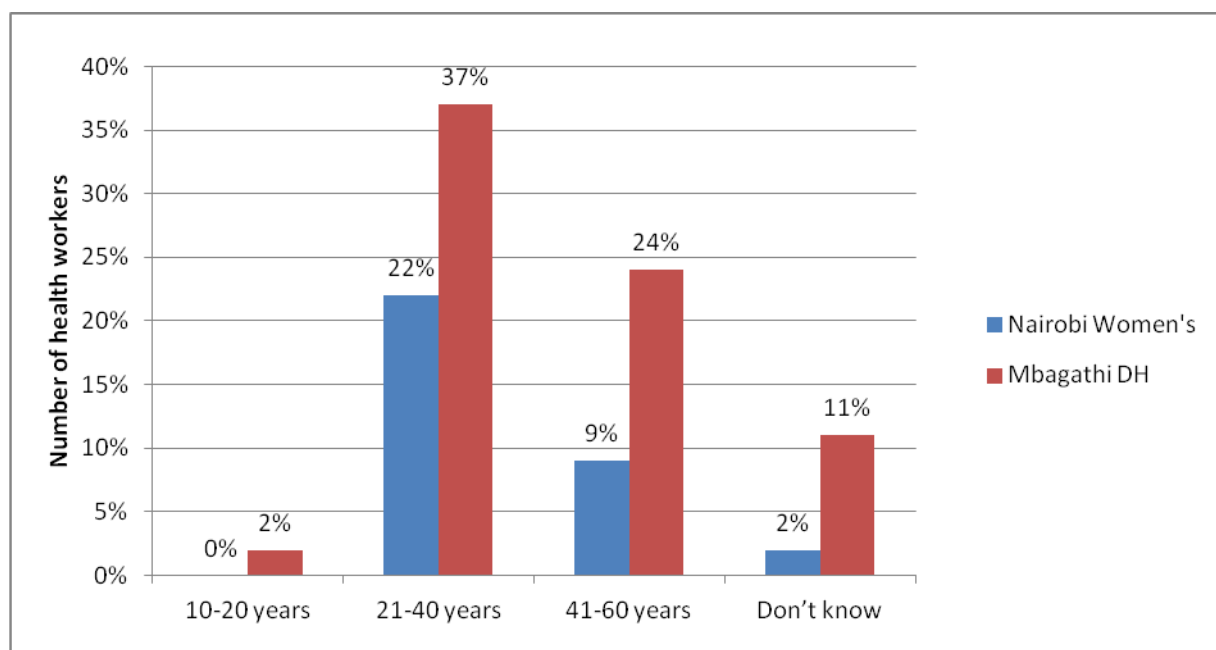
	Health worker cadre		
	Doctor	Nurse	CO
Ever heard about HPV vaccine	10(100.0)	61(77.2)	15(83.3)
Heard about vaccine in:			
College/university training	8(80.0)	38(48.1)	11(61.1)
Workshop/CME	1(10.0)	13(16.5)	4(22.2)
Journal/magazine	1(10.0)	6(7.6)	0(0.0)
Attended CME on HPV			
0–6 months	3(30.0)	38(48.1)	5(27.8)
6mths–1yr	0(0.0)	4(5.1)	0(0.0)
1–2yrs	1(10.0)	1(1.3)	1(5.6)
more than 2 years	1(10.0)	0(0.0)	3(16.7)
Cervical cancer and HPV			
HPV causes cervical cancer	3(30.0)	33(41.8)	2(11.1)
HPV predisposes someone to cervical cancer	5(50.0)	40(50.6)	14(77.8)

Responses on the affected age group

Figure 3 shows most health workers at both Mbagathi and Nairobi Women indicated that cervical cancer was

most commonly found in the age groups 21 to 40 years, followed by the age group 41 to 60 years.

Figure 3: Comparison on age group affected by cervical cancer





Perceptions and practices of healthcare workers towards HPV vaccines

Table 4 shows practices and attitudes related to HPV vaccines among health workers at Mbagathi and Nairobi Women's hospital. Attitudes measured by question on whether healthcare workers were willing to get vaccinated, recommend the vaccine or receive the vaccine if HPV was funded. The responses showed that with the exception of willingness to get vaccinated under current conditions where healthcare workers in Nairobi Women had a more positive attitude (93.9%

versus 43.2%), there were no differences in attitude towards vaccination in terms of recommending HPV to clients (81.8% versus 81.1%) and recommending or receiving vaccine if funding were made available to subsidise HPV vaccine costs (93.9% versus 82.4%). In regard to practices health workers at Nairobi Women were more likely to report having received HPV vaccine (69.7% versus 2.7%), administered (87.9% versus 4.1%) and recommended (87.9% versus 17.6%) HPV vaccine to a client compared to health workers at Mbagathi.

Table 4: Perceptions and practices of healthcare workers towards HPV vaccine

Question/issue	Hospital	Yes	No	Not sure
Would you get vaccinated with HPV vaccine?	Nairobi Women's	31(93.9)	0	2(6.1)
	Mbagathi DH	32(43.2)	17(23)	25(33.8)
Would you recommend the vaccine to a client?	Nairobi Women's	27(81.8)	0	6(18.2)
	Mbagathi DH	60(81.1)	3(4.1)	11(14.8)
Would you recommend/receive the vaccine if it is funded hence cheaper?	Nairobi Women's	31(93.9)	0	2(6.1)
	Mbagathi DH	61(82.4)	6(8.1)	7(9.5)
Have you received the HPV Vaccine at the hospital?	Nairobi Women's	23(69.7)	10(30.3)	NA
	Mbagathi DH	2(2.7)	72(97.3)	NA
Have you administered the vaccine to a patient?	Nairobi Women's	29(87.9)	4(12.1)	NA
	Mbagathi DH	3(4.1)	71(95.9)	NA
Have you already recommended the vaccine to a client?	Nairobi Women's	29(87.9)	4(12.1)	NA
	Mbagathi DH	13(17.6)	61(82.4)	NA

Willingness of the healthcare workers to be vaccinated with vaccine

Table 5 below shows that 60% of nurses and doctors compared to (50%) of Clinical Officers were willing to get vaccinated with HPV vaccine. Most health workers across the different cadres would recommend the vaccine to clients both at the market price and if the

vaccine price was subsidized. Less than one-third of doctors (20%), nurses (29.1%) and Clinical Officers (0%) had received the vaccine in the hospital. (40%) of doctors had administered the vaccine to a client compared to (34.2%) of nurses and (5.6%) of Clinical Officers.



Table 5: Perceptions and practices towards HPV vaccine according to cadre of healthcare worker

Issues	Cadre of healthcare worker		
	Doctors	Nurses	CO
Would get vaccinated with HPV vaccine	6(60.0)	48(60.8)	9(50.0)
Would recommend the vaccine to a client	7(70.0)	63(79.7)	17(94.4)
Would recommend/receive the vaccine if it is funded hence cheaper	7(70.0)	71(89.9)	14(77.8)
Had received the HPV Vaccine at the hospital	2(20.0)	23(29.1)	0(0.0)
Had administered the vaccine to a patient	4(40.0)	27(34.2)	1(5.6)
Had already recommended the vaccine to a client	5(50.0)	31(39.2)	6(33.3)

Perception of healthcare workers on Vaccines

The perception of the healthcare workers on HPV vaccines was assessed using qualitative data collected from open-ended questions administered to all 107 participating health workers and additional data from in-depth key informant interview among health workers (n

= 10) in-charge of different services. The 10 key informants included medical officers (n = 2), a clinical officer and nurses (n = 8). This is shown in table 6 below.

Table 6: Perceptions of health workers on HPV vaccines at Nairobi Women's and Mbagathi

Perception/issue	Nairobi Women's n = 33	MDH n = 74	Total n = 107
Reasons for not getting HPV vaccination			
Not aware of vaccine	1(3%)	6(8.1%)	7(6.5%)
Not well informed on	0(0%)	11(14.9%)	11(10.3%)
Fear of side effects	0(0%)	1(1.4%)	1(0.9%)
Cost of vaccine	1(3%)	5(6.8%)	6(5.6%)
Availability of vaccine	2(6.1%)	4(5.4%)	6(5.6%)
Don't know	0(0%)	2(2.7%)	2(1.9%)
Reasons for not recommending HPV to client			
Cost of vaccine	27(81.8%)	12(16.2%)	39(36.4%)
Fear of side effects	0(0%)	3(4.1%)	3(2.8%)
Not well informed	2(6.1%)	21(28.4%)	23(21.5%)
Vaccine schedule	0(0%)	1(1.4%)	1(0.9%)
Availability of vaccine	1(3%)	18(24.3%)	19(17.8%)
Other	0(0%)	1(1.4%)	1(0.9%)



Reasons why health workers have never received HPV at Hospital			
Not aware of vaccine	2(6.1%)	12(16.2%)	14(13.1%)
Not well informed on HPV	2(6.1%)	17(23%)	19(17.8%)
Fear of side effects	0(0%)	1(1.4%)	1(0.9%)
Cost of vaccine	1(3%)	8(10.8%)	9(8.4%)
Availability of vaccine	1(3%)	14(18.9%)	15(14%)
Don't know	0(0%)	1(1.4%)	1(0.9%)
Reason why health workers have never administered vaccine			
Not aware of vaccine	2(6.1%)	16(21.6%)	18(16.8%)
Not well informed on HPV	0(0%)	6(8.1%)	6(5.6%)
Fear of side effects	0(0%)	2(2.7%)	2(1.9%)
Cost of vaccine	0(0%)	1(1.4%)	1(0.9%)
Availability of vaccine	1(3%)	36(48.6%)	37(34.6%)
Don't know	0(0%)	2(2.7%)	2(1.9%)

Discussion

East Africa has been highlighted as having the highest incidence of invasive cervical cancer in the world (30). In this regard, highly effective prophylactic vaccines against HPV-16 and -18, have been made available for use in many countries. HPV vaccines have been recognized and recommended by WHO as an integral way of preventing cervical cancer (12,31,32). Many countries including Kenya have put up strategies towards the implementation and realization of prophylactic HPV vaccination. This saw Kenya becoming the first nation among the developing countries to protect girls with free vaccines in 2013 under the GAVI initiative. HPV vaccines have been shown to prevent infections by certain types of human papillomavirus associated with the development of cervical cancer, genital warts, and other cancers (33,24). There are two vaccines (Gardasil and Cervarix) in the market, which have been approved for

use in many countries as of 2014 (34). Both vaccines protect against the two HPV types (HPV-16 and HPV-18) which has been shown to cause 70% of cervical cancers, 80% of anal cancers, 60% of vaginal cancers and 40% of vulvar cancers (35).

However, this study has found out that the uptake of health services in any facility is largely dependent upon, among other factors, the efficient manner in which healthcare workers relate clients' assessments to the type of treatment to be prescribed and administered. This ability is informed by the overall knowledge (acquired through experience or education by perceiving, discovering, or learning) of the healthcare workers on recognizing and handling patients up-to administering the right drugs. Many a times a gap in knowledge may be witnessed amongst health workers in as far as acceptance, priority setting and other issues related to new interventions is concerned. Further, the success of any integrated service has been shown in a



study to be related to several factors, including knowledge, understanding and preferences of health workers and the community members (33).

This study shows that 58.1% of respondents in Mbagathi indicated that cervical cancer mostly affects individuals between age 21–40years whereas 12.2% of respondents did not know the age distribution of cervical cancer in the population. All the healthcare workers (100%) in Nairobi Women's hospital perceived that there is an association between HPV infection and cervical cancer while 91.9% of those in Mbagathi had the same understanding. Further, this study found that 75.5% of the healthcare workers at Mbagathi were not aware of the types of HPV vaccines available in Kenya while 87.1% at Nairobi Women's reported knowing one commercially available vaccine. This can be attributed to the availability and accessibility of the vaccines at the respective hospitals. The vaccines are not available at Mbagathi while they are stocked at Nairobi Women's hospital. 30% and 33.3% of healthcare workers at Nairobi Women's hospital perceived 0–5 and 26–30years respectively as being appropriate age for target group vaccination while 31% of Mbagathi district hospital respondents perceived 16–20years as being appropriate age for vaccination. This finding is similar to that of another study done in western Kenya where focused group discussions were done with caregivers and opinion leaders (40).

In addition, this study has shown that 46% of all respondents knew of a specific vaccine and 25% mentioned cervarix when asked to specify the HPV vaccine known to them. This shows that there is no sufficient knowledge on HPV and HPV vaccines among the respondents. A study in Mulago hospital, in Uganda, whose objective was to describe knowledge on cervical cancer found that 93% considered cancer of

the cervix a public health problem and knowledge about Pap smear was 83% among respondents (41). Worth noting also is the finding of this study that 69% of healthcare workers had heard of HPV and the vaccine during training either at university or college with only 21% and 9% having heard of the same through workshops and journals respectively.

Findings of this study demonstrated that healthcare workers can, with that knowledgeable background, be able to detect HPV and subsequently treat it soonest before it can lead to cervical cancer. The primary goal in HPV vaccination is to prevent cervical cancer. Although the importance of the Pap smear in reducing cancer incidence and mortality is known, many developing countries especially in Africa have not mounted national cervical cancer screening programs. However, Kenya took up the initiative to provide universal HPV immunization in 2013 (14).

This study has shown that all participants (100%) at Nairobi Women's hospital were aware that HPV is a sexually transmitted virus and knew of existence of vaccines for HPV as compared to those at Mbagathi hospital where 84.7% of respondents knew that HPV is a sexually transmitted virus and 71.4% had heard of the vaccine. This finding (which is similar to another finding by [36] shows that healthcare workers in private health facilities seem to be more aware of the HPV vaccine as well as knowing that HPV is a sexually transmitted virus. This could be attributed to many issues that support the same in the private sector. For instance, the private health sector such as the Nairobi Women's hospital, is providing all health services using the latest interventions as their procurement plans are not subjected to numerous and tedious bureaucracies witnessed in public health facilities such as at Mbagathi district hospital.



The practices of the healthcare workers towards HPV varied between the two hospitals. Most respondents in Nairobi Women's hospital reported having received (79.3%), administered the vaccine (93.6%) and recommended (93.6%) to patients. In Mbagathi hospital on the other hand only 2.8% reported having received the vaccine with only 4% having administered the vaccine while 18.9% had recommended the vaccine. One respondent observed;

"You see, we only administer what we have in our stores"

This could be attributed to the fact that the vaccine is not available more often in public hospitals and or lack of marketing of the vaccines to the public facilities. This is further shown in this study where the greatest barrier to HPV uptake as perceived by healthcare workers was availability and accessibility of the vaccine in Mbagathi in contrast to what was found out at the Nairobi Women's Hospital where the vaccine was noted to be readily available. This study found that where healthcare workers reported availability of the vaccine at the hospital there were concerns on the affordability and this hampered accessibility of the vaccines. This finding concurs with findings in a study in Hong Kong which showed that 68.3% of the respondents agreed that HPV vaccination be fully paid by the government as an important public health strategy (37).

Despite studies that have shown a clear link between HPV and cervical cancer, HPV vaccines have not been widely accessible and affordable both to the healthcare workers and the beneficiaries. Other issues such as lack of awareness and stigma associated with cancer pose a real threat to accessing HPV vaccines despite WHO's recommendation in 2009 that routine HPV vaccination be included in national immunization programs. Cancer is however preventable through

vaccination and effective screening. The emergence of HIV has been shown in a study to exacerbate HPV infection, which can develop into cervical cancer more quickly in women living with HIV than in women who are HIV negative (38). However, this study found out that the greatest barrier to HPV uptake as perceived by health workers was availability and accessibility of the vaccine, as noted by one health worker;

"Aki, kupatikana kwa hii chanjo kwa zahanati hasa za umma ni ngoma na ikipatikana inakuwa ni kwa gharama kubwa sana (truly, getting this vaccine especially in public facilities is a tall order and if they are available it's at big price)

This study also found out that lack of prioritization and clarity on government policy concerning HPV use and ordering problems at hospital level and the overall procurement of HPV vaccine was attributed to the unavailability of the vaccine in public facilities, as noted by one respondent;

"You know how commodities and other supplies are procured..This is a tedious process where commodities may get late in reaching facilities, thus missing the need of getting them to needy populations"

The Kenya Medical Supplies Agency (KEMSA), established as a state corporation under Cap 446, is a specialized Government medical logistics provider for Ministry of Health-supported health facilities and programmes in Kenya. One of its main tasks is to play a key role in procuring, storing and distributing health commodities for the public sector. Vaccine procurement is a specialized field that is different from the procurement of other pharmaceuticals and health products in several ways. Despite some similarities to other pharmaceuticals, this study found out that vaccines possess a number of peculiarities, which



require specific consideration during the procurement process.

Healthcare workers interviewed were cognizant of the critical role of the perceptions of the healthcare workers in influencing uptake of the vaccine with all the respondents indicating a need for training on HPV and HPV vaccines within their institutions. One respondent noted;

"The healthcare worker is a strong pillar regarding the utilization of this essential service is concerned and their perceptions are always very critical and important"

Lack of information on the HPV vaccine was found out to be a major issue among healthcare workers at Mbagathi DH and not Nairobi Women's Hospital. A respondent at Nairobi Women's noted;

"We have sufficient information on HPV vaccine...thanks to the hospital management which made it possible to get them"

This lack of information influenced perception of the vaccine in Mbagathi and was cited as an important reason, which hampered the recommendation of HPV vaccine by healthcare workers to clients, and vaccine administration. However, at Nairobi Women's hospital this study found out that healthcare workers had adequate information on HPV vaccine. This result is similar to findings of a study done in Nyanza where it was noted that success of HPV vaccination would depend critically on information, communication and social mobilisation of healthcare workers (39).

Though the level of education was not a significant factor in influencing the perceptions of the health workers on the HPV vaccines, there was no significant difference in the levels of education at the two health facilities. Nurses accounted for between 52% and 59% of the respondents at the two facilities.

There was a significant difference ($p=0.001$) in ages of respondents at the two facilities. The average age of respondents at Nairobi Women's was 25.9% while at Mbagathi hospital average age was 30.3% with none of the participants at Nairobi Women's being above 40years of age. This study has therefore shown that age is a key influencing factor on perceptions of healthcare workers on the HPV vaccines.

Healthcare worker attitude and their level of awareness were both found out in this study as potential enablers and barriers to HPV uptake depending on the whether workers displayed positive or negative attitude or whether they had adequate or inadequate knowledge about the vaccine.

Conclusions

The policies and the management practices in the private sector have been noted to greatly influence certain aspects including how the health workers perceptions and practices relating to work and particularly in as far as the acquisition of HPV is concerned. This study has noted that though Kenya provided universal HPV immunization in 2013, the vaccines can be accessed easily in a private health facility (Nairobi Women) than in the public facility like Mbagathi.

The attitudes and practices of the healthcare workers and the general uptake of HPV vaccine are influenced by many factors that include the availability of vaccine and policies and lack of information. Moreover, there is a discrepancy in the level of perception and practices towards HPV among health workers in public and private health facilities with those in the private sector having more levels on all the issues.



Recommendations

To be able to reach out to many needy populations, there is need to prioritize the availability and the acquisition of the vaccines especially to the public health facilities at the community level for optimal utilization in order to realize the desired target of alleviating un-necessary suffering and the pain associated with their health concerns are addressed. Given the importance of the vaccine and the association of HPV with several cancers the government should step in with other partners such as GAVI to make the vaccine available probably through inclusion in the KEPI program. The management policies that govern public health sector should therefore be targeted for revision to fasten acquisition of the vaccines, among other health services.

In an attempt to improving on the perceptions and the overall practices of the health workers both in the private and public sectors on HPV, there should be intentional efforts by the government through the ministry of health to continue providing and supporting refresher courses, educative seminars or set resources towards training them on the health expectations associated with HPV.

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