Health professional feedback on HPV vaccination roll-out in a developing country

ABSTRACT

Background: Worldwide, Zambia has the highest cervical cancer incidence rates (58.4/100,000 per year) and mortality rates (36.2/100,000 per year). The human papilloma virus (HPV) vaccine is considered a vital preventative measure against cervical cancer, particularly in sub-Saharan countries, such as Zambia. Past research suggests health professionals' experiences with HPV vaccination rollout can have practical implications for effective delivery.

Objective: To explore health professionals' perspectives on the HPV vaccination programme in Zambia.

Methods: Researcher travelled to Zambia and conducted semi-structured interviews with fifteen health professionals working in private, government, and missionary clinics/hospitals. Observation was conducted for triangulation purposes. Thematic analysis was used to analyse the data.

Findings: Five main themes emerged; medical misconceptions about the HPV vaccination, particularly with regards to infertility; fear of the unknown, including possible side effects and inadequate empirical research; need for prior desensitisation to resolve cultural barriers

prior to vaccination rollout; a rural-urban divide in health awareness, particularly in relation to cancer vaccines; and economic concerns associated with access to the HPV vaccination for most of the Zambian population.

Conclusion: Overall, the findings indicate that an essential avenue for facilitating HPV vaccination rollout in Zambia is by implementing a pre-rollout community effort that removes or softens cultural barriers, particularly in rural areas. It is also essential to correct erroneous HPV presumptions health professionals may have around infertility. Affordability remains a seemingly intractable hindrance that hampers HPV vaccination rollout in Zambia.

Key words; HPV; vaccination; Zambia; health professionals

INTRODUCTION

Cervical cancer is a major global health problem, rated as the third most common cancer in women [1]. Around 85% of cases occur in developing countries [2, 3]. Zambia in particular has the highest cervical cancer incidence rates (58.4/100,000 per year) and mortality rates (36.2/100,000 per year) worldwide [4]. Today, cervical cancer is the first cause of female cancer in Zambia, and the most common female cancer in women aged 15 to 44 years in this country [5]. Tackling cervical cancer in sub-Saharan countries is difficult, partly because multiple and complex socio-cultural factors contribute to its high mortality rates in these geographical regions [6].

HPV (human papilloma virus) infection is extremely detrimental for women in countries like Zambia, where the known adult HIV prevalence rate is 16% [7]. HIV and cervical cancer rates are strongly correlated [3]. HPV infection can double a woman's risk of acquiring HIV as it causes lesions in the cervix and vagina, which act as transmission sites

for the virus [8]. Not only are HIV positive women more likely to develop cervical cancer, but once contracted, cervical cancer develops even faster in HIV positive women [8]. Although systematic cervical cytology screening programmes are considered an essential tool for addressing cervical cancer in developing countries, research suggests these schemes aren't necessarily feasible in some developing countries [9]. One systematic review suggests lack of resources faced by less economically developed countries, like Zambia, limits women's access to both treatment and screening services, possibly contributing to the high prevalence of cervical cancer in such countries [3]. Knowledge of HPV is poor in many developing regions. For example, a study of 500 women in Sudan found that only 39.2% had heard about the HPV vaccination [10]. A similar investigation in Lebanon reported a knowledge score of just 52.7%, suggesting limited awareness of the vaccine [11]. However, knowledge of HPV appears to be relatively high in Zambia, with one study suggesting 74.7% of adult women have heard about cervical cancer, and 73.3% consider it preventable [12].

Pilot HPV vaccination programme in Zambia

The HPV vaccine was one of four new vaccines planned to be introduced into the routine immunization system in Zambia (the others comprising the rotavirus vaccine, pneumococcal, and the second dose of measles) [13]. However it has only been introduced on a pilot basis in three districts in the Lusaka province [14]. On 27 May 2013, the pilot scheme was launched, targeting schoolgirls (aged 9 to 13) in grade four. During the initial phase (2013 to 2014) approximately 50,000 girls were targeted [15]. Girls out of school were meant to receive the vaccine through outreach strategies and health centres [15]. Over the course of the pilot programme, from 2013 to 2014, an estimated 33,733 young girls were vaccinated with the full three doses [16]. The international organization Pink Ribbon Red Ribbon is donating an extra 30,000 vaccines [16]. As the HPV vaccine is one of the most expensive recommended

inoculations, its success is pivoted upon its affordability in limited resource settings [17]. The Global Alliance for Vaccines and Immunisation (GAVI) have taken steps to increase affordability and access to routine vaccines in low income countries [18]. Zambia was one of the countries approved for GAVI support, although at present the HPV vaccine does not appear to be one of the inoculations subsidised by the GAVI alliance [19].

Role of health professionals

It is estimated that about 500 health workers were trained (and 50 clinics involved) in the HPV vaccination programme in Zambia [20]. As Zambia has a doctor-patient ratio of just 0.173/1000 [21], and relatively few qualified gynaecologists – currently, there are only 40 members of the Zambia Association of Gynaecologists and Obstetricians [22] – how health professionals interact with their female patients, and their role in delivering the HPV vaccination, is an important issue to consider [23]. Health professionals can significantly amplify HPV vaccine uptake, for example by recommending vaccination during routine doctor-patient consultations [24]. It has also been argued that the potential success of the HPV vaccination can be improved if the challenges faced by healthcare providers are understood [25].

Some research has explored HPV-related knowledge and attitudes amongst health professionals from developing countries, including African countries [26-28]. For example, a questionnaire-based study of 602 Nigerian healthcare professionals concluded that while they had good knowledge of HPV, their awareness the vaccine was low [26]. Nurses in particular had the lowest level of knowledge about the HPV vaccine, or even its existence. Another quantitative study conducted in a South African hospital reported similar findings [27]. Using self-report questionnaires administered to 345 nurses, this study attempted to determine the factors that affect recommendations of HPV vaccination to patients. They found that the

majority of the nurses lacked understanding of HPV infections and vaccinations, but yet were still willing to recommend vaccinations to patients. These findings mirror those of another questionnaire based study of 178 female nurses in Nigeria [28]. The South African study also found that nurses who thought their patients would accept HPV vaccination were more likely to recommend it [27]. The authors concluded that before a HPV vaccination programme could be successful nationwide, nurses needed to receive more education on HPV in general, as well as the HPV vaccination specifically.

The present study

Overall, past research has shown that exploring health professionals' knowledge and views on HPV vaccination can yield valuable insights for vaccine implementation [27, 28]. Health workers' perceptions can influence their administration of the HPV vaccine. For example, interviews with 15 health professionals in exploring their views on cervical cancer screening concluded that professionals' perceptions of screening barriers influenced their management goals, practices and decisions surrounding how best to deal with cervical cancer [29]. Despite Zambia being particularly burdened by cervical cancer, and having recently benefited from a HPV vaccination pilot, no such study had been conducted in the region. The fact that Zambia has some of the highest cervical cancer mortality rates in the world emphasises the severity of the issue, and the requirement for health professional feedback on how to more effectively administer the HPV vaccination [4, 5, 30]. The views of health professionals involved in the HPV pilot scheme will be particularly helpful in identifying themes that may impede or facilitate vaccination rollout campaigns in this region. Thus, the current study aimed to address this gap in the literature, by exploring health professionals' experiences of the HPV vaccination rollout in Zambia.

METHODOLOGY

Thematic analysis was used as it allows the researcher to explore issues without the constraints that might otherwise be imposed by more structured analytical techniques, such as Interpretative Phenomenological Analysis (IPA) or GT [31]. A total of 15 healthcare professionals (4 males, 11 females) involved in cervical cancer were recruited from several health organisations in Kabwe, and also a private hospital/clinic, government hospital and district health center in Lusaka. Participants consisted of two gynaecologists, one oncologist, and twelve nurses. One professional worked in a private clinic, eight in a government hospital, one in a missionary hospital, one in a district health centre, two in an NGO hospice, and two at a cervical cancer clinic. The health worker (a nurse) from the district health centre was directly involved in running the pilot vaccination programme. Two professionals (nurses) working in Lusaka were parents/ guardians of girls targeted for vaccination. Given that there are only about 40 obstetrician/gynecologists in Zambia [22], finding anyone who knew about the HPV vaccine, or who worked on oncology wards, was a challenge. Health workers in charge of addressing cervical cancer found it hard to suggest who to talk to.

A Dictaphone was used to record the (semi-structured) interviews. The device was an Olympus VN- 711PC with 2GB memory (circa 823 hours of recordings), battery life of up to 72 hours, and USB connection for fast downloading to a PC. In order for the interviews to be standardized, each participant was asked the same ten core open-ended questions. These are presented in *Table* 1. Ethical approval was obtained from Liverpool John Moores University Research Ethics Committee (UREC), University of Zambia Biomedical Ethics Committee (UNZABREC, Ref. No. 004-06-15), and the Zambian Ministry of Health.

Figure 1 illustrates the key procedural steps. One of the researchers travelled to Zambia to recruit participants. Purposive sampling (specifically snowball sampling) was used. Recruitment was implemented through third-party recommendations (friends, family

and acquaintances). Although an hour was allocated for each interview, on average, an interview lasted about 30 minutes. Participants were informed both in the consent form and verbally that they had the right to withdraw from the study at any given time. With gatekeeper's approval, observation of some of the participants' places of work was also conducted. Observation consisted of the researcher taking field notes on the surrounding facilities and the interactions between staff and patients. Overall data collection took approximately 3 weeks.

Non-participant unstructured observation was conducted alongside the interviews to verify participants' reports. Following data analysis, some of the participants were contacted via email. They were presented with an outline of the findings, and asked to provide feedback. As the mother of one of the researchers had passed away with cancer, we were aware this might introduce some personal bias during data analysis. Thus, an inductive approach was used in data coding, to ensure it was primarily data-driven. However, it is important to note that the coding of data is never conducted in an 'epistemological vacuum'. Hence, the researchers acknowledged that the extent to which they were able to separate their subconscious thoughts from the analysis was limited [32].

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177 RESULTS

178 Interview data was transcribed using the step-by-step procedure for thematic analysis

179 outlined in the literature (see *Figure* 2) [31]. This process included generating initial codes

180 (see *Table* 2), then searching for and reviving themes. A total of five overarching themes

181 were derived from the data; 'medical misconceptions', 'fear of the unknown', 'prior

182 desensitisation', 'rural-urban divide', and 'economic concerns'.

183

184 **Theme 1: Medical misconceptions**

185 Despite the high-profile launch of the HPV vaccine roll-out in Zambia [15], participants

186 expressed misconceptions and myths surrounding the vaccine which translated into a fear of

187 the HPV vaccine in the community. Some of these misconceptions were that the vaccine

188 causes infertility, illness such as cervical cancer itself, and that it is untested and Zambians

189 are being used as experimental trials. Interestingly, one of the healthcare workers also held

190 this belief:

191

192 *"What I have heard about the vaccine, some say that it has been developed to*

193 *reduce the population, to reduce the fertility in a woman, an African woman."*

194 Participant J (L: 88-89)

195

196 *"They were saying if they give those vaccines to young girls, maybe those young*

197 *girls they won't get pregnant in the future, it will prevent them from getting*

198 *pregnant, so those are beliefs that they have."* Participant F (L: 16-18)

Theme 2: Fear of the unknown

It appears that health workers not directly facilitating the pilot programme were not given HPV vaccine training [20]. Thus suggesting that the informing of the healthcare workers on the vaccine was neither nationwide nor continuous. While most participants were in support of the vaccine, some had fears of the side effects and felt that not enough research had been done on it. This lack of knowledge even led to open rejection of the vaccine for one participant:

> *"I am telling you, about this vaccination, me I am against about it."* Participant D (L: 3)

In addition, although parents were meant to have been given information on the vaccine by the teachers or nurses that visited the schools [15], it was apparent that this was not always the case. For some of the nurses, this lack of information affected their preparedness to allow their child to be vaccinated or recommend it to the community.

> *"I feel they haven't done much work on it for them to even start giving a vaccine. And this is why I wasn't comfortable for my daughter to have the vaccine."* Participant I (L: 2-8)

> *"The females what they think about it, the others think that it is the wrong thing, they are scared, others they accept, but most of them they are scared. When the children tell their parents they want to give us this vaccine, most of the parents they*

were refusing saying 'no us we don't know about this drug', so they refuse." Participant M (L: 19-22)

Participants noted a lack of information on the HPV vaccine, contributing to the illusion not much research has been done on it. This perceived knowledge deficit seemed to affect their ability to deliver accurate vaccine information, and willingness to discuss the vaccine with patients, and the community. It appears professionals in Kabwe were not given such information as the pilot was carried out in the Lusaka district alone. However, even participants from Lusaka reported that information had not been disseminated specifically to them.

Theme 3: Prior desensitisation

Participants highlighted a need for specific cultural barriers to be addressed prior to rollout, to make the whole community (including health professionals) more receptive to the vaccine. This need for preliminary desensitisation was due to the cultural issues that were discussed, such as females' reliance on male or elder's permission to vaccinate their children. During the pilot children were sent home with consent slips, and parents were asked to sign them. Obtaining consent may be problematic if significant males or elders are not educated on the vaccine. Some participants felt that they have less influence over their patients than the males or elders in the society.

"The cultural background, that a woman should seek permission from her husband, whether she should take her daughter for the vaccine. So those are cultural issues that will always be there." Participant K (L: 155-158)

"But with education we should include the male folk because mostly we side line them, because they also play an important role, because if them the male folk understand, it will be easy to encourage the wife or the mother to the child or the daughter, it will be very easy." Participant J (L: 122-125)

Theme 4: Rural-urban divide

Participants perceived differences between the rural and urban communities in terms of education levels. This lack of education in the rural communities in turn was perceived to create challenges in delivering health education, and getting them to understand the need for vaccinations.

"When you speak to people with less education, or low education, they really don't understand why it is important. They even don't understand what it means to have cancer in the uterus and why the uterus is important. Or what it means to have cancer. Because it is just lack of knowledge, lack of education." Participant G (L: 82-89)

Theme 5: Economic concerns

The cost of the HPV vaccine was seen to be a barrier to vaccination for most of the Zambian population. Participants stressed that if introduced in Zambia, the vaccine needs to be offered for free, or at a reduced cost. It was also noted that the availability and promotion of the vaccine would need to be sustained, especially as it is a multi-dosed vaccine. Issues regarding access to the vaccine were also highlighted, especially by professionals located far away from participating schools or health centres (e.g. cost of transport).

"Because money is hard to come by in the current situation that there is, money is very difficult to come by, and there are only a few in formal employment, a large group they don't have anything to do. So they can't even be willing to spare that pin (ZMK 1) on a vaccine, they would rather spend that on food." Participant L (L: 48-51)

DISCUSSION

The main findings can be summarised as follows: (a) HPV vaccine education is needed for health professionals; (b) concerns about unknown side effects and insufficient research may dampen uptake; (c) resolving cultural hindrances prior to vaccine rollout is essential; (d) increasing HPV education levels in rural communities is necessary, and (d) economic issues need to be addressed. The implication that rural populations are especially vulnerable to low HPV vaccination uptake (due to lack of education, and access to health care), and that the cost of the vaccine is a major barrier, is consistent with past research [33].

Even with the support of organisations like GAVI's support, access to the vaccine remains a problem. However, economic barriers highlighted by participants were focused primarily on the cost of service users accessing the vaccine, rather than its delivery. Given that Zambia has a per capita income of about $1,700, and 70% of the population live below in poverty, many women may be unable to afford the cost of transportation to distant participating schools or health centres [20]. Possible solutions include local training programmes for doctors and nurses in remote areas, village-based screening, and use of mobile hospitals [20].

Various studies have highlighted the need for improved HPV awareness in less economically developed countries [10, 11, 34]. Medical knowledge may affect the support provided by some health professionals [35, 36], but not others [27]. This seems to suggest the

relationship between knowledge of the vaccine and support for its rollout locally is complex. Health professionals attitudes are informed by factors beyond medical knowledge, such as past vaccination experiences [26]. Of particular interest here was the scepticism in the vaccine's safety and efficacy, despite the high profile launch of the vaccination programme [15]. Scepticism may discourage some health professionals from supporting its rollout [36]. Lack of information on the vaccine influenced beliefs in its safety, as well as willingness to recommend or discussed it with patients, correlating with past research [35]. Overall, the medical knowledge of some health professionals was a problem. Thus, it may be essential that health workers in this part of the world (including those not directly involved in administering the vaccine) are made aware that the HPV vaccine's safety has been approved by relevant international health authorities, and that there is published supporting evidence [37]. Even so, merely presenting existing research may not be sufficient 'proof' of the vaccine's safety for some. Apart from lack of vaccine literacy, there are some health professionals who will remain weary of the vaccine, due to the lack of longitudinal studies indicating its long-term effects [38]. Although this concern is understandable, as mentioned before, in countries so burdened by cervical cancer the rewards of a vaccine arguably outweigh the risks for the time being.

Other studies have highlight various cultural hindrances to vaccination rollouts in developing countries, based on health professional feedback [26-28]. However, the present emphasis on the authoritative control Zambian men have over women's health decision making (e.g. screening and vaccination) is unique to this study. This finding offers a unique insight into culture-specific barriers to the HPV vaccine in Zambia. Health professionals may be able to help address the issue, by using routine doctor-patient consultations, or local community outreach initiatives, to encouraging male patients to play a more constructive role in facilitating vaccination programmes. The misconception that the HPV vaccine causes

infertility is also a concern, seemingly associated with the gender-specific nature of HPV vaccination rollouts. Making the vaccine seem exclusive to women may fuel suspicions that it is being used as a form of population control by the government [39]. Thus, it may be helpful for health professionals to advise male patients to get vaccinated against HPV, as this has been shown to deflate such rumours [39]. Research suggests the general acceptability of the HPV vaccination in some African communities may be diminished by rumours, misunderstands, and fear about possible side effects (e.g., infertility), in addition to insufficient education about the vaccine [40]. To increase acceptance of the HPV vaccination in Zambia, health professionals need to find ways to educate local communities, not just about the importance of the HPV vaccination in cancer prevention, but also its role in the promotion of reproductive health (HPV infections are implicated in problematic reproductive functioning) [41].

Overall, despite the introduction of the HPV vaccination programme in Zambia, health professionals involved in the rollout harbour multiple concerns that may diminish their willingness to support the scheme. Perhaps, most worryingly, some professionals (nurses, more so than doctors) have misconceptions about the vaccine that may denote deficits in medical training, and/or deeper socio-cultural factors transcending professional knowledge. These findings have implications for other developing countries, where knowledge of the HPV virus is inadequate, such as Sudan [10], and Lebanon [11]. Efforts to improve knowledge levels will have limited effectiveness if the health professionals responsible for running the necessary educational schemes are themselves poorly informed about the virus, and/or harbour misconceptions that discourage them from supporting vaccination programmes.

Although research suggests widespread acceptance of HPV vaccine in Zambian women [12], the present findings nevertheless suggest a dire need for better understanding

amongst health workers of the role of the vaccine in advancing reproductive health. International organisations involved in vaccination rollout programmes (e.g., GAVI) should forge closer collaborative ties with Zambian (and other African) universities, to assist with developing new, or improving existing community educational programmes, to help correct rumours and misconceptions [18]. It is also necessary to identify and resolve cultural barriers around male authority, prior to offering the vaccination to female patients. While the present findings reflect experiences of health professionals, rather than the patients themselves, the key role played by the former in delivering vaccination services means their views can have a direct effect on patient outcomes [29]. Health professionals working in developing countries such as Zambia should recognise their own medical misapprehensions about HPV vaccination, and the reluctance of males and elders in local communities to support vaccination rollouts.

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CONFLICT OF INTEREST STATEMENT

There is no conflict of interest

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