Knowledge and attitudes towards maternal immunization: Perspectives from pregnant mothers, healthcare providers and community members in urban South Africa

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Abstract

Background: Maternal immunization has prevented millions of child deaths globally; nevertheless incomplete vaccination remains a public health concern in South Africa, where almost half of child deaths occur during neonatal period. This study explored the knowledge and attitudes inhibiting vaccine acceptancy during pregnancy.

Methods: Key informant and semi-structured interviews were conducted with pregnant women receiving antenatal care at community clinics, antenatal staff, women enrolled in maternal immunization trials and non-pregnant women residing in Soweto. Focus Group Discussions were also held with church and community leaders.

Results: The study established a positive attitude and high acceptability of maternal immunization. However, there is poor knowledge regarding the health benefits and types of vaccinations administered. Reasons adduced for poor knowledge about vaccination include lack of communication on maternal immunization during antenatal sessions or clinic visits and power dynamics that tend to exist between healthcare workers and patients.

Conclusion: Ensuring that healthcare workers provide useful information regarding benefit of vaccination may increase patients' confidence and immunization uptake.

Keywords: Maternal immunization; vaccination; knowledge; attitudes

Background

Maternal Immunization has been utilized for decades as a method for protection of pregnant mothers, their unborn and new born child from severe infectious diseases (Gerdts, van Drunen Littel-van den Hurk, & Potter, 2016). Several vaccines are currently being recommended and used in pregnant women, including tetanus toxoid, influenza and pertussis vaccines. It is estimated that about 86% of infants worldwide received three doses of diphtheria-tetanus-pertussis (DTP) in 2016 (WHO, 2018). As a result, maternal immunization, in combination with better surveillance and hygienic practices, has reduced the global tetanus mortality rate by more than 94% (Ridpath et al., 2017). The benefits accrued in tetanus immunization highlight the importance of expanding immunization to include other equally deadly vaccine preventable diseases such as meningitis and pneumococcal diseases. This is particularly important in countries where infant mortality rates are still high, particularly in sub-Saharan Africa. For example, , twenty-four countries in the Sub-Saharan region are yet to eliminate maternal and neonatal tetanus (MNT) (Thwaites, Beeching, & Newton, 2014). The World Health Organization (WHO) estimates that about 47 countries in Sub-Saharan Africa continue to carry a

substantial burden of MNT cases (Ridpath et al., 2017). These countries include Angola, Chad, Central African Republic, DRC, Kenya, Mali and Nigeria (Messeret et al., 2018). In South Africa, while pertussis infection is increasingly common among infants, tetanus toxoid is the only maternal immunization that is recommended to pregnant women to prevent neonatal tetanus infection (Dangor & Lala, 2016).

Poor availability of resources and a reluctance of pregnant women to accept vaccination due to fears about adverse impact on foetal development and health have been mentioned as major barriers to the achievement of national and internal targets on maternal and child health (Greenwood, 2003; J.R. et al., 2012; Munoz & Ferrieri, 2013). A study conducted in Nigeria found that lack of awareness of antenatal care service among the target population, under-utilization of antenatal services, negative cultural beliefs and lack of economic and decision making empowerment of the targeted population are also among the key factors that inhibit uptake of vaccinations such as MNT (Messeret et al., 2018). Given existing challenges with the current immunization programmes, it makes it difficult to expand their immunization programmes to include new vaccinations such as Group B streptococcus (GBS) and Respiratory Syncytial Virus (RSV) once they are developed.
In this study, we aimed at understanding knowledge, attitudes and acceptability of maternal immunization amongst pregnant and non-pregnant women, healthcare providers and community members in selected urban (Soweto, Gauteng) settlements in South Africa. The results are part of a larger study that aims to understand the acceptability of maternal immunization in both urban and rural (Mtubattuba, KwaZulu-Natal) settlements in South Africa. The results emerging from this study are important to increase acceptancy of and future immunization programmes. The study is also crucial for informing larger studies in similar and/or different contexts on acceptable entry points to introduce future immunization programmes.

Methods

Context

The study was conducted in Soweto, an urban settlement in South Africa. The settlement was selected because of an ongoing health and demographic surveillance established in 2008 which is a reliable sampling frame (Emina et al., 2011).

Study Design and Data

We designed a qualitative study to explore the knowledge and attitudes towards maternal immunization of pregnant women receiving antenatal care at community clinics, antenatal staff, women enrolled in maternal immunization trials, non-pregnant women as well as church and community leaders residing in Soweto. The study employed an exploratory study design.

Data Collection Methods

A total of x12 Key informant interviews (KIIs), x31 Semi-structured interviews (SSI) and x2 Focus Group Discussions (FGDs) were, respectively, conducted with the following study population:

Table 1: Study population and method of data collection

Study Participant	Sample size	Data collection method
Pregnant mothers – primigravida & multips	6	SSI
Non-pregnant women with/without children	10	SII
Women enrolled in maternal immunization trials and who previously had a child with Group B streptococcus (survived or died)	10	SII

Husbands/partners of pregnant women	1 x 6 participants	FGD
Mothers of pregnant women	1 x 6 participants	FGD
Antenatal and maternity staff from community and tertiary hospitals	7	KII
Other maternity healthcare providers such as doulas, midwives, breastfeeding consultants	5	SII
Community leaders	5	KII

The interviews were conducted by a Social Scientist and research assistant from the Respiratory and Meningeal Research Pathogens Unit (RMPRU). Individual interviews lasted between 20 – 30 minutes while the FGDs were approximately 60 minutes in duration. The study participants differed in their ethnic background, level of education, employment status and age. Depending on the participant's literacy level, the interviews were conducted in either English and/or a vernacular/local language.

Table 2: Distribution of individual interview & FGD participants by select background characteristics

Age	**Percent (%)**
22-29	45.4
30 - 39	29.0
40 + years	16.4
Level of education	
Some secondary	24.4
Matric	45.4
Tertiary	30.0
Employment status	
Unemployed	47.2
Employed	49.0
Self employed	3.6
Race	
Black	96.3
Coloured	3.6
Children ever born	
None	32.7
1-2	49.0
3+	18.1
N = 55	

Data Analysis

All interviews were translated into English. The transcriptions was organized under thematic headings and later developed into an ethnographic summary with illustrative quotes.

Ethical considerations

Ethical clearance was obtained from the Human Research Ethics Committee (Non-Medical) at the University of the Witwatersrand. The research objectives were explained to all study participants. Signed consent forms and verbal consent for the tape recording was obtained before commencing the interviews and FGDs. Confidentiality was maintained by not allowing any of the interviews to be accessible to anyone outside of the research team.

Results: A total of 55 interviews were conducted, This is inclusive of two FGDs that each had six participants. The knowledge and attitudes towards maternal immunization were analysed across 4

thematic areas. This included knowledge of maternal immunisations, beliefs/misconceptions, acceptability of maternal immunization and potential use of future maternal immunizations. The results are structured according to these thematic areas.

Knowledge of maternal immunization

Overall, there was fair knowledge regarding maternal immunization. We sought to understand whether participants had any knowledge of the term "maternal immunization". All antenatal and maternity staff were able to fully explain that the term referred to vaccinations provided to pregnant women to prevent the child from various infections. The majority of the other study participants broke the term down referring to "maternal" as having to do with women or mother and "immunization" being injections. The types of immunization given to pregnant women were, however, largely unknown by participants that were not maternity or antenatal staff. All the midwives reported that pregnant mothers are given two vaccinations during pregnancy, namely, influenza and tetanus toxoid. Only 1 of the 6 pregnant women interviewed and (3/10) non-pregnant women who had ever been pregnant confirmed receiving tetanus toxoid vaccine. A few women (2/10) of women in maternal immunization trails and (4/10) non-pregnant reported ever receiving the influenza vaccine. Most cited that they did not ask about immunization during antenatal visits because they trusted that their midwives were knowledgeable and experienced and would, therefore, not provide them with any medication that would harm their babies. 3/7 antenatal staff interviewed confirmed that pregnant women attending antenatal classes/check-ups rarely asked about medications administered to them or vaccinations for that matter. Two of the unit managers stated that midwives educated pregnant women about different vaccinations during antenatal classes. However, of the pregnant women attending antenatal classes at the community clinics, no mention was made about current antenatal classes that included lessons on maternal immunization. Some participants confused maternal immunization with prevention of mother to child transmission (PMTCT) of HIV. Knowledge of maternal immunization was poorest among community leaders and mothers of pregnant women. Most men in the FGDs were able to partly explain the term maternal immunization. Their understanding was mainly that it was the "injections given to children", not necessarily pregnant women. All men in the FGD had no knowledge of the types of immunizations given to pregnant women or even to the "children".

Beliefs and misconceptions regarding maternal immunization

After providing an explanation of maternal immunization, the majority of study participants expressed some fear regarding immunization. The fears varied across the different participants that were interviewed. Among pregnant women; non-pregnant women who had never had a child and mothers of pregnant women, the most reoccurring fear was the possibility that immunization would affect the health of the baby. However, most said they were reassured by that the immunizations were provided in a health facility and by professional nurses. Some mother's in the FGDs went on to mention that they trusted immunizations from public health facilities as opposed to private health facilities because they have heard that some private doctors purchase their practice license and are not 'real doctors' that are authorised to provide vaccinations. Some men (3/6) in the FGDs had the perception that immunization was "a way used by the government to control people". Given this view, these men were reluctant for their pregnant partners to be immunized. Some of the participants had a negative attitude towards the influenza vaccine. The (3/6) pregnant women, (4/10) non-pregnant women and (1/6) mothers of the pregnant women reported that they knew someone who had taken the flu vaccine but still later developed a cold or that they had experience this themselves. This made them question the effectiveness of vaccinations and their usefulness.

Acceptability of maternal immunization

About 80% of all study participants were in support of maternal immunization once it was explained to them. We explained that maternal immunization is the vaccination given to pregnant women to protect both the mother and the fetus from morbidity and infection. We provided examples such as tetanus toxoid, influenza vaccine and explained that new vaccinations to prevent Group B Streptococcus (GBS) and other infections were being developed. The participants that were most keen to accept future immunization programmes were the women enrolled in the maternal immunization trails. About 40% of these women had a baby that died due GBS. The remaining 40% had a child that

was infected with GBS but survived. These women reported that their experience made them more cautious about taking vaccinations. The husband of these women expressed the similar views. Antenatal staff was also keen to hear more vaccinations are to be developed and only expressed that

Factors affecting use of future immunizations

An above average percentage of the participants expressed that the only hindrance that may affect their use of vaccinations is if they come at a cost. They noted that all services currently provided at the public clinic were free and thus future vaccinations provided within these facilities should be made free as well. Another factor commonly raised was religion. Most study participants mentioned that some religions were against the use of vaccinations. However, when prompted to talk about their own religion, they expressed that theirs had no problem with maternal immunization. Two of the community leaders that were interviewed were pastors of local, Christian, churches. These participants expressed that they were in full support of maternal immunization. Only 1 of the 6 pregnant women interviewed and 1 of the mothers in the FGD who were Muslim mentioned that they worried about the ingredients used in medications and vaccinations because their religion was strict on the use of alcohol. Within the men's FGDs, two of the participants mentioned that their culture required pregnant women to undergo and make use of specific traditional medication. However, they noted that this often does not interfere with immunization and can be done concurrently with maternal immunization. The antenatal staff said they had not experienced any challenges patients who objected medications or vaccinations because of their cultural beliefs.

Analysis was also performed by socio-demographic characteristics. The younger (22- 29 year old & 30 -39 year old) participants were more accepting of maternal immunization compared to the 40+ year olds. The younger participants mentioned that many of their fears regarding maternal immunization were eased because they could use Google to obtain further information if they were uncertain. However, two of the maternity unit managers mentioned that the challenges they received were of younger pregnant mothers visiting the clinic later in their pregnancy for antenatal care and, therefore, being too late to be administered vaccinations. They also reported that in most cases, older pregnant women (30 + years) were more accepting of vaccinations than younger pregnant women because the younger ones rarely visited the clinics for antenatal care. In the men's FGDs, the younger participants also mentioned that they lived in an era of "responsible fathers" and, thus, encouraging their partners to immunize fit well within this role. On the other hand, while the older (40+ years old) were open to maternal immunization, most expressed that access to information regarding it was still a problem. The majority of the study participants had matric (grade 12). These participants had better knowledge regarding maternal immunization compared to those that only had some secondary education. With regards to employment status, all participants mentioned that they felt they were at a disadvantage if future maternal immunizations were to come at a cost because they would not afford to purchase them. The unemployed participants who had children and were pregnant noted that they were dependent on grant money. Even the unemployed participants expressed that they would be reluctant to pay for maternal immunization because they were used to services provided at public clinics to be free. Lastly, participants that had children were more open to maternal immunization compared to those that no children. Those without children had the most fears regarding maternal immunization.

Discussion: This study found that knowledge of maternal immunization was a little above average. In addition, there is an overall positive attitude regarding maternal immunization among pregnant women and the general society (non-pregnant women, men, mothers of pregnant women, church and community leaders). This is encouraging given that various studies previously noted poor knowledge of maternal immunization in both low and middle income countries (Ahmed et al., 2001; Mayet et al., 2017;). Several studies have shown that knowledge of maternal immunization was a key determinant of uptake of maternal immunization (Eppes et al., 2013; Bushar et al., 2017). However, we found that uptake of maternal immunization was low despite fair knowledge and a general positive attitude towards vaccinations. This could be because of fears and misconceptions that continue to exist regarding immunization. For example, this study found that some people believed that immunization was used to control people. This result is similar to findings from another study that found that

rumours regarding immunization included that it was used as a means to control birth (Messeret et al., 2018). Despite research that has found that fears of receiving vaccinations during pregnancy is no longer a barrier for maternal immunization as compared to a century ago, (Greenwood, 2003; J.R. et al., 2012; Munoz & Ferrieri, 2013), our study revealed that fears such as the possible harm of immunization on the baby continue to exist even among pregnant women.
We found that antenatal and maternity staff have an important role to play in easing existing fears around maternal immunization by providing adequate information regarding maternal immunization to pregnant women and all other patients attending health facilities. Currently, a major concern is that in addition to low uptake, most of the study participants had no knowledge of the types of vaccination they received/given to pregnant women or what it protected their babies from. This shows that there exists a knowledge gap in terms of the types of vaccinations available and the infections that these vaccinations prevent. Overall, pregnant mothers hold the belief that the medication they receive from their antenatal care providers will benefit them and their unborn children. However, it was unclear whether information on maternal immunization was included during antenatal classes or when the pregnant mothers were being vaccinated. The lack of a comprehensive introduction and explanation of maternal immunization, particularly, to pregnant mothers may prove to be problematic for current and future immunization programs because pregnant mothers may become reluctant to immunize or request to be vaccinated in the event that immunization is not offered.

This study further found that the Islamic religion may have some reservations on the use of maternal immunization particularly if the ingredients contain sufficient amounts of alcohol. This is line with several studies that have also found religion to constitute as a barrier to child immunization for some women (Imdad et al., 2013; Pelčić et al., 2016). For example in one of these studies, Muslim children had a greater chance of being under vaccinated (Pelčić et al., 2016). Our study also showed that cost was a major factor that could affect uptake of future immunizations. The findings show an overall preference for vaccinations to be provided for free in order to ensure consistent use, even for unemployed pregnant women or women that cannot always afford to pay for the immunization. Finally, in this study we found that participants with matric had better knowledge regarding maternal immunization compared to those with just some secondary education. This corroborates findings from other studies which show that mother's education was significantly associated with maternal immunization (Arsenault et al., 2017; Balogun et al., 2017; Chidiebere, Uchenna, & Kenechi, 2014). However, while level of education has an impact on knowledge, we noted that it had no influence on attitude because the majority of the study participants had a positive attitude towards maternal immunization despite their level of education.

Conclusion: This study has shown that knowledge about maternal immunization in urban South Africa has not yet reached optimal levels. However, there is a general positive attitude towards maternal immunization which could be a good indicator for uptake of future immunization programmes. To increase knowledge of maternal immunization, antenatal and maternity staff , who we have revealed to be a trusted source of information, need to be trained to provide adequate information regarding maternal immunization. Extending immunization information to everyone attending health facilities and not just pregnant women is crucially important as studies have shown that while men do not necessarily have an influence on the decision making regarding maternal immunization, pregnant women often seek advice from their mothers, peers or other family members (Wilson et al., 2019). Through conducting this study, we are to the view that when society has the correct and sufficient knowledge regarding maternal from a trusted sources of information, then this could ease most of the existing fears and misconceptions regarding immunization. Improved knowledge coupled with the already existing positive attitude towards maternal immunization may increase confidence current in maternal immunization programmes and uptake of future immunization programmes.

Recommendations: Structured training on immunization should be provided for antenatal and maternity health care providers. Information on maternal immunization should be incorporated into antenatal classes and put up in health facilities in the form of posters and information pamphlets for the attention of everyone visiting a health facility.

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