

Vaccine hesitancy in Sudan

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Summary

Official reports in Sudan indicate that measles is the third cause of death among children under five and the first among vaccine-preventable diseases. Data show an inconsistency between the measles vaccine coverage and the rate of measles in the last 12 years, which led to questioning the validity of reported data and also suggest the emergence of more measles vaccine hesitancy. Sudan is one of the countries that is experiencing measles outbreaks annually. There were 4,978 confirmed cases in 2018, an increase of 649% compared to the number of measles cases in 2017.

The national vaccination coverage of the measles vaccine is suboptimal for the first and the second dose of measles-containing vaccine (88% and 72%, respectively), especially when compared to the other vaccines that are provided at the same health services facilities, such as the pentavalent vaccine (DTP-HepB-Hib) and the Poliomyelitis vaccine (OPV) for which 95% of the children are vaccinated.

There is a gap in knowledge regarding the reasons behind this low coverage of the measles vaccine in Sudan. Therefore, studies in this thesis used a mixed methods approach to address research gaps in vaccine hesitancy generally and particularly measles vaccine hesitancy in Khartoum state in Sudan. The ultimate goal of this project is to inform future policies to increase the uptake of the measles vaccine in Sudan.

Chapter 2 presents in-depth interviews among the Expanded Program on Immunization (EPI) officers at the ministry of health, WHO, UNICEF, and frontline providers of vaccines at Khartoum-based primary healthcare centers. This study aims to understand in-depth the determinants of measles vaccine hesitancy in Sudan from the perspectives of these stakeholders. The participants could identify various determinants of measles vaccine hesitancy that were grouped into three domains including contextual, groups, and vaccination influences. The main contextual determinant as reported by these stakeholders is the presence of people who can be qualified as “anti-vaccination”. They mostly belong to particular religious and ethnic groups. Parents’ beliefs about prevention and treatment from measles are the main determinants of the group influences. The attitude of the vaccine providers, the measles vaccine schedule, and its mode of delivery were the main vaccine-related determinants. Measles vaccine hesitancy in Sudan appears complex and highly specific to local circumstances. Therefore, to better understand the magnitude and the context-specific causes of measles vaccine hesitancy and to develop adapted strategies to address them, we suggested further research to investigate measles vaccine hesitancy among parents.

Chapter 3 examines the validity and reliability of an adapted version of the measles vaccine hesitancy scale (aMVHS) by assessing its items' consistency and its ability to predict the concurrent status of the measles vaccine uptake among children in Sudan. The vaccine hesitancy scale (VHS) was originally developed by the WHO/SAGE Working Group of Vaccine Hesitancy. We conducted this study to facilitate identifying and quantifying hesitant parents towards the measles vaccine in Sudan. Our findings showed that the aMVHS and its confidence and complacency sub-scales are reliable and have a moderately good convergent validity. However, the aMVHS has a limitation in predicting the concurrent child's vaccination status. More work is needed to revise and amend this aMVHS, particularly by additionally including the 'convenience' construct and by further evaluating its validity in other contexts.

Chapter 4 presents a community-based study conducted to assess measles vaccine hesitancy and characterize its determinants among Sudanese parents in Omdurman in Khartoum state. In this study, we used the Parents Attitude about Childhood Vaccination (PACV) scale to measure measles vaccine hesitancy. Our findings showed that the majority of respondents perceived the measles vaccine as important, effective and safe. However, some have risk perceptions about the measles vaccine as well as having practical and access issues related to measles vaccination sessions. As exposure to anti-vaccine information is predicting measles vaccine hesitancy among parents, investment in vaccine communication will most likely be a cost-effective intervention for measles vaccine acceptance and demand. As well, changing the open vial policy for measles vaccine will improve access to measles vaccine in Sudan and thus will increase vaccine coverage.

Chapter 5 examines the influence of measles vaccine hesitancy among parents on uptake of the measles vaccine by their children in Sudan. In this community-based cross-sectional study, we aimed to evaluate whether the measles vaccination status of children can be predicted by measles vaccine hesitancy among their parents. Measles vaccine uptake was measured as either fully vaccinated (i.e. two doses) or partially (i.e. single dose)/not vaccinated. We used the Parents Attitude about Childhood Vaccination scale (PACV) to measure measles vaccine hesitancy as the main independent variable. Our findings explained that measles vaccine hesitancy directly influences the uptake of the measles vaccine. Therefore, we suggested that developing communication strategies and revisiting immunization policies related to the measles vaccine are needed to address vaccine hesitancy and thus increase the uptake of the measles vaccine in Sudan.

Chapter 6 describes the processes that we used to develop and improve a web-based intervention called the Tat3im initiative website. This website aims to increase the uptake of vaccines in Sudan by increasing knowledge and addressing issues related to vaccine hesitancy and vaccine safety in the Arabic language. The development processes were informed by using and combining three sources including, Garrett's user experience framework as a basis for the development, Vaccine Safety Net's criteria for good information practices (i.e. credibility, content (quality and quantity), design and accessibility criteria), and previous relevant research that assessed the local context in Sudan. We found that using available evidence as well as combining the VSN's criteria and previous research findings in the five planes of Garrett's framework enabled us to cover many essential elements of user experience and to address issues related to the website's strategy and content. We suggest using social marketing to promote the use of this website as well as monitoring and evaluating the website and users' experience using different approaches such as visitor traffic and qualitative measures.

Chapter 7 summarizes and discusses the main findings of this thesis, elaborates on implications, and presents recommendations for research, policy, and practice. We specifically described how we addressed the four objectives of the thesis including: 1) identifying, measuring, and quantifying measles vaccine hesitancy among Sudanese parents (Chapter 3), 2) assessing determinants of measles vaccine hesitancy among parents in Sudan (Chapter 2 and 4), 3) examining the effects of vaccine hesitancy on uptake of the measles vaccine (Chapter 5), and 4) developing a web-based intervention (Tat3im initiative website) to increase vaccine uptake including measles vaccine in Sudan (Chapter 6). In conclusion, we noted that the problem of measles vaccine hesitancy is complex in Sudan with perceived causes and consequences. Therefore, we recommend addressing not only the negative beliefs and attitudes of people but also practical and access issues related to measles vaccination sessions, such as changing the number of doses per container from ten to five.