



CASE SERIES ARTICLE

Case study of COVID-19 immunization behaviour in the Maldives

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ABSTRACT

Introduction: COVID-19 scenario and people's reaction to vaccination changed rapidly across the globe, including the Maldives. This case study presents the findings from a formative assessment, focusing on the motivations around COVID-19 booster vaccination behaviour and information sources to inform design of future risk communication and community engagement strategies.

Methods: Qualitative inquiry methods were adopted. Vaccine hesitancy and acceptance was conceptualized through the Protection Motivation Theory. Primary data collection was conducted in five locations of the Maldives; Male', HA. Ihavandhoo, ADh. Digurah, L. Gan and GDh. Madaveli from July-October 2022. Focus group discussions were conducted for primary audience groups consisting of the elderly, those with chronic disease conditions (co-morbidities), migrant workers, youth, parents and caregivers of elderly, using flashcards to prompt the inquiry, and in-depth interviews were conducted for secondary audiences consisting of frontline workers, faith-leaders, community leaders, and influencers using an interview guide.

Results: Overall, protection motivation was low among the participants, there was complacency about COVID-19 booster vaccinations, driven by low threat appraisal and low coping appraisal. This situation poses a significant challenge for health and communication experts working to improve vaccine coverage. The main causes of these issues were that (i) perception that the COVID-19 vaccine was not effective in preventing infections, (ii) the misconceptions were not addressed particularly on the rumors on adverse effects and anecdotes on social media about the vaccines, (iii) there was mismatch in where people seek information and where healthcare-workers provide information. In the early stages of vaccination, regulatory requirements for travel across localities was the main reason for vaccine acceptance while the social value of protecting dependents in family is the core motivation of COVID-19 vaccine acceptance in the later stages.

Conclusions: The protection motivation for vaccination for COVID-19 vaccine is low among the public due to the perceived low vaccine efficacy in preventing disease and adverse effects. The risk communication messaging needs to reposition vaccination about protection of family and loved ones and reducing severity of disease through trusted healthcare workers on social media most frequented by the population groups.

Key words: vaccine, COVID-19, risk communication, motivation behaviour.

Introduction

Vaccines are an essential commodity for the prevention and control of infectious disease outbreaks and to fight future pandemics. Despite the evidence on safety of vaccines, there is increasing hesitancy toward vaccination.¹ Growing misconceptions about vaccinations are increasing the number of people who decline recommended vaccinations. This hesitancy towards vaccination is dropping vaccine coverage and emergence of vaccine-preventable diseases.²

The COVID-19 pandemic provided a novel situation to study public perceptions and behaviour towards vaccination. Previous studies have examined the factors associated with vaccine hesitancy. Several socio-economic factors such as sex, age, education, income and work, religion and politics were reported to be factors associated with COVID-19 vaccine hesitancy.^{3,4} However, information on the factors affecting COVID-19 booster vaccine hesitancy among fully vaccinated (two doses) individuals is limited.⁵⁻⁹ According to the World Health Organization,¹⁰ infodemics created as a result of expanded social media and internet access causes confusion, mistrust in health authorities and leads to risk-taking behaviors that can negatively affect vaccine uptake.

In the Maldives, COVID-19 vaccination programme was introduced in February 2021, starting with

defined at-risk population groups at the start, as per WHO recommendations at the time, later expanding to all eligible populations once vaccines were available in the country. The policy was to provide free vaccination to the whole resident population, including foreign migrants irrespective of their legal status.¹¹ In preparation, a national vaccine communication campaign was launched with specific branding (Dhifaau).¹¹ This campaign used the existing risk communication and community engagement (RCCE) framework for the COVID-19 response that was multipronged with targeted messaging for different audiences through traditional and digital platforms.¹² The policy framework for the Maldives COVID-19 vaccination is presented in Figure 1. With the vaccination campaign and other policies for pandemic control, the country achieved a high vaccination rate for the 1st dose (88%) and 2nd dose (85%), but the vaccination coverage with the booster dose was much lower at 37%.¹¹

While several questions remained at the start of the COVID-19 vaccinations across the world, scientific evidence answered questions on safety of the COVID-19 vaccines.¹³⁻¹⁵ Despite the evidence, several countries, including the Maldives continue to grapple with the uptake of additional doses of COVID-19 vaccination.¹⁶⁻¹⁹

Figure 1: Policy framework of COVID-19 vaccination in the Maldives

Policy target	<p>Reduce COVID-19 hospitalization and death; Reduce transmission; Empower community for protection behaviour</p>
Legislation	<p>Health Protection Act (2012); Public Health Emergency Act (2020)</p>
Guidelines and Protocols	<p>Vaccine specific <i>Type:</i> WHO prequalified vaccines; no restrictions on manufacturer if WHO prequalified (mix of vaccine products). <i>Cost:</i> Free vaccination for all residents including foreigners <i>Priority groups:</i> Opened up gradually according to an allocation framework, starting with health care workers and other pandemic response front-line workers, aged 65 and above, people with chronic diseases, immunocompromising conditions, and staff working in economically sensitive industries such as tourism and related workers; When adequate amounts of vaccines were available in the country (early 2021) opened for all above 18 years and later from Aug 2021 2021 to all above 12 years, <i>Availability:</i> At designated vaccination centers (usually located at health facilities); Additional mass vaccination centers in urban areas; By trained vaccinators (nurses and public health officers) <i>Community engagement:</i> Vaccine communication campaign <i>Surveillance:</i> AEFI surveillance at vaccination centers and from all health care facilities Others: Movement/travel restrictions between islands without full vaccination (2 doses); Mandatory quarantine if not fully vaccinated (2 doses); Restrictions on work and school attendance without vaccination without full vaccination (2 doses); No restrictions if fully vaccinated (2 doses)</p>
Actors	<p>Health Emergency Coordination Committee (government multi-sectoral), Healthcare providers, Humanitarian Organisations (Red Crescent), Businesses including tourism sector, Local councils, Law enforcement, Community leaders, Development partners, Academia & Professional bodies, Media, Civil Society Organisations, Community /Social media influencers including religious leaders</p>

To understand the community perceptions around COVID-19 vaccination, an assessment was conducted in 2022 in the Maldives exploring the causes of vaccine hesitancy and to inform future risk communication and community engagement interventions.²⁰ This case study presents the

findings from this assessment focusing on the motivations around COVID-19 vaccination behavior and information sources in the Maldives. As COVID-19 continues to be a disease of public health importance, and vaccination is one of the recommended interventions for high risk groups²¹

the findings from Maldives provide important lessons in promoting vaccination uptake that are of interest to public health practitioners.

Methods

Qualitative inquiry methods were adopted conceptualized through the lens of complacency, confidence and convenience²² that allowed for applying complementary theoretical frameworks such as the Behavioral and social drivers (BeSD) model of vaccine acceptance,¹⁰ the Health Belief Model (HBM)²³ and Protection Motivation Theory (PMT).²⁴

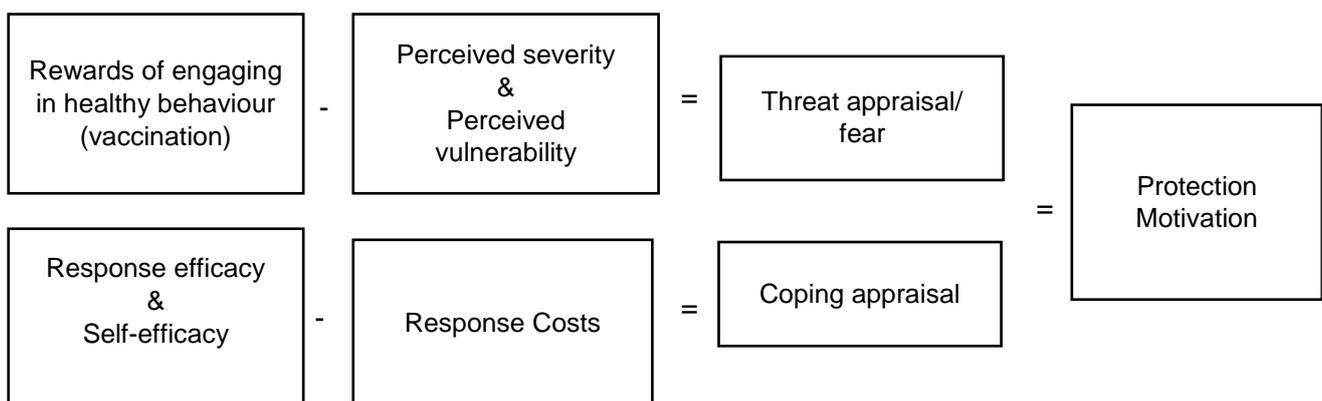
Ethics approval was obtained for the primary data collection of the assessment from the National Health Research Council (NHRC/2022/19).

Data was collected from July-October 2022 from five islands of Maldives; Male', HA. Ihavandhoo, ADh. Digurah, L. Gan and GDh. Madaveli selected purposively to represent varying population sizes, geographic location and development status. Focus group discussions were held for each primary audience group, consisting of the elderly, those with pre-existing comorbidities, foreign migrant workers, youth, parents, caregivers of elderly using flashcards to prompt the inquiry. The flashcards each presented with a short scenario depicting different community settings and groups to initiate discussions around what makes them adopt a specific behaviour towards vaccination and

how they go about obtaining information on vaccination. In-depth interviews were conducted with secondary audiences consisting of stakeholders. These include frontline workers (healthcare workers), religious-leaders, community leaders, and community level influencers (youth/women leaders, social media influencers) using an interview guide. Social media advertisements and snowballing were used to recruit individuals for each focus group in each of the five islands. Data was collected from 165 persons in the primary audience across the groups and 28 people from the secondary audience.

All interviews were transcribed verbatim and translated to English for analysis with the lead interviewer reviewing the transcripts and translations for assuring quality of the data. Deductive or theory driven thematic analysis method²⁵ was adopted using the components of the PMT model (Figure 2). Thematic analysis was conducted using the PMT model components by two researchers independently, both comparing notes following code selection and assigning theme selection. At the stage of code selection, key words were identified, compared and consensus built. Theme selection followed a similar process with both researchers agreeing to assign selected codes to the themes corresponding to the components of the PMT model. The inferences in the PMT model components were arrived from a discussion of all the researchers.

Figure 2: Analytical framework using the PMT model²⁴



Results

The protection motivation was generally low across the primary audience as the threat appraisal and fear was low, and coping appraisal moderate (Table 1). This was driven by the perceived low reward from vaccination. The perceptions of the disease severity and vulnerability to the COVID-19

were low at the time of assessment, so was the perceptions on response efficacy of COVID-19 vaccine in preventing disease transmission. The participants' perception of self-efficacy in terms of ability to access information and vaccines but felt that response cost was high due to inability work and study.

Table 1: Public perception themes driving COVID-19 vaccination behavior

Public perception themes
REWARDS - LOW
First two doses allowed work and movement within the community
No rewards with subsequent doses
RESPONSE EFFICACY (vaccine efficacy) -LOW
Vaccine was not effective for preventing infection /transmission
Vaccine produced several adverse effects (reproductive system, death)
SELF EFFICACY (Self efficacy) – MODERATE
Able to access vaccine information easily (internet, social media, group chats)
Moral values for protecting dependents (elderly)
Employers dictate vaccination (particularly foreign migrants)
Government rules dictated vaccination for first two doses, but no more
Limited engagement with healthcare workers for information
SEVERITY AND VULNERABILITY
Disease is no longer serious
Elderly and people with chronic diseases are vulnerable
RESPONSE COSTS - HIGH
Not able to work, go to school

THREAT APPRAISAL AND FEAR

At the time of the assessment, people felt that except for the elderly and those with pre-existing diseases, the disease was no longer serious, people were not afraid, and did not perceive any rewards of engaging in vaccination behaviour. Several narrated instances of getting infected but not becoming sick and children in the family not getting sick even when infected. People felt that

the threat of the disease and its consequences were not serious for healthy individuals.

The motivations for uptake of the first and second dose of COVID-19 vaccine were influenced by the movement restrictions imposed by the government. Several narrated that they had no choice if they wanted to move around or work or go to school, but as there are no more restrictions, they can choose.

COPING APPRAISAL

Several people felt that the efficacy of COVID-19 in preventing the disease is low, hence the hesitancy to get vaccinated. People narrated several instances of getting infected despite being vaccinated with two doses. Further they narrated instances of getting infected but was not serious.

Self-efficacy was moderate with the perception that they have the information and the ability to go and get the vaccine from the public health facility if they really needed. Employees, particularly foreign migrant workers' behavior were influenced by the employer's direction.

VACCINATION INFORMATION

The focus group discussions indicated that the most popular source of information was social media along with shared group chats of family and friends that affected the motivation to vaccinate. This differed by population segments: for locals the common sources were Facebook, Twitter, Viber groups; for foreign migrants, it was YouTube and Facebook; for older people, it was the local TV or Radio. The health care workers, however, were noted as the most trusted source of information on vaccines but there was limited direct engagement.

Stakeholder interviews resonated these community perceptions, validating the findings with regard to threat and coping appraisal. There were some divergences when it related to vaccine communications and accessing correct information. Stakeholders noted that although healthcare workers were most trusted, they were not using the social media platform for vaccination messaging. Healthcare workers noted they do not have official social media accounts or channels and were not confident to use social media for messaging on vaccine information.

Discussion

The motivation for uptake of COVID-19 vaccines additional doses is low among the people of Maldives. The reasons relate to the perceived low

threat, and limited correct knowledge on the vaccine efficacy and misperceptions on its safety. The perception at the time of the study was that the risk of disease is not serious, except in the elderly and in those with pre-existing chronic diseases. Studies of adult vaccination such as influenza have shown one of the main reasons for low uptake was the low perceived risk.²⁶

The misinformation on adverse effects was substantial, particularly on reproductive health and some of the sudden deaths that occurred in younger people at the time of the pandemic. Evidence on reproductive changes following COVID-19 vaccination was scarce and emerging at the time of the pandemic and during vaccination roll out. While some earlier studies reported menstrual changes,²⁷ others did not observed significant differences.²⁸ Early systematic reviews of studies on COVID-19 vaccination and pregnancy outcomes showed no differences in the probability of delivering small for gestational age babies between vaccinated and unvaccinated pregnant women.²⁹ More recent systemic reviews have provided evidence re-iterating the safety of COVID-19 vaccines.¹³⁻¹⁵ However, the vaccination communications were not able to address these misperceptions of the public at the time. With the continuing recommendations for vaccinate high risk individuals,²¹ there is a need to undertake effective vaccination communication by health care workers using selective social medial platforms to different population segments.

Some of the narratives indicated the information from the government made them concerned about the safety of the vaccine. Other research showed that the phrase Emergency Use Authorization triggered mixed responses from risky to suspicious and the need for more information.³⁰ When the messaging from the government does not align with other information sources, people are unsure about the course of action to protect their health and their families.^{31,32} The perceived low effectiveness of COVID-19 vaccine in reducing transmission was another barrier for vaccination.

People's experience of childhood vaccines such as polio that effectively prevent the disease is prominent and compared this experience with the COVID-19 vaccine with the same expectation. The communication strategies and messaging were not able to deliver the correct knowledge that the primary purpose of vaccination was to reduce severity and reducing transmission was secondary. As this phase has passed, going forward, vaccination communication strategies need to re-affirm the safety of the current COVID-19 vaccines using recent evidence and choose specific messaging for intended policy objective.

On the positive vaccine uptake behavior, it was moral values that influenced vaccine uptake among younger adults, particularly in the interest of protecting loved ones at home. Other studies in this focus have shown pro-social societal value orientations were instrumental in motivating COVID-19 vaccine uptake.^{33,34} This finding needs to be in designing future COVID-19 vaccination communication strategies in the country particularly and can be considered for those vaccinations that specifically target vulnerable and high risk population groups. There is also a need to conduct further study on the using moral values in messaging that are effective in motivating protection behavior with vaccination in other predominantly pro-social societies.

The study is limited by the timing of the study as it was conducted towards the end of the pandemic. Several changes that occurred including the evolution of the COVID-19 virus itself, the mix of vaccine products and the changes to government's disease control strategies mediated public perceptions. Hence, these findings may not be generalisable to other contexts. Nevertheless, it contributes to a deeper understanding of the motivations of vaccination behavior in public health

emergencies with novel disease and provides evidence to design risk communication strategies.

In sum, the Maldives experience shows that as the pandemic progressed, people were complacent with the disease situation and the confidence in COVID-19 vaccination was low even though it was convenient to access vaccination. There were some gaps in the design of risk communication strategies in reaching audience segments with the correct messaging and sources on their preferred platforms that need to be considered in future risk communications.

Conclusion

The protection motivation for COVID-19 vaccination is low in the Maldives. The risk communication efforts need to reposition vaccination from a moral values lens for protection of family and loved ones to reduce severity of disease, through trusted healthcare workers on social media most frequented by the population groups. This requires reskilling public health and health promotion workers on behavior change communication with effective use of social media platforms for communications on vaccination.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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