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"This is a Pakhtun disease": Pakhtun health journalists' perceptions of the barriers and facilitators to polio vaccine acceptance among the high-risk Pakhtun community in Pakistan

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ABSTRACT

Introduction: Pakistan is one of only three poliomyelitis-endemic countries in the world. Twelve wild poliovirus (WPV) cases were recorded in the country in 2018. Even though resistance to oral polio vaccine (OPV) has decreased over time, there are still pockets of communities, mostly ethnic Pakhtun living in the Khyber Pakhtunkhwa (KP) province, that resist OPV. Although local journalists may be important sources of health information, past studies have overlooked their role in this context. The purpose of this study was to examine Pakhtun health journalists' beliefs regarding OPV and their views of the barriers and facilitators that influence OPV acceptance or hesitancy in their communities.
Methods: We recruited and interviewed 33 Pakhtun journalists covering health issues for diverse media outlets in high-risk districts for WPV of the KP province. The semi-structured interviews were translated, transcribed, and analyzed for themes.
Results: The participants strongly supported OPV and advocated that children in their own families and communities get vaccinated against polio. At the same time, they felt that their communities faced more urgent health needs that were not addressed by the government. They identified barriers at the media organizational level operating against accurate coverage of OPV, including financial and time constraints, a lack of checks and balances, and limited health literacy. They regarded press releases issued by the officials associated with OPV campaigns as the main facilitators in the coverage of OPV. The participants perceived lack of community trust in the government, security concerns, and community members' religious beliefs as the major impediments to increase in uptake of OPV.
Conclusion: Pakhtun health journalists have the potential to be important partners in national polio eradication initiatives. They should receive culturally sensitive training in local languages at appropriate literacy levels. We also suggest direct involvement of journalists in community mobilization efforts.

1. Introduction

Polio, also known as Poliomyelitis or Infantile Paralysis, was one of the most feared childhood diseases in industrialized countries in the 20th century. Following the availability of the first polio vaccine to the public in 1956, the prevalence of cases in those countries declined dramatically. The successful polio vaccination campaigns by the Global Polio Eradication Initiative (GPEI) [1] led to the certification of the Americas as polio-free in 1994, the Western Pacific in 2000, and Europe in 2002 [2,3]. By 2011, many developing countries also achieved polio-free status. Globally, these efforts led to a decline from an estimated 350,000 cases in 1988 to under 100 in the past few years. These remaining cases reflect the persistence of polio as endemic in three countries, including Pakistan. The polio eradication initiative launched in Pakistan in 1994 recorded remarkable success as the number of recorded polio cases in the country dropped from 1155 in 1997 to 28 in 2005 [4]. However, since then, resistance to polio vaccination has increased. In 2014, 306 polio cases were recorded in the country [5]. Although the oral polio vaccine (OPV) acceptance rate has steadily increased since 2015, there are still pockets of communities, mostly ethnically Pakhtun, that resist OPV [6]. In 2018, eight out of 12 wild poliovirus (WPV) cases were recorded in the predominantly Pakhtun- populated province of Khyber Pakhtunkhwa

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(KP) [7]. After a vaccination drive in May 2018, the health department recorded 26,610 polio vaccine refusal cases in the province [8]. The OPV hesitancy/refusal is only one public health problem facing these communities. The Pakistani health infratructure is weak [4], and the health sector is overwhelmed with high population growth, the burden of both communicable and non-communicable diseases, and high infant, child and maternal mortality rates [9]. These problems are particularly severe in the rural areas of KP where a majority of the Pakhtun population lives [10], and where the majority of polio cases were recorded in 2018 [7] (see Fig. 1).

OPV refusal in the ethnically Pakhtun-populated areas of Pakistan is a complex phenomenon [11]. Factors associated with refusal include parents' lack of knowledge about vaccination, low income and education levels, and number of children per household [5,12–15]. The barriers to vaccination include conspiracy theories about the content and efficacy of polio vaccine [13,16], including rumors that the vaccine contains pig fat, which Muslims are forbidden to consume. The involvement of U.S.-funded organizations in the polio eradication efforts, weak governance, and inaccessible areas due to the ongoing war on terror constitute additional barriers to OPV acceptance in these countries [4,5,17], as well as local and global politics, mistrust of science, and lack of basic health facilities [18,19]. OPV resistance significantly increased among Pakhtuns when the U.S. killed Osama bin Laden, the former al-Qaeda chief, in a military operation in Pakistan. The US reportedly used a fake hepatitis vaccination campaign to trace bin Laden. Since this killing, more than 100 polio vaccination team members and police officials protecting them have been killed [5,20]. The United Nations Children's Fund (UNICEF) and

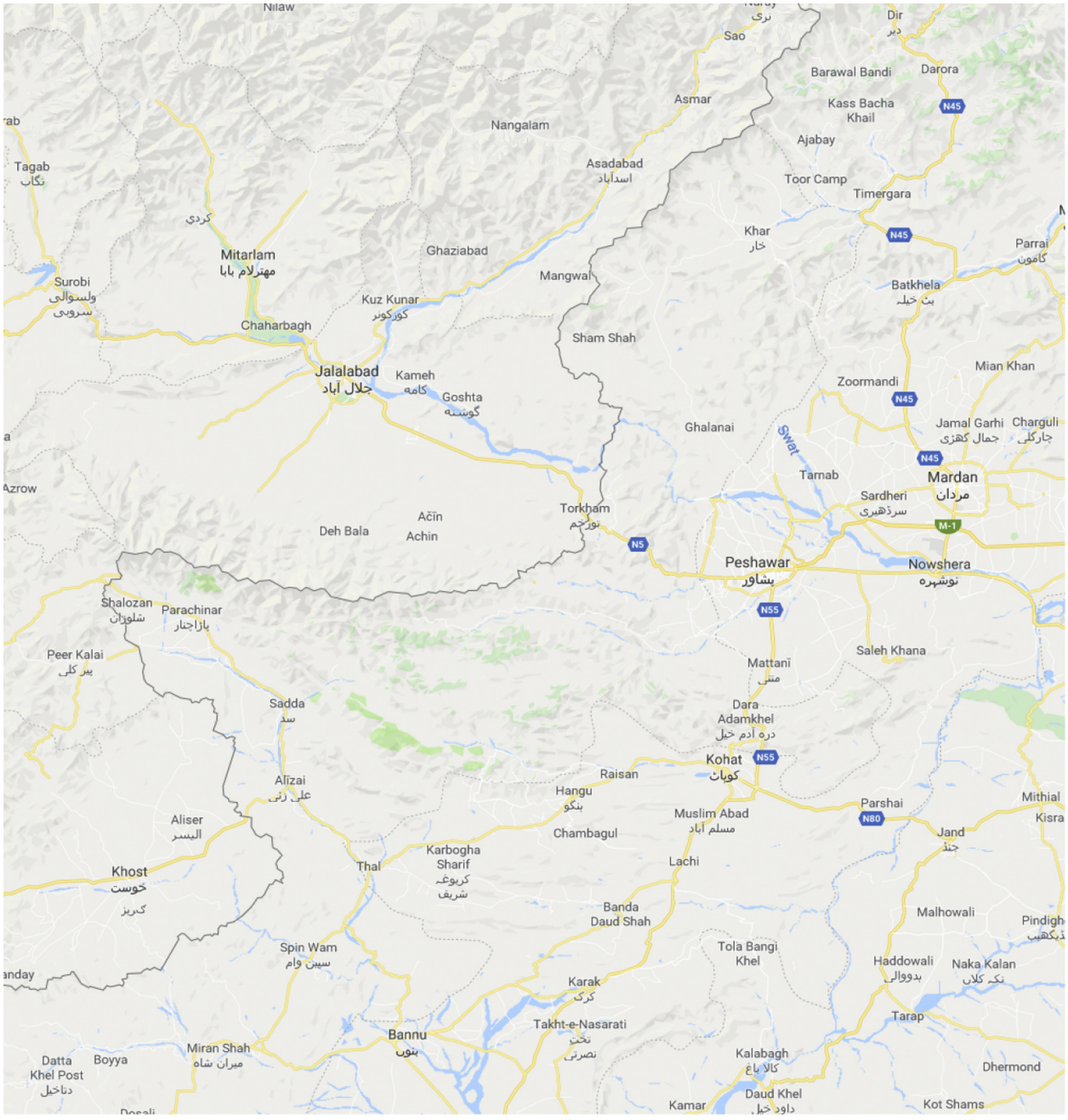

Fig. 1. Map location of the border provinces of Pakistan and Afghanistan where the Pakhtun community lives. Adapted from google maps®.

the Pakistani government are using multi-pronged communication strategies including social mobilization guided by real-time data collection and large-scale media campaigns to increase OPV uptake [12,21].

Media remain at the center of communication strategies in Pakistan [22] with the goal of providing information about polio, associated risks, campaign efforts, vaccine efficacy, and safety [12,22]. UNICEF collaborates with the Pakistani government to brief the media, pitch stories, train journalists and public information officers [6] and train doctors who work in high risk areas on communicating with the media [23,24]. UNICEF has also involved celebrity journalists in media advocacy campaigns and created WhatsApp groups to provide timely information to the journalists. In 2012, UNICEF also created a "Journalists Against Polio" forum that consisted of journalists from major cities of the country. UNICEF also recently collaborated with Voice of America's Pashto language service *Deewa* to hire reporters who were dedicated to cover polio related stories in the Pakhtun dominant areas. However, these strategies have not been examined by scholars and there is anecdotal evidence that suggests that they may not be effective. A majority of the news items have a neutral tone toward polio vaccination, and journalists regularly pick up anti-vaccination propaganda spread through social media and publish it as news stories [12]. In March 2018, for example, both national and local media outlets reported an unsubstantiated news story that three children had died after receiving OPV. consequently, the number of polio vaccine refusal cases doubled in April 2018 [25]. This incidence provided an insight into the critical role that these news stories play in parents' decisions to refuse vaccine.

Pakistan has one of the most vibrant, robust, outspoken media systems in South Asia [26]. The country has more than 90 television channels, 115 radio stations, and around 1,800 newspapers and magazines [27]. Despite many restrictions from the government, state agencies, and non-state actors, the Pakistani media talk openly about different issues [28]. The Pakistani media reflect a multi-linguistic, multi-ethnic, and stratified class society with a clear divide between Urdu/Vernacular and English media [29]. The English language newspapers target the social elite, such as politicians, businessmen, military officers, and bureaucrats and therefore they play a role in the policy making of the country. In contrast, Urdu language newspapers and vernacular media outlets are consumed by members of rural and lower/middle class urban communities and play a significant role in building public opinion about different issues. Radio stations are popular in the rural areas of the country, especially in those areas where electricity is not available for most of the day and in which the literacy rate is low. There are also television channels, radio stations, and newspapers that deliver information to the public in vernacular languages [30].

Journalists in Pakistan can be divided into three different categories: (1) those working in major cities like Karachi, Lahore, and Islamabad, which are the are headquarters for the major media outlets; (2) those working in provincial capitals and bureau offices such as Peshawar and Quetta; and (3) those working at the district level [31]. Journalists operating in the largest cities of the country are more educated and better trained, whereas journalists working at the district level are least trained and educated [32]. Journalists employed by the headquarters and bureau offices in the major cities work with one organization and are usually assigned to cover politics, crime, entertainment, education and health; whereas journalists working at the district level/small towns are supposed to cover all the major news in their communities. Health reporting remains a neglected coverage area nationwide [33].

Journalists play a critical role in the dissemination of health information [34], but research done in Western contexts has reported that health journalists are not adequately trained to report on complex health issues. Consequently, their stories lack comprehensive information and are hard for average readers to understand [35]. Despite the potentially critical part played by local journalists in OPV coverage [36], little is known about those journalists' perceptions and experiences. To address this gap, the present study aims to understand Pakhtun journalists' perceptions of the barriers to and facilitators for OPV in their communities, including their own beliefs regarding polio and OPV. To advance this understanding, the Social Ecological Model serves as a theoretical framework.

1.1. Social Ecological Model

The Social Ecological Model (SEM) is a framework that helps explain complex social phenomena. The model is composed of five levels, or concentric rings of influence, for health-related behaviors and conditions: intrapersonal/individual characteristics such as knowledge, attitudes, behavior, self-concept and skills; interpersonal processes related to social networks; organizational factors related to organizational characteristics such as rules and regulations; community factors consisting of relationships among organizations, institutions, and networks; and public policy factors including local, state, and national laws and policies [37,38]. Considering the different levels of influence is essential in understanding social processes and identifying solutions. UNICEF is using the framework as part of its communication strategy to examine and address norms that influence individual behavior, collective behaviors and societal norms about polio vaccine [22].

2. Methods

2.1. Data collection

The study received approval by the University of New Mexico Institutional Review Board. Recruitment followed purposive, snowball sampling techniques [39]. The first author, a former Pakhtun journalist, received from different unions and Press Clubs contact information of journalists who covered health issues in Urdu and Pashto language newspapers and radio stations in KP. To be eligible for participation, they had to be journalists covering health issues who had reported on polio related stories during the preceding 12 months. The journalists contacted were also asked to contact other local journalists who have been regularly writing about polio and related issues but might not have been members of the press clubs. A total of 61 journalists were contacted. Thirteen journalists were not eligible as they did not cover polio in the past year, eleven did not respond, and five refused to participate. Thirty-three journalists were eligible and consented to participate in the study. The participants included journalists working in Peshawar bureau offices of the media outlets and journalists reporting from districts. The purpose of the study was explained to the recruited journalists, and their verbal consent was sought. The participants did not receive or expect to receive incentives for participation in the study. See Table 1 for participants' demographic information.

A semi-structured interview protocol with open-ended questions in numerous domains was utilized. It related to participants' work experiences, perceptions of OPV media coverage in KP, of the barriers and facilitators to their OPV coverage, and their own knowledge of polio vaccine (e.g., *What is polio?, Is polio contagious?, Is polio curable?,* and *How can polio virus be prevented and eradicated?).* Other questions focused on journalism and professionalism, trainings, and their interactions and perceptions of communities OPV hesitancy. The recorded interviews' length ranged from 21 to 67 minutes with an average of 44 minutes.

Table 1
Demographic characteristics of participants.

Characteristics	n
Sex	
Male	33
Female	0
Age (mean)	38.4
Media affiliation	
Newspaper	12
Radio	8
More than one medium	13
Experience as a journalist (in years)	8.5
Salary per month (mean)	180 USD

2.2. Data analysis

The first author transcribed the interviews from Urdu and Pashto and translated them into English, and checked the transcriptions for errors and accuracy. He kept notes taken during the interviews in a separate file. Transcripts and notes were analyzed using NVIVO 10, a qualitative analysis data software program (QSR International 2010). We followed a multi-step iterative process. We took memos and did initial coding during the transcription phase. The initial coding entailed line-by-line close reading of the data. During this phase, we remained open to all possible theoretical directions indicated by the data and tried to understand the journalists' views and actions from their perspectives [40]. Secondly, we conducted focused coding of the themes that appeared more frequently in the initial coding or were otherwise significant. The focused coding helped us synthesize, analyze, and conceptualize larger segments of data and advance the theoretical direction of the study [40]. Throughout the coding process, we engaged in constant comparative analysis. We compared statements and incidents discussed within and across interviews [41,42]. This use of constant comparative analysis helped us analyze the data at a higher level of abstraction and arrive at our analytical categories. At this stage, we noted that the themes emerging from our focused coding were correlated with the fields of the Socio Ecological Model (SEM). We used the Socio Ecological Model as a mapping tool to organize and interpret our findings.

3. Findings

The analysis indicated that participants overall were supportive of OPV and advocated for it. At the same time, they listed barriers that ranged from individual/intrapersonal factors, to interpersonal, organizational, and community/policy factors. These levels were largely consistent with the SEM, and are reported in the following section (see Fig. 2).

3.1. Individual level: Participants' knowledge, beliefs, attitudes and literacy skills

At the individual level, participants shared health-related knowledge, attitudes, beliefs, perceptions of risks and benefits, values, and their perceived health literacy skills.

3.1.1. Participants' polio-related knowledge as facilitator of pro-vaccination attitudes and behaviors

Participants shared knowledge about polio that was embedded in an overall belief system consistent with the biomedical model. Specifically, all the participants knew that polio was a contagious disease that could cripple children for life and could be prevented only through vaccine. A respondent noted, "Polio is a contagious disease. It can only be prevented through vaccine. It cannot be treated." Another participant reported: "I personally believe that vaccines are really effective. Their effectiveness is a universal reality." Participants expressed this support by having their children vaccinated and by advocating in their personal networks. A respondent stated: "Whenever I return home I inquire about that. If polio teams do not pay a follow-up visit, I take my children to the nearby Basic Health Unit." All 33 respondents stated that they vaccinated their children.

3.1.2. Participants experiences with polio and polio eradication efforts in their communities

The participants stated that they were supportive of the OPV because they have seen the risks associated with contracting poliovirus and the benefits of its prevention through vaccine. They shared that their interactions with people crippled by poliovirus made them aware of its associated risks and of OPV's benefits. One journalist said: "Now we see people affected by the virus in the villages." Another explained: "I saw that in Khyber Agency and vaccines work. No cases have been reported from the areas where vaccine has been administered." Witnessing the risks of poliovirus and the effectiveness of vaccination facilitated participants' framing of polio as a health issue that disproportionally affected their communities.

3.1.3. Polio as a Pakhtun-specific health concern

Some participants noted that poliovirus has disproportionately affected Pakhtun children. A participant relayed: "most [polio] cases were recorded among Pakhtun population. The government vaccinates them at the airports whenever they want to go abroad. We are getting isolated from rest of the world due to this disease. Why not vaccinate our children?" This participant was referring to the fact that the Pakistani government mandated presenting polio vaccination certificates to immigration officers at airports before flying abroad. He emphasized that prevention through vaccine was the only available option in his community: "We do not have medical facilities for disabled children... Therefore, the only good option is to vaccinate our children. Polio destroyed children's dreams. This is called a Pakhtun virus." Another participant echoed that opinion, saying "it is so unfortunate that polio cases are emerging among Pakhtun, be that in Afghanistan or Pakistan. [...] Peshawar, Karachi, Baluchistan -- everywhere this disease affected Pakhtuns. This is a Pakhtun disease." These quotes indicate how participants' were aware of their communities' poliovirus risk which bolstered their OPV support.

3.1.4. Low-self efficacy due to limited health literacy as a barrier to pro-OPV coverage

Participants believed that they did not have sufficient knowledge or skills to cover complex health stories generally and polio-related stories specifically. Thirty-one respondents noted that their health literacy was low and consequently believed that they were unable to provide comprehensive and accurate coverage on health stories. A journalist said: "I am relying on information from the internet to understand different medical terms. I fear that there is information on the internet that is incorrect but I do not have the capacity to differentiate" [between correct and incorrect information]. Similarly, the journalists felt that they lacked the professional capacity to write their news stories in easy-to-understand language. One participant noted that only a few reporters "can understand and explain abbreviations." He explained that while "some reporters consult their seniors" in order to produce a clear story, this lack of health literacy results in others writing unclear stories: "Some of them write the story in a very difficult language that is very hard to understand." Consequently, these stories are not informative to readers.

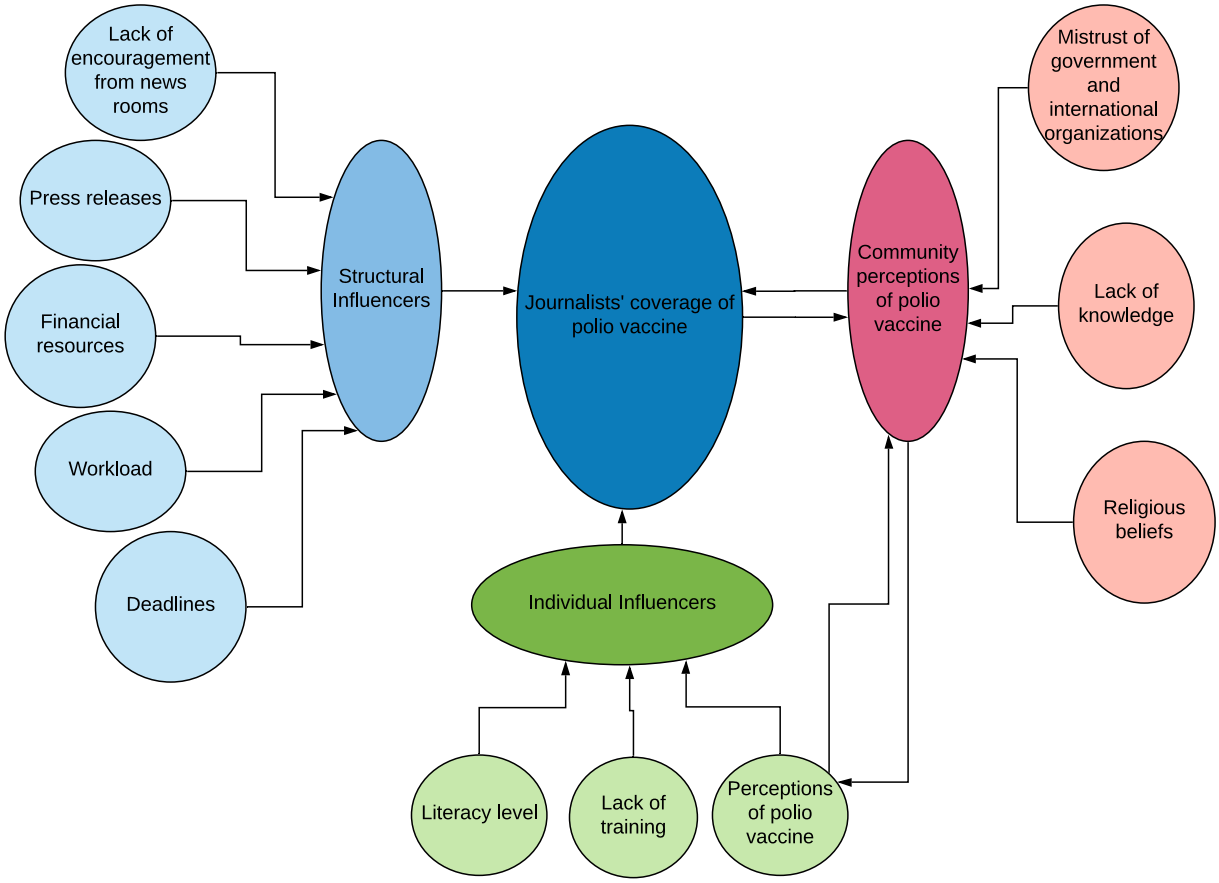

Fig. 2. Influencers on journalists' coverage of polio vaccine.

3.2. Interpersonal level: Journalists as pro-OPV advocates

Participants indicated that they were sought after as sources of information for people in their personal social networks and in the communities they covered, and that they used the opportunity to advocate for OPV. For instance, one participant noted that he had to overcome his wife's hesitancy to get their children vaccinated after his wife had heard rumors, spread through media, that polio vaccine had caused deaths of children: "My wife was so worried. She did not want to vaccinate our children. She believed the news reports published in the newspapers . . . I told her that the deaths were not caused by vaccination."

Nine respondents noted that community members ask them questions about OPV efficacy or side-effects. One of them explained: "people usually ask questions about polio vaccines. [. . .] I usually tell them that polio is a disease which is not curable. [. . .] This is why the vaccine is so important. Another reporter shared how he was traveling in a taxi to a community affected by polio after hearing a rumor that some children had died from vaccination. He said:

> The driver said he used to vaccinate his children in the past but did not want to anymore since the vaccine killed children in his area. I told him that his information was incorrect; however, the driver wanted written guarantee from the polio health worker and me that his children would not die after vaccination.

Although participants described how they advocated for OPV in their social networks, some of them also noted that they were not prepared to answer the questions raised by community members. Despite having basic biomedical knowledge of polio, they expressed low self-efficacy and literacy levels and felt that they could not answer many questions on the topic. Moreover, some community members' questions even created doubts about OPV in their minds. A respondent noted:

> Several community members raise questions about polio vaccination that we are unable to answer and create doubts in our minds too. For example, people ask if there are diseases that kill more people than polio, for example, cancer and other diseases, then why the government and international organizations spend so much money on polio vaccination and campaigns.

A similar experience was echoed by another respondent: "I know that polio is contagious but so are other diseases; why doesn't the world invest in the eradication of other diseases? People always ask tough questions that I am unable to answer." Therefore, communication with community members who were vaccine-hesitant left some of the participants feeling a need to better understand the topic and reduced their ability to report on the topic and to advocate for it.

3.3. Organizational level

Whereas participants felt comfortable advocating for OPV informally at the interpersonal level, they listed different organizational/structural barriers to positive, accurate coverage of poliovirus in the community and OPV campaigns.

3.3.1. Lack of journalistic checks and balances

Twenty-two respondents believed that a major reason for the inaccurate or incomplete polio vaccination coverage by media

was the lack of in-house checks and balances in their organizations, due to lack of resources, the need to provide fast reporting and the desire to publish "news that sell" at the expense of accuracy. They described their editors as feeling under pressure, and even encouraged, to publish critical news stories before their competitors "scoop" them. A reporter shared his experience:

> Recently, there was a rumor that a child got killed due to polio vaccine in Peshawar. Some local television channels broadcast the story. Now, my editor wanted me to file the story in two hours. I told him that the government officials are denying the claims of the parents that vaccine caused the casualty. However, my assignment editor said "let us first run the parents' claim as a story and then later on air the official version."

Another participant said: "my editors do not appreciate in-depth stories. They are mostly interested in quantity over quality. At times, the journalists are forced to file stories even without confirmation from sources just because another media organization is running a specific story." The participants noted that their editors want to compete with rival media outlets and therefore pressure the reporters to file stories that can make breaking news even if they are not accurate or verified. A participant explained:

> The editors just need stories. They want a story that can create sensation. So when the reporters hear rumors about the side-effects of polio vaccines, they do not wait for the results of the tests. They want to file the story as soon as they can. Even if that is at the cast of accuracy. They do not do research. They do not wait for the results from the National Institution of Health.

Eleven participants told stories in which they or their friends were forced or encouraged to file factually incorrect information so that they could compete with their rivals in the market. They explained that the practice of sharing unverified stories was the result of the financial constraints that their organizations were experiencing.

3.3.2. Financially-related organizational constraints

Half of the respondents described tight deadlines, lack of funding, lack of incentives, and lack of support for accurate, in-depth coverage of polio vaccination as barriers to its acceptance. Lack of funding prevented participants from investigating the stories. A respondent noted, "I get a meager salary. I cannot travel and spend all that money to attend events. I do not get any incentives to do detailed stories."

Notably, the journalists from smaller, more peripheral districts did not even get a monthly salary. One of them explained: "I just cannot go and hire a taxi from my own money to attend events." Another respondent revealed: "we do not get salaries but are required to file five to eight stories a day. How is it possible?"

Consequently, journalists from smaller communities were more likely to report organizational barriers to accurate pro-OPV reporting. The financial restrictions were not just limited to the salaries of the journalists. One of our participants noted that his organization discouraged detailed stories on polio vaccination in order to get more advertisements from the organizations supporting the polio eradication initiative.

> In 2010, when people came back to Swat, I met the parents of a polio affected child. I recorded a television package on that child. I invited the child, his parents, a physician, a religious scholar, and the local community members to talk about polio and why vaccinations are mandatory. However, when I sent the recording to the head office, my managers called me saying that there is an organization called EPI that pays money to do such programs. Initially, they suspected that I had taken money from EPI to do the package; however, when I convinced them that I did not take any money to this story, they asked me to demand money from EPI and transfer the money to the head office and only then they will run the package. They called an explanation from me. I told them that this was a public issue. However, they wanted money."

This participant's experience reveals how some local media organizations treat polio vaccination as a commodity and want to use it for commercial purposes. A participant recommended that UNICEF and the government of Pakistan should consider media owners and managers as part of the problem and engage them in a dialogue:

> For the owners only advertising matters. For them, polio or other things do not matter. Their organizations should arrange meeting with editors and owners to request them to provide space and airtime to polio related stories. The journalists know what his organization publishes and what it does not. Journalists follow the organizations policy.

3.3.3. Press releases as facilitators of reporting on polio

Most of the respondents noted that press releases on immunization issued by UNICEF and government organizations facilitated reporting and made it easier for them to share the latest information about OPV with their communities—thus helping to overcome barriers stemming from their own low health literacy and from organizational factors. A respondent mentioned, "I find it hard to find good stories about health or polio. So, whenever the government launches an OPV campaign, I write a story about that based on the press release." Another said: "The journalists are not properly trained on how to report. So, it gets easier for them to publish the press release as it is." Another journalist expressed a similar opinion, saying "I find it hard to find good stories about health or polio. So, whenever the government starts a polio vaccination campaign, I write story about that based on the press release.

Whereas the press releases have facilitated the process of writing about polio, eight respondents felt that there was room for improvement in the health literacy level of these releases. One reporter noted that "most of the time they use jargon in those press releases and write them in English. So, most of the reporters, especially those working in the tribal areas and smaller districts, do not understand what these press releases say." Another journalist underscored the opportunity to design more-sophisticated health messages that would address parental OPV concerns: "The press releases themselves just consist of [official] statements." He suggested that public relations officers should "provide detailed information about polio in simple words and answer parents' concerns."

3.3.4. Training for journalists as a missed opportunity

Our participants noted that UNICEF is arranging trainings for journalists to cover OPV stories, but they believed that those trainings were not effective due to their content and the fact that only a few journalists from the affected communities were invited. A journalist explained: "I got one training. However, only a few journalists got that training. The trainers focus on few media outlets. Out of the 60 regular members of the Swat press club, only two got training in polio reporting from UNICEF." Moreover, those who participated in the training regarded it as a "bribe" to influence their reporting, rather than a true professional development opportunity. A reporter said: "Those trainings are more like perks and bribing techniques. What can someone learn in a days training? There should be a comprehensive training program. Those

are just enjoyment days for us. No attractive content. The organizers also just fill out forms." Another participant was also critical of the merit of training programs:

> Those trainings are useless. They are just a way to win the hearts of journalists by giving them perks and the journalists also understand that. For example, in one of the trainings I attended the trainers were doctors. They provided numbers about the epidemiology. The slides were in English. Basically, it was information that anyone could find from a simple Google search. They did not give any additional information. Some of our journalist friends do not understand English slides. Why don't they just deliver these trainings in the local language and improve the content and quality?

A participant who had attended several trainings explained that whereas in most programs "the trainers are usually doctors who discuss technical information which most of the journalists find very hard to comprehend," UNICEF had funded an effective program with communication experts from Johns Hopkins University which he described as "The most productive training I got [...]. That training changed my thoughts in so many ways." However, only two journalists from KP managed to get into that training, which limited its impact.

3.4. Community level

This theme related to participants' perceptions regarding the barriers and facilitators to polio vaccination in their communities. The participants felt that the government had failed to frame polio as a public health issue for local communities, due to prioritizing OPV over more- pressing health issues. Religious beliefs exacerbated by governmental neglect contributed to anti-vaccination beliefs, and finally, lack of overall personal safety and political/military conflicts, including the "war on terrorism", impeded public health officials' efforts to vaccinate children.

3.4.1. Different priorities between the community and the government leads to mistrust

All the participants regarded the lack of basic health facilities as the primary cause of mistrust, and consequently of the resistance to OPV, in some Pakhtun communities. Thirty participants noted that there are more-pressing health issues than the polio vaccination. For example, a participant said: "In winter, children die of pneumonia and in the summer, they die of different diseases spread by mosquitos." Another explained: "Polio is not on the priority list of health issues of the community. People want access to clean water, pediatricians, etc. It infuriates them when the government invests money in OPV but not in their basic needs." The respondents noted that the government did not take any serious steps to improve the basic health facilities in the rural areas, which resulted in the communities' lack of trust in the government. Specifically, the "war on terror" left many health care facilities in ruins and basic services were not available to rural community dwellers. Participants also reported that the resistant parents in their community were unable to comprehend why the government was focusing so much on a disease that was less pressing than other health issues. A reporter noted: "they [community members] say that there are other diseases that are killing people and government is ignoring those issues, so why so much focus on polio vaccine?" A participant described his interactions with OPV-skeptical parents as follows: "People ask if there are diseases that kill more people than polio, for example, cancer and other diseases, then why do the government and international organizations spend so much money on polio vaccination campaigns? There is no outbreak of polio." Another respondent echoed the "invisibility" of polio in the opinions expressed by community members: "people do not see examples of polio in their everyday lives. However, they see children dying of diarrhea and women dying from pregnancy or delivery complications."

3.4.2. Communities' use of OPV as a leverage to mobilize resources

The gap between the international and national resources that were mobilized to eradicate polio and the more-pressing local needs made parents see polio as a government/global health problem rather than a local one. Therefore, some parents refused to vaccinate their children as a form of political leverage to get the government to address their political/economic problems. A respondent said:

> Some families are demanding that the government build roads in their areas and only then they will vaccinate their children. Recently, around 280 families in the suburbs of Peshawar demanded that the government close the factories in their neighborhood that produces pollution and then they will vaccinate their children.

Hence, the lack of basic health services in Pakhtun communities created mistrust and motivated parents to use OPV-related decisions as leverage to obtain other community health needs.

3.4.3. Religious and politically motivated OPV skepticism and resistance

The participants described a complex relationship between religious beliefs and OPV skepticism and resistance as barriers and facilitators to OPV. Specifically, they described an environment in which religion and politics were inseparable, and parents were often pawns in a larger political game. Twenty-three participants stated that different rumors were strategically spread about OPV as part of larger political efforts related to the security situation in the country due to the ongoing war on terror. Participants shared that rumors that described OPV as a conspiracy against Muslims were initially floated by Nigerian doctors in support of a religious Pakistani party, with one journalist saying the following:

> In 2004–05 a team of African doctors visited Pakistan ... and held a press conference in which they claimed that ... the vaccines make the girls attain puberty before the natural time frame and decrease immunity in the body. A lawyer then filed a case in the Peshawar High Court [against administration of OPV].

These rumors were strategically propagated by local religious scholars who claimed that the U.S. and other Western countries were using OPV to control the Muslim population and as a tool of espionage. The respondents believed the ongoing "war on terror" in the region was a significant reason behind the opposition of religious people. The opposition, according to them, was mostly from Deobandi religious scholars, a religious faction of Muslims closely associated with, and proponents of, the cause of the Taliban and al-Qaeda, who were proponents of the cause of the Taliban.

For example, a participant noted: "Initially, Mullah Fazlullah [a leader of an Islamist, Taliban-related militia] banned vaccination. Now there is no more forced boycott of vaccination after the Taliban were defeated in the region. However, still there are religious extremists who oppose vaccination." He continued: "Poor people cannot decide on their own. They hear about vaccination from extremists that the vaccination is *haram* [forbidden in Islam] and it's a Western conspiracy, or it is used for family planning." He explained that a combination of low literacy among these communities and mistrust in international and governmental organizations creates reliance on religious leaders who oppose OPV.

3.4.4. The fall of the Taliban as a facilitator of OPV campaigns

The participants described a decrease in religious resistance to OPV. They attributed this decrease to the defeat of militants and to the involvement of religious scholars in polio vaccination campaigns since 2014. They noted that when the Pakistan military launched a military operation in the tribal districts of KP, the residents of the areas moved to major cities where the government vaccinated their children. Once these families moved back to their towns after the successful completion of the military operation, the polio vaccination teams could visit their houses without facing any threats. A participant described how in 2012, a militant commander banned OPV in North Waziristan:

> When the ban was imposed the number of polio-affected children increased [58 cases across the country, 20 in the KP Tribal Districts]. When people were shifted to the camps, they were properly vaccinated and the number of polio cases dropped to 0 in [in that area] in 2016.

3.4.5. Involvement of religious leaders in OPV campaigns

Participants noted that the involvement of religious scholars in the OPV campaigns also helped the cause of polio eradication. As one participant noted, "now the government has involved religious scholars like Maulana Samiul Haq [a Deobandi religious leader who had close contacts with militants]. The involvement of the religious scholars has decreased the number of non-compliant parents." Another participant echoed that opinion, emphasizing that this strategy was effective among OPV-hesitant parents:

> The involvement of religious scholars has decreased resistance to polio vaccination. Notably, the participation of religious scholars in the polio vaccination has worked with the parents who were confused about whether to vaccinate their children based on religious concerns. However, the staunch opponents of polio vaccine still resist vaccination.

The above quote reflects the effectiveness of the strategy of involving religious leaders as pro-OPV advocates, but also its limitation in breaking down resistance among parents who are strong opponents. Moreover, participants noted that involving religious leaders on a small scale often backfired, as their opponents rejected the same pro-OPV messages they endorsed. A participant explained:

> The government did not involve the religious scholars on a large scale ... If you hire and compensate one scholar from a particular faith or school of thought [to endorse OPV], others start campaigning against OPV just because their enemy was the representative of the campaign.

These participants believed that the failure of the government to involve more religious scholars from local communities was a significant gap in the polio eradication effort.

4. Discussion

This study is the first to explore perceptions of Pakhtun journalists in KP regarding OPV. Specifically, we examined their personal views as well as their insights about the barriers and facilitators that influence vaccine acceptance in their communities. Our findings show that, overwhelmingly, journalists who cover health topics in KP see the poliovirus as a danger to children and believe that the vaccine is efficacious. These beliefs are consistent with the biomedical model [43] and motivated them to vaccinate their own children. Moreover, our participants voiced perceptions consistent with public health models that do not view individuals' health in isolation, but instead as part of a community's health. Consistent with the SEM, they described different levels, from intrapersonal to political, as mutually influential in facilitating or hindering polio vaccination. While they advocated for the vaccine in their social networks, they also identified with other community members and viewed other public health issues, including child mortality, as more pressing than polio. They articulated different community priorities and needs in ways that are consistent with public health models, emphasizing the overall health of the public and considering social factors that contribute to health and disease prevention [44].

As experts on local media, participants described media organizations publishing inaccurate or false information about OPV. Research by Obregón and Waisbord [36] similarly found that Nigerian and Indian media spread rumors about OPV that resulted in increased resistance to the vaccine in their own countries. In addition to extending this phenomenon to the Pakhtun context, our analysis underscored the interpersonal and organizational processes that lead to the creation of such "fake news." Furthermore, participants highlighted the low health literacy rate of journalists as a major barrier to accurate and comprehensive polio-related coverage. Moreover, consistent with our participants' reports, we identified press releases as potentially important factors in polio-related coverage. This importance was previously documented in Western contexts only [34,45].

As a unique contribution, our findings have implications for the applicability of the SEM in capturing perceptions of journalists in non-Western countries. Whereas the SEM categorizes community and policy as two separate levels [37], our participants described community-level factors that were inseparable from the policy level. For instance, they described different stages in the "war on terror" that influenced polio vaccine uptake. Similarly, while our participants supported OPV, they also related to community members' concerns and identified with their goals.

One of the most notable findings of this study relates to participants' attributing much of the OPV resistance and hesitancy to a difference in priorities between local communities and the government that leads to mistrust in the OPV. These findings were consistent with previous studies [19,46–49] that regarded structural problems such as lack or non-existence of basic health services as major reasons for the resistance to OPV.

Consistent with previous studies [50–54], our participants identified religious beliefs, lack of knowledge, and lack of trust in the government and its international partners as the reasons for resistance to OPV. In contrast to those studies, our participants were able to provide nuanced perspectives on the interrelationships between these concepts. According to our participants, religious beliefs are not independent of the overall political situation or from the lack of resources that drive OPV resistance. Moreover, they perceived involvement of religious scholars from the Deobandi school of thought in the OPV campaigns as showing promise in increasing OPV acceptance. Whereas this finding was consistent with previous studies that showed that involvement of religious scholars helps decrease resistance to OPV [55,56], our findings point that there is room for improvement in that strategy. The involvement of nationally reputable scholars caused resentment among local scholars, who felt left out and therefore opposed OPV.

4.1. Recommendations

Our findings point at ways that local governments and UNICEF may be able to improve advocacy, including media coverage of OPV. Although training are available for some journalists [23,24], most of our participants were not invited to attend such trainings, and the few who were able to attend noted that the sessions were

often ineffective: they did not address their information needs or their professional identity as autonomous reporters. In view of our findings that perceived low language competency and literacy level of journalists from small towns served as barriers in the effectiveness of these trainings, we propose that trainings should involve local journalists in the advocacy efforts and be tailored for them. Such trainings should increase journalists' health literacy levels, including their understanding of different issues related to OPV. They should be delivered in local languages and should be detailed enough to improve journalists' ability to address their communities' concerns properly. The trainings should also be respectful of the journalists' professional identity and autonomy in reporting, to avoid perceptions that they are being "bribed."

Our findings also highlighted structural barriers such as pressure from news rooms, lack of financial resources, and at times pressure from the media managers to not cover polio vaccination-related stories in details. UNICEF's collaboration with Voice of America could be a roadmap for resolving some of these issues. Voice of America in collaboration with UNICEF has hired a team of reporters dedicated to the coverage of polio vaccination in Pakhtun dominant areas. UNICEF could offer one- or two-years long fellowships to reporters from the high-risk districts of KP to report on polio vaccination. As a component of these fellowships, the reporters could sign agreements with the managers of these media outlets that the they would be given sufficient time each month to report on a number of stories on polio. The fellowship could include training and cover the expenses incurred by the reporters while working on polio-related stories.

Organizations working for polio eradication should also include local journalists and media managers in policymaking regarding OPV campaigns and media coverage. There is a need to alert media managers in the major cities about how their policies negatively affect less-privileged, peripheral areas. These health organizations should arrange workshops for media managers, owners, and reporters from the small towns of KP. A conversation among media owners, editors, and reporters from Pakhtunkhwa can help reduce disparities in the coverage of health between major cities and the peripheries. In addition, the government of Pakistan and its international partners need to improve the messages they send out through news reports, advertisements, and community mobilization efforts.

The communication experts working for polio eradication need to involve religious scholars from every mosque in localities where resistance is high. However, it is important to understand that involving renowned scholars may not work in some communities due to sectarian rifts and international lobbying within different sects. Moreover, UNICEF and other organization should communicate not only polio-related messages, but also increase their efforts in other health-related domains important to local communities, and share them with the community. Efforts to advance polio-vaccination should therefore be sensitive to other communities' needs particularly in in remote rural communities, to restore trust and facilitate collaborations.

4.2. Limitations

Our study is not without limitations. As it is a qualitative study, our findings may not be generalizable to all Pakhtun journalists. Quantitative methods such as cross-sectional surveys might recruit a larger number of participants and provide insights about the relationship between different variables such as journalists' demographics and their coverage of OPV. Similarly, as opposed to the self-reported measures employed in our study, future studies should explore actual reporting by journalists. Furthermore, ethnographic methods could capture the experiences of the journalists in more depth.

4.3. Conclusions

Our findings highlight the complexity of resistance to polio vaccination among Pakhtun communities and the media coverage of OPV. Future interventions should attempt to use different facilitators--most notably journalists' support for OPV and their prominence as health information sources in their communities--to advance OPV campaigns. Moreover, these interventions should utilize multilevel strategies to address the different levels of barriers, most notably lack of trust, due to neglect of more-pressing community health concerns.

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Declaration of Competing Interest

The authors have no conflicts of interest.

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