Communication Strategy for Effective Polio Vaccination: A Case Study of Dera Ismail Khan District

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Pakistan is among the two polio-endemic countries in the world and is still struggling to eradicate the poliovirus. Keeping in view the virus circulation the new communication strategy is specifically designed for the purpose to address all social values that cause refusing vaccination. It stresses the role of communication in building trust and strong bonds between the community and health workers. Communication is thought to be the basic pillar of the successful implementation of polio campaigns. This study is designed to review and analyze the sources of information regarding polio campaigns in district Dera Ismail Khan and the effectiveness of interpersonal communication in changing attitudes towards polio vaccination. A sample of 20 years and above was selected through a convenient sampling technique. The researcher used a closed-ended questionnaire to collect data. The result of the study suggests health workers/polio workers remain the main source of information regarding polio campaigns and local leaders shape a more positive attitude towards polio-vaccination as compared to mass media.

Introduction

Poliovirus invades the Central Nervous System and cause paralysis to the children up to fifteen years. In severe cases it affects the respiratory system and leads to death. Poliovirus enters the human body with polluted water or food (Global Polio Eradication Initiative, 20 Jan 2019). Polio virus can live and survive only in human body. Polio is an irreversible disease and can be prevented only by vaccinating the children with Polio Vaccine (Zaffran & Patel, 2016)).

There has been seen a growth in recent years in the efforts to eliminate polio by the government of Pakistan with the help of WHO and other partner organizations. The result of these efforts can be noted in the decreasing cases in the previous years, but unfortunately in 2019 the country is badly hit by the Wild Polio Virus with 147 registered cases. Pakistan needs more efforts to become a certified polio free nation.
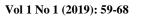
Communication can assist in mass awareness, creating and maintaining demand, avoiding and preventing propaganda against polio vaccine and encouraging vaccination. It is communication which helps in AFP surveillance and polio outbreaks (Waisbord, et al., 2010). Interpersonal communication is thought to be the suitable way of changing public opinion. Polio FLWs pay visits to each house hold during SIAs and is creating awareness in the community. This study is crucial in identifying the main sources of information regarding polio campaigns and the effectiveness of interpersonal communication in changing attitude towards polio vaccination. Findings of this research study are helpful in understanding how GPEI is improving the quality and impact of communication services to increase vaccination.

Literature Review

Attitude about Vaccination

Studies have emphasized the need to increase the communication skills of the health workers in persuading the parents and to change their attitude for OPV. Garon, et al (2016) suggested in their study converting the parent's attitude towards repeated vaccination it is necessary to study their minds and to prepare a constructive strategy for the fulfillment of their needs. Larson et al. (2018) explores, higher the exposure to media messages about benefits of vaccine higher will be the vaccination or acceptance towards vaccination. While if the audience are exposed to negative messages about vaccination their attitude will be negative. In a study Khowaja, et al. (2012) highlights these points about how to change the negative attitude and compel care givers for immunization.

- Evidence based motivation through radio, TV storytelling techniques and live shows can be used to reach and persuade targeted individuals for vaccination and to transform the negative attitude.
- Involving the famous and energetic individuals from the community who are well-linked with the opinion leaders can be the ideal faces in framing the positive attitude of the care givers about vaccine.
- Communicating the experts for answering the questions of the care givers about vaccine can boost the immunization and minimize the misconceptions about vaccine.
- The messages which educate the target audience about critical aspects effects people decision for vaccination more than other types of media messages.

Social Mobilization in Polio Eradication Initiative

A study found that house to house visits and mic announcements increased vaccination status in rural and urban areas in Mozambique (WHO 2018). Obregón et al. (2009) with the help of Social Mobilizers Pakistan has increased knowledge and adoption towards poliomyelitis and its oral vaccine in SM districts as compared to those deprived of social mobilization. According to Taylor and Shimp (2010) study, (SM) Social Mobilization activities had increased awareness regarding OPV in high and low risk zones. In SM area 78% of the respondents think after using oral polio vaccine their children are safe from virus as compared to 71% in the zones with no SM events. Global Polio Eradication Initiative technical brief: gender: Geneva: World Health Organization (2018) in the south east city of Kandahar Afghanistan nearly two thousand missed children was detected by female social mobilizers and got vaccinated for the first time. In Pakistan Community Based Vaccination was initiated in Karachi in 2014 where local ladies were involved for vaccination purposes that boost vaccination.

Abdulraheem et al. (2011) claims frontline polio workers are the main source of sharing information regarding vaccination. The study found, when interviewed in the villages of Nigeria, 72.2% of the mothers claimed they were informed by the polio health workers about immunization services. Hennessey, et al. (2000) door to door visits of the health employees is the main source of information to the general public about polio campaigns. Due to low educational level written communication was not successful informing people about polio campaigns in far flung areas of Sindh province. Khan, et al. (2015) found Health Care Workers being the part of society and the medium of information are aware of the polio but at the same time there is space in administering polio vaccine and misleading information to the families, can be the barrier in achieving polio eradication goal in Pakistan.

Role of Interpersonal Communication in Polio Eradication Initiative

Inter personal communication play pivotal role in persuasion and is considered effective and more powerful than mass media in creating awareness as it is done face to face or in dialogue. Rogers (1973) claims in his book (*communication of Innovations*) both mass media and inter personal communication plays vital role in disseminating/interpreting information. While writing the role of opinion leaders he further transforms Two Step flow Model into Multi Step Flow Model as the media messages are further spread by these leaders. Mass communication is effective in cognitive and inter personal communication in attitudinal level. Rice and Atkin (1994) conclude mass media increase the knowledge level and the attitude of the masses is changed by interpersonal communication. Rozario, et al. (2016) found mic announcements and health employees were the big source of information about polio campaigns. Bach et al., (2018) concludes in their study people are influenced by their friends, families and relatives in making negative attitude towards vaccine. This occurs not only face to face but through social networking sites as well. While hearing negative information about vaccine and vaccination they refuse to take it. Oluwadare (2009) those mothers who have poor level of education are at risk and can easily be misled by the religious scholars and community leaders.

Hypotheses

H1:   It is more likely that front line workers are the main source of information regarding polio campaigns as compared to media messages.

H2:   Interpersonal communication is more effective than mass media communication in changing attitude towards polio vaccination.

Methodology

This study adopted survey method and used cross sectional research design to collect fresh data through a closed ended questionnaire. In present study residents of District Dera Ismail district was the population. According to the criteria provided by Gay (2013) for population of more than 5000 people, sample of 400 is adequate. So a sample of 520 people was selected using convenient sampling technique. To ensure that respondents fill the questionnaire appropriately, each questionnaire was administered separately and the respondents were requested to fill the questionnaire at spot, the researcher will help them to sort out problem in filling the questionnaire if any. The face validity of the tool was checked. The results for all the questions and statements were above $r = 0.7$, which was above the satisfactory level.

Measurement of Concepts

In the present study, following questions were asked by the researcher to measure the variables/concepts/constructs of the study. Demographic variables for the study were gender, age, ethnicity, education, and residential pattern. These variables tried to understand how background information affects media consumption and or perception about polio vaccination.

1. Gender
        a. Male   b. Female

2. Age
        a. 20 to less than 30   b. 30 to less than 40   c. 40 to less than 50
        d. 50 to less than 60   e. 60 and above

3. Ethnicity
        a. Pashtun   b. Saraiki   c. Urdu Speaking   d. Other (specify)_____

4. Educational level
        a. Literate   b. Illiterate

5. Occupation
        a. Jobless   b. Govt: Employee   c. Self Employed   d. Laborer

6. Residential Pattern
        a. Rural   b. Urban

Attitude level of the respondents was measured by given statements using 5-point Likert Scale, ranging from, Strongly Disagree (1) to Strongly Agree (5).

Polio vaccine is safe for my children, Polio vaccine is Haram, Polio has adverse effects, Polio vaccine is linked with infertility, Polio vaccine is linked with AIDS, Polio is part of western agenda, Polio vaccination is not necessary, Only polio is being focused not other diseases, Polio vaccines are not capable of preventing the disease, Quality of vaccine is not well maintained, Excessive campaigns result in over dose.

Questions regarding demographic variables No.1 to 6 (stated above) of the respondents along with the following sources were asked to explore major source of information about polio.

1. Banners, 2. Booklets/Pamphlets, 3. Health Workers/Polio Workers,4. Internet/Social media,5. Newspapers,6. Radio,7. TV and 8. Any other (please specify…………………)

To measure the relationship between major source of information and attitude level (stated above) following question was asked from the respondents.

What encourages you the most towards Polio vaccination?

  a. Media Messages, b. Health Workers/Polio Workers, c. Relatives, d. Local Leaders. Any other (Please specify…………………………….)

Results

The results of the analysis are provided in an organized manner in order to give better understanding of the findings. Chi-square test was used for the first hypothesis and tested the major sources of information with the different demographics, while one-way ANOVA was used for hypotheses second. The alpha level is .05. The results are presented in three separate tables.

Table No 1: Association between various demographic variables and major source of information about polio vaccination

		Banner	Booklets/ Pamphlets	Health Worker	Internet/ Social Media	Newspaper	Radio	TV	Any Other	Total
Gender	Male	5	20	153	80	5	5	45	5	318
	Female	5	5	123	45	0	5	19	0	202
Age	20 to < 30	5	5	110	30	0	0	25	5	180
	30 to <40	5	5	63	40	5	0	14	0	132
	40 to <50	0	0	49	25	0	0	25	0	99
	50 to < 60	0	5	39	20	0	0	0	0	64
	60 & above	0	10	15	10	0	10	0	0	45
Ethnicity	Pashtun	5	15	83	65	5	0	10	0	183
	Non-Pashtun	5	10	193	60	0	10	54	5	337
Education	Literate	10	5	154	115	5	5	44	5	343
	Illiterate	0	20	122	10	0	5	20	0	177
Occupation	Jobless	5	10	108	30	0	5	20	0	178
	Govt: Employee	0	0	75	25	0	5	24	5	134
	Self Employed	5	10	54	60	0	0	15	0	144
	Laborer	0	5	39	10	5	0	5	0	64
Residency	Rural	10	10	231	85	5	10	54	5	410
	Urban	0	15	45	40	0	0	10	0	110
Total		10	25	276	125	5	10	64	5	520

Chi-square test of independence was used to measure association between different demographic variables and major source of information about polio vaccination. For

gender, χ^2 (7) = 17.62, p=.01, suggested that the association between gender and source of information about polio vaccination is significant, thus fail to accept the null hypothesis. Cramer's V=.18 show 18% of association between the two variables.

The above crosstab shows that health workers are the main source of information (male=153, female= 123) while, internet/social media is the second major source of information (male=80, female=45) and TV is the third major source of information for them (male=45, female=19).

For age, χ^2 (28) = 215.44, p=.00, suggested that the association between age and source of information about polio vaccination is significant, thus fail to accept the null hypothesis. Cramer's V=.32 show 32% of association between the two variables. For all age groups health workers are the main source of information about polio particularly the youngest group (20 to <30) highly depend on health workers (110). Similarly, the youngest group gets information about polio from internet/social media and TV with slight difference (30, 25).

For ethnicity, χ^2 (7) = 54.46, p=.00, suggested that the association between ethnicity and source of information about polio vaccination is significant, thus rejected the null hypothesis. Cramer's V=.32 show 32% of association between the two variables.

Health workers are main source of information for Pashtuns and non-Pashtuns (83,195) as the table shows. Internet/social media (65, 60) are the second major sources of information for them. While booklets/pamphlets (15) for Pashtuns and TV (54) for non-Pashtuns are the third major source of information.

For education, χ^2 (7) = 85.65, p=.00, suggested that the association between educational status and source of information about polio vaccination is significant, thus fail to accept the null hypothesis.

Cramer's V=.41 show 41% of association between the two variables. The table above shows that the health workers (Literate= 154, illiterate= 122) and internet/social media (Literate= 115, illiterate= 10) are the main source of information for people with different educational backgrounds respectively. TV is also the third major source of info for them (Literate= 44, illiterate= 20).

For Occupation, χ^2 (21) = 113.08, p=.00, suggested that the association between occupation and source of information about polio vaccination is significant, thus fail to accept the null hypothesis. Cramer's V=.27 show 27% of association between the two variables. The table shows that for all occupational background people health workers are the main source of information (jobless=108, Govt employees= 75, laborer=39) except self-employed (60), for whom internet/social media is the main source to get information about polio. For, jobless people (internet/social media= 30, TV=20) Govt employees (internet/social media= 25, TV=24), self-employed (health workers= 54, TV=15) laborer (internet/social media= 10, TV, booklets/pamphlets, newspaper =5)

For residential pattern, χ^2 (7) = 44.55, p=.00, suggested that the association between residential pattern and source of information about polio vaccination is significant, thus rejected the null hypothesis. Cramer's V=.29 show 29% of association between the two variables.

The crosstab shows that health workers are the primary source of information for rural (231) and urban (45) residents. Internet/social media (rural= 85, urban=40) is the second major source for getting information about polio while for rural (TV=54) and for urban (booklets/pamphlets= 15) are the third major sources of information about polio.

Therefore, the research hypothesis that "It is more likely that front line workers are the main source of information regarding polio campaigns as compared to media messages" is accepted.

Table No 2: Descriptive analysis of different sources of information and attitude level towards polio vaccination
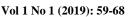
	N	M	S. D
Media Messages	50	3.67	.88
Health Workers/Polio Workers	187	3.37	.73
Relatives	35	3.30	.71
Local Leaders	20	2.07	.35
Any Other	228	3.70	.95
Total	520	3.49	.90

The descriptive analysis of five sources of information showed that the local leaders (M= 2.07; SD= .35) has lowest mean and standard deviation. The mean values of all the other sources of information are either higher Media Messages (M= 3.67; Any Other, M= 3.70) or lower (Health Workers/Polio Workers, M= 3.37; Relatives, M= 3.30) than the total mean value (M= 3.49) But all of them are higher than the mean and standard deviation value of local leaders. In the same way, the standard deviation of all the other groups except Any Other is higher than the total standard deviation. Local leaders, relatives and health workers/polio workers have comparatively lower mean value and standard deviation than others. This data revealed that Media messages, health workers/Polio workers and relatives develop positive attitudes about polio vaccination among the people as their mean values are higher than the midpoint of measuring scale. While the local leaders, with lower mean value than the midpoint of measuring scale, shape negative attitude among the people.

Table No 3: Difference among various sources of information regarding the effectiveness of attitudes towards polio vaccination

	SS	df	MS	F	Sig.
Between Groups	56.37	4	14.10	20.18	.000
Within Groups	359.71	515	.70		
Total	416.09	519			

To measure the attitude of people towards source of information about polio vaccination One-way ANOVA was used. At alpha=.05, the result suggested significant difference among various age groups [F (4,515) = 20.15, p=.000]. Post-Hoc test (Bonferroni) was used for multiple comparisons. This test showed that Local Leaders (M= 2.07; SD= .35) was significantly different from all other sources of information. There was no significant difference among the remaining sources of information. So, the research hypothesis (H2) of the present study that "interpersonal communication is more effective than mass media communication in changing attitude towards polio vaccination" is accepted and the null hypothesis that Interpersonal communication is not effective than mass media communication in changing attitude towards polio vaccination. These results recommend that the local leaders are comparatively more effective in changing attitude towards the polio vaccination than the other sources of communication.
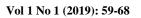
Discussion and conclusion

The researcher found majority of the respondents get information about polio campaigns through health workers visiting their houses. As compared to health workers/polio workers other sources of media are not much useful in getting information regarding polio vaccination. While internet and social networking sites are the second big source of information about polio. Chi-Square test used to test the association between demographics of the respondents and source of information and result showed that there is association between demographics and source of information thus 1st hypothesis of the study which states that frontline workers are the main source of information for people regarding polio campaigns than media, is accepted. Same was claimed by Abdulraheem et al. (2011) that 72.2% of the mothers were informed by the polio workers about immunization services. Rozario, et al. (2016) also proved that miss-announcements and health workers are the main source of information about polio. Same can be seen in the studies conducted in Mozambique and Kandahar Afghanistan where door to door visits of the health workers has increased polio vaccination. Similarly, the 2nd hypothesis of study emphasis on the role of interpersonal communication in changing attitudes towards Polio vaccination was also approved. As Rogers (1973) claims in his book (communication of Innovations) that both mass media and inter personal communication plays pivotal role in disseminating information. The study of Rice and Aktin (1994) concludes that mass media increase the knowledge level and the attitude of the masses is changed by inter personal communication.

The study also found media messages, polio workers and relatives develop positive attitude while local leaders shape negative attitude towards polio vaccination. Results suggest that interpersonal communication is more effective than any other mean of communication in changing the attitudes of the people toward polio campaigns. For information related to vaccinations, Mass Media Campaign is a common source for the general people (Sheikh, et al., 2013) while the most common reason in Pakistan and Nigeria for Non-Vaccination of the children is the lack of knowledge (Babalola, 2015). A study conducted in the northern region of Nigeria in 2010 to explore the role of mass media and interpersonal communication in the eradication of polio (Babalola, 2015). Results of the study indicate that interpersonal communication was much more effective when it was compared with the role of mass media. He further adds by stating the role of local communities was stronger in molding the opinion of the people when seen in the contrast with the effect of mass media. The present research study also considers the role of interpersonal contacts as it is proved that as compared to mass media local leaders are more effective in changing attitude towards polio vaccination.

Policy implications and research suggestions

From the knowledge gained through this study, hopefully more effective policies and programs can be introduced to eradicate and protect children from polio. Effective Communication should be taught to the front-line workers, so that they can counter the issues in the field related to vaccination more effectively. Government must earmark adequate budget for health communication to promote the health-related activities and to mobilize parents and reach every child in order to get maximum out-put. The number of female frontline workers should be increased. As the results

indicate that health workers are the main source of information for the people about polio and females have easy access inside homes. With more positive attitude and interpersonal communication skills better vaccination status can be achieved. The knowledge level of the local leaders through participation in workshops and media messages needs to be improved. As they have high influence that's why can largely enhance the vaccination process.

Present study was carried with a Non-Probability sampling and another study should be conducted using a probability sample to compare the results with the present study and to generalize the results on entire population. The present research study was limited to check the difference among the people of Pashtun and Non-Pashtun ethnicities. Another study should be carried out to explore the difference among other ethnicities of the city. Present study was carried out in the city of Dera Ismail Khan which is the mixture of different cultures whom share so many similarities. Future study should be conducted in a place where population is clearly heterogeneous.

Note: This research paper is part of MPhil thesis of Mr. Raz Muhammad

References

Abdulraheem, I. S., Onajole, A. T., Jimoh, A. A. G., &Oladipo, A. R. (2011). Reasons for incomplete vaccination and factors for missed opportunities among rural Nigerian children. *Journal of Public Health and Epidemiology*, *3*(4), 194-203.

Babalola, S. (2011). Maternal reasons for non-immunisation and partial immunisation in northern Nigeria. *Journal of Paediatrics and Child Health, 47*(5), 276-281.

Garon, J., Seib, K., Orenstein, W. A., Ramirez Gonzalez, A., Chang Blanc, D., Zaffran, M., & Patel, M. (2016). Polio endgame: the global switch from tOPV to bOPV. *Expert review of vaccines*, *15*(6), 693-708.

Hennessey, K. A., Marx, A., Hafiz, R., Ashgar, H., Hadler, S. C., Jafari, H., & Sutter, R. W. (2000). Widespread paralytic poliomyelitis in Pakistan: a case-control study to determine risk factors and implications for poliomyelitis eradication. *The journal of Infectious Diseases*, *182*(1), 6-11.

Khan, M. U., Ahmad, A., Aqeel, T., Akbar, N., Salman, S., &Idress, J. (2015). A cross-sectional survey of healthcare workers on the knowledge and attitudes towards polio vaccination in Pakistan. *PloS one*, *10*(11), e0142485.

Khowaja, A. R., Khan, S. A., Nizam, N., Omer, S. B., & Zaidi, A. (2012). Parental perceptions surrounding polio and self-reported non-participation in polio supplementary immunization activities in Karachi, Pakistan: a mixed methods study. *Bulletin of the World Health Organization*, 90, 822-830.

Larson, H. J. (2018). Politics and public trust shape vaccine risk perceptions. *Nature Human Behaviour, 2*(5), 316-316.

Napolitano, F., Della Polla, G., &Angelillo, I. F. (2019). Knowledge, Attitudes, and Behaviors of Parents towards Recommended Adult Vaccinations: An Explanatory Survey in the Geographic Area of Naples, Italy. *International Journal of Environmental Research and Public Health*, *16*(12), 2070.

Nigeria National Programme for Immunisation (NPI) et al. (1999). Communication for immunization and polio eradication in Nigeria: *A joint case study by NPI, WHO, USAID=BASICS and USAID=JHUPCS. NPI*, Nigeria.

Obregón, R., Chitnis, K., Morry, C., Feek, W., Bates, J., Galway, M., & Ogden, E. (2009). Achieving polio eradication: a review of health communication evidence and lessons learned in India and Pakistan. *Bulletin of the World Health Organization*, *87*, 624-630.

Oluwadare, C. (2009). The social determinants of routine immunisation in Ekiti State of Nigeria. *Studies on Ethno-Medicine, 3*(1), 49-56.

Polio cases in provinces, (2019).End Polio Pakistan. http://www.endpolio.com.pk/polioin-pakistan/polio-cases-in-provinces. Accessed 14 Jan 2019

Global polio eradication initiative, (2019). Available from: http://www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx Accessed January 14 2019.

Rice, R. E., &Atkin, C. K. (2009). Public communication campaigns: Theoretical principles and practical applications. *Media Effects* (pp. 452-484). Routledge.

Rogers, E.M. (1973). Communication Effects. *Lawrence Erlbaum Associates*, Publishers, UK.

Rozario, S., Omer, M. D., Gallagher, K., Aregay, A. K., Shikh Aden, B., & Mohamoud Abdi, S. (2016). The Polio Communication Network Contribution to the Polio Outbreak Response in Ethiopia's Somali Region, 2013– 2015. *Global Health Communication*, *2*(1), 39-49.

Sheikh, A., Iqbal, B., Ehtamam, A., Rahim, M., Shaikh, H. A., Usmani, H. A. ...&Wasim, W. (2013). Reasons for non-vaccination in pediatric patients visiting tertiary care centers in a polio-prone country. *Archives of Public Health, 71*(1), 19-32.

Tran, B. X., Boggiano, V. L., Nguyen, L. H., Latkin, C. A., Nguyen, H. L. T., Tran, T. T., ... & Ho, R. C. (2018). Media representation of vaccine side effects and its impact on utilization of vaccination services in Vietnam. *Patient preference and adherence*, *12*, 1717.

Taylor, S., & Shimp, L. (2010). Using data to guide action in polio health communications: experience from the Polio Eradication Initiative (PEI). *Journal of Health Communication*, *15*(S1), 48-65.

Waisbord, S., Shimp, L., Ogden, E. W., & Morry, C. (2010). Communication for polio eradication: improving the quality of communication programming through real-time monitoring and evaluation. *Journal of Health Communication*, *15*(S1), 9-24.

World Health Organization, & Global Polio Eradication Initiative. (2018). *Technical brief: gender* (No. WHO/POLIO/18.05). World Health Organization.