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ORIGINAL ARTICLE

Effect of Electronic and Social Media Messages on Typhoid Conjugate Vaccination Campaign

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ABSTRACT

Objective: To evaluate the role of electronic and social media in disseminating information to caregivers regarding a recent typhoid vaccination campaign.

Study Design: Cross-sectional, quantitative survey.

Place and Duration of Study: Karachi, between January - February, 2020.

Material and Methods: Interviews of 403 parents of children between 9 months to 15 years, receiving TCV vaccine in Karachi, were conducted using a structured questionnaire. Information was obtained regarding channels of information for the campaign focusing on electronic and social media messages and their effect on the uptake of vaccination. The most frequent medium of communication was also ascertained. Data analysis was done by SPSS version 21.

Results: Ninety six percent of respondents received campaign information and 80% got their children vaccinated. Frequency of messages received were from schools (51%), television (30%), WhatsApp (20%) and Face book (8.7%). Electronic media had a positive impact on decision making ($p>0.0001$). Social media messages by private groups, were also statistically significant in influencing decision making ($p>0.0001$). Certain visual messages propagated by unofficial sources on WhatsApp, produced uncertainty. Government sponsored social media messages were only generated as a reaction to anti-vaccine videos.

Conclusion: Government should do proactive advocacy using social media for fast, effective dissemination of messages and demand generation during health and vaccination campaigns.

Key Words: *Social media, Electronic media, Typhoid vaccination, Children, Immunization*

INTRODUCTION

With increasing emergence of antimicrobial resistance towards *Salmonella Typhi*, children under-15 years of age, across the globe, are more at risk of developing infections with a multi-resistant strain which would be life threatening. According to a WHO Report, since November

2016 onwards, Pakistan is facing a continuous surge of extensively drug-resistant (XDR) *Salmonella Typhi* infections, especially in children.¹

Since there are limited therapeutic options available for XDR typhoid infections, the best option is to prevent the risk of acquiring the

disease. Prevention can be achieved by utilizing prescribed sanitation, hygienic practices and techniques and through use of an effective vaccine.²⁻⁴ Pakistan is the first country in the world to introduce the World Health Organization (WHO) pre-qualified and recommended typhoid conjugate vaccine (TCV) into its routine immunization programme. It is the first typhoid vaccine that can be given to children as young as 6 months of age and confers longer-term protection against typhoid. The Government of Pakistan launched the TCV vaccine campaign between 18th - 30th November 2019, in the urban areas of Sindh Province.

With an aim to achieve maximum coverage of typhoid vaccination by the Expanded Program of Immunization, the Government disseminated information regarding the campaign through pamphlets, school messages, banners and through television. Minimal information was available in the social media and that only through personal groups.

Use of electronic media mostly television, radio and social media i.e. Facebook, WhatsApp, Twitter, Tik-Tok, YouTube or Instagram, have tremendously influenced our social lives in accessing information, in positive and negative manner.^{5,6} Parents and other members of our population are susceptible to incorrect or misleading medical information and it is the role of the Government health departments, physicians and other healthcare providers to make sure clients are provided with correct medical information to make informed decisions especially related to vaccination.⁷

There is a great need to evaluate the effectiveness of the use of social media (Facebook, WhatsApp, Twitter, YouTube or Instagram) as well as electronic media in decision making of caregivers during the TCV campaign in Sindh. No study has been undertaken on this subject. The present study was therefore, conducted in the city of Karachi using cross-sectional quantitative survey.

The study explored relationship of different channels of communication, especially electronic and social media on the decision making of parents in vaccinating their children with the new typhoid conjugate vaccine. Information resulting

from our study will be helpful for policymakers and caregivers in planning future campaigns or other health related messages using suitable media channels in an appropriate manner.

MATERIAL AND METHODS

A quantitative cross-sectional survey was undertaken using a structured questionnaire. The study population represented children vaccinated in Karachi. Informants were selected by a purposive sampling method, based on mobile numbers of respondents from Karachi. The data collection tool was a structured questionnaire aligned to the objectives of the study. It was pilot tested and finalized. The questionnaire was then utilized by trained interviewers. Interviews were conducted by telephone and some by face to face contact. The study obtained ethical approval from Institutional Ethical Review Board of SZABIST.

Sample size was calculated based on estimate of mobile phone users in Pakistan.⁸ Assuming a 5% margin of error and 95% CI with at least 50% response rate, a minimum sample size of 384 was calculated. To round-off the figure, the minimum sample size of 400 respondents was finalized. The level of significance was kept with p-value of less than 0.05.

Only caregivers of children eligible for vaccination as per government protocol for this vaccine, aged between 9 months to 15 years who were vaccinated in Karachi were recruited for this study. Purposive sampling was done of caregivers who had their children vaccinated in Karachi during the campaign. Those parents who did not give consent to participate were excluded. The level of education was grouped into those with no schooling, primary education, matriculation, intermediate education, graduates and post-graduates.

Data was collected by trained data collectors using telephonic and face to face techniques. It was individually documented onto a structured questionnaire having close ended questions to obtain yes/no answers. The data was then collated to obtain quantitative results.

Data Analysis was undertaken by SPSS. Results were expressed using frequency, percentages, median and standard deviation. For estimating relationship between different groups, chi-square

test was used. Data analysis was undertaken to identify the effect of social and electronic media on informing and decision making, regarding the uptake of TCV vaccine for their children. As a secondary outcome the study also determined which other means of communication were most frequently received by the respondents. Moreover, it was also attempted to determine if some messages contributed negatively towards decision making for uptake of TCV vaccine.

RESULTS

A total of 403 interviews were conducted of parents or care givers of children between the ages of 9 months to 15 years. Results of all interviews have been included in the analysis.

Sociodemographic profile of respondents: Table 1 provides the basic distribution of sociodemographic characteristics of the respondents. Of total interviews conducted, 96% of respondents had received information regarding the campaign. A total of 322 respondents had their children vaccinated during this typhoid vaccination campaign (80%). Similarly, 79 respondents did not vaccinate their children (19.7%). Of the ones who got their children vaccinated, 28.2% (n=91) were college graduates. Of those who did not get vaccination for their children, 34.2% (n=27), were also college graduates. The effect of education level of care

takers, on the outcome (vaccinating/not vaccinating their child), was not found to be significant ($p=0.8$), table 1 and 2.

Table 1 majority of the respondents were females, 78% of them being mothers of the children vaccinated.

TABLE 1: Sociodemographic profile of the respondents

Charac- teristics	Groups	Num- ber	Percen- tage	p value
Gender	Male	81	20.00	
Literacy level	Female	321	80.00	0.548
	Under matriculation	48	11.90	
	Matriculate	43	10.70	
	Intermediate	51	12.70	
	Graduate	118	29.40	0.8
	Master	99	24.60	
Age group	No formal schooling	43	10.70	
	18-28 years	106	26.30	
	29-38 years	184	46.00	
	39-48 years	100	25.00	0.186
Relationship with child	49-58 years	12	3.00	
	Mother	312	78.00	
	Father	81	20.00	
	Grand parent	3	0.75	0.218
	Aunt	6	1.50	

TABLE 2: Comparison of educational status and vaccination status

Did you vaccinate your child	Graduate (%)	Intermediate (%)	Masters (%)	Matric (%)	No Formal School (%)	Under- matric (%)	Total (%)	p- value
No	27 (34.20)	8 (10.10)	17 (21.50)	10 (12.70)	9 (11.40)	8 (10.10)	79 (100.00)	0.80
Yes	91 (28.20)	43 (13.30)	82 (25.40)	33 (10.20)	34 (10.50)	40 (12.40)	323 (100.00)	

The frequency distribution of various sources of information regarding the typhoid campaign is given in table 3. However, our data indicates that people received information from multiple sources. According to the results, 206 (51%) respondents received vaccination related information through messages from schools, of which 81% of such children were vaccinated. This

source of information did not seem to influence parents significantly in their decision to vaccinate their children ($p= 0.257$) as it was seen that even in those caregivers who did not receive a message from school, 82.7% vaccinated their children

TABLE 3: Frequency and level of significance of different mediums for propagation of information regarding TCV campaign (arranged in order to most influential)

	School (%)	TV (%)	Radio (%)	WhatsApp (%)	Facebook (%)	Twitter (%)	YouTube (%)	Instagram (%)
Number of received messages	206 (51.0)	120 (30.0)	6 (1.5.0)	79 (20.0)	35 (8.7)	2 (0.5)	2 (0.5)	5 (1.2)
'p' value	0.257	0.0001	---			0.0001		

Electronic media (television) was the next most frequent medium of information (30%) table 3. Of the total care givers who received information through this source, 99% vaccinated their children but of those who did not receive information through this source, only 74.3% vaccinated their children. This difference was statistically significant ($p>0.0001$), thus indicating that television was a very influential medium of information.

Similarly, out of the respondents who received messages through social media, WhatsApp (20%), Facebook (8.7%), 98.7% had their children vaccinated vs. 75.9% of those who did not receive messages through social media ($p>0.0001$). But it was also observed that a particular video on WhatsApp which went viral on the first day of the campaign had a very negative impact on majority of care givers who viewed this video.

DISCUSSION

The Sindh Health Department campaign for vaccinating children between 9 months to 15 years with the new conjugate typhoid vaccine was conducted in November 2019. According to government reports it was a successful campaign and resulted in immunizing 95% of the target population⁹ in urban communities of Sindh.

The majority of the caregivers in Karachi, received information through schools (51%). In other such reports of campaigns, where school going children were targeted to receive a vaccine, similar measures were used¹⁰⁻¹², with proven success. The impact of literacy level of care takers, on the outcome (vaccinating/not vaccinating their child), was, however, not found to be significant ($p=0.8$) in our study.¹³

The role of electronic media (radio and TV) has also been studied^{14,15} and found to be positive. Well designed, clear and informative messages can play an important role in vaccination campaigns.¹⁶ In our study, 30% of caregivers were exposed to messages from TV. Radio did not play a significant role, as only 1.5% of respondents heard specific messages for the campaign through radio channels. This is different from other campaigns which have been implemented, where radio messages were conducive in informing care-givers of children and achieving a positive response in complying with these messages.¹⁵ In urban areas of Pakistan, almost all homes even in squatter settlements have a TV in their house and therefore, radio is not a popular source of entertainment. The latter channel would probably be more important for rural populations.

The role of social media in informing recipients and convincing caregivers for obtaining a particular response with the message, has been widely studied.¹⁷⁻¹⁸ In most instances, Twitter and Instagram have been the usual mode of information exchange. But in countries such as Pakistan, India and Bangladesh, WhatsApp plays a major role in spreading information as well as misinformation, through videos.⁵ Other popular social media channels are You-tube, Tik-Tok and blogs.²⁰⁻²² In the present campaign, only 20% received messages through WhatsApp and 8.7% through Facebook, which were an influential medium of communication. But, a particular video on WhatsApp, which went viral on the first day of the campaign suggesting serious side effects of the TCV vaccine had a very negative effect on acceptance of the TCV vaccine. So much so that refusal for vaccinating children with TCV, increased exponentially after viewers saw this video. None of the messages on social media

were proactively generated from government sources, before the start of the campaign, but were initiated by the government sources as a reaction to the above mentioned video. It took almost a week, in a campaign lasting for 2 weeks only, especially in the metropolis of Karachi, for the campaign managers to overcome negative propaganda and misinformation regarding the TCV vaccine generated through social media.

Since 37.7% of population have access to 3G and 4G technology,²³ and almost all of them have access to WhatsApp and other social media applications, it would be important to utilize this medium proactively by the government, with clear scientifically correct messages for the public.

Some limitations of the present study include non-randomization of the study sample. Responses to questions failed to document the ages of children who did or did not receive vaccination.

CONCLUSION

It is important to state that in addition to campaign messages through electronic and print media, it is necessary for our health planners to increase transmitting videos and messages through all available social media channels which play a very important role on the spread of information or misinformation. It is an influential channel for disseminating accurate knowledge to the masses, specially because of wide access in our urban population to this medium of communication. On the contrary, misinformation through private sources have long term implications in increasing vaccine hesitancy, ultimately leading to an increase in the burden of diseases that are largely preventable.

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