Open Access

Original Article

Effect of Information Channels on Covid-19 Vaccine Acceptance Among University Students of Rawalpindi/Islamabad: A Cross Sectional Study

Shamaila Mohsin, Mamoona Zahoor, Syed Fawad Mashhadi, Muhammad Anees ur Rehman, Willma Naeem Abbasi, Rabiah Javaid, Zainab Imran, Usama Faiz

Army Medical College/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Objectives: To find the effect of information channels on Covid-19 acceptance among university students of Rawalpindi/ Islamabad.

Study Design: Cross sectional analytic study.

Place and Duration of Study: Study was conducted in four imminent Universities in Rawalpindi/Islamabad, Air University, Rawalpindi Medical University, Riphah University and Quaid-e-Azam University, Rawalpindi, from May to Aug 2022.

Methodology: Participants from four universities in Rawalpindi/Islamabad Pakistan, were recruited for this current research from May to August 2022. A sample size of 377±14 was computed using the Rao soft sample size calculator, maintaining a 5% margin of error and a 95% confidence interval a population proportion (50%). Non-probability convenient sampling was used. Data was analysed using SPSS version 26.

Results: There were 377 students recruited, out of which majority 207(55%) were female. Most of the students were in the Medicine and allied fields 227(60.2%). Almost, half of the respondents (44.56%) received information about the COVID-19 vaccine from mobile networks. The level of trust in vaccine information was also highest for Mobile Networks (31.30%). Participants' perceptions of the covid 19 risk, 156(41%) revealed high concerns for infecting family and friends with the virus. There was a significant association of female gender (p<0.05) and being from the Medicine and allied fields (p=p<0.05) with vaccine acceptance.

Conclusion: In our study the mobile and traditional media were reported as the main sources of information about the COVID-19 vaccination however they were not significantly associated with vaccine acceptance. Female gender, education level and being from the Medicine and allied fields was associated with intention to be vaccinated.

Keywords: COVID-19, Information channels, Mobile networks, Social media, Traditional media, Vaccination.

How to Cite This Article: *Mohsin S, Zahoor M, Mashhadi SF, Rehman MA, Abbasi WN, Javaid R, Imran Z, Faiz U. Effect of Information Channels on Covid-19 Vaccine Acceptance among University Students of Rawalpindi/Islamabad: A Cross Sectional Study. Pak Armed Forces Med J 2022; 72(Suppl-4): S693-697. DOI: https://doi.org/10.51253/pafmj.v72iSUPPL-4.9640*

INTRODUCTION

The World Health Organization (WHO) has identified that misinformation regarding vaccinations is linked to substantial negative effects on public health, including a decline in vaccination rates and an increased risk of disease outbreaks.[1] Evidence indicates that risk communication to the public has a profound impact on uptake of vaccination.[2] Studies have indicated that risk communication is implemented through different types of information channels such as traditional media, social media etc.[3] In Low Middle Income (LMIC) safety concerns, disseminated through various information sources, have resulted in a decline in vaccination coverage.[4,5] COVID pandemic has resulted in the increase use of information channels for risk communication.[6] Information has been made available on the type, efficacy and safety of different vaccines available in the COVID pandemic utilising different media channels.[7] Vaccine acceptance also stems from various factors including lack of information.[8] A study found that vaccine acceptance was linked to a lack of confidence in the seriousness of the COVID-19 situation, the vaccine's ability to control the pandemic, and a lack of confidence in the public autho-rities' ability to handle the pandemic due to the poor provision of information.[9]

Refusal to believe in evidence has also been linked to conspiracy theory. It was falsely reported that the virus originated from 5G wireless networks and was developed as a doomsday device.[10] Studies have also reported that the use of unreliable and scientifically unproven information through different media of information enhances hesitancy to the vaccine.[11] This has been especially observed in the use of mediums such as social media, blogs and video logs (v-logs).[11] In another study by Singh *et al*. It was observed that in the use of low-quality resources led to mis information regarding the use of vaccines.[12] This evidence was also

Correspondence: Dr Shamaila Mohsin, Department of Community Medicine, Army Medical College, Rawalpindi, Pakistan

supplemented in a comparative study conducted to analyse(YouTube, Reddit, Twitter, Instagram, and Gab) content and the spread of misinformation online that was observed to influence risk perception and vaccine hesitancy.[13]

Research also indicates that dependence on social media platforms was significantly associated with lower intention to get COVID-19 vaccines (19.8%) compared to dependence (47.2%) on medical doctors, scientists, and scientific journals.[9] In a study it was reported that, as opposed to social media, conventional me-dia, particularly national TV, national newspapers, and local newspapers, boosted the likelihood of COVID-19 vaccine uptake.[6] Social media could be used to raise public awareness of health issues and promote vaccine trust.[1] Risk perception is identified as being primarily influenced by the content, medium, and kind of risk warning information.[11] Warning messages are essential in risk communication because they educate and in-spire the public to take action to stop or lessen harm.[12]

In Pakistan, mobile and social media users are mainly the younger population and they access these media for information.[14] In Pakistan, SMS text messag-es and automated phonebased communication was sent during the pandemic regarding symptoms, hand washing and then vaccination. It was documented in a cross sectional study (between Jan-Mar 2021) at PIMS, Islamabad Pakistan that the majority of partici-pants (52.3%) learned about the COVID-19 vaccine from print and live news outlets as well as with social media (23%).[15] However, research gap exists to docu-ment the use of various information channels used for COVID-19 vaccine information in the students, the trust-worthiness of the information, and the relative effect on vaccination acceptance. In order to address this the study was conducted to find the effect of information channels on COVID-19 acceptance among university students of Rawalpindi/Islamabad Pakistan.

METHODOLOGY

A cross sectional study was conducted in four imminent universities in Rawalpindi/Islamabad, Air University, Rawalpindi Medical University, Riphah University and Quaid-e-Azam University, Rawalpindi Pakistan. This study was conducted from 31st May to August 2022. A sample size of 377±14 was computed using the Rao soft sample size calculator, maintaining a 5% margin of error and a 95% confidence interval a population proportion (50%). Non-probability convenient sampling was used.-

Inclusion Criteria: Under graduate and Master's university students were included in the study.

Exclusion Criteria: PhD and Post-doctorate students were excluded from the study.

The participants were sent a survey over Whats-app after it was created on Google Forms. The questionnaire consisted of four sections: a first section consisted of demographic variables such as age, eth-nicity, gender, education; a second section on the types of information channels used to collect information regarding the vaccine, how well each channel provided information and level of trust on information provided by respective channels; a third section on how one perceived the risk of getting the COVID-19 virus; and a fourth section on whether one was willing to get the COVID-19 vaccine. The IBM Statistical Package for the Social Sciences (SPSS) version 26 was used to enter and analyse all of the data collected via Google form. Categorical data were created out of continuous data. To calculate the means and standard deviations of continuous variables as well as the frequencies and percentages of categorical data, descriptive analysis was used. Keeping the significance level at p=0.05.

RESULTS

There were 377 students recruited in this current study, out of which 170(45%) were male and 207(55%) were female. Participants age was in the range of 18-27 years and mean age of participants was 22(SD=2.12). Most of the students were in the Medicine and Allied 227(60.2%) while the rest were from other fields (BA, MA, Engineering). Majority of students, 247(65.5%) were Punjabi, followed by 63(16.7%) were Pukhtun. There were 250(66.3%) participants, who already had received COVID-19 vaccine (Table-I).

Figure-1 shows that 168 respondents (44.56%) mentioned that they received information about the COVID-19 vaccine from mobile networks, whereas 134 respondents (35.54%) said they received it from traditional media.

Results showed that level of trust in vaccine infor-mation was highest for Mobile Networks 118(31.30%) and lowest for social media 47(12.47%). The majority of Mobile Network users 145(38.46%) reported that they heard positive reviews about the vaccine, compared to negative 03(0.8%) or neutral 20(5.30%). Overall, the level of trust in vaccine information was high for 183(48.54%) respondents, moderate for 116(30.80%), and low for 78(20.70%). As evident from Figure-2.

Table-I: Demographic Information of Respondents

Demographics Variables	Frequency (%)
Ethnicity	
Punjabi	247(65.52%)
Sindhi	28(7.4%)
Pakhtun	63(16.73%)
Balochi	10(2.65%)
Others	29(7.7%)
Gender	
Male	170(45.1%)
Female	207(54.9%)
Type of Students	
Medicine and Allied	227(60.2%)
Other Fields (BA, MA, Engineering)	150(39.8%)
Age	
18-22	226(59.94%)
23-27	151(40.06%)
Education	
MBBS	124(32.9%)
BDS	65(17.2%)
DPT	22(5.84%)
Bachelor	62(16.4%)
Master	53(14.1%)
LLB	15(3.98%)
Pharm D	16(4.28%)
Engineering	20(5.3%)
Vaccinated with the COVID Vaccine	
Yes	250(66.3%)
No	127(33.7%)

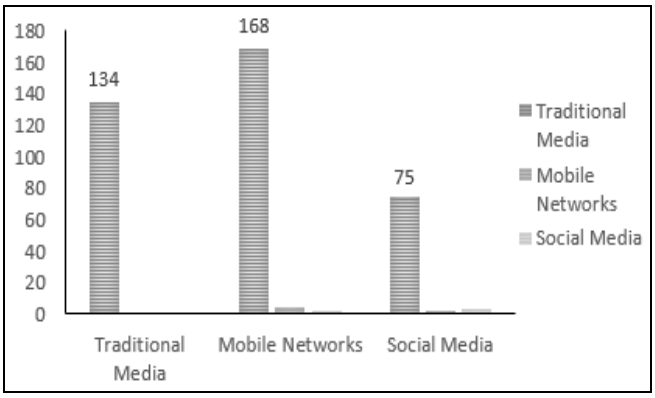

Figure-1: Frequency Distribution of Source of Information

According to information from the current study on participants' perceptions of the COVID-19 risk, 158(42%) reported moderate concerns for acquiring the infection at work, 186(49.2%) showed low concerns outside the workplace, and 156(41%) revealed high concerns for infecting family and friends with the virus. Only 97 people (25.7%) have had covid-19 infection in past, while 210 people (55.7%) had known someone who had died from COVID-19 illness, as shown in Figure-3.

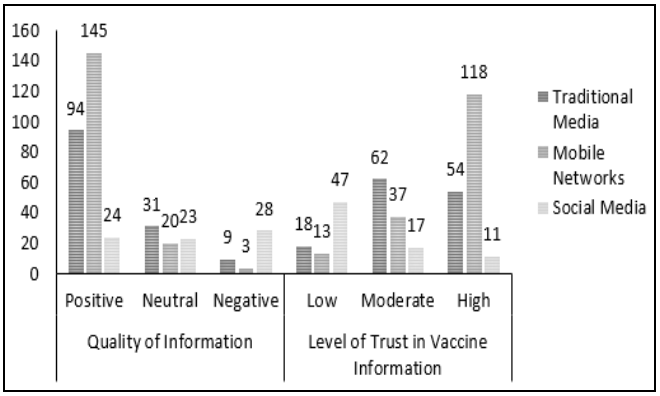

Figure-2: Comparison of Types of Information Channels with Quality and Level of Trust on Information Channels

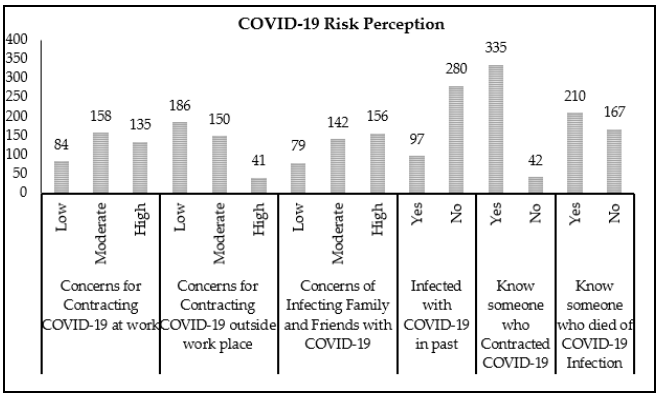

Figure-3: Frequency Distribution of Covid-19 Risk Perception

It is evident from Table-II, that out of 377 participants 201(81.4%) Punjabis, 179(79.2%) people of age between 18 to 22, 163(54.0%) who had already received vaccination and 234(77.5%) who had received other vaccine like flu vaccine, had more vaccine acceptance than other participants but showed non-significant association (p>0.05). Whereas female gender 176(85%), working in health sector 200(88%), MBBS education 112(90.3%) and social media information channel 47(63%) revealed significant association with vaccine acceptance (p<0.05). Despite of the fact majority of mobile users 142(84.5%) showed more vaccine acceptance ,but association analysis reported insignificant results.

DISCUSSION

To our knowledge this is the first multicentre study to document effect of information channels on COVID-19 vaccine acceptance among university students. In our study the mobile and traditional media were reported as the main sources of information about the COVID-19 vaccination. The result of our study was in contradiction to a study

conducted in the United States that concluded that the use of traditional channels of information, especially TV, newspapers, and local newspapers increased the likelihood of vaccine acceptance as compared to social media.[13] This was also documented in the study published in UK,[2] that emphasized the importance of traditional media over other medias that shared fact-based vaccine information linked to governmental, healthcare, or academic data and reports. The disparity in our results may be due to the use of automated phone-based communication & test messages that was being sent by the government to all the mobile users.

Table-II: Association of Vaccine Acceptance with Demo-graphic Variables and Types of Information Channels

Demographics	Vaccine Acceptance		*p*- value
	Yes (n=302)	No(n=75)	
Ethnicity			
Punjabi	201(81.4%)	46(18.6%)	0.21
Sindhi	21(75%)	07(25%)	
Pakhtun	45(71.4%)	18(28.6%)	
Balochi	09(90%)	01(10%)	
Others	26(89.7%)	03(10.7%)	
Total	302(80.1%)	75(19.9%)	
Gender*			
Male	126(74%)	44(16%)	0.008*
Female	176(85%)	31(15%)	
Health Sector*			
Part of health sector	200(88%)	27(12%)	0.001*
Other than health sector	102(68%)	48(32%)	
Age			
18-22	179(79.2%)	47(20.8%)	0.59
23-27	123(81.5%)	28(18.5%)	
Education*			
MBBS	112(90.3%)	12(9.7%)	0.001*
BDS	53(81.5%)	12(18.5%)	
DPT	19(86.4%)	03(13.6%)	
Bachelor	31(50%)	31(50%)	
Master	42(79.2%)	11(20.8%)	
LLB	12(80%)	03(20%)	
Pharm D	16(100%)	00	
Engineering	17(85%)	03(15%)	
Have you already received the COVID-19 Vaccine?			
No	139(46.0%)	29(38.7%)	0.25
Yes	163(54.0%)	46(61.3%)	
Did you receive any other vaccine this year? (e.g., Flu)			
No	234(77.5%)	57(76%)	0.78
Yes	68(22.5%)	18(24%)	
Information channels			
Mobile networks	142(84.5%)	26(15.5%)	0.127
Traditional media	113(84%)	21(16%)	0.054
Social Media*	47(63%)	28(37%)	0.001*

**p-value< 0.05 is statistically significant*

However, similar to other evidence there was minimal reliance on social media for vaccine information in our study. As was documented in a study conducted in Saudi Arabia to determine the effect of social media on COVID-19 vaccination that revealed that majority (74.6%) of the participants agreed that social media had led to mis-information regarding the COVID-19 vaccine.[3] Another study conducted in Australia stated that on social media vaccination promotion faced a variety of obstacles, such as false information, anti-science sentiment, and a convoluted vaccination narrative.[16] In the present study gender (female), education level and being from the health sector were associated with intention to be vaccinated. This finding was similar to the sociodemo-graphic factors such as gender, age, education, and occupation that were linked to vaccination accepta-bility in India.[17] Another similar study reported that the most important variables associated with willing-ness to use COVID-19 vaccines were age, gender, education level, race/ethnicity.[18,19] Contrary to current study, one cross section study in Greece revealed ma-les reported more vaccine acceptance than females.[20]

According to the source of information the participants' perceptions of the COVID-19 risk, in our study reported moderate concerns for acquiring the infection at work and high concerns for infecting family and friends with the virus. This was also according to the results reported in a similar study that vaccine information provided by information channels may be more strongly linked to risk perception and vaccination related behaviour.[13]

This study sought to assess the effect of information channels for promoting vaccination acceptance among students in an urban setting (Rawalpindi and Islamabad). This study can be emulated in a rural setting to observe the contrast and similarity of the findings. Traditional media channels are also accessible online, and their content on the COVID-19 vaccine is free for public viewing. Qualitative studies can be conducted to assess the audience perceptions regarding the content information being provided regarding vaccine acceptance in these channels in the future. Traditional media platforms that promote vaccination uptake and combat false information should combine scientific data with audience perceptions that increase vaccine promotion and their own credibility. Information channels should keep promoting to their viewers data-driven and genuine vaccine content. Social media could be used to raise public awareness of health issues and promote vaccine trust.

ACKNOWLEDGMENT

The Army Medical College and National University of Medical Sciences are to be acknowledged by the authors for giving them the chance to conduct this research.

LIMLTATIONS OF STUDY

The study did have certain limitations; firstly, the study's sample was limited majority to undergraduate students at Rawalpindi's medical and non-medical universities, it cannot be generalised to the whole country. Secondly, this was a cross-sectional study and is a weak study design it can be followed by a longitudinal study design. Thirdly this study did not evaluate the cumulative effect of getting information from multiple channels or the frequency of information from a given channel.

CONCLUSION

In our study the mobile and traditional media were reported as the main sources of information about the COVID-19 vaccination, however they were not significantly associated with vaccine acceptance. Female gender, education level and being from the Medicine and allied fields was significantly associated with vaccine acceptance. COVID -19 risk perception revealed that based on the information majority of the participants expressed greater risk about their family and friends contracting the virus.

Conflict of Interest: None

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SM: Supervision, Conception, Study design, analysis and Interperitation of data, Critically reviewed manuscript & approval for the final version to be published.

MZ: Co-supervision, Data entry, analysis and interpretation, manuscript writing & approval for the final version to be published.

SFM: Critically reviewed, Drafted manuscript & approval for the final version to be published.

MAR: Data colllection, Entry and analysis of data, preparation of rough draft & approval for the final version to be published.

WN:, RJ:, ZI:, UF: Data collection and entry & approval for the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Puri N, Coomes EA, Haghbayan H, Gunaratne K. Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases. Hum Vaccin Immunother 2020; 16(11): 2586-2593.
2. Nielsen R, Fletcher R, Newman N, Brennen J, Howard P. Navigating the 'infodemic': How people in six countries access and rate news and information about coronavirus: Reuters Institute for the Study of Journalism 2020, [internet] available at: https://www.comminit.com /content/posnavigating-infodemic-how-people-six-countries-access-and-rate-news-and-information-about
3. Alfatease A, Alqahtani AM, Orayj K, Alshahrani SM. The Impact of Social Media on the Acceptance of the COVID-19 Vaccine: A Cross-Sectional Study from Saudi Arabia. Patient Prefer Adherence 2021; 15(1): 2673-2681.
4. Andre FE, Booy R, Bock HL, Clemens J, Datta SK, John TJ, et al. Vaccination greatly reduces disease, disability, death and inequity worldwide. Bull World Health Organ 2008; 86(2): 140-146.
5. Gesser-Edelsburg A, Diamant A, Hijazi R, Mesch GS. Correcting misinformation by health organizations during measles outbreaks: A controlled experiment. PLoS One 2018; 13(12): e0209505.
6. Piltch-Loeb R, Savoia E, Goldberg B, Hughes B, Verhey T, Kayyem J, et al. Examining the effect of information channel on COVID-19 vaccine acceptance. PLoS One 2021; 16(5): e0251095.
7. Hong J, Xu XW, Yang J, Zheng J, Dai SM, Zhou J, et al. Knowledge about, attitude and acceptance towards, and predictors of intention to receive the COVID-19 vaccine among cancer patients in Eastern China: A cross-sectional survey. J Integr Med 2022; 20(1): 34-44.
8. Albahri AH, Alnaqbi SA, Alshaali AO, Alnaqbi SA, Shahdoor SM. COVID-19 Vaccine Acceptance in a Sample From the United Arab Emirates General Adult Population: A Cross-Sectional Survey, 2020. Front Public Health 2021; 9(1): 614499.
9. Sallam M, Dababseh D, Eid H, Hasan H, Taim D, Al-Mahzoum K, et al. Low COVID-19 Vaccine Acceptance Is Correlated with Conspiracy Beliefs among University Students in Jordan. Int J Environ Res Public Health 2021;18(5): 2407
10. Imhoff R, Lamberty P. A bioweapon or a hoax? The link between distinct conspiracy beliefs about the coronavirus disease (COVID-19) outbreak and pandemic behavior. Social Psychol Personal Sci 2020; 11(8): 1110-1118.
11. Guo Y, An S, Comes T. From warning messages to preparedness behavior: The role of risk perception and information interaction in the Covid-19 pandemic. Int J Disaster Risk Reduct 2022; 73(2): 102871.
12. Rahn M, Tomczyk S, Schopp N, Schmidt S. Warning Messages in Crisis Communication: Risk Appraisal and Warning Compliance in Severe Weather, Violent Acts, and the COVID-19 Pandemic. Front Psychol 2021; 12: 557178.
13. Margolis MA, Brewer NT, Shah PD, Calo WA, Gilkey MB. Stories about HPV vaccine in social media, traditional media, and conversations. Prev Med 2019; 118: 251-256.
14. Al-Wutayd O, Khalil R, Rajar AB. Sociodemographic and Behavioral Predictors of COVID-19 Vaccine Hesitancy in Pakistan. J Multidiscip Healthc 2021; 14(1): 2847-2856.
15. Chaudhary FA, Ahmad B, Khalid MD, Fazal A, Javaid MM, Butt DQ. Factors influencing COVID-19 vaccine hesitancy and acceptance among the Pakistani population. Hum Vaccin Immunot 2021; 17(10): 3365-3370.
16. Steffens MS, Dunn AG, Wiley KE, Leask J. How organisations promoting vaccination respond to misinformation on social media: a qualitative investigation. BMC Public Health 2019; 19(1): 1348-1350.
17. Joshi A, Kaur M, Kaur R, Grover A, Nash D, El-Mohandes A. Predictors of COVID-19 Vaccine Acceptance, Intention, and Hesitancy: A Scoping Review. Front Public Health 2021; 9(1): 698111.
18. AlShurman BA, Khan AF, Mac C, Majeed M, Butt ZA. What Demographic, Social, and Contextual Factors Influence the Intention to Use COVID-19 Vaccines: A Scoping Review. Int J Environ Res Public Health 2021; 18(17): 9342-9345.
19. Biswas MR, Alzubaidi MS, Shah U, Abd-Alrazaq AA, Shah Z. A Scoping Review to Find Out Worldwide COVID-19 Vaccine Hesitancy and Its Underlying Determinants. Vaccines (Basel) 2021; 9(11): 1243-1245.
20. Galanis P, Vraka I, Katsiroumpa A, Siskou O, Konstantakopoulou O, Katsoulas T, et al. Predictors of Willingness of the General Public to Receive a Second COVID-19 Booster Dose or a New COVID-19 Vaccine: A Cross-Sectional Study in Greece. Vaccines (Basel) 2022; 10(7): 1061-1065.