Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i6.6909

KNOWLEDGE, ATTITUDE AND PRACTICES ABOUT COVID VACCINATION AMONG RURAL AND URBAN POPULATION

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Abstract

Introduction: In the current phase of widespread availability of safe and effective COVID-19 vaccines, the subsequent challenge lies in addressing vaccine hesitancy and dispelling prevalent myths surrounding vaccination. The aim and objective of this study are to investigate the knowledge, attitudes, and practices concerning COVID vaccination within both rural and urban populations.
Material and Methods: The study employs a pre-designed semi-structured questionnaire as its primary tool, adopting a cross-sectional design. The targeted study population includes 250 individuals from both urban and rural areas within the vaccination age group. Inclusion criteria encompass individuals aged 20 and above who willingly participate, while exclusion criteria involve those who decline participation.
Results: The study, with a mean participant age of 37.15±4.3 years, revealed an educational distribution where 57.8% were graduates. Notably, 69.6% of graduates were from urban areas, indicating significant urban-rural disparities. A male preponderance was observed, with higher proportions of females in rural and males in urban areas. Vaccination status showed that approximately 78.6% had received two doses, with higher unvaccinated individuals in urban areas. Urban regions exhibited higher knowledge levels, with 59.2% awareness of COVID-19 vaccine preparation and statistically significant awareness of three doses (40%) and variants (83.6%). Urban residents also displayed a strong belief (91.6%) that COVID vaccines were provided free of cost. Urban areas demonstrated proactive preventive behaviors, including adherence to precautions (87.6%) and booster doses (75.6%) after the second vaccine dose. In contrast, rural regions exhibited a lower readiness for vaccination, with 47.6% willingly receiving the vaccine.
Conclusion: Overall, this study provides valuable insights into the dynamics of COVID-19-related factors in both urban and rural populations, offering a foundation for targeted interventions, policy adjustments, and further research endeavors.

Keywords: COVID-19, Vaccination, awareness, Knowledge, booster dose

Introduction

In the current phase of widespread availability of safe and effective COVID-19 vaccines, the subsequent challenge lies in addressing vaccine hesitancy and dispelling prevalent myths surrounding vaccination.[1] It is imperative to implement appropriate measures to counter the dissemination of false information related to COVID vaccination. Receiving a COVID vaccine not only reduces the risk of severe illness following a COVID-19 infection but also contributes to the protection of those in our immediate vicinity, especially vulnerable individuals such as the elderly and those with compromised immune systems. As COVID-19 can lead to severe complications and even death, the absence of specific treatments underscores the pivotal role of vaccines. Unlike symptomatic treatment protocols, vaccines offer a proactive approach by allowing the body to build immunity through the creation of antibodies without subjecting individuals to the detrimental effects associated with the actual diseases.[2,3]

The World Health Organization (WHO) is actively collaborating with partners to tirelessly develop, manufacture, and deploy safe and effective vaccines. While these vaccines represent a transformative tool in our fight against the pandemic, it is crucial to recognize that, for the foreseeable future, maintaining other preventive measures is imperative. This includes the continued use of masks, regular hand hygiene, ensuring proper indoor ventilation, practicing physical distancing, and avoiding large gatherings.[4] It is vital to emphasize that being vaccinated does not grant immunity from exercising caution.[5,6] The responsibility to adhere to preventive measures remains crucial, as these measures collectively contribute to the broader goal of protecting ourselves and others. In essence, while vaccines are a game-changing tool, the comprehensive strategy for combating COVID-19 entails a multi-faceted approach that includes vaccination along with the continuation of established preventive measures.[7] The aim and objective of this study are to investigate the knowledge, attitudes, and practices concerning COVID vaccination within both rural and urban populations.

Material and Methods

The study employs a pre-designed semi-structured questionnaire as its primary tool, adopting a cross-sectional design. The targeted study population includes 250 individuals from both urban and rural areas within the vaccination age group. The sample size was arrived using dobson formula for sample size calculation with prevalence of 80% response rate.[8] Inclusion criteria encompass individuals aged 20 and above who willingly participate, while exclusion criteria involve those who decline participation.

The study protocol involves obtaining approval from the institutional ethical committee prior to initiation. Following this, informed consent is secured from participants, and the questionnaire is administered to both rural and urban populations, even in the local language if necessary. Participants are given sufficient time to complete the questionnaire, with the option to withdraw from the study freely. The study's implications are threefold: firstly, to assess knowledge about COVID vaccination among rural and urban populations; secondly, to raise awareness about myths and misconceptions related to COVID vaccination; and thirdly, to recommend the health education department to conduct various awareness programs through mass media and local authorities, enhancing overall awareness and motivating individuals to get vaccinated.

Descriptive statistics were reported as mean (SD) for continuous variables, frequencies (percentage) for categorical variables. Chi square was used to find the association between categorical variables. Data were statistically evaluated with IBM SPSS Statistics for Windows, Version 26.0., IBM Corp., Chicago, IL.

Results

The study participants had a mean age of 37.15±4.3 years, with educational distribution revealing that 57.8% were graduates, 19% had completed secondary schooling, 8.2% had finished primary

schooling, and 15% had attained post-graduation. A notable 69.6% of the graduates were from urban areas, while only 46% were from rural areas, demonstrating statistical significance. The study exhibited a male preponderance, with a higher proportion of females in rural areas and males in urban areas. In terms of vaccination status, approximately 78.6% had received two doses, 15% had received a single dose, and 6.4% remained unvaccinated, with a higher number of unvaccinated individuals observed in urban areas compared to rural areas (Table 1).

Table 1: Distribution of demographic details among the study participants (N=500)

Slno	Variable	Rural	Urban	Total	p
1	**Education**				
	Primary schooling	27 (10.8)	14 (5.6)	41 (8.2)	
	Secondary schooling	62 (24.8)	33 (13.2)	95 (19)	<0.001
	Graduation	115 (46)	174 (69.6)	289 (57.8)	
	Post-graduation	46 (18.4)	29 (11.6)	75 (15)	
2	**Gender**				
	Male	96 (38.4)	121 (48.4)	283 (56.6)	
	Female	154 (61.6)	129 (51.6)	217 (43.4)	0.03
3	**Vaccination status**				
	Two doses taken	18 (7.2)	14 (5.6)	393 (78.6)	
	Single dose taken	55 (22)	20 (8.0)	75 (15)	
	Not all vaccinated	177 (70.8)	216 (86.4)	32 (6.4)	<0.001

Urban areas showed a relatively higher level of knowledge about COVID-19 vaccine preparation at 59.2%, although this difference was not statistically significant. In urban areas, 40% of individuals were informed about the three doses of COVID-19 vaccination, and this finding was statistically significant. Similarly, 83.6% of urban residents were aware of COVID-19 variants, and a significant proportion (91.6%) believed that COVID vaccines were provided free of cost in urban areas. Awareness about COVID vaccination locations, such as subcentres, primary health centres, and anganwadi, was noted among 48.8% of urban residents. Additionally, 84.4% of individuals in urban areas were aware that those suffering from blood pressure and diabetes could receive vaccinations. Approximately 16.8% of urban residents were aware of specific cures for COVID-19. Moreover, 74.8% of urban residents believed that vaccinated individuals gain protection from COVID. Regarding concerns about side effects, 58.4% of urban residents and 40.8% of rural residents thought that COVID vaccination could cause side effects. In rural areas, 54.4% believed that individuals tested positive for COVID should be reported to the local health worker (Table 2).

Table 2: Distribution of knowledge about COVID vaccination among rural and urban population (N=500)

Slno	Variable	Rural (n=250)	Urban (n=250)	Total	p
1	**Covid-19 vaccine Preparation**				
	Yes	133 (53.2)	148 (59.2)	219 (43.8)	0.207
	No	117 (46.8)	102 (40.8)	281 (56.2)	
2	**Doses of covid-19 vaccination**				
	1	28 (11.2)	6 (2.4)	34 (6.8)	
	2	131 (52.4)	137 (54.8)	268 (53.6)	
	3	80 (32)	100 (40)	180 (36)	
	4	11 (4.4)	7 (2.8)	18 (3.6)	0.001
3	**Covid-19 variants**				
	Yes	165 (66)	209 (83.6)	126 (25.2)	

	No	85 (34)	41 (16.4)	374 (74.8)	0.001
4	**Covid vaccine given free of cost**				
	Yes	191 (76.4)	229 (91.6)	420 (84)	
	No	59 (23.6)	21 (8.4)	80 (16)	0.001
5	**Covid vaccination done at**				
	Sub centre	46 (18.4)	23 (9.2)	69 (13.8)	
	Primary health centre	87 (34.8)	88 (35.2)	175 (35)	
	Anganwadi	29 (11.6)	17 (6.8)	46 (9.2)	0.001
	All the above	88 (35.2)	122 (48.8)	210 (42)	
6	**Person suffering from blood pressure / diabetes can get their vaccination**				
	Yes	174 (69.6)	211 (84.4)	115 (23)	0.001
	No	76 (30.4)	39 (15.6)	385 (77)	
7	**Any specific cure for covid-19**				
	Yes	92 (36.8)	42 (16.8)	134 (26.8)	
	No	158 (63.2)	208 (83.2)	366 (73.2)	0.001
8	**Vaccinated individual get protection from covid**				
	Yes	162 (64.8)	187 (74.8)	349 (69.8)	
	No	88 (35.2)	63 (25.2)	151 (30.2)	0.010
9	**Covid vaccination cause any side effect**				
	Obviously	45 (18)	25 (10)	70 (14)	
	Mostly	50 (20)	39 (15.6)	89 (17.8)	
	Probably	102 (40.8)	146 (58.4)	248 (49.6)	0.001
	Not at all	53 (21.2)	40 (16)	93 (18.6)	
10	**If a person in your locality tested positive for covid, what next**				
	Bring it to the notice of local health worker	112 (44.8)	136 (54.4)	248 (49.6)	
	Isolate him	98 (39.2)	104 (41.6)	202 (40.4)	<0.001
	Forbid him from area	31 (12.4)	7 (2.8)	38 (7.6)	
	Let him roam out freely	9 (3.6)	3 (1.2)	12 (2.4)	

Approximately 84.8% of individuals residing in urban areas see vaccination as an effective measure to control the spread of COVID-19. While approximately 66% of urban dwellers willingly received the vaccine, the readiness among rural residents was lower at 47.6%. Among those vaccinated in rural areas, 48.8% expressed no fear of reinfection. The perception of COVID vaccination for comorbid conditions was similar across both urban and rural groups.

Following vaccination, about 87.6% of urban residents continue to adhere to COVID-appropriate precautions. Moreover, 82.8% of urban respondents believe in the efficacy of vaccination for controlling the virus, with approximately 90.4% recommending vaccination to their relatives. In rural areas, around 58.8% of the population believes in government incentives post-COVID vaccination. Additionally, 76% of urban dwellers believe that the government provides paid holidays for 1-2 days after vaccination, while 75.2% find campaigns by actors/politicians advocating for COVID vaccination to be beneficial (Table 3).

Table 3: Distribution of attitude about COVID vaccination among rural and urban population (N=500)

Slno	Variable	Rural (n=250)	Urban (n=250)	Total	p
1	**Vaccination is the effective way to control spread covid-19**				
	Yes	174 (69.6)	212 (84.8)	386 (77.2)	
	No	76 (30.4)	38 (15.2)	114 (22.8)	<0.001
2	**Response when you are asked for covid vaccination**				
	Readily got vaccinated	119 (47.6)	165 (66)	284 (56.8)	
	Hesitated	47 (18.8)	31 (12.4)	78 (15.6)	
	Feared	58 (23.2)	32 (12.8)	90 (18)	<0.001
	Not at all want to take vaccine	26 (10.4)	22 (8.8)	48 (9.6)	
3	**If vaccinated don't need to fear of getting infected again**				
	Yes	122 (48.8)	85 (34)	207 (41.4)	0.001
	No	128 (51.2)	165 (66)	293 (58.6)	
4	**Comorbid conditions, can avail covid vaccination**				
	Yes	133 (53.2)	139 (55.6)	272 (54.4)	0.654
	No	117 (46.8)	111 (44.4)	228 (45.6)	
5	**Following covid appropriate precautions after getting vaccinated**				
	Yes	180 (72)	219 (87.6)	399 (79.8)	<0.001
	No	70 (28)	31 (12.4)	101 (20.2)	
6	**Vaccine is the effective way to control spread of covid**				
	Yes	160 (64)	207 (82.8)	367 (73.4)	<0.001
	No	90 (36)	43 (17.2)	133 (26.6)	
7	**Suggest any relatives to get vaccinated**				
	Yes	175 (70)	226 (90.4)	401 (80.2)	
	No	75 (30)	24 (9.6)	99 (19.8)	<0.001
8	**Expecting any incentives from government after covid vaccination**				
	Yes	147 (58.8)	117 (46.8)	264 (52.8)	
	No	103 (41.2)	133 (53.2)	236 (47.2)	<0.001
9	**Good if government give you paid holidays for 1-2 days after covid vaccination**				
	Yes	174 (69.6)	190 (76)	364 (72.8)	
	No	76 (30.4)	60 (24)	136 (27.2)	0.132
10	**Actor/politician campaigning for covid vaccination is useful**				
	Yes	168 (67.2)	188 (75.2)	356 (71.2)	0.06
	No	82 (32.8)	62 (24.8)	144 (28.8)	

Approximately 81.6% of individuals in urban areas chose to receive the COVID vaccine voluntarily. Of these, about 50.8% opted for vaccination at primary health centres, while 58% decided to get vaccinated with the assistance of family members. Following vaccination, around 82.8% of urban residents adhered to safety measures by wearing masks and sanitizing their hands. In terms of ongoing preventive measures, approximately 75.6% of urban individuals opted for a booster dose after completing their second vaccine dose. Furthermore, 70.8% of urban dwellers sought COVID testing when experiencing symptoms. In rural settings, around 45.2% hosted functions or gatherings at home during the pandemic. In urban areas, roughly 80% of the population diligently followed COVID precautionary guidelines at both the workplace and public spaces. Despite the challenges of the pandemic, about 85.2% of urban parents allowed their children to return to school after its peak. Additionally, the allowance for children to play in groups in open areas after the pandemic showed comparable patterns between urban and rural groups (Table 4).

Table 4: Distribution of practices about COVID vaccination among rural and urban population (N=500)

Slno	Variable	Rural (n=250)	Urban (n=250)	Total	p
1	**Vaccinated voluntarily**				
	Yes	169 (67.6)	204 (81.6)	373 (74.6)	
	No	81 (32.4)	46 (18.4)	127 (25.4)	0.001
2	**Vaccinated at**				
	Sub centre	71 (28.4)	57 (22.8)	128 (25.6)	
	Primary health centre	96 (38.4)	127 (50.8)	223 (44.6)	
	Anganwadi	49 (19.6)	37 (14.8)	86 (17.2)	0.048
	At your doorstep	34 (13.6)	29 (11.6)	63 (12.6)	
3	**Decided to get your vaccination shot from**				
	Village head	60 (24)	14 (5.6)	74 (14.8)	
	Neighbour	62 (24.8)	26 (10.4)	88 (17.6)	
	Friend	51 (20.4)	65 (26)	116 (23.2)	<0.001
	Family Members	77 (30.8)	145 (58)	222 (44.4)	
4	**Wearing mask and sanitizing hands after vaccination**				
	Yes	176 (70.4)	207 (82.8)	383 (76.6)	
	No	74 (29.6)	43 (17.2)	117 (3.4)	0.001
5	**Willing to take booster dose of covid vaccine after completing your second dose**				
	Yes	155 (62)	189 (75.6)	344 (68.8)	
	No	95 (38)	61 (24.4)	156 (31.2)	0.001
6	**Getting yourself tested for covid if u have symptoms**				
	Yes	160 (64)	177 (70.8)	337 (67.4)	
	No	90 (36)	73 (29.2)	163 (32.6)	0.127
7	**Any functions/gatherings conducted at home during these covid pandemic**				
	Yes	113 (45.2)	62 (24.8)	175 (35)	<0.001
	No	137 (54.8)	188 (75.2)	325 (65)	

8	**Following covid precautionary guidelines at workplace and public places**				
	Yes	172 (68.8)	200 (80)	372 (74.4)	
	No	78 (31.2)	50 (20)	128 (25.6)	0.006
9	**Sending children to school after covid pandemic**				
	Yes	175 (70)	213 (85.2)	388 (77.6)	
	No	75 (30)	37 (14.8)	112 (22.4)	<0.001
10	**Allowing children to play in grounds with their friends after the pandemic**				
	Yes	172 (68.8)	174 (69.6)	346 (69.2)	
	No	78 (31.2)	76 (30.4)	154 (30.8)	0.923

Discussion

The study provides a comprehensive snapshot of the demographic characteristics, vaccination status, and awareness levels regarding COVID-19 and its vaccination across urban and rural populations. The mean age of the study participants at 37.15±4.3 years indicates a relatively young sample. Educational distribution reveals a higher percentage of graduates, with significant differences observed between urban and rural areas. The urban preponderance of graduates suggests potential variations in access to education between the two settings. The gender distribution, with a higher proportion of females in rural areas and males in urban areas, introduces an interesting sociodemographic aspect. This divergence could stem from various factors such as occupation, cultural norms, or healthcare-seeking behaviors, warranting further investigation.

Vaccination status delineates a notable proportion of individuals having received two doses, with differences between urban and rural areas. The higher number of unvaccinated individuals in urban areas is a noteworthy finding, possibly linked to accessibility, awareness, or hesitancy factors specific to urban populations. Knowledge levels about COVID-19 vaccine preparation, awareness of the three doses, knowledge of COVID-19 variants, and beliefs about vaccine costs demonstrate varied levels of understanding, especially in urban areas. The awareness of vaccination locations in urban areas suggests a more informed populace regarding vaccination infrastructure. Perceptions about COVID-19 vaccination's efficacy and its role in controlling the virus exhibit positive attitudes, particularly among urban residents. The willingness to recommend vaccination to relatives indicates a potential influence of social networks in promoting vaccination.

In research conducted by Siddiquea et al[8]., a significant 78% of participants exhibited positive attitudes towards COVID-19. The majority of participants, totaling 92.8%, concurred that maintaining physical distance is effective in preventing the spread of the infection. Similar studies conducted in Bangladesh also highlighted a widespread prevalence of positive attitudes towards COVID-19.[9,10] Interestingly, certain demographic factors and sources of COVID-19 information were identified as influencing positive attitudes. Women, individuals with a history of smoking, those experiencing depression, and individuals who received COVID-19 information from family members, friends, relatives, neighbours, and health professionals were more likely to express positive attitudes towards COVID-19. These findings align with the results of a previous study reported in the literature.[11]

In rural areas, the belief in government incentives post-COVID vaccination may be a crucial factor in driving vaccine uptake. Additionally, the perception of government-provided paid holidays and the perceived effectiveness of campaigns by actors/politicians further underscores the multifaceted approach required for effective public health communication. The study sheds light on post-vaccination behaviors, with a significant percentage of urban residents continuing to adhere to

COVID-appropriate precautions. This emphasizes the need for sustained public health efforts even after vaccination campaigns.

In research conducted by Siddiquea et al[8] individuals aged 30 years or older and those with formal education (primary/secondary/bachelor and above) demonstrated a higher likelihood of adopting and practicing preventive behaviors compared to those without formal education. This aligns with similar age and education disparities observed in prior studies.[12,13] Notably, our findings revealed a contrast with a study conducted in Bangladesh, as current smokers in our study were less likely to engage in preventive measures.[13]

A particularly concerning revelation from our study was that fully vaccinated participants exhibited a lower likelihood of practicing preventive measures. This is noteworthy given the persistence of breakthrough infections and the global spread of highly contagious variants, leading to ongoing outbreaks. It suggests a potential gap in information among vaccinated individuals regarding the efficacy and effectiveness of vaccines against the virus and its variants, fostering a false sense of security and reduced engagement in preventive behaviors. Moreover, our study identified a higher likelihood of individuals with anxiety practicing preventive measures, consistent with a previous study conducted in Taiwan. This association may stem from the adverse health impacts of severe anxiety, while a moderate level of anxiety could potentially encourage individuals to adopt preventive practices.[14]

The findings regarding functions/gatherings at home during the pandemic, adherence to COVID guidelines, and the return of children to school highlight the societal impact of the pandemic on routine activities. The comparable patterns between urban and rural areas in children playing in open areas post-pandemic suggest shared experiences across these diverse settings.

Conclusion

Overall, this study provides valuable insights into the dynamics of COVID-19-related factors in both urban and rural populations, offering a foundation for targeted interventions, policy adjustments, and further research endeavors. Notably, disparities in age, education, and vaccination status contribute to varying levels of awareness and adherence to preventive measures. Urban areas exhibit higher knowledge levels and proactive vaccination behaviors, while rural regions demonstrate specific beliefs and practices related to government incentives. The findings underscore the importance of tailored public health interventions that consider demographic nuances and regional dynamics for effective pandemic management and mitigation strategies.

Declarations

Acknowledgement: Nil
Conflict of Interest: Nil
Funding: Nil
Institutional Ethical Committee Approval Number: 22M066 dated 10.11.2022.
Informed Consent: Obtained from all the participants in the study
Author's contribution: All authors contributed equally in the manuscript
Data Availability: Data is included in the manuscript
Use of Artificial Intelligence: Not applicable

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