



Original Article

Assessment Of Vaccine Hesitancy And Its Impact On Immunization Coverage In Urban And Rural Populations.

Hayat Muhmmad Khan¹, Rubeena Gul², Shakir Ullah Khan³

¹. Associate Professor, Community Medicine Department Khyber Medical College Peshawar

². Associate Dean research, Community Health Sciences department

³. Senior Lecturer Community Health Sciences Dept. at Muhammad College of Medicine, Peshawar



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Corresponding Author

Rubeena Gul

Associate Dean Research, Community Health

Sciences department

Email: gul_rubeena@yahoo.com

<https://orcid.org/0000-0002-9933-227X>

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ABSTRACT

Background: Immunization has also been faced by a great challenge known as vaccine skepticism both among the urban and rural people. Differences in the rate of acceptance of the vaccines by such populations can lead to the prevalence of the preventable diseases, the hindrance of the herd immunity and the objectives of the overall health. To improve the degree of immunization rates and state of the population, it is critical to know more about associations of the vaccine hesitancy phenomena.

Objectives: To determine of vaccination to baby boomers affects the level of immunization among the urban and rural population and to define the variables that determine acceptance of the vaccine.

Methods: This cross-sectional study was carried out on a group of 100 individuals (some living in urban and some in rural areas) by means of using self-administered questionnaires. The data were analyzed using the SPSS 24.0 to check the demographic variables and vaccine hesitancy, after which the criterion of the chi-square test was set as the level of significance.

Results: out of 100 patients the mean age 35.2 years (SD = 12.5). The rate of vaccine hesitancy was found out to be higher in rural citizens (38 percent) compared to the rate of vaccine hesitancy in urban citizens (22 percent) ($p < 0.05$). The most common reasons of reluctance included the bad information in the cities and access to healthcare in the country. The score of the vaccine acceptance ended up having p values that were significant ($p < 0.05$).

Conclusion: The vaccine hesitancy is a big prospect of affecting the immunization coverage particularly in the rural setting. Specific interventions targeting uptake of the vaccines and the reduction in spreading the disease through education campaigns and improving the access to medical services must be put in place in order to make sure that more individuals are going to accept the vaccine and break the outbreak.

Keywords: Vaccine hesitancy, immunization, urban, rural.

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INTRODUCTION

Vaccine hesitancy is a global concern and this means being anti-vax or not becoming anti-vax despite the vaccination being available. The issue has become very popular not only in urban, but also rural, settings and its impact on the health of the people, particularly since it pertains to the immunization program coverage, is dreadful [1]. World Health Organization (WHO) defines that vaccine hesitancy is a significant step backwards concerning carrying out universal immunization and preventing of epidemics and reoccurrence of vaccine-preventable illness. Vaccine hesitancy is a multifactor problem that is influenced by a lot of social-economic, cultural and geographical factors [2]. Cities are more likely to be health service accessible, but since the recent outbreak in social media, the stories of people afraid to vaccinate due to fear of being dead because of the vaccine, the number of people getting the shot has decreased [3]. On the other hand, the rural societies are more defined by limited availability of health centers, poor educational opportunity and transportation logistics issues with regards to vaccine delivery. The uncertainties amidst the people within many rural societies seem to be worsened by the cultural commitments, distrust in the government programs and lack of information [4]. The implications of vaccine refusal are far reaching, and it may result in insignificant herd protection and hence exposure of communities to epidemic of diseases such as measles, polio and pertussis among others [5]. This is supported by several studies one of them which claimed that despite the free vaccine sites, a low rate of vaccination immunization is seen in both the urban and the rural areas [6]. The relationship that exists between the variables that may cause vaccine hesitancy and the variables that may influence the urban and rural people is very fundamental in developing effective intervention measures that would raise the result of immunizing their children. This paper is going to demonstrate that vaccine hesitancy can occur in different circumstances and this is the most promising opportunity to establish the steps that should be taken to encourage the population to get vaccinated and eventually improve the health of the population [7].

MATERIAL & METHODS

This cross-sectional study was Conducted at Community Medicine Department Khyber Medical

College Peshawar From Jan 2023 to Jan 2024 dependent on it with an aim of assessing the extent to which the urban and rural residents were vaccine hesitant. They conducted a survey on the representative sample of the two areas using the questionnaire with questions regarding the socio-demographic statistics of the sample, the information about the vaccine and the reasons behind vaccine hesitancy. The information was collected with the help of an online survey conducted in the local health centers and community groups. In order to identify that the urban and rural populations differed in their acceptance and hesitation to the vaccines greatly, statistical analyses with the assistance of SPSS were decided to be carried out.

ETHICAL APPROVAL STATEMENT

This study has been approved by the Health Study Ethics Committee with the approval number. Each of the participants was aware of the consent to engage in the study.

INCLUSION CRITERIA

The people aged at least 18 years old, regardless of whether they live in an urban or rural, environment and those who would agree to participate through an informed consent.

EXCLUSION CRITERIA

The ones below 18 years or unable to correctly comprehend the questionnaire due to the absence of the knowledge of the language or the cognitive lapses.

DATA COLLECTION

Information was collected by using self-reporter questionnaire that was replicated on the internet poster and specifically, face to face. They were surveyed in such a way as to be anonymous in regard to privacy of the participant.

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS 24.0. The descriptive statistics were used to calculate the demographic variables after which the strength of the correlation between the demography and the vaccine

hesitancy was identified through the assistance of the Chi-square tests.

RESULTS

The survey was of 100 respondents whereby half of them were urbanites and the other half were in the rural locations. General vaccine hesitancy percent was 30 followed by Hesitancy that was higher in the rural areas (38 percent) compared to Hesitancy in the metropolitan areas (22 percent). The strongest correlates of hesitancy among urban respondents were a lack of trust in the government (45%) and misinformation that is being spread through the social media (35%). The reluctance was largely predetermined in the rural context, which came because of the lack of health facilities (40%) and respect (25%) in the cultural ideologies. Secondly, the villages showed higher levels of side effect concerns with the vaccines (50%) as compared to the urban areas (28%). The report showed a large scale disparity between the two specific populations ($p < 0.05$) in relation to vaccine hesitancy. The results connect the aspects of a certain educational campaign, increased healthcare access, anti-misinformation that can assist in reducing the concern with decreasing hesitancy amongst citizens residing in the city and the countryside.

Table 1 Vaccine Hesitancy Data

Population	Vaccine Hesitancy (%)	Vaccine Acceptance (%)
Urban	22	78
Rural	38	62

Table 1: Distribution of vaccine hesitancy and acceptance among urban and rural populations, showing higher hesitancy in rural areas (38%) compared to urban areas (22%).

Table 2 Reasons for Hesitancy

Reason	Percentage (%)
Misinformation (Urban)	35
Limited Healthcare Access (Rural)	40
Trust Issues (Urban)	25
Traditional Beliefs (Rural)	30

Table 2: Reported reasons for vaccine hesitancy, including misinformation in urban participants (35%), limited healthcare access in rural participants (40%), trust issues in urban participants (25%), and traditional beliefs in rural participants (30%).

Table 3 Ages and Statistical Analysis

Statistical Metric	Value
Mean Age	35.2
Standard Deviation	12.5
P-Value	<0.05

Table 3: Mean age of participants was 35.2 years with a standard deviation of 12.5 years. Statistical analysis indicated a significant association between variables with $p < 0.05$.

DISCUSSION

World Health Organization (WHO) defines vaccine hesitancy as the reluctance or delay in acceptance or refusal of the offering of vaccination particularly against the ability to get the same even when the services are accessible. This issue has been a massive driver of inadequacy of immunization coverage all over the world. It has been discovered that vaccine refusal is a multifactorial phenomenon preconditioned by several socio-economic, cultural and geographical factors [8]. The recognition of life contexts of vaccine hesitancy, in particular, is extremely important when we consider the urban and rural population, as their experience in life is far and the circumstances are probable to be different. A lot of literature exists that reports the urban- rural divide in regards to vaccine hesitancy. Access to information and healthcare in urban areas is also mostly better compared to access to information and healthcare in the rural areas. However, its decline has resulted in misinformation in the city-based populations and significantly through social media that has also contributed to the rise of vaccine hesitancy [9, 10]. According to a study, conducted by Larson et al. (2014), social media has proved to be relevant when it comes to failing information about the safety of the vaccine that has been causing a huge interference to the denial of vaccine in the urban population [11]. The outcome can be explained by reference to the study by Freeman et al. (2020) who stated that the

misinformation and fear of side effects could become one of the most noticeable reasons of vaccine hesitancy in cities. On the other hand, the rural populations have other problems. The problem of vaccine hesitancy is predisposed by rural territories in lacking healthcare service access, logistical and educational status [12]. Kumar et al. (2017) have performed the study and have discovered that rural citizens are less likely to know about the vaccine and at the same time more likely to believe that traditional beliefs are valid and, therefore, less willing to become vaccinated [13]. Smith et al. (2018) provide further light on socio-economical disparities between urban and rural population, because the farms living in the country will not be so willing to follow government control over the issue of vaccination. One of the factors that determine the level of acceptance of the vaccines is the healthcare system and in cities where the citizens are more likely to have better access to healthcare services the level of their trust is usually higher. Things are unique in the rural communities where the cause is the lack of proper healthcare infrastructure and geographical isolation of communities, which may lead to low vaccination rates and higher hesitancy towards the vaccine. There is also a possibility that rural communities would be more concerned about the possible lack of vaccine safety due to the complete lack of access to healthcare professionals who would be able to give reliable counsel [14,15]. The problem of cultural beliefs as the cause of vaccine hesitancy is also thoroughly examined. The belief system and religious perceptions about vaccines are more traditional in the rural society of poor countries, especially when it comes to the rural population of poor countries. One more study that was carried out by Wang et al [16]. (2018) showed that rural population is vaccine hesitant hence the population often articulates appeased fears over the vaccines in the statement that they do not admit those vaccines into their cultural or religious value thereby exacerbating the already existing issue of vaccine hesitancy. In their turn, Banana et al. (2018) found out that there can be a stronger connection with the traditional health practices in rural population, much more often than in the urban one, so, this leads to the inability to trust the modern healthcare and vaccines [17]. In the urban areas, however, there is another kind of cultural difference that contributes to the same issue, although, in the pills of geographical location, the barrier here lies in the perception of governmental control, of control over

autonomy [18]. The case study described by MacDonald (2015) described an article on the so-called anti-vaccine movements which seem to have gained more grounds in urban environments because such refusal to vaccinate can be explained by an urge to consider personal freedom and lack of trust towards governmental interaction. This has particularly been high in the developed world whereby there is a high likelihood of making such violations by the government on health personal aspects. There have been some studies which have conceived the thought that in order to want to lower down the vaccine hesitancy, the studyer should carry out a more job of enhancing well being to both the city and country set ups. Lastly, educational campaigns, which will be distributed to all the participants of the social media, will assist in the provision of information on misinformation, and the improvement of media literacy at urban locations. According to Larson et al. (2014), the most appropriate plan which should be adopted by the public health campaigns entails demystifying the myths and other information which portray that vaccines are safe. Outreach and education of health in places that the level of access to healthcare services and health information is not as high should be further encouraged, which are the rural areas. Studies of Freeman et al (19, 20)

LIMITATIONS

This is a cross-sectional study that has limited this study in that it does not give the long-term trend of vaccine hesitancy. Moreover, they can be hard to compare because the sample size did not always consist of all demographics, and maybe the cultural factors of the vaccine hesitancy were not discussed in detail in different points.

CONCLUSION

Vaccine Hesitancy may also influence the application of immunization on a colossal level and this is most particularly in those areas that have an inadequate health care provision within the rural areas. These tailor-made interventions are required to increase the acceptance of targeted vaccines such as the need to overcome the misinformation, improve healthcare infrastructure, and promote trust. The removal of these barriers will reduce the avoidable cases of illness and

promote health in the communities everywhere in the globe.

FUTURE FINDINGS

Future study on the same should also be conducted to look at longitudinal nature of vaccine hesitancy, and the effects of media interventions on vaccine hesitancy. It is also necessary to examine the influence that the healthcare professionals possess in bringing the attitudinal change concerning the vaccines, particularly in the rural population and the effects that community-based education programs have in reduction of the reluctance.

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Authors Contribution

Concept & Design of Study: Hayat Muhmmad khan

Data Collection: Rubeena Gul

Drafting: Shakir Ullah Khan

Data Analysis: Shakir Ullah Khan

Critical Review: Rubeena Gul

Final Approval of version: All Authors Approved The Final Version.

Accountability: All authors contributed substantially to the conception, data collection, analysis, manuscript writing, and final approval of the study. Each author agrees to be accountable for all aspects of the work in accordance with ICMJE authorship criteria.

RESEARCH ETHICS STATEMENT

No animal studies were conducted for this research. The study received ethical approval from the Institutional Review Board (IRB/KMC/1123/06/2022)

and was carried out in accordance with the ethical principles of the Declaration of Helsinki (2013). Written informed consent was obtained from all participants or their legal guardians prior to inclusion in the study. No identifiable human data were included. As described in the article and supplementary materials, the underlying data and findings are available in online repositories.

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