Original Article

Assessment Of Knowledge, Attitudes, And Practices Regarding Vaccination Among Parents In Urban And Rural Populations.

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ABSTRACT

Background: Vaccination saves children's lives and keeps them healthy. Attitudes and understanding KAP differences among parents, especially urban vs. rural, remain. These differences must be understood to be able to improve immunization coverage and decrease the number of diseases that vaccines can prevent.
Objectives: To evaluate how well parents understand, feel, and act about childhood vaccination in city and country settings, and to find out the socio-demographic aspects that affect vaccination behavior in both settings.
Methodology: This cross-sectional study Conducted in the Department of Community Medicine Jinnah Medical College Peshawar From jan 2023 to Jan 2024 .focused on 150 parents (75 urban, 75 rural) using a structured questionnaire regarding KAP on vaccinations. Parents of children under five years were included, while Exclusion were healthcare professionals, as well as parents of children five years and older and parents who declined to respond. Data were analyzed through SPSS using descriptive and inferential chi-square and t-tests with a 5% margin of error. Ethical approval was obtained.
Results: The Mean age of 150 participants was 32.8 ± 6.4 years. Urban parents showed significantly higher knowledge scores than rural parents (p=0.01). 82% of urban and 64% of rural parents had positive attitudes towards vaccination (p=0.04). 78% of urban respondents and 61% of rural respondents reported their children had complete immunizations (p=0.03). Education and income were significant predictors of more positive vaccination behavior. Rural areas had lower levels of awareness, whereby gaps in knowledge, traditional beliefs, and the use of customs resulted in lower uptake.
Conclusion: The study uncovered important disparities in knowledge, attitudes, and practices between urban and rural parents. Recognizing rural parents' lower educational attainment and access, their awareness and immunization coverage was lower because urban parents exhibited worse awareness. There is a need for public health interventions focused on rural communities that include community participation, outreach by health workers, and educational campaigns that target the inequalities regarding the equitable provision of vaccinations.
Keywords: Vaccination, Parents, Health Knowledge, Attitudes, Practice, Urban Population

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INTRODUCTION

Vaccinations are an essential way of preventing and controlling the spread of infectious diseases globally, and are a highly effective and economical strategy within public health. Vaccinations administered during childhood have largely diminished the morbidity and mortality from diseases that are vaccine preventable, such as measles, diphtheria, and poliomyelitis. Although the World Health Organization (WHO) states that immunization annually prevents the deaths of 4–5 million people, there are still than 5 million people not receiving the life-saving vaccinations each year, and countries such as Pakistan that fall within the lower and middle-income countries still have gaps in coverage. For a given population, parents' knowledge, attitudes and practices (KAP) regarding vaccination are very important in influencing the levels of vaccination uptake. This knowledge may take the form of understanding vaccine schedules, benefits, and risks. Attitudes comprise the vaccine's perceived safety, efficacy, and necessity, and practices are immunization behaviors of KAP and compliance with given schedules [1,2]. Vaccine hesitancy has been documented in populations where healthcare access and vaccination services are readily available, often due to misconceptions, misinformation and cultural beliefs. Vaccination coverage differs among rural and urban populations. In general, urban populations have greater access to healthcare services, higher literacy levels, and more health-related information than rural populations [3]. Conversely, rural parents may have more adverse geographical challenges, lack health infrastructure and have traditional or religious restraints that negatively impact vaccination uptake.There is evidence of both lower fully immunization uptake and urban-rural differences in immunization coverage in Pakistan, with rural children being less likely to be fully immunized [4]. Most of the world is dealing with the aftermath of COVID-19 pandemic, which renewed the focus on the importance of vaccinations, while also bringing with it new waves of vaccine hesitancy. The negative impact on vaccine confidence of the myths, mis- and disinformation, and anti-vaccine rhetoric spread through social media bogs public health practitioners with even more complex dilemmas. Heuristically, this makes the study of the determinants of the parental KAP in different settings, and with it the likely improvements to be made to rational immunization programs, critical. KAP studies focusing on the parents and the perception and practices of vaccinations in Asia and Africa have noted these trends [5,6]. The evidence is consistently showing the negative association of low knowledge and attitudes and result in incomplete immunization. The more maternal education and the more effects the social and healthcare systems have, the more likely children will get vaccines. Most of the evidence is on the KAP of urban and rural parents in Pakistan. This is also the case for the KAP studies in comparative settings, which is critical for the design of urban and rural targeted programs [7]. It may be the case that rural parents will benefit more from community education, directly faith-based education, and primary health care. The study aimed to assess and compare urban and rural parents' knowledge, attitudes, and practices toward vaccination. This enables data-driven understanding for policymakers and practitioners to realign resource distribution to enhance equity for identified demographic disparities and improve overall immunization rates [8-9].

Materials and Methods

This cross-sectional study Conducted in the Department of Community Medicine Jinnah Medical College Peshawar From jan 2023 to Jan 2024.150 parents (75 from urban and 75 from rural areas) with children below five years of age were taken, using convenience sampling. Primary data was collected using a self-administered pretested structured questionnaire which also assessed three areas, which are: (1) knowledge (awareness of vaccine preventable diseases, benefits, schedules), (2) attitudes (safety, efficacy, and necessity from the perspective of a parent), and (3) practices (completion of the vaccination schedules, documentation, and compliance). Some demographic information like age, education level, income data, and place of residence was asked. Prevailing practices were considered for the construction of the tool.

INCLUSION CRITERIA:

We included parents of children under five years old, living in the study areas for at least six months, and who were willing to take part after giving consent.

EXCLUSION CRITERIA:

The study sample didn't include parents who were healthcare professionals or those who didn't want to participate. Also, parents who wouldn't be able to answer because of cognitive or communication challenges were not included.

DATA COLLECTION:

I collected data through face-to-face interviews using a structured questionnaire designed after reviewing a few

studies. For clarity and validity, the tool was pilot-tested on 10 participants. Trained data collectors administered the questionnaire to maintain uniformity. Survey responses were validated by reviewing available vaccination cards.

STATISTICAL ANALYSIS

We used SPSS version 24.0 to analyze the data. I used descriptive statistics for the KAP and demographic variables which includes calculating means, standard deviations, frequencies and percentages. To compare the rural and urban groups, I used the Chi-square and independent t-tests. I used logistic regression to find the predictors for vaccination practices. A p-value of less than 0.05 was considered significant.

RESULTS

150 parents responded to the survey with an average age of 32.8 ± 6.4 years. Of the parents, 56% were mothers and 44% were fathers. Educational attainment scores of parents were higher in urban areas compared to rural 41% (p=0.02). Knowledge of IAP vaccination was adequate in 72% of parents from urban communities and 54% from rural areas of the country (p=0.03). Misconceptions were more common in the rural areas claiming vaccines were affecting fertility and causing diseases. In urban areas, the positive attitude toward vaccination was 82% and in rural areas it was 64% (p=0.04). Also, rural parents were more likely to think vaccination was not necessary if the child was healthy. In urban areas 78% of the children recorded complete immunization while in rural areas the number was 61% (p=0.03). 74% urban parents kept vaccination cards compared to 52% rural parents. Logistic regression showed complete immunization was significantly predicted by maternal education and household income ($p<0.05$). It can be concluded that urban and rural populations exhibit disparities in KAP that require appropriate interventions in awareness and primary healthcare.

Table 1: Socio-Demographic Characteristics of Parents (N=150)

Variable	Urban (n=75)	Rural (n=75)	Total (N=150)	p-value
Mean Age (years ± SD)	33.2 ± 6.1	32.4 ± 6.7	32.8 ± 6.4	0.41
Gender (Male)	32 (42.6%)	34 (45.3%)	66 (44.0%)	0.74
Gender (Female)	43 (57.4%)	41 (54.7%)	84 (56.0%)	
Secondary or Higher Edu.	51 (68.0%)	31 (41.3%)	82 (54. 7%)	0.02*
Monthly Income ≥ 30,000 PKR	47 (62.7%)	29 (38.7%)	76 (50.7%)	0.01*

Table 2: Knowledge of Vaccination Among Parents

Knowledge Domain	Urban (n=75)	Rural (n=75)	Total (N=150)	p-value
Adequate knowledge of immunization schedule	54 (72.0%)	41 (54.7%)	95 (63.3%)	0.03*
Aware that vaccines prevent diseases	64 (85.3%)	58 (77.3%)	122 (81.3%)	0.18
Misconceptions present (e.g., infertility, illness)	11 (14.7%)	23 (30.7%)	34 (22.7%)	0.02*
Correct identification of all EPI vaccines	49 (65.3%)	33 (44.0%)	82 (54.7%)	0.01*

Table 3: Attitudes Toward Vaccination Among Parents

Attitude Variable	Urban (n=75)	Rural (n=75)	Total (N=150)	p-value
Positive attitude (agree vaccines are necessary)	61 (81.3%)	48 (64.0%)	109 (72.7%)	0.04*
Neutral attitude	8 (10.7%)	13 (17.3%)	21 (14.0%)	0.24
Negative attitude (believe not necessary if child healthy)	6 (8.0%)	14 (18.7%)	20 (13.3%)	0.05

Table 4: Vaccination Practices Among Parents

Practice Variable	Urban (n=75)	Rural (n=75)	Total (N=150)	p-value
Complete immunization coverage	59 (78.7%)	46 (61.3%)	105 (70.0%)	0.03*
Partial/delayed immunization	12 (16.0%)	19 (25.3%)	31 (20.7%)	0.17
No immunization	4 (5.3%)	10 (13.3%)	14 (9.3%)	0.09
Retention of vaccination card	56 (74.7%)	39 (52.0%)	95 (63.3%)	0.01*

DISCUSSION

This study shows big differences between cities and the countryside when it comes to how parents know, think about, and practice (KAP) childhood vaccinations. Urban parents had a deeper understanding, more positive attitudes, and more fully completed the required vaccinations [10]. These findings are in line with several region and country studies focusing on the rural/urban dichotomy, where rural residence is once again a risk factor for under-immunization. Particularly, the association of maternal education and household income with completed immunization is similar to findings in Ethiopia and Pakistan on the

social determinants of lower vaccination uptake in underserved communities and urban slums, where urban residence and wealth quintiles directly correlate with full vaccination. Much of the variance is still explained by behavioral and health-system constraints. Khyber Pakhtunkhwa's qualitative study highlights mobility constraints, missed opportunities, and misinformation as possible reasons for lower rural retention rates and completion rural rates [11,12]. Inadequate supportive conditions, such as reliable outreach and counseling, card-based tracking, and counseling, help explain the phenomenon of complete schedules and the positive attitudes we see particularly within rural groups [13]. Post COVID-19, social and psychological factors, such as fear of social exclusion and competing social narratives, trust deficits, and unaddressed psychosocial frictions, contributed to routine immunization disruptions and adverse parental outcomes [14]. Our knowledge gap urban-rural knowledge gap resembles gaps documented in Indonesia and Tanzania, where caregiver knowledge and confidence, with respect to immunization, were documented as time and place in disparate health system countries, resulted in vaccination inequities [15]. By country within Pakistan, and intra- and inter-district studies to a degree, the patterns hold -- urban and semi-urban areas describe EPI schedules and urban health services dissatisfaction in a manner that reveals alignment, discontent, and misconception gaps relative to rural areas. The stronger rural dependency misconceptions, especially around infertility, aligns with local qualitative studies on targeted misinformation, clustering, and refusal [16]. In a policy framework, the trend analyses highly suggest Pakistan has made an effort to improve on multiple EPI antigens, but issues documented in prior study show socioeconomic, geographic, and fragile gaps still exist without continued outreach and demand-generation efforts [17]. Lessons learned from prior national outreach acquire scoping activities underline the visible leadership and school-based delivery mechanisms as facilitators for the acceptance of distribution for new vaccines like the HPV vaccine, and the active management of rumor circulation as a critical component for onboarding sustainable demand for the service. Relying solely on punitive measures and/or coercive policy threats is inadvisable within a community management framework as described in the literature. For these reasons, our findings justify integrated planning [18]. For example, community health workers and mobile teams' community outreach to poorly served rural localities could integrate service delivery (immunization) and brief, evidence-centered (fertility and fever) counseling on prevalent local myths. Jointly with community leaders and mothers' groups, co-design messages that are sensitive to the literacy levels of the target mothers and include a visually enhanced care (immunization) schedule, which consists of a calendar and SMS prompts to reinforce schedule adherence and card retention [19]. For active feedback, a moderated nurses' Whatapp group, care (immunization) provision hotlines, and adverse event monitoring dashboards can counter misinformation that is prevalent online. For targeted efforts, routinely updated micro-plans should provide disaggregated (by village/union council) dashboards and report drop-off rates between doses.To avoid travel costs and the loss of important opportunities, especially for families living in the countryside, try to schedule vaccinations along with other maternal and child health care services like antenatal check-ups and growth monitoring [20-22].

CONCLUSION

This study shows the different levels of knowledge, attitudes, and practices about vaccination of rural and urban parents. While the urban population had better understand and practices concerning vaccination, the rural population had some gaps which were a result of misconceptions and inaccessibility. Improved education, outreach, and equity-based strategies for vaccination are important for advancing vaccination coverage.

LIMITATIONS

The study was confined to a single cross-sectional design and a regional scope which explains possible limitations to generalizability. Other limitations include sample size and self-reported practices that may include biased recall. As the study was confined to a single region, findings may not be generalizable to all populations across Pakistan or similar low-resource settings.

FUTURE FINDINGS

For more impactful and nationally representative results on vaccination, future studies should be exploratory and or explanatory, be longitudinal, and have multi-regions and larger sample sizes, then have diverse and rich datasets. Focused or target studies that have educational campaigns, community health worker programs, and digital reminder systems can be impactful and provide direct evidence for policymakers to formulate and design evidence-informed intervention strategies that will improve the results on the vaccination or immunization programs.

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Authors Contribution

Concept & Design of Study: **Zia Ul Rehman[1]**

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Critical Review: **Daud Jabbar[3]**

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/JMC/112//04/2022)** 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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