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Original Research Article

A Study of Vaccine Hesitancy among Parents in an Urban Slum in Mumbai

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Abstract:

Introduction: In the urban slum of Malwani, Mumbai, India, this study aimed to investigate vaccine hesitancy among parents of children aged 1 to 5 years. The research aimed to assess prevalence, explore associated factors, and understand reasons contributing to vaccine hesitancy within this marginalized community.

Methodology: A cross-sectional study involving 95 parents was conducted using an interview schedule encompassing sociodemographic profiling, the Parent Attitude about Childhood Vaccines Survey (PACV), and questions addressing determinants of vaccine hesitancy. Systematic random sampling was employed, and statistical analysis utilized chi-square tests for associations.

Results: The majority of parents exhibited a non-hesitant attitude (86.3%) towards vaccination, while 7.4% demonstrated hesitancy. Concerns about side effects (28.4%) emerged as a prevalent reason for hesitancy, followed by 'not applicable' reasons (62.1%). The study revealed varying perceptions influencing vaccination attitudes, highlighting the need for tailored interventions.

Conclusion: Vaccine hesitancy in Malwani's urban slum reflects diverse perceptions and concerns among parents. Addressing safety apprehensions, dispelling misconceptions, and fostering trust through targeted communication strategies are essential to enhance vaccine acceptance within this community.

Keywords: Vaccine hesitancy, Parents, Urban slum, Malwani, Mumbai, Childhood vaccination, Attitudes, Associated factors, Interventions, Trust-building.

Introduction

In India, the persistent challenge of achieving optimal immunization coverage is intricately linked with the pervasive issue of vaccine hesitancy, particularly in marginalized urban areas such as Malwani in Mumbai.[1] Despite the nation's remarkable strides in healthcare, the hesitancy among parents to vaccinate their children poses a significant hurdle in ensuring comprehensive protection against preventable diseases.[2]

The complexity of vaccine hesitancy is magnified in India's urban slums, where multifaceted socioeconomic disparities intersect with cultural beliefs and access barriers, creating a complex matrix of challenges for immunization programs.[3,4] Malwani, a densely populated urban slum, epitomizes this scenario, grappling with inadequate healthcare access, suboptimal living conditions, and information asymmetry, all of which influence parental attitudes towards vaccination.[5] This study's significance is deeply rooted in the Indian context, especially against the backdrop of the COVID-19 pandemic that accentuated existing challenges and spotlighted the critical role of vaccination in safeguarding public health. The country's robust efforts in expanding vaccination programs are continually met with the resistance and skepticism prevalent among certain communities, hindering the achievement of universal immunization coverage.

Understanding the nuanced determinants of vaccine hesitancy among parents of children aged 1 to 5 years in Malwani, Mumbai, becomes pivotal in informing tailored interventions and bolstering public health strategies. India's evolving health policies and initiatives, such as the Intensified Mission Indradhanush, emphasize the urgency to address immunization gaps and bridge the divide in vaccine acceptance, particularly in vulnerable urban settings. This research endeavor aligns with

global insights into vaccine confidence and hesitancy, acknowledging India's unique socio-cultural landscape that shapes healthcare behaviors. Insights garnered from this study hold the promise of contributing not only to the local context but also to broader national strategies aimed at strengthening immunization programs and fostering community engagement in health initiatives.

Methodology

This was a cross-sectional study conducted within the specified demographic and geographic parameters. Parents (mothers or fathers) of children aged 1 to 5 years residing in Malwani for at least the past 6 months were included.

The total sample size was 95. A list of children aged 1 to 5 years was obtained for the study area. Children were selected from the list using systematic random sampling. Parents with children aged 12 to 59 months having valid child immunization cards were included while parents without valid child immunization cards were excluded from the study. Consent was obtained from the parents before the interview. Interviews were conducted at the parent's convenience and privacy will be ensured. The interview schedule comprises three parts Sociodemographic profile of the parent, Parent Attitude about Childhood Vaccines Survey (PACV), Questions assessing determinants of vaccine hesitancy, Responses regarding vaccination delays or refusals will be cross-checked with the child's vaccination card. Determinants of Vaccine Hesitancy were assessed using questions developed by the Strategic Advisory Group of Experts (SAGE).

Data from the interviews was compiled and tabulated using Excel. SPSS software was used for analysis. Variables like child's age, gender, mother's education; socioeconomic class was expressed using descriptive statistics. Chi-square tests will be employed to find associations between sociodemographic data and vaccine hesitancy. The same test will be used to analyze the association between vaccine hesitancy and selected factors determining it.

Parents will be assured that their information will remain confidential. Informed consent a was obtained before the interview process.

Results

Table 1: Demographic Characteristics of Subjects

Demographic Variable	Counts	% of Total	Cumulative %
Relation with Child			
Mother	81	85.3 %	85.3 %
Father	14	14.7 %	100.0 %
Education Of Mother			
high school certificate	1	1.1 %	1.1 %
intermediate or diploma	18	18.9 %	20.0 %
graduate	13	13.7 %	33.7 %
high school certificate	35	36.8 %	70.5 %
middle school certificate	3	3.2 %	73.7 %
illiterate	20	21.1 %	94.7 %
primary school certificate	5	5.3 %	100.0 %
Occupation Of Mother			
unemployed	91	95.8 %	95.8 %
elementary occupation	4	4.2 %	100.0 %
Education Of Father			
high school certificate	1	1.1 %	1.1 %
graduate	19	20.0 %	21.1 %
intermediate or diploma	25	26.3 %	47.4 %
high school certificate	26	27.4 %	74.7 %
illiterate	14	14.7 %	89.5 %
middle school certificate	4	4.2 %	93.7 %
primary school certificate	6	6.3 %	100.0 %
Occupation of Father			
elementary occupation	1	1.1 %	1.1 %
skilled workers and shop & market sales workers	39	41.1 %	42.1 %
unemployed	2	2.1 %	44.2 %
clerks	4	4.2 %	48.4 %
plant and machine operators and assemblers	3	3.2 %	51.6 %
elementary occupation	33	34.7 %	86.3 %
craft & related trade workers	9	9.5 %	95.8 %
plant & machine operators and assemblers	4	4.2 %	100.0 %

The study comprised 95 parents of children aged 1 to 5 years from an urban slum in Malwani, Mumbai.

The majority of respondents were mothers (85.3%), highlighting their predominant role in childcare within this demographic. Fathers constituted a smaller proportion (14.7%) in the study sample.

Mothers' Education: The education levels of mothers varied, with the highest percentage holding a high school certificate (36.8%) and a considerable proportion being illiterate (21.1%). However, a substantial number had completed intermediate or diploma courses (18.9%) or graduated (13.7%).

Fathers' Education: Similarly, fathers exhibited diverse educational backgrounds, with a notable portion having completed high school (27.4%), followed by intermediate or diploma (26.3%) and graduate (20.0%) levels. A significant percentage was also found to be illiterate (14.7%).

Mothers' Occupation: The overwhelming majority of mothers were unemployed (95.8%), indicating a predominant focus on household responsibilities or potential limitations in accessing formal employment opportunities. Fathers' Occupation: Among fathers, the largest group was engaged in skilled occupations such as skilled workers, shop & market sales workers (41.1%), followed by those in elementary occupations (34.7%). These demographic findings underscore a gender-skewed distribution in parental participation within the study, with a substantial representation of mothers compared to fathers.

Additionally, the prevalent levels of lower education and unemployment among mothers highlight potential socio-economic barriers or limitations in accessing educational resources and formal employment opportunities. The varying educational backgrounds among both mothers and fathers illustrate the diverse educational landscape within the urban slum. This diversity might contribute to differing perspectives on healthcare and vaccination, potentially influencing vaccine hesitancy levels among parents.

Moreover, the dominance of unemployment among mothers might suggest a higher involvement in childcare, potentially influencing vaccination decision-making.

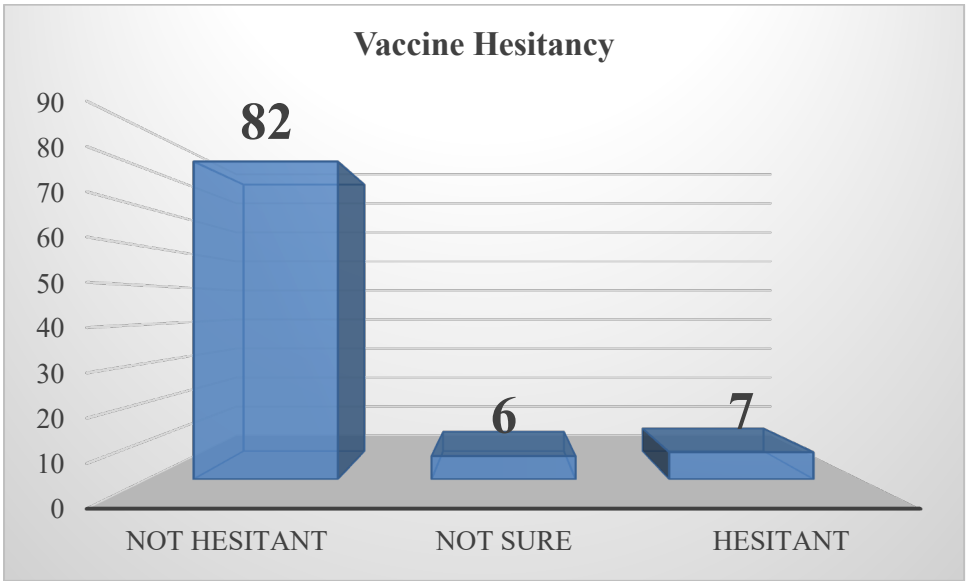

Figure 1: Vaccine Hesitancy among Subjects

Among the 95 parents surveyed in the study conducted in the urban slum of Malwani, Mumbai, the assessment revealed varying degrees of vaccine hesitancy.

- **Not Hesitant:** The majority of parents exhibited a non-hesitant attitude towards vaccination, constituting 86.3% (n = 82) of the respondents.
- **Not Sure:** A smaller proportion of parents (6.3%, n = 6) expressed uncertainty ('not sure') regarding vaccination.
- **Hesitant:** Approximately 7.4% (n = 7) of parents demonstrated a hesitant attitude towards vaccination.

These findings highlight the diverse spectrum of attitudes and perceptions regarding vaccination among parents within the urban slum context. The majority demonstrating a non-hesitant stance indicates a favorable inclination towards vaccination among a significant portion of the surveyed parents.

The presence of a smaller subset of parents expressing uncertainty ('not sure') suggests a need for targeted educational interventions or information dissemination to address any misconceptions or lack of clarity regarding vaccination benefits and safety. Strategies aimed at resolving uncertainties

might contribute to enhancing vaccine confidence among this subgroup of parents. The identification of a minority exhibiting a hesitant attitude towards vaccination underscores the presence of a distinct group that might require more nuanced approach-esin addressing concerns, building trust, and providing accurate information to alleviate apprehensions.

Table 2: Association between Vaccine Hesitancy and Various Perceptions:

	Multiple Doses of Vaccine					
Vaccine Hesitancy	**disagree**	**not sure**	**agree**	**Total**	χ^2 Tests	p
not hesitant	29	27	26	82		
not sure	1	5	0	6	7.15	0.128
hesitant	3	3	1	7		
Total	33	35	27	95		
	Protection from Severe Illness					
not hesitant	38	35	9	82		
not sure	1	5	0	6	6.03	0.197
hesitant	5	2	0	7		
Total	44	42	9	95		
	Causes Severe Side Effect					
not hesitant	18	53	11	82		
not sure	5	0	1	6	12	0.018
hesitant	2	4	1	7		
Total	25	57	13	95		
	Does not Trust Vaccination					
not hesitant	80	2	0	82		
not sure	2	4	0	6	60.4	< .001
hesitant	4	1	2	7		
Total	86	7	2	95		

The cross-tabulated data examining vaccine hesitancy perceptions among 95 parents in the urban slum of Malwani, Mumbai, revealed associations between different attitudes towards vaccination.

Not Hesitant: Among parents categorized as 'not hesitant' towards vaccination, there were varied responses across perceptions:

- On the perception of multiple doses of vaccines, the distribution of 'disagree,' 'not sure,' and 'agree' responses was 29, 27, and 26, respectively ($\chi^2 = 7.15$, $p = 0.128$).
- Regarding the belief in protection from severe illness, the distribution of responses was 38, 35, and 9 for 'disagree,' 'not sure,' and 'agree,' respectively ($\chi^2 = 6.03$, $p = 0.197$).
- Regarding the belief that vaccines cause severe side effects, the distribution of responses was 18, 53, and 11 for 'disagree,' 'not sure,' and 'agree,' respectively ($\chi^2 = 12$, $p = 0.018$).
- On the perception of trust in vaccination, the distribution of responses was heavily skewed with 80 'disagree,' 2 'not sure,' and no 'agree' responses ($\chi^2 = 60.4$, $p < 0.001$).

Not sure and Hesitant Groups: The 'not sure' and 'hesitant' groups demonstrated smaller sample sizes and diverse perceptions. Notably:

- The 'not sure' group showed varied perceptions on the number of vaccine doses and beliefs in severe side effects, but these associations were not statistically significant.
- The 'hesitant' group exhibited mixed responses, reflecting uncertainties or disagreements with perceptions regarding multiple doses of vaccines, protection from severe illness, belief in severe side effects, and lack of trust in vaccination.

The χ^2 tests revealed significant associations between parental attitudes categorized as 'not hesitant' and their perceptions regarding the number of vaccine doses, belief in severe side effects, and trust in vaccination. However, no statistically significant associations were found between the 'not sure' or 'hesitant' groups and these perceptions.

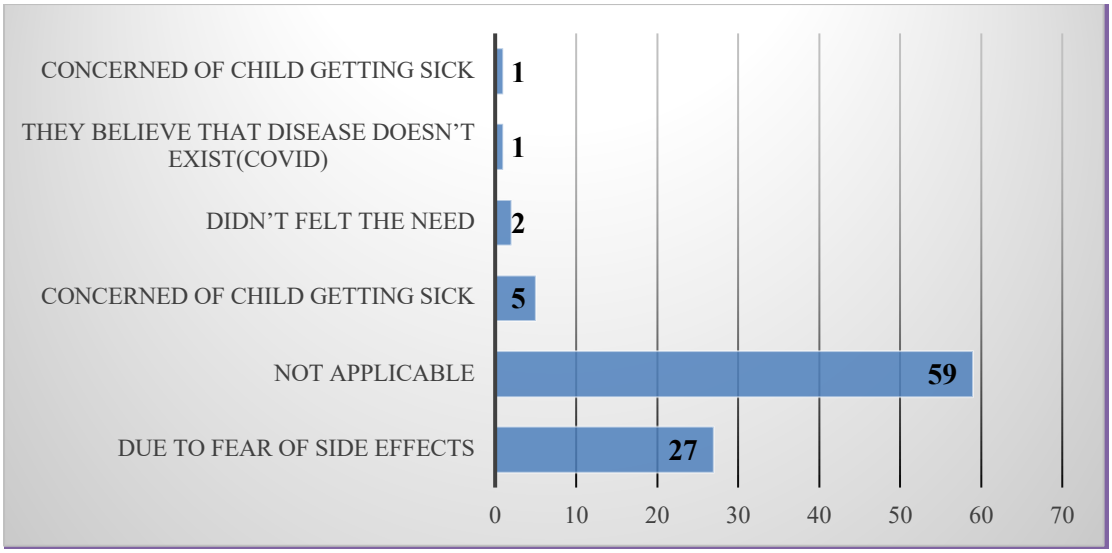

Figure 2: Distribution of Reasons for Hesitancy:

Among the 95 parents surveyed in the urban slum of Malwani, Mumbai, reasons for vaccine hesitancy varied significantly:

Fear of Side Effects: Approximately 28.4% (n = 27) of parents expressed hesitancy due to concerns about potential side effects from vaccines.

Not Applicable: A majority, constituting 62.1% (n = 59), indicated that vaccine hesitancy reasons were 'not applicable' to them, suggesting a lack of specific concerns or reasons for hesitation.

Concerns of Child Getting Sick: A smaller proportion, 5.3% (n = 5), cited concerns about their child falling ill as a reason for vaccine hesitancy.

Perception of Unnecessary Need: Only 2.1% (n = 2) stated they didn't perceive the need for vaccination for their child.

Belief in Nonexistence of Disease (COVID-19): A minimal portion, 1.1% (n = 1), expressed hesitancy due to the belief that the disease (COVID-19) doesn't exist.

The reasons provided for vaccine hesitancy reflect a spectrum of concerns and beliefs among parents within the urban slum community. The most prevalent reason, cited by approximately 28.4% of parents, is fear or apprehension about potential side effects stemming from vaccines. This fear may be influenced by misinformation, past experiences, or concerns about the safety profile of vaccines.

The large proportion of respondents (62.1%) indicating 'not applicable' as the reason for hesitancy implies a lack of specific concerns or uncertainties regarding vaccination. This could suggest a need for further exploration or tailored interventions to address potential underlying reasons for hesitation not explicitly stated by this group. The smaller percentages citing concerns about the child's health, perceptions of unnecessary need for vaccination, or disbelief in the existence of diseases, including COVID-19, highlight diverse attitudes and beliefs contributing to vaccine hesitancy. Addressing these varied concerns through targeted communication strategies and education might help alleviate hesitancy and enhance vaccine acceptance within this community.

Discussion

The study revealed diverse attitudes and reasons for vaccine hesitancy among parents in the urban slum of Malwani, shedding light on critical factors influencing vaccination uptake within this community.

Prevalence and Reasons for Hesitancy:

The predominant reason cited for vaccine hesitancy was the fear of side effects, resonating with global concerns about vaccine safety perceptions.[6] This fear, prevalent among nearly a third of respondents, underscores the crucial role of addressing safety concerns and enhancing confidence in vaccine safety profiles [7]. Furthermore, the substantial percentage (62.1%) indicating reasons as 'not applicable' suggests a need for deeper exploration to uncover underlying concerns or uncertainties that might not have been explicitly expressed by parents.[8]

Implications of Attitudes:

The presence of varying perceptions, such as concerns about the child getting sick, notions of unnecessary vaccine need, and disbelief in disease existence, indicates the complexity of attitudes influencing vaccine acceptance.[9] These diverse attitudes necessitate tailored interventions, targeted communication strategies, and culturally sensitive educational initiatives to address misinformation, increase awareness, and build trust in vaccination within this community.[10]

Importance of Communication and Education:

Effective communication strategies, leveraging trusted community channels, and culturally relevant educational campaigns could play a pivotal role in dispelling misconceptions and fostering vaccine confidence.[11,12] Engaging community leaders and healthcare providers to disseminate accurate information and address concerns may serve as a gateway to enhancing vaccine acceptance.

Limitations and Recommendations: The study's limitations include a limited sample size and potential self-reporting bias. Future research could employ qualitative methods to delve deeper into the nuanced reasons behind hesitancy and explore community-specific beliefs and practices influencing vaccination decisions [8].

Conclusion

Understanding the multifaceted landscape of vaccine hesitancy among parents in urban slums like Malwani is crucial for targeted interventions and tailored approaches to enhance vaccine acceptance. Addressing safety concerns, dispelling misinformation, and fostering trust through community-engaged initiatives are imperative steps towards bolstering immunization programs within marginalized urban settings.

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