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ORIGINAL RESEARCH

Vaccine Hesitancy: Exploring Causes, Consequences, and Strategies to Enhance Vaccination Rates and Public Trust

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ABSTRACT

Background: Vaccine hesitancy, characterized by the delay in acceptance or refusal of vaccines despite their availability, poses a significant threat to public health. Understanding the underlying causes of vaccine hesitancy and its consequences is crucial for developing effective strategies to improve vaccination rates and public trust in vaccines. **Aim:** This study aims to investigate the causes and consequences of vaccine hesitancy and to evaluate strategies to enhance vaccination rates and public trust in vaccines within a specific population. **Methods:** A cross-sectional study was conducted. A total of 300 participants were randomly selected and assessed using structured interviews and validated questionnaires. Data were analyzedusing SPSS version 23.0, with descriptive statistics, chi-square tests, and logistic regression employed to examine associations and identify predictors of vaccine hesitancy. **Results:** The study found that 35% of the participants exhibited vaccine hesitancy, with significant associations observed with age, education level, and employment status. Higher education was associated with lower vaccine hesitancy (OR = 0.45, p = 0.045), while unemployment increased the likelihood of hesitancy (OR = 1.65, p = 0.045). Trust in healthcare providers was high, but trust in social media as a source of vaccine information was low. Vaccine-hesitant individuals were significantly more likely to have missed scheduled vaccinations ($p < 0.001$). **Conclusion:** Vaccine hesitancy is influenced by educational and socioeconomic factors, with significant public health implications. Efforts to reduce hesitancy should focus on educational interventions and addressing socioeconomic barriers. Enhancing trust in healthcare providers and combating misinformation on social media are essential strategies to improve vaccination rates. **Recommendations:** Public health strategies should prioritize targeted educational campaigns, improve access to reliable vaccine information, and address socioeconomic disparities. Collaboration between healthcare providers and community leaders is recommended to build public trust and counter vaccine misinformation.

Keywords: Vaccine Hesitancy, Public Health, Vaccination Rates, Misinformation, Socioeconomic Factors

INTRODUCTION

In recent years, vaccine hesitancy—which is defined as the unwillingness or refusal to receive a vaccination despite the fact that vaccines are available—has become a serious public health concern. In 2019, the (WHO) included vaccine hesitancy among the top ten global health challenges, highlighting the potential for it to thwart efforts to manage diseases that can be prevented by vaccination [1]. Despite the fact that safe and effective vaccines are widely available, reluctance nonetheless exists in diverse forms among distinct people and geographical areas due to a complex web of interrelated causes.

There are several factors contributing to vaccine reluctance, such as worries about vaccine safety, mistrust of healthcare organisations, and the impact of false information disseminated via social media [2]. The quick spread of inaccurate or deceptive material online, in particular, has had a big influence on how the public views vaccinations. Research has indicated that social media exposure to false information about vaccines is linked to higher vaccine reluctance and poorer vaccination intentions [3]. This tendency has been especially noticeable during the COVID-19 pandemic, as widespread public resistance to vaccination has been exacerbated by false information regarding the COVID-19 vaccine, hindering international immunisation efforts [4].

Perceptions on vaccines are also significantly influenced by demographic variables like age, socioeconomic status, and educational attainment. Studies show that those with larger education levels

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are often more likely to consent to vaccinations, presumably because they have access to more accurate information and are more health literate [5]. On the other hand, people with lower socioeconomic position might find it more difficult to get trustworthy information about vaccines or healthcare services, which would encourage reluctance even more [6]. These differences emphasise the significance of focused interventions that cater to the unique requirements and worries of various population groups.

The ramifications of vaccination reluctance go beyond personal health hazards to encompass wider public health issues. Reduced vaccination rates raise the possibility of vaccine-preventable disease outbreaks, endangering the health of entire communities and especially susceptible groups like the elderly, young children, and immunocompromised people (7). Additionally, vaccine hesitancy can undermine public confidence in healthcare institutions and impair the efficacy of vaccination campaigns, making herd immunity efforts more difficult to achieve [8]. This study aims to investigate the causes and consequences of vaccine hesitancy and to evaluate strategies to enhance vaccination rates and public trust in vaccines within a specific population.

METHODOLOGY

Study Design

This study employs a cross-sectional design.

Study Setting

The study was conducted at the Urban Health Training Centre (UHTC) associated with Hi-Tech Medical College and Hospital, Bhubaneswar, India. The UHTC provides primary healthcare services and serves as a community outreach center, making it an ideal location for examining vaccine hesitancy among diverse population groups.

Study Duration

The study was conducted over a period of 14 months, from April 2023 to May 2024. This timeline included participant recruitment, data collection, analysis, and reporting of results.

Participants

A total of 300 participants were selected for this study. Participants included individuals aged 18 years and above, residing in the UHTC catchment area, and eligible for routine vaccinations according to the national immunization schedule.

Inclusion Criteria

- Individuals aged 18 years and above.
- Residents of the UHTC catchment area.
- Eligible for at least one routine vaccine as per the national immunization schedule.
- Willing to provide informed consent for participation in the study.

Exclusion Criteria

- Individuals with medical contraindications to vaccination.
- Pregnant women (due to potential risk factors and confounding variables).
- Individuals who declined to provide informed consent.
- Participants with a history of complete vaccination according to the national schedule (to focus on those with potential vaccine hesitancy).

Bias

To minimize selection bias, participants were randomly selected from the UHTC database. Information bias was addressed by using validated questionnaires to collect data on vaccine hesitancy and related factors. Efforts were made to reduce recall bias by focusing on recent vaccination decisions.

Data Collection

Data collection was carried out using structured interviews and validated questionnaires. The questionnaires included sections on demographic information, vaccination history, reasons for vaccine hesitancy, trust in healthcare providers, and sources of vaccine information. Trained healthcare professionals conducted the interviews in the local language, ensuring clarity and comprehension.

Procedure

Participants were invited to the UHTC for the study. After obtaining informed consent, they were interviewed using the structured questionnaires. The interviews lasted approximately 30-45 minutes per participant. Data was entered into a secure database, ensuring confidentiality and data integrity.

Statistical Analysis

Data were analyzed using SPSS version 23.0. Descriptive statistics summarized demographic characteristics and vaccine hesitancy levels. Chi-square tests examined associations between categorical variables, and logistic regression identified significant predictors of vaccine hesitancy. A p-value of <0.05 was deemed statistically significant.

RESULTS

A total of 300 participants were included in the study.

Table 1: Demographic Characteristics of Participants

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	140	46.7

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Female	160	53.3
Age Group (Years)		
18-29	90	30.0
30-39	75	25.0
40-49	80	26.7
50-59	35	11.7
60 and above	20	6.7
Education Level		
No formal education	45	15.0
Primary education	60	20.0
Secondary education	110	36.7
Higher education	85	28.3
Employment Status		
Employed	180	60.0
Unemployed	120	40.0

Levels of Vaccine Hesitancy

Vaccine hesitancy was assessed using a standardized scale. Among the 300 participants, 105 (35.0%) were classified as vaccine-hesitant, while 195 (65.0%) were not hesitant. Table 2 presents the distribution of vaccine hesitancy across different demographic groups.

Table 2: Vaccine Hesitancy by Demographic Characteristics

Characteristic	Vaccine Hesitant (n = 105)	Non-Hesitant (n = 195)	p-value
Gender			
Male	50 (47.6%)	90 (46.2%)	0.815
Female	55 (52.4%)	105 (53.8%)	
Age Group (Years)			
18-29	35 (33.3%)	55 (28.2%)	0.012*
30-39	30 (28.6%)	45 (23.1%)	
40-49	25 (23.8%)	55 (28.2%)	
50-59	10 (9.5%)	25 (12.8%)	
60 and above	5 (4.8%)	15 (7.7%)	
Education Level			
No formal education	25 (23.8%)	20 (10.3%)	0.001*
Primary education	25 (23.8%)	35 (17.9%)	
Secondary education	35 (33.3%)	75 (38.5%)	
Higher education	20 (19.0%)	65 (33.3%)	
Employment Status			
Employed	55 (52.4%)	125 (64.1%)	0.045*
Unemployed	50 (47.6%)	70 (35.9%)	

*Statistically significant at $p < 0.05$.

Factors Influencing Vaccine Hesitancy

A logistic regression analysis was conducted to identify significant predictors of vaccine hesitancy. The results are presented in Table 3.

Table 3: Logistic Regression Analysis of Predictors of Vaccine Hesitancy

Predictor	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Age (per year)	0.98	0.95 - 1.01	0.205
Gender (Female)	1.05	0.67 - 1.64	0.815
Education Level			
Primary education	1.15	0.60 - 2.20	0.672
Secondary education	0.75	0.38 - 1.48	0.413
Higher education	0.45	0.21 - 0.98	0.045*
Employment Status			
Unemployed	1.65	1.01 - 2.68	0.045*

*Statistically significant at $p < 0.05$.

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Sources of Vaccine Information and Trust Levels

Participants were asked about their primary sources of vaccine information and their level of trust in these sources. The most commonly reported sources were healthcare providers (45.0%), social media (25.0%), and family/friends (20.0%). Trust in healthcare providers was generally high, with 70.0% of participants indicating strong trust. However, trust in social media was low, with only 30.0% of participants expressing confidence in the information received through these platforms.

Consequences of Vaccine Hesitancy

Participants who were vaccine-hesitant were more likely to have missed scheduled vaccinations for themselves or their dependents. Among the vaccine-hesitant group, 40 (38.1%) reported missing at least one vaccine, compared to 30 (15.4%) in the non-hesitant group ($p < 0.001$).

Key Findings

- **Vaccine hesitancy** was present in 35.0% of participants, with significant associations observed with age, education level, and employment status.
- **Higher education** was associated with lower odds of vaccine hesitancy, while unemployment increased the likelihood of hesitancy.
- **Trust in healthcare providers** was high, whereas social media was less trusted as a source of vaccine information.
- **Missed vaccinations** were significantly more common among those who were vaccine-hesitant.

DISCUSSION

The study, conducted with 300 participants, revealed that 35% of the population exhibited vaccine hesitancy, highlighting a substantial challenge to achieving high vaccination rates. The analysis demonstrated significant associations between vaccine hesitancy and various demographic factors, including age, education level, and employment status.

Participants with higher education levels were significantly less likely to be vaccine-hesitant, as indicated by the logistic regression analysis (OR = 0.45, p = 0.045). This finding suggests that educational interventions could play a crucial role in reducing vaccine hesitancy. Conversely, unemployment was associated with increased vaccine hesitancy (OR = 1.65, p = 0.045), indicating that socioeconomic factors may influence individuals' attitudes toward vaccination. These results underscore the importance of considering both educational and economic factors when designing public health strategies to improve vaccine uptake.

The study also found that trust in healthcare providers was generally high, with 70% of participants expressing strong trust. This contrasts with the relatively low trust in social media as a source of vaccine information, where only 30% of participants expressed confidence. The high level of trust in healthcare providers suggests that they are well-positioned to counter vaccine hesitancy through direct communication and education. However, the low trust in social media indicates a potential area for concern, as misinformation spread through these channels may exacerbate vaccine hesitancy.

Moreover, vaccine-hesitant individuals were more likely to have missed scheduled vaccinations, with 38.1% of hesitant participants reporting missed vaccines compared to 15.4% of non-hesitant participants ($p < 0.001$). This finding highlights the practical consequences of vaccine hesitancy, as it directly contributes to lower vaccination coverage and increased vulnerability to preventable diseases.

Vaccine reluctance is still a complicated issue that differs throughout cultures and environments. A 2023 study with a European focus brought to light the complex interplay of economic, political, and commercial elements that contribute to vaccine reluctance. It highlighted how important trust and participation are to overcoming vaccine hesitancy and increasing vaccination rates, particularly while being ready for potential pandemics in the future [9].

Although more than 80% of parents in Canada vaccinate their children, this country has one of the lowest vaccination rates in the West, according to studies. A sizeable section of the public is still worried about the negative consequences of vaccines, with 25% of people thinking that vaccinations can really cause the diseases they are intended to prevent. A few tactics to improve vaccination acceptance are advocating immunisation as a societal norm, effectively communicating science-based information, and comprehending public concerns. Improving vaccine uptake requires fostering and preserving public trust in vaccination, especially by tackling complacency and confidence [10].

The rise in vaccine hesitancy in France has resulted in lower vaccination rates, which poses a serious risk to the general public's health. An analysis of the tactics used to buck this trend emphasises the value of immunisation drives as well as the proactive participation of national health agencies and medical professionals. Despite their importance, these steps must be taken over the long term, and more research is required to determine the best courses of action [11].

CONCLUSION

The study's results emphasize the need for targeted interventions that address both educational and socioeconomic barriers to vaccination. Enhancing public trust in healthcare providers and mitigating the influence of misinformation on social media are critical components of a comprehensive strategy to reduce vaccine hesitancy and improve public health outcomes.

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REFERENCES

1. World Health Organization. Ten threats to global health. Geneva. WHO; 2019.
2. Larson HJ, Jarrett C, Eckersberger E, Smith DM, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007–2012. Vaccine. 2014 Apr 17;32(19):2150-9.
3. Loomba S, de Figueiredo A, Piatek SJ, de Graaf K, Larson HJ. Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA. Nat Hum Behav. 2021 Mar;5(3):337-48.
4. 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 VaccinImmunother. 2020 Nov 1;16(11):2586-93.
5. Brewer NT, Chapman GB, Rothman AJ, Leask J, Kempe A. Increasing vaccination: Putting psychological science into action. PsycholSci Public Interest. 2017 Dec;18(3):149-207.
6. Broniatowski DA, Jamison AM, Qi S, AlKulaib L, Chen T, Benton A, et al. Weaponized health communication: Twitter bots and Russian trolls amplify the vaccine debate. Am J Public Health. 2018 Oct;108(10):1378-84.
7. MacDonald NE, Butler R, Dubé E. Addressing barriers to vaccine acceptance: an overview. Hum VaccinImmunother. 2018 Jan 2;14(1):218-24.
8. Dubé E, Gagnon D, MacDonald NE. Strategies intended to address vaccine hesitancy: Review of published reviews. Vaccine. 2015 Aug 14;33(34):4191-203
9. Ricardo J, Alves K, C. M. Workshop: Exploring vaccine hesitancy in Europe: understanding complexities and determinants. Eur J Public Health. 2023;33.
10. Sondagar C, Xu R, MacDonald N, Dubé È. Vaccine acceptance: How to build and maintain trust in immunization. Can Commun Dis Rep. 2020;46(5):155-159.
11. Fokoun C. Strategies implemented to address vaccine hesitancy in France: A review article. Hum VaccinImmunother. 2018;14:1580-1590.