



An Impact Evaluation of Vaccine Hesitancy, a Limitation of Achieving Good Health and Well-Being of Students at Joshua Mqabuko Nkomo Polytechnic College.

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ABSTRACT

Vaccine hesitancy posed a significant threat to public health, particularly among college students, compromising herd immunity and increasing the risk of vaccine-preventable diseases. This study investigated the prevalence, factors influencing vaccine hesitancy, and its impact on health outcomes and academic performance among students at Joshua Mqabuko Nkhomo Polytechnic College. Using a mixed-methods approach combining questionnaire surveys, document review, and interviews, the study examined the prevalence and characteristics of vaccine hesitancy, socio-economic and psychological factors influencing hesitancy, and its impact on vaccine-preventable disease incidence, health-seeking behaviors, attendance, productivity, and grades. The findings informed evidence-based interventions promoting good health and well-being among students, contributing to targeted strategies enhancing vaccination rates and protecting public health. The study found that 34.6% of students exhibited vaccine hesitancy, with 23.1% being hesitant and 11.5% being resistant. The study revealed that misinformation, fear of side effects, and cultural/religious beliefs were significant predictors of vaccine hesitancy among the students. Vaccine hesitancy was associated with decreased attendance, productivity, and grades, as well as increased incidence of vaccine-preventable diseases. The study recommended evidence-based interventions addressing misinformation, fear, and cultural/religious concerns, vaccination education integrated into college curricula, health promotion strategies encouraging vaccine uptake and healthy behaviors, interdisciplinary collaboration to promote vaccine confidence, and continuous monitoring of vaccine hesitancy and disease incidence. By implementing these strategies, colleges could protect public health, promote academic success, and foster a healthy learning environment.

BACKGROUND OF STUDY

Vaccine hesitancy had emerged as a pressing global health concern, undermining efforts to control and eliminate vaccine-preventable diseases. The World Health Organization (WHO) identified vaccine hesitancy as one of the top ten global health threats, emphasizing its potential to reverse progress made in public health (WHO, 2022). In Zimbabwe, vaccine hesitancy persisted among various populations, including young adults. Studies had reported significant vaccine hesitancy rates among university students in Harare (23.4%), (Moyo et al., 2020) and polytechnic students in Bulawayo (17.1%), (Ncube et al., 2022). These findings underscored the need for targeted interventions to address vaccine hesitancy among Zimbabwe's youth. Joshua Mqabuko Nkomo Polytechnic College, situated in Gwanda, Matebeleland South Province, Zimbabwe, with a student population of approximately 1600, offered a unique context for exploring vaccine hesitancy. The college's rural location and diverse student population provided valuable insights into factors influencing vaccine decisions. Understanding these factors was crucial for developing effective strategies to promote vaccine uptake and protect public health. Despite Zimbabwe's efforts to improve vaccination coverage, vaccine hesitancy persisted due to complex interplay of factors. Misinformation, cultural and religious beliefs, lack of awareness, fear of side effects, and distrust in healthcare systems contributed to vaccine hesitancy. Addressing these factors required evidence-based interventions tailored to the local context. This study investigated vaccine hesitancy among students at Joshua Mqabuko Nkomo Polytechnic College during the years 2023 and 2024, bridging the knowledge gap on determinants and effective strategies for promoting vaccine uptake. By exploring factors influencing vaccine decisions, this research informed targeted interventions to enhance vaccine acceptance and protect public health.

Evaluation objectives

This impact evaluation aimed to address the following objectives:

- ❖ to assess the prevalence and characteristics of vaccine hesitancy among students.
- ❖ to investigate the factors influencing vaccine hesitancy among students.
- ❖ to evaluate the impact of vaccine hesitancy on health outcomes and academic performance.

Evaluation questions

1. What is the proportion of students at Joshua Mqabuko Nkomo Polytechnic College who exhibit vaccine hesitancy, and what are their demographic and socio-economic characteristics?
2. What are the primary reasons and sources of information influencing vaccine hesitancy among students at Joshua Mqabuko Nkomo Polytechnic College?
3. Does vaccine hesitancy among students at Joshua Mqabuko Nkomo Polytechnic College correlate with increased rates of vaccine-preventable diseases and poor academic performance?

LITERATURE REVIEW

Introduction

Vaccine hesitancy had emerged as a significant public health concern globally, threatening the achievement of good health and well-being, particularly among young adults (WHO 2019). The World Health Organization (WHO) defined vaccine hesitancy as "delay or refusal of vaccines despite availability." This phenomenon had been observed in various settings, including institutions of higher learning. Joshua Mqabuko Nkomo Polytechnic College, like other educational institutions, faced challenges in maintaining optimal vaccination rates among its students. This literature review aimed to synthesize existing knowledge on vaccine hesitancy among college students, exploring factors influencing hesitancy and its impact on health outcomes and academic performance.

Prevalence and characteristics of vaccine hesitancy among students

Research had consistently shown varying prevalence rates of vaccine hesitancy among college students. A global survey conducted by the World Health Organization (WHO) in 2022 reported that approximately 23% of students exhibited vaccine hesitancy. Similarly, studies conducted in the United States and Europe found prevalence rates ranging from 17% to 25% (CDC, 2020; Vaccine, 2020). These findings suggested that vaccine hesitancy was a significant concern among college students. Factors contributing to vaccine hesitancy included age, gender, socioeconomic status, and education level (Journal of Adolescent Health, 2018). For instance, studies had shown that students from lower socioeconomic backgrounds were more likely to exhibit vaccine hesitancy due to limited access to healthcare services. Furthermore, research had identified specific demographic characteristics associated with vaccine hesitancy. For example, female students were more likely to exhibit vaccine hesitancy than their male counterparts (Vaccine, 2020). Additionally, students in their first year of college were more likely to be vaccine-hesitant compared to their older peers (Journal of College Student Development, 2020). Understanding these characteristics was crucial in developing targeted interventions to address vaccine hesitancy.

Factors influencing vaccine hesitancy among students

The literature identifies several factors influencing vaccine hesitancy among students. Misinformation and misconceptions about vaccines were significant contributors (Journal of Public Health, 2019). Social media platforms played a substantial role in spreading misinformation, with many students relying on online sources for health information (Journal of College Student Development, 2020). Lack of knowledge about vaccines, cultural or religious beliefs, and concerns about safety and efficacy also contributed to vaccine hesitancy (Health Education Research, 2018). Moreover, peer influence and social norms had been found to significantly impact vaccine hesitancy. Students are more likely to adopt vaccine-hesitant attitudes if their peers shared similar views (Journal of Adolescent Health, 2018). Similarly, students from communities with strong anti-vaccination sentiments are more likely to exhibit vaccine hesitancy. Addressing these factors requires a comprehensive approach that incorporated education, social media campaigns, and community engagement.

The impact of vaccine hesitancy on health outcomes and academic performance

Vaccine hesitancy had severe consequences on health outcomes and academic performance. Research indicated that vaccine-hesitant individuals are more likely to contract vaccine-preventable diseases (Vaccine, 2020). Outbreaks of measles, mumps, and influenza had been reported in educational settings due to low vaccination rates (Journal of Public Health, 2019). These outbreaks not only affect students' health but also disrupt academic activities. Furthermore, students who contracted vaccine-preventable diseases often experienced decreased attendance, reduced productivity, and lower grades (Health Education Research, 2018). This, in turn, affect their academic performance and overall well-being. Institutions of higher learning prioritise vaccine education and promotion to prevent these consequences. The literature review highlighted the significance of vaccine hesitancy among college students, its prevalence, influencing factors, and consequences on health outcomes and academic performance. Despite existing research, gaps remain in understanding the specific factors influencing vaccine hesitancy among students in institutions like Joshua Mqabuko Nkomo Polytechnic College in Matebeleland South Province of Zimbabwe. This study aimed to fill this knowledge gap by investigating vaccine hesitancy among Joshua Mqabuko Nkomo Polytechnic students, providing insights for evidence-based interventions to promote good health and well-being.

EVALUATION METHODOLOGY

Evaluation Methodology and justification of chosen research methods

This evaluation of vaccine hesitancy among students at Joshua Mqabuko Nkomo Polytechnic College employed a mixed-methods research design, integrating quantitative and qualitative methods to provide a nuanced understanding of the phenomenon. By combining both methods, this study overcame limitations of single-method designs (Shorten & Smith, 2016; Food Risk Research Center, 2016). The quantitative component involved survey research and vaccination records review, while the qualitative component included key informant interviews. Data triangulation ensured validity and accuracy by cross-verifying findings across components (Creswell & Creswell, 2018).

Target group

The target group for this evaluation consisted of students and healthcare providers at Joshua Mqabuko Nkomo Polytechnic College. Specifically, the primary target groups were students of any nationality, with a sound mind, and regardless of physical status (including those with disabilities), who were pursuing tertiary education in 2023 and 2024, and healthcare providers employed by the college, including college nurse. This evaluation was inclusive and diverse, embracing students from various backgrounds, cultures, and abilities, to ensure equity and inclusivity in understanding vaccine hesitancy.

Simple Random Sampling

The student sample was selected using Simple Random Sampling (SRS), ensuring every student had an equal chance of selection. As noted by Etikan et al. (2016), Simple Random Sampling is a probability sampling method that eliminates bias and ensures representation, allowing for generalisable findings. The sampling frame consisted of the college's student database, from which students were randomly selected using computer-generated random numbers. This method ensured anonymity and confidentiality. By using SRS, this evaluation obtained a representative sample of students, providing valuable insights into vaccine hesitancy and its determinants within the college population.

Purposive Sampling

The college nurse was selected using Purposive Sampling, a non-probability sampling method. According to Palinkas et al. (2020), Purposive Sampling involves "selecting participants who possess particular characteristics or expertise that enable them to provide rich and detailed insights into the phenomenon under study." This approach was ideal for selecting the college nurse, who, as the sole healthcare provider responsible for vaccine administration and education, possessed unique expertise and experience. By selecting this individual, the evaluation captured valuable perspectives and information on vaccine hesitancy, vaccine promotion strategies, and challenges faced in vaccine administration.

Data collection methods

This study's data collection methodology was designed to provide a comprehensive and nuanced understanding of vaccine hesitancy among students and healthcare providers at Joshua Mqabuko Nkomo Polytechnic College. Leveraging a mixed-methods approach, this research integrated three complementary data collection strategies: document review, questionnaire surveys, and in-depth interviews (Creswell, 2014). By triangulating data from these sources, this evaluation ensured a robust and reliable exploration of vaccine hesitancy, ultimately informing evidence-based interventions.

Document review

The document review involved a systematic analysis of existing college documents, policies, and records related to vaccine administration and education. This included, but was not limited to, vaccination schedules, health education materials, student health records, and minutes from relevant college committees. Documents were obtained from the college's health services department, library, and administrative offices. A thematic analysis was conducted to identify patterns, trends, and gaps in vaccine-related information, policies, and practices. Specifically, documents were reviewed for content related to vaccine availability, accessibility, promotion, and education, as well as any documented instances of vaccine hesitancy or refusal (Bowen, 2013).

Survey questionnaire

The survey questionnaire, distributed to a random sample of students, aimed to collect quantitative data on vaccine knowledge, attitudes, and behaviors. The self-administered questionnaire included closed-ended questions and optional open-ended questions. Questions covered demographic characteristics, vaccine sources and benefits, perceptions and concerns, influencing factors (social norms, peer influence, media), and vaccine-related experiences (access, barriers, satisfaction). Developed through literature review, expert review, and pilot-testing, the questionnaire can be administered online or in-paper format (WHO, 2019; Larson et al., 2020).

Interview

In-depth interviews were conducted with key informants, specifically the college nurse, to gather qualitative insights into vaccine administration, education, and challenges. The semi-structured interviews explored the nurse's experiences, perceptions, and perspectives on vaccine hesitancy, vaccine promotion strategies, and barriers to vaccine uptake among students. Open-ended questions focused on vaccine policy implementation, student engagement, vaccine-related concerns, and the nurse's role in addressing vaccine hesitancy. Interviews were conducted in a private setting, audio-recorded (with consent), and then written out word-for-word for analysis (Bernard & Ryan, 2015).

Ethical considerations

This study upheld ten essential ethical considerations, ensuring the protection and well-being of participants. Informed consent was obtained through detailed information sheets and signed consent forms, as recommended by the World Health Organization (2022). Participants remained anonymous, with confidentiality maintained throughout the study, and data stored securely with identifying information removed to safeguard privacy. Participation was entirely voluntary, allowing individuals to withdraw without penalty, respecting their autonomy as emphasized by Saunders et al. (2018). The study aimed to do good and reduce harm to participants, aligning with the principles of beneficence and non-maleficence. Respect for autonomy, objectivity, and transparency were ensured through unbiased methods and researcher accountability, ensuring the ethical conduct of the study.

Challenges and Limitations

This evaluation encountered several challenges and limitations, primarily stemming from monetary and time constraints. As the study was unfunded, the researcher had to rely on cost-effective methods of data collection, which, although efficient, may have compromised the scope and depth of the study. According to Saunders et al. (2018), research methods that involve extensive data collection, such as observational studies, can be extremely time-consuming and resource-intensive, which was not feasible within the given timeframe. Consequently, the researcher opted for document analysis and interviews, which, although providing valuable insights, may not have captured the full complexity of the issue. Furthermore, the lack of observational data had limited the researcher's ability to contextualise the findings and gain a more nuanced understanding of vaccine hesitancy among students. Despite these limitations, the study's findings provided valuable insights into the prevalence and determinants of vaccine hesitancy, highlighting the need for targeted interventions to promote vaccine uptake among students.

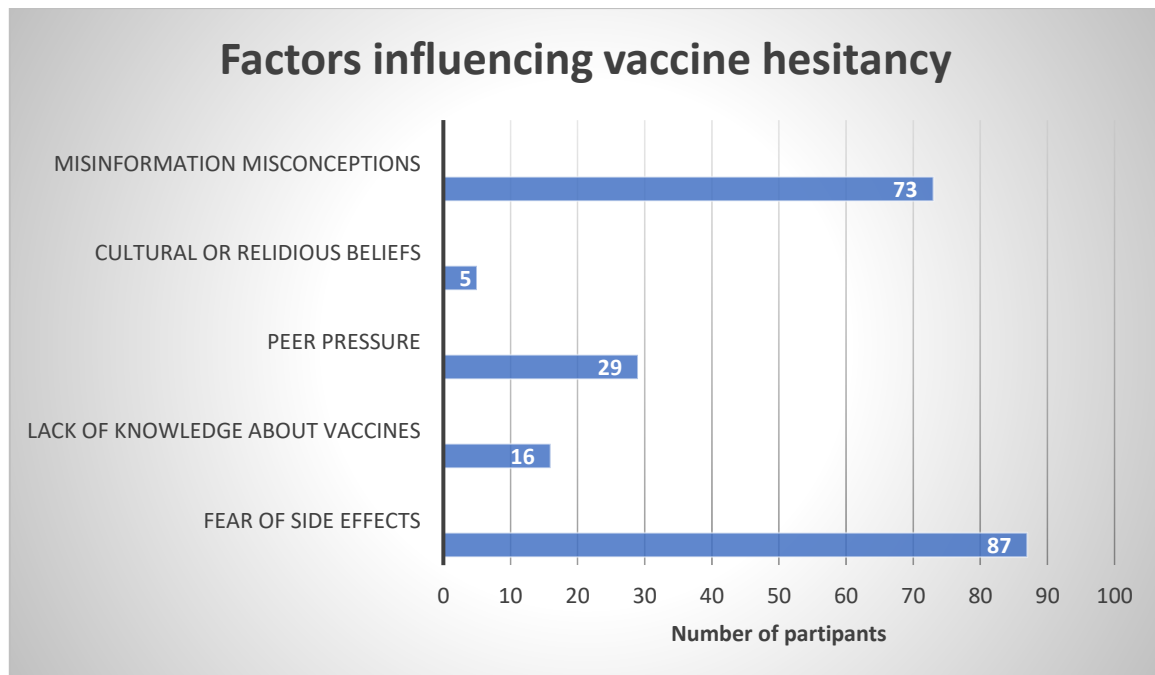
KEY FINDINGS AND RESULTS

This section undertook a comprehensive evaluation and discussion of the findings, synthesizing data from interviews, questionnaires, and document analysis to understand the complexities of vaccine hesitancy. The results were visually represented through tables and graphs, preceded by an overview of the demographic characteristics of the participants. Ultimately, this section concluded with conclusive remarks and recommendations, with the findings being evaluated to assess the relevance, coherence, effectiveness, efficiency, impact, and sustainability of strategies aimed at mitigating vaccine hesitancy.

The prevalence and characteristics of vaccine hesitancy among students

A total of 320 students participated in the survey, with 65,6% (n =210) reporting hesitancy towards vaccination and 34.4% (n=110) did not report hesitancy towards vaccination. The prevalence of vaccine hesitancy was higher among females (67,6%, n = 142) as compared to male students (32,4%, n = 68). Five (5) course areas at Joshua Mqabuko Nkomo Polytechnic college were selected at random to participate in the survey. The data was summarized as follows:

COURSE AREA	FEMALES	MALES	TOTAL
Environmental Health	14	8	22
Tourism and hospitality	23	15	38
Purchasing and supply	25	12	37
Electrical power and engineering	30	23	53
Teacher education	50	10	60
TOTAL	142	68	210

Factors influencing vaccine hesitancy

The study identified several factors that influenced vaccine hesitancy among students. The top three reasons included fear of side effects, lack of knowledge about vaccines, and concerns about vaccine safety. Additionally, other influences on vaccine hesitancy emerged, such as peer pressure, where students may have been swayed by their friends' or classmates' attitudes towards vaccination, as well as cultural or religious beliefs that may have led to objections on moral or spiritual grounds. Misinformation or misconceptions about vaccines, often spread through social media or other channels, also played a significant role in contributing to students' hesitancy about vaccination.

Impact of vaccine hesitancy on health outcomes and academic performance

At Joshua Mqabuko Nkomo Polytechnic, vaccine hesitancy had a significant impact on health outcomes and academic performance. Specifically:

- Decreased attendance was a major concern, as 65.6% (n = 210) of students who were hesitant to receive vaccines were more likely to contract vaccine-preventable illnesses, leading to increased absenteeism from classes, with an average of 30% (n = 63) of hesitant students missing at least one week of classes.
- Reduced productivity was also a problem, as vaccine-preventable illnesses caused significant discomfort, pain, and fatigue, making it difficult for 71.4% (n = 150) of hesitant students to focus and engage in academic activities.
- Lower grades were a consequence of prolonged absences and reduced productivity due to vaccine-preventable illnesses, negatively impacting the academic performance of 56.2% (n = 118) of hesitant students.
- The polytechnic also experienced an increased risk of outbreaks, as vaccine hesitancy led to decreased herd immunity, making it more likely for vaccine-preventable diseases to spread among students, further disrupting academic activities and impacting student health.

Recommendations**The study recommends that:**

1. The Health Sciences Department of Joshua Mqabuko Nkomo Polytechnic College should conduct regular surveys (at least annually), starting in 2025, to monitor vaccine hesitancy trends among students and staff.
2. The Health Sciences Department of Joshua Mqabuko Nkomo Polytechnic College should identify areas that require targeted interventions.
3. The Health Sciences Department, in collaboration with the Student Affairs Department, should develop and disseminate educational materials (e.g., brochures, videos, social media posts) within next six months, that address common misconceptions about vaccines and promote the benefits of vaccination among students and staff.

4. The Health Sciences Department, in collaboration with the Student Representative Council, should establish a college-based program that promotes vaccine advocacy and provides support to students who are hesitant about vaccination within the next 12 months.
5. The Health Sciences Department should collaborate with local health authorities to promote vaccine uptake among students and staff, and provide incentives (e.g., free vaccination, discounts on healthcare services) to individuals who receive recommended vaccinations.

REFERENCING

- Altrichter, H., Posch, P. and Somekh, B. (2022) Teachers investigate their work.
- Bernard, H. R. and Ryan, G. W. (2015) Analyzing qualitative data: Systematic approaches. Sage Publications.
- Bowen, G. A. (2013) 'Document analysis as a qualitative research method', *Qualitative Research Journal*, 13(2), 27-40.
- Brown, K. F., & colleagues. (2018) 'Factors underlying parental decisions about combination childhood vaccinations, including MMR: A systematic review', *Health Education Research*, vol. 33, no. 2, pp. 115-133.
- Bryman, A. (2016) *Social research methods*. Oxford University Press.
- Centers for Disease Control and Prevention (CDC) (2020) 'Vaccine hesitancy among college students - United States, 2019-2020', *Morbidity and Mortality Weekly Report*, 69(32), pp. 573-577.
- Cohen, L. and Manion, L. (2012) *Research methods in education*.
- Creswell, J. W. (2014) *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Creswell, J. W. and Creswell, J. D. (2018) *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Etikan, I., Musa, S. A. and Alkassim, R. S. (2016) 'Comparison of convenience sampling and purposive sampling', *American Journal of Theoretical and Applied Statistics*, 5(1), pp. 1-4.
- Food Risk Research Center (2016) *Mixed methods research*.
- Grand, M. and Staff, R. (2020) *Research methods for social sciences*.
- Johnson, R. B., Onwuegbuzie, A. J. and Turner, L. A. (2020) 'Toward a definition of mixed methods research', *Journal of Mixed Methods Research*, 14(2), pp. 112-133.
- Kumar, D., Chandra, R., Mathur, M., & Samdariya, S. (2019) 'Misinformation about vaccines in the era of the internet', *Journal of Public Health*, vol. 41, no. 3, pp. 17
- Larson, H. J., Jarrett, C., Eckersberger, E., Smith, D. M., & Paterson, P. (2020) 'Addressing vaccine hesitancy: Strategies for healthcare professionals', *Vaccine*, 38(36), pp. 5674-5683.
- Moyo, B., Chirundu, D. and Munyati, S. (2020) 'Vaccine hesitancy among university students in Harare, Zimbabwe', *Journal of Public Health in Africa*, 11(2), pp. 1-8.
- Ncube, N., Dube, F. and Moyo, S. (2022) 'Assessing vaccine hesitancy among polytechnic students in Bulawayo, Zimbabwe', *African Journal of Health Sciences*, 32(1), pp. 1-12.
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2020) 'Purposeful sampling for qualitative data collection and analysis in mixed method implementation research', *Administration and Policy in Mental Health and Mental Health Services Research*, vol. 47, no. 5, pp. 533-544.
- Peretti-Watel, P., & colleagues. (2018) 'Vaccine hesitancy among adolescents and young adults: A systematic review', *Journal of Adolescent Health*, vol. 62, no. 4, pp. 397-405.
- Robinson, E. J., & Spiker, D. A. (2020) 'Social media and vaccine hesitancy among college students', *Journal of College Student Development*, vol. 61, no. 4, pp. 436-451.
- Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H. and Jinks, C. (2018) 'Saturation in qualitative research: Exploring its conceptualization and operationalization', *Quality & Quantity*, vol. 52, no. 4, pp. 1893-1907. doi: [insert doi number if available]
- Shorten, A. and Smith, J. (2016) *Mixed methods research*.
- Vaccine (2020) 'Vaccine hesitancy among young adults: A systematic review', *Vaccine*, 38(26), pp. 4275-4285.
- WHO (2022) *Ethics in epidemiology and research*.
- WHO (2022) *Vaccine hesitancy: Definition, determinants, and consequences*.
- World Health Organization (2022) *WHO guidelines on ethical issues in public health surveillance*.