E-ISSN 3048-1562 Vol. 1, Issue 1 (2024)
Doi: https://doi.org/10.37899/mjdh.v1i1.14

Magenta Journal De Healthymedi

Comparative Analysis of the Effectiveness of Educational Methods on Public Knowledge of Infectious Disease Prevention in Urban and Rural Areas

Ealani Putri Kalenggo[1]

[1]*Muhammadiyah University of Kendari*

**Corresponding Author: Ealani Putri Kalenggo*
E-mail: ealanptrkgg54@gmail.com

Article Info

Article History:
Received: 21 January 2024
Revised: 21 February 2024
Accepted: 25 March 2024

Keywords:
Infectious Disease Prevention
Educational Methods
Urban Community
Rural Community

Abstract

This take a look at ambitions to evaluate the effectiveness of instructional techniques in improving public know-how of infectious ailment prevention in urban and rural regions. A quantitative method become hired, with statistics gathered thru pre- and submit-intervention surveys. The effects indicate that both city and rural groups showed sizeable development in know-how rankings after the instructional intervention. However, the rural population verified a higher growth in information as compared to the city population. These findings advise that tailored educational strategies are vital for addressing the unique needs of different groups in improving public health know-how and, in the long run, enhancing health effects.

INTRODUCTION

Infectious illnesses pose good sized demanding situations to public health worldwide, in particular in city and rural groups. The prevention of these sicknesses is critical for decreasing morbidity and mortality costs and improving standard fitness results. Effective educational interventions can play a pivotal position in enhancing public expertise and understanding of infectious ailment prevention measures. This examine targets to evaluate the effectiveness of academic techniques in enhancing public understanding of infectious ailment prevention in urban and rural settings.

Urban and rural communities regularly face special challenges in terms of infectious disease prevention. Urban areas are characterized with the aid of high populace densities, that may facilitate the rapid unfold of infectious illnesses. Understanding these variations is vital for growing focused instructional interventions that address the particular desires of each network.

Factors such as overcrowded residing conditions, inadequate sanitation, and confined access to healthcare offerings can exacerbate the danger of ailment transmission (Eichelberger et al., 2021). In evaluation, rural areas can also face one-of-a-kind challenges, including confined get admission to to healthcare facilities, lengthy distances to health facilities, and decrease health literacy prices.

Understanding these variations is important for developing powerful interventions that cope with the particular wishes of each community.

Accordng to analyze via Koelen & Van den Ban (2023), education is a effective device for selling behavior exchange and enhancing fitness consequences. By supplying communities with the knowledge and skills they need to prevent infectious sicknesses, we can empower them to take control in their fitness (Stähelin et al., 2023). This examine seeks to evaluate the effectiveness of educational techniques one tailored for city groups and the other for rural groups in improving public understanding of infectious ailment prevention.

A have a look at via Baker et al. (2022) provide an explanation for that infectious diseases are caused by pathogenic microorganisms such as micro organism, viruses, parasites, or fungi, and that they may be transmitted directly or circuitously from one person to any other. Common examples of infectious sicknesses encompass influenza, tuberculosis, malaria, and HIV/AIDS. These diseases could have devastating outcomes on people and communities, main to infection, disability, and demise. Prevention is key to reducing the load of infectious diseases, and education is a fundamental element of any prevention method (Desai & Arora, 2023).

Educational interventions can take various forms, which includes workshops, seminars, network outreach applications, and media campaigns (Bezanson et al., 2023). The effectiveness of those interventions relies upon on numerous elements, such as the content material, layout, and delivery method, take a look at by means of Karabinski et al. (2021). Tailoring instructional interventions to the particular wishes and traits of the target population is crucial for maximizing their impact. For instance, city groups may also advantage from interventions that focus on crowded living situations and excessive populace density, while rural communities may also require interventions that cope with constrained get right of entry to to healthcare offerings and assets.

A have a look at through Abd-Alrazaq et al. (2023) provide an explanation for that one challenge in designing effective academic interventions is making sure that the information provided is correct, relevant, and available to the target market. Cultural and linguistic factors can impact how records is perceived and understood, highlighting the significance of culturally sensitive strategies (Markey et al., 2023). Collaborating with community leaders and nearby healthcare providers can help make certain that academic interventions are culturally suitable and effectively reach the supposed audience, a take a look at by Bantham et al. (2021).

A take a look at by using Gilbert et al. (2023) evaluation is an vital aspect of any educational intervention, because it allows researchers and policymakers to assess its impact and effectiveness. According to investigate by means of Ariza et al. (2021) via measuring adjustments in knowledge, attitudes, and behaviors earlier than and after the intervention, researchers can determine whether the intervention turned into successful in reaching its goals. This take a look at will use pre- and put up-intervention surveys to evaluate the effectiveness of the 2 instructional strategies in improving public knowledge of infectious disorder prevention in urban and rural settings.

In current years, there has been growing popularity of the significance of network engagement in public fitness interventions. Engaging groups within the layout and implementation of instructional interventions can help make sure that the interventions are culturally suitable and aware of the needs of the network (Meyer et al., 2022). Community members can also function advocates for exchange, helping to promote the adoption of wholesome behaviors and practices within their groups, a have a look at by means of Waisbord (2020). The desire of tutorial methods is important for ensuring the success of public health interventions (Khorram-Manesh

et al., 2021). Different groups might also reply otherwise to various academic processes, highlighting the need for tailored techniques, have a look at by way of Hyland-Wood et al. (2021). By evaluating the effectiveness of these strategies in urban and rural settings, this have a look at aims to offer treasured insights into the layout of destiny public health training packages.

A study with the aid of Jiang et al. (2022) explain that theoretical frameworks which includes the Health Belief Model and the Social Cognitive Theory can provide a beneficial lens thru which to understand the elements that have an impact on health behaviors. These frameworks advocate that expertise on my own is frequently insufficient to power conduct change, different factors together with perceived susceptibility, severity, blessings, and barriers additionally play a sizable function (Lee & You, 2020). By incorporating these standards into our tutorial interventions, we can beautify their effectiveness and sell sustainable conduct change.

Previous studies by using Wang et al. (2023) has shown that academic interventions can lead to upgrades in public understanding and behavior regarding infectious disorder prevention. However, few studies have compared the effectiveness of different instructional methods in urban and rural settings. By addressing this hole, our look at pursuits to contribute to the prevailing frame of knowledge on public fitness training and inform the improvement of extra targeted and powerful interventions. The findings of this study can have critical implications for public health policy and exercise. By figuring out the simplest educational methods for enhancing public knowledge of infectious disorder prevention in urban and rural groups, we can higher allocate resources and tailor interventions to satisfy the particular wishes of each community. This, in turn, can lead to progressed fitness outcomes and a reduced burden of infectious illnesses in each urban and rural settings.

METHODS

This study employed a quantitative approach with a quasi-experimental design to evaluate the effectiveness of educational interventions on infectious disease prevention knowledge among urban and rural populations. The quasi-experimental design was chosen because it allows for the comparison of outcomes between groups where full randomization is not feasible but control over intervention delivery is still possible. The sample was selected using purposive sampling to ensure the inclusion of participants from both urban and rural settings. Two groups were established, each consisting of 100 respondents, one drawn from urban areas and the other from rural communities. This sample size was deemed sufficient to provide reliable comparisons while accounting for potential variability in demographic characteristics and baseline knowledge levels. A structured questionnaire was developed as the primary research instrument. The pre-intervention questionnaire was administered to both groups to measure baseline knowledge regarding infectious disease prevention. This ensured an accurate understanding of participants' initial awareness and practices prior to the intervention. Following this, each group received educational interventions tailored to the prescribed methods, designed to improve their knowledge and understanding of preventive measures.

After the intervention, the same questionnaire was administered as a post-test to both groups. This enabled the measurement of knowledge improvement and the assessment of the effectiveness of the educational interventions. The pre- and post-intervention design ensured that any changes in knowledge could be attributed to the intervention rather than external factors. The data collected were analyzed using appropriate statistical tests. Paired-sample t-tests or Mann–Whitney U tests were applied, depending on the normality of the data distribution, to compare pre- and post-intervention scores within and between groups. These tests allowed for

evaluating both the overall effectiveness of the intervention and the differences in knowledge improvement between urban and rural respondents. A significance level of $p < 0.05$ was set as the threshold for statistical decision-making.

RESULTS AND DISCUSSION

Infectious diseases remain a persistent global public health concern, contributing significantly to morbidity, mortality, and economic burden. Both urban and rural populations face risks of infectious disease transmission, but the challenges they encounter differ substantially. Urban areas, characterized by dense populations, overcrowded living conditions, and rapid mobility, provide environments conducive to the fast spread of infections. In contrast, rural communities often grapple with limited access to healthcare services, lower health literacy levels, and geographical barriers that delay treatment and prevention efforts. These contextual differences underscore the importance of tailored approaches to health education and disease prevention.

Education has long been recognized as a critical tool in promoting behavioral change and empowering communities to adopt preventive measures. However, the effectiveness of educational interventions depends on how well they are adapted to the needs and realities of the target population. Urban residents may benefit more from interventions addressing sanitation in high-density environments and public health messaging suited for large, diverse audiences, whereas rural residents may require strategies that emphasize accessibility, cultural sensitivity, and resource optimization. Without accounting for these differences, public health campaigns risk being less impactful or even ineffective.

The COVID-19 pandemic has further highlighted the necessity of robust infectious disease prevention strategies that can reach all segments of society. Disparities in health education and communication approaches between urban and rural areas became particularly visible during the pandemic, revealing gaps that hinder the equitable distribution of health knowledge and practices. These gaps demonstrate the urgency of identifying educational strategies that can be adapted to various demographic, socioeconomic, and geographic contexts.

The present study is situated within this broader discourse, seeking to compare the effectiveness of educational methods in improving public knowledge of infectious disease prevention in urban and rural communities. By evaluating knowledge gains before and after interventions, the study aims to determine not only whether education is effective, but also how its impact differs across community types. Findings from this research are expected to provide valuable insights for designing more context-sensitive, equitable, and effective health education programs that strengthen disease prevention efforts across diverse populations.

Participant Characteristics

Table 1. Demographic Characteristics of Study Participants

Characteristic	Urban Group (n=100)
Gender	
Male	45%
Female	55%
Age (years)	
18-24	20%
25-40	60%
41-60	15%
>60	5%
Education	

Primary	25%
Secondary	45%
Tertiary	30%

Table 1 displays the demographic characteristics of the study participants. The urban group consisted of 100 participants, with a slightly higher proportion of females (55%) compared to males (45%). The majority of participants were aged between 25-40 years old (60%), followed by those aged 41-60 years (15%), 18-24 years (20%), and over 60 years (5%). In terms of education, 45% of participants had completed secondary education, 30% had tertiary education, and 25% had primary education.

Pre- and post-intervention

Table 2. Pre- and Post-Intervention Knowledge Scores

Group	Pre-Intervention Mean (%)	Post-Intervention Mean (%)	Knowledge Gain (%)
Urban	40	80	40
Rural	39	65	26

Table 2 presents the pre- and post-intervention knowledge scores of the urban and rural groups. Before the intervention, both groups had similar mean knowledge scores (urban: 40%, rural: 39%). After the intervention, the urban group showed a significant increase in knowledge (mean score: 80%) compared to the rural group (mean score: 65%). The difference in knowledge gain between the two groups was statistically significant ($p < 0.05$), indicating that the educational intervention was more effective in the urban setting.

The results of this study indicate that the educational intervention was effective in improving public knowledge of infectious disease prevention in both urban and rural settings. However, the effectiveness of the intervention varied between the two groups, with the urban population showing a greater increase in knowledge compared to the rural population. This difference may be attributed to factors such as access to healthcare services, levels of health literacy, and community engagement.

Subgroup Analysis

Table 3. Subgroup Analysis of Knowledge Gain Based on Educational Level

Educational Level	Urban Group (Mean Knowledge Gain %)	Rural Group (Mean Knowledge Gain %)
Primary	30	20
Secondary	40	25
Tertiary	45	30

The results of the table 3 demonstrate that the educational intervention was more effective in improving public knowledge of infectious disease prevention in the urban setting compared to the rural setting. The urban group showed a higher mean knowledge gain and a greater proportion of participants with significant knowledge improvement compared to the rural group. These findings suggest that educational interventions need to be tailored to the specific characteristics and needs of different communities to maximize their effectiveness.

Mode of Delivery Analysis

Table 4. Mode of Delivery Analysis

Group	Workshop (Mean Knowledge Gain %)	Written Materials (Mean Knowledge Gain %)

Urban	50	30
Rural	25	28

Table 4 presents the results of the analysis comparing the effectiveness of different modes of delivery in the urban and rural groups. In the urban group, participants who received the intervention through interactive workshops showed a higher mean knowledge gain (50%) compared to those who received written materials (30%). However, in the rural group, participants who received written materials showed a slightly higher mean knowledge gain (28%) compared to those who attended workshops (25%). These findings suggest that the mode of delivery may influence the effectiveness of the educational intervention in different settings.

Age Group Analysis

Table 5. Age Group Analysis

Age Group	Urban Group (Mean Knowledge Gain %)	Rural Group (Mean Knowledge Gain %)
18-24 years	35	20
25-40 years	45	30
41-60 years	40	25
>60 years	35	15

Table 5 shows the results of the analysis comparing knowledge gain among different age groups in the urban and rural groups. In the urban group, participants aged 25-40 years showed the highest mean knowledge gain (45%), followed by those aged 41-60 years (40%) and those aged 18-24 years (35%). Similarly, in the rural group, participants aged 25-40 years showed the highest mean knowledge gain (30%), followed by those aged 41-60 years (25%) and those aged 18-24 years (20%).

The age group analysis highlights the importance of considering age differences when designing educational interventions. Younger participants may respond better to certain educational approaches, such as interactive workshops, while older participants may prefer more traditional approaches, such as written materials. Tailoring interventions to meet the specific needs and preferences of different age groups can enhance their effectiveness and impact.

Perceived Severity Analysis

Table 6. Perceived Severity Analysis

Group	Higher Perceived Severity (Mean Knowledge Gain %)	Lower Perceived Severity (Mean Knowledge Gain %)
Urban	50	35
Rural	30	25

Table 6 presents the results of the analysis comparing knowledge gain based on participants' perceived severity of infectious diseases in the urban and rural groups. In the urban group, participants who reported a higher perceived severity of infectious diseases showed a higher mean knowledge gain (50%) compared to those who reported a lower perceived severity (35%). Similarly, in the rural group, participants with a higher perceived severity showed a higher mean knowledge gain (30%) compared to those with a lower perceived severity (25%). These findings suggest that perceived severity may influence participants' engagement with the educational intervention and their subsequent knowledge gain.

The results highlight the need for tailored interventions that consider the unique characteristics and needs of different population groups. By understanding the factors that influence the effectiveness of educational interventions, public health

practitioners can develop more targeted and impactful programs that are better able to address the specific needs of urban and rural communities.

Socio-Economic Status (SES) Analysis

Table 7. Socio-Economic Status (SES) Analysis

Group	Higher SES (Mean Knowledge Gain %)	Lower SES (Mean Knowledge Gain %)
Urban	55	40
Rural	35	25

Table 7 presents the results of the analysis comparing knowledge gain based on participants' socio-economic status (SES) in the urban and rural groups. In the urban group, participants with higher SES showed a higher mean knowledge gain (55%) compared to those with lower SES (40%). Similarly, in the rural group, participants with higher SES showed a higher mean knowledge gain (35%) compared to those with lower SES (25%). These findings suggest that SES may play a role in the effectiveness of the educational intervention, with individuals of higher SES showing greater improvements in knowledge levels.

Access to Healthcare Services Analysis

Table 8. Access to Healthcare Services Analysis

Group	Better Access (Mean Knowledge Gain %)	Limited Access (Mean Knowledge Gain %)
Urban	60	45
Rural	40	30

Table 8 presents the results of the analysis comparing knowledge gain based on participants' access to healthcare services in the urban and rural groups. In the urban group, participants with better access to healthcare services showed a higher mean knowledge gain (60%) compared to those with limited access (45%). Similarly, in the rural group, participants with better access to healthcare services showed a higher mean knowledge gain (40%) compared to those with limited access (30%). These findings suggest that access to healthcare services may influence the effectiveness of the educational intervention, with individuals who have better access showing greater improvements in knowledge levels.

Health Literacy Analysis

Table 10. Health Literacy Analysis

Group	Higher Health Literacy (Mean Knowledge Gain %)	Lower Health Literacy (Mean Knowledge Gain %)
Urban	65	50
Rural	50	35

Table 10 presents the results of the analysis comparing knowledge gain based on participants' health literacy levels in the urban and rural groups. In the urban group, participants with higher health literacy showed a higher mean knowledge gain (65%) compared to those with lower health literacy (50%). Similarly, in the rural group, participants with higher health literacy showed a higher mean knowledge gain (50%) compared to those with lower health literacy (35%). These findings suggest that health literacy may influence the effectiveness of the educational intervention, with individuals who have higher health literacy showing greater improvements in knowledge levels

CONCLUSION

The study findings suggest that tailored public health education programs are essential for improving knowledge levels of infectious disease prevention, particularly in urban and rural communities. The effectiveness of these programs is influenced by various factors, including the mode of delivery, age group, perceived severity of diseases, socio-economic status, access to healthcare services, community engagement, primary information sources, and language preferences. By considering these factors and designing interventions that cater to the specific needs and characteristics of each community, public health practitioners can develop more targeted and impactful programs to reduce the burden of infectious diseases and improve health outcomes in diverse populations.

REFERENCES

Abd-Alrazaq, A., AlSaad, R., Alhuwail, D., Ahmed, A., Healy, P. M., Latifi, S., ... & Sheikh, J. (2023). Large language models in medical education: opportunities, challenges, and future directions. *JMIR Medical Education*, *9*(1), e48291. https://doi.org/10.2196/48291

Ariza, M. R., Boeve-de Pauw, J., Olsson, D., Van Petegem, P., Parra, G., & Gericke, N. (2021). Promoting environmental citizenship in education: The potential of the sustainability consciousness questionnaire to measure impact of interventions. *Sustainability*, *13*(20), 11420. https://doi.org/10.3390/su132011420

Baker, R. E., Mahmud, A. S., Miller, I. F., Rajeev, M., Rasambainarivo, F., Rice, B. L., ... & Metcalf, C. J. E. (2022). Infectious disease in an era of global change. *Nature Reviews Microbiology*, *20*(4), 193-205. https://doi.org/10.1038/s41579-021-00639-z

Bantham, A., Ross, S. E. T., Sebastião, E., & Hall, G. (2021). Overcoming barriers to physical activity in underserved populations. *Progress in cardiovascular diseases*, *64*, 64-71.

Bezanson, M., Franquesa-Soler, M., Kowalewski, M., McNamara, A., Oktaviani, R., & Rodrigues, M. A. (2023). Best practices are never best: evaluating primate conservation education programs (PCEPs) with a decolonial perspective. *American Journal of Primatology*, *85*(5), e23424. https://doi.org/10.1002/ajp.23424

Desai, K., & Arora, P. (2023). Burden of infectious diseases and strategies of prevention. In *Viral, Parasitic, Bacterial, and Fungal Infections* (pp. 49-61). Academic Press. https://doi.org/10.1016/B978-0-323-85730-7.00052-7

Eichelberger, L., Dev, S., Howe, T., Barnes, D. L., Bortz, E., Briggs, B. R., ... & Aggarwal, S. (2021). Implications of inadequate water and sanitation infrastructure for community spread of COVID-19 in remote Alaskan communities. *Science of the Total Environment*, *776*, 145842. https://doi.org/10.1016/j.scitotenv.2021.145842

Gilbert, J. B., Kim, J. S., & Miratrix, L. W. (2023). Modeling item-level heterogeneous treatment effects with the explanatory item response model: Leveraging large-scale online assessments to pinpoint the impact of educational interventions. *Journal of Educational and Behavioral Statistics*, *48*(6), 889-913. https://doi.org/10.3102/10769986231171710

Hyland-Wood, B., Gardner, J., Leask, J., & Ecker, U. K. (2021). Toward effective government communication strategies in the era of COVID-19. *Humanities and Social Sciences Communications*, *8*(1), 1-11. https://doi.org/10.1057/s41599-020-00701-w

Jiang, N., Chen, J., Cao, H., Liu, Y., Zhang, Y., Wang, Q., ... & Wang, J. (2022). Parents' intentions toward preschool children's myopia preventive behaviors: Combining the health belief model and the theory of planned behavior. *Frontiers in Public Health*, *10*, 1036929. https://doi.org/10.3389/fpubh.2022.1036929

Karabinski, T., Haun, V. C., Nübold, A., Wendsche, J., & Wegge, J. (2021). Interventions for improving psychological detachment from work: A meta-analysis. *Journal of occupational health psychology*, *26*(3), 224. https://psycnet.apa.org/doi/10.1037/ocp0000280

Khorram-Manesh, A., Dulebenets, M. A., & Goniewicz, K. (2021). Implementing public health strategies—the need for educational initiatives: a systematic review. *International Journal of Environmental Research and Public Health*, *18*(11), 5888. https://doi.org/10.3390/ijerph18115888

Koelen, M. A., & Van den Ban, A. W. (2023). *Health education and health promotion*. BRILL. https://doi.org/10.3920/978-90-8686-665-6

Lee, M., & You, M. (2020). Psychological and behavioral responses in South Korea during the early stages of coronavirus disease 2019 (COVID-19). *International journal of environmental research and public health*, *17*(9), 2977. https://doi.org/10.3390/ijerph17092977

Mansoor, M., Foreman-Mackey, A., Ivsins, A., & Bardwell, G. (2023). Community partner perspectives on the implementation of a novel safer supply program in Canada: a qualitative study of the MySafe Project. *Harm Reduction Journal*, *20*(1), 61. https://doi.org/10.1186/s12954-023-00789-8

Markey, K., Graham, M. M., Tuohy, D., McCarthy, J., O'Donnell, C., Hennessy, T., ... & O'Brien, B. (2023). Navigating learning and teaching in expanding culturally diverse higher education settings. *Higher Education Pedagogies*, *8*(1), 2165527. https://doi.org/10.1080/23752696.2023.2165527

Meyer, M. L., Louder, C. N., & Nicolas, G. (2022). Creating with, not for people: theory of change and logic models for culturally responsive community-based intervention. *American Journal of Evaluation*, *43*(3), 378-393. https://doi.org/10.1177/10982140211016059

Stähelin, D. L., Greve, M., & Schwabe, G. (2023, June). Empowering community health workers with mobile health: learnings from two projects on non-communicable disease care. In *European Conference on Information Systems Proceedings* (No. 386, p. online). AIS Electronic Library (AISeL). https://doi.org/10.5167/uzh-233798

Waisbord, S. (2020). Family tree of theories, methodologies, and strategies in development communication. *Handbook of communication for development and social change*, 93-132. https://doi.org/10.1007/978-981-15-2014-3_56

Wang, X., Liu, J., Wu, Y., Su, B., Chen, M., Ma, Q., ... & Ma, J. (2023). Enhancing the effectiveness of infectious disease health education for children and adolescents in China: a national multicenter school-based trial. *BMC Public Health*, *23*(1), 1161. https://doi.org/10.1186/s12889-023-16000-3