The Utilization of E-Commerce to Improve Access to Nutrition in Stunting Prevention in Lebak Regency: An Innovative Prototype Study

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Abstrak

Stunting, masalah kesehatan masyarakat utama di Indonesia, khususnya di daerah pedesaan seperti Kabupaten Lebak, berasal dari kekurangan gizi yang terus-menerus dan terbatasnya akses terhadap makanan yang terjangkau dan berkualitas tinggi. Studi ini meneliti potensi e-commerce sebagai solusi inovatif untuk meningkatkan akses terhadap gizi dan berkontribusi pada pencegahan stunting. Prototipe e-commerce dikembangkan untuk menghubungkan produsen makanan lokal dengan konsumen yang kurang terlayani, memastikan ketersediaan produk gizi yang beragam dan terjangkau. Dengan menggunakan pendekatan metode campuran, studi ini menilai kelayakan, kegunaan, dan dampak platform terhadap akses gizi dan kesejahteraan masyarakat. Data kuantitatif mengungkapkan peningkatan yang signifikan dalam keragaman makanan dan keterjangkauan di antara rumah tangga yang menjadi sasaran, sementara wawasan kualitatif menyoroti peningkatan kesadaran akan manfaat gizi dan ekonomi bagi produsen lokal. Platform ini juga mengatasi hambatan logistik dengan mengoptimalkan jaringan distribusi di daerah yang terisolasi secara geografis. Selain itu, inisiatif ini memberdayakan usaha skala kecil, meningkatkan jangkauan pasar dan keberlanjutan pendapatan mereka. Temuan tersebut menunjukkan skalabilitas dan keberlanjutan e-commerce sebagai alat untuk mengatasi tantangan gizi di daerah pedesaan. Studi ini memberikan wawasan yang dapat ditindaklanjuti bagi para pembuat kebijakan, penyedia layanan kesehatan, dan inovator digital, yang mengadvokasi integrasi e-commerce ke dalam strategi nasional untuk pencegahan stunting dan peningkatan kesehatan masyarakat. Penelitian di masa mendatang harus mengeksplorasi aplikasi platform digital yang lebih luas dalam mengatasi tantangan kesehatan yang kompleks.

Kata kunci: E-commerce, pencegahan stunting, akses gizi, inovasi pedesaan, Kabupaten Lebak, kesehatan masyarakat.

Abstract

Stunting, a major public health concern in Indonesia, particularly in rural areas such as Lebak Regency, stems from persistent nutritional deficiencies and limited access to affordable, high-quality food. This study examines the potential of e-commerce as an innovative solution to enhance access to nutrition and contribute to stunting prevention. An e-commerce prototype was developed to connect local food producers with underserved consumers, ensuring the availability of diverse and affordable nutritional products. Using a mixed-methods approach, the study assessed the platform's feasibility, usability, and impact on nutritional access and community welfare.Quantitative data revealed a significant improvement in dietary diversity and affordability among targeted households, while qualitative insights highlighted increased awareness of nutrition and economic benefits for local producers. The platform also addressed logistical barriers by optimizing distribution networks in geographically isolated areas. Moreover, the initiative empowered small-scale enterprises, enhancing their market reach and income sustainability.The findings demonstrate the scalability and sustainability of e-commerce as a tool for addressing nutritional challenges in rural settings. This study provides actionable insights for policymakers, healthcare providers, and digital innovators, advocating for the integration of e-commerce into national strategies for stunting prevention and public health improvement. Future research should explore broader applications of digital platforms in addressing complex health challenges.

***Keywords**: E-commerce, stunting prevention, nutrition access, rural innovation, Lebak Regency, public health.*

INTRODUCTION

Stunting, characterized by chronic undernutrition during critical growth periods, is a major global public health concern, particularly in low- and middle-income countries (Rahmadhita, K,2020). Indonesia remains among the nations with a high prevalence of stunting, with 21.6% of children under five affected as of 2022 (Ministry of Health, 2023). The condition not only hampers physical growth but also affects cognitive development, school performance, and future economic productivity. In rural areas like Lebak Regency, limited access to diverse and affordable nutrition exacerbates the problem, calling for comprehensive strategies that address both supply and demand barriers (Hoddinott et al., 2013). The growing adoption of digital technology offers innovative pathways to address public health challenges. E-commerce, in particular, has transformed access to goods and services, demonstrating its potential to bridge the accessibility gap in rural areas. Studies suggest that e-commerce can reduce logistical challenges and improve affordability in food distribution systems, especially for underserved populations (Zhu et al., 2020). Despite its transformative potential, existing e-commerce models are predominantly urban-centric, leaving rural communities with limited benefits. This gap underscores the importance of tailored approaches to utilize e-commerce in improving nutritional access for vulnerable populations (Gomez & Ricketts, 2013).

This study introduces an innovative e-commerce prototype designed to enhance access to nutrition for communities in Lebak Regency. The prototype leverages local food producers and distributors to create a sustainable supply chain while utilizing digital platforms to connect them directly with consumers. By addressing logistical barriers and promoting nutritional diversity, the platform aims to provide an inclusive solution for stunting prevention in rural areas. This approach aligns with global health recommendations for integrating technology into community-based interventions (World Health Organization, 2021). Employing a mixed-methods approach, this research evaluates the platform's feasibility, adoption, and impact on nutritional access and socioeconomic outcomes. It explores the role of digital innovation in addressing rural health inequities while providing actionable insights for policymakers and stakeholders. The findings contribute to the discourse on the intersection of public health, technology, and community development, highlighting the scalability and sustainability of e-commerce solutions in addressing stunting and similar health challenges (Kapoor et al., 2022).

METHOD

This study employs a mixed- methods approach to evaluate the feasibility, implementation, and impact of an e-commerce prototype aimed at improving access to nutrition in stunting prevention in Lebak Regency. The methodology integrates quantitative and qualitative techniques to ensure comprehensive data collection and analysis.

1. Research Design

The study is divided into three main phases:

- **Phase 1: Prototype Development**A tailored e-commerce platform was designed, focusing on connecting local food producers and suppliers with rural consumers. The design prioritized user-friendly interfaces, affordability, and integration with existing digital infrastructure in the community. Stakeholder consultations were conducted during this phase to incorporate input from community members, local food producers, and public health experts.
- **Phase 2: Pilot Testing** The prototype was piloted in three villages in Lebak Regency with high stunting prevalence. The pilot involved 100 households, local food producers, and logistics partners to simulate real-world usage. Key performance indicators (KPIs) such as user adoption rate, product availability, affordability, and nutritional diversity were monitored.

- **Phase 3: Evaluation and Analysis** The platform's impact on nutritional access and stunting-related outcomes was evaluated through surveys, interviews, and focus group discussions (FGDs). Quantitative data were collected on household food expenditure, dietary diversity scores, and platform usage metrics. Qualitative data explored user experiences, challenges, and perceived benefits.

2. **Data Collection**

- **Quantitative Data** Structured surveys were administered to 100 households before and after platform usage to measure changes in nutritional access and dietary diversity. Logistic data, such as delivery times and order accuracy, were also collected.
- **Qualitative Data** Semi-structured interviews and FGDs were conducted with households, local producers, and stakeholders to understand their experiences, challenges, and satisfaction with the platform.

3. **Data Analysis**
    - **Quantitative Analysis** Data were analyzed using descriptive and inferential statistics. Paired t-tests and regression models were employed to assess changes in dietary diversity and food affordability. Adoption and retention rates were calculated to evaluate user engagement.
    - **Qualitative Analysis** Interview and FGD transcripts were coded thematically to identify recurring themes and insights about user experience and barriers to implementation. Triangulation was applied to validate findings from different data sources.

4. **Ethical Considerations**

The study adhered to ethical standards for research involving human participants. Informed consent was obtained from all participants, ensuring confidentiality and voluntary participation. Ethical clearance was approved by a university institutional review board (IRB).

5. **Limitations**

The study is limited to the pilot phase and focused on a specific geographical area. While the findings provide valuable insights, broader application may require adaptation to other contexts with different demographic and infrastructure characteristics.This robust methodological framework ensures reliable and actionable findings, offering a strong foundation for scaling the e-commerce solution to address nutritional challenges in rural Indonesia.

RESULT AND DISCUSSION

The results of this study highlight the significant potential of e-commerce as an innovative solution to improve nutritional access and contribute to stunting prevention in rural areas, specifically in Lebak Regency. The findings are aligned with global research suggesting that digital technologies can play a pivotal role in addressing complex public health issues, particularly in underserved communities (Gomez & Ricketts, 2013; Kapoor et al., 2022). By bridging the gap between local food producers and consumers through an accessible online platform, this study demonstrates that e-commerce can reduce logistical and economic barriers to nutrition, leading to improved dietary diversity and affordability (Drimie, Scott & Ruysenaar, Shaun,2010).

1. E-commerce as a Tool for Nutritional Accessibility

One of the most notable findings from this study is the improvement in dietary diversity and food security among participating households. Before using the platform, many households faced challenges in accessing diverse and nutritious food, largely due to geographical isolation and limited market options (Bima, A,2019). The e-commerce prototype effectively addressed these issues by providing a convenient and reliable channel for sourcing locally produced foods at affordable prices (Fitriani, R., & Hidayat, M.,2020). These results are consistent with previous studies, which have shown that e-commerce platforms can facilitate greater access to nutritious

food, reduce food prices, and increase market availability, particularly in rural and remote areas (Zhu et al., 2020; Hoddinott et al., 2013).Furthermore, the affordability of nutritious food improved significantly as local producers were able to reach a broader customer base without incurring high distribution costs. This aligns with findings by Zhu et al. (2020), who emphasize that e-commerce can enhance the efficiency of food supply chains, thus benefiting both producers and consumers. By reducing intermediaries, local producers in Lebak Regency were able to offer competitive prices for their products, which directly impacted household expenditure on food and improved overall food security.

2. Challenges in Adoption and Engagement

Despite the positive outcomes, the study also identified several barriers to full adoption and engagement with the e-commerce platform. These challenges included limited digital literacy among rural populations, poor internet connectivity, and hesitance towards online transactions. These barriers are consistent with the findings of studies such as those by Gomez & Ricketts (2013) and Kapoor et al. (2022), which highlight the importance of addressing technological barriers when introducing digital solutions in rural settings. Although the platform was designed to be user-friendly, the digital divide remains a significant challenge in ensuring equitable access to such innovations. Moreover, while the e-commerce platform successfully reached a portion of the target population, the overall engagement rate was lower than expected. The platform's impact was more pronounced among households with higher levels of education and access to technology, which further underscores the need for complementary interventions, such as digital literacy training and infrastructure improvement, to maximize the effectiveness of e-commerce initiatives in rural health interventions (Kapoor et al., 2022).

3. Economic and Social Impacts

The platform not only improved nutritional access but also had positive economic implications for local producers. By expanding their market reach, small-scale farmers and food producers saw an increase in income and market stability. This outcome resonates with research on the socio-economic benefits of e-commerce for small businesses in rural areas (Hoddinott et al., 2013). Local producers reported greater confidence in the sustainability of their businesses, which contributed to community resilience and empowerment. Additionally, the platform's ability to connect local producers with consumers without the need for middlemen helped boost the local economy by retaining more value within the community. This study's findings also align with global health recommendations emphasizing the importance of integrating local economic empowerment into public health strategies (World Health Organization, 2021). By fostering a local digital economy, the e-commerce platform contributed to both stunting prevention and broader socio-economic development, demonstrating the potential for multi-faceted solutions in rural public health interventions.

4. Policy Implications and Recommendations

The findings of this study have several important policy implications. First, there is a clear need for the government and other stakeholders to support digital infrastructure and literacy initiatives in rural areas. This includes investments in internet connectivity and training programs to enhance digital skills, particularly among rural populations. Second, future efforts should focus on scaling the e-commerce platform by incorporating feedback from users and expanding the product range to include a wider variety of nutritious foods. Policymakers should also consider integrating such platforms into national health programs aimed at stunting prevention, aligning with broader digital health strategies outlined by the World Health Organization (2021). Furthermore, there is potential for e-commerce to become a central component of Indonesia's

national strategy for reducing stunting and improving food security. The integration of digital technologies in agricultural and food distribution systems can enhance the sustainability and scalability of such solutions. Future research should explore the long-term effects of e-commerce interventions on stunting rates and assess the broader implications of digital health interventions for rural development (Setiana Andarwulan,2020).

CONCLUSION

This study demonstrates the potential of e-commerce as an innovative tool to improve nutritional access and support stunting prevention in rural areas, particularly in Lebak Regency. The implementation of a tailored e-commerce platform not only improved dietary diversity and food security for participating households but also empowered local food producers by providing them with access to broader markets. While the prototype successfully addressed several logistical and economic barriers to food accessibility, challenges related to digital literacy and internet connectivity remained significant. The mixed - methods approach of this study has provided valuable insights into the feasibility and impact of using e-commerce in rural health interventions, with notable improvements in both nutritional outcomes and economic opportunities for local communities.

IMPLICATIONS

The findings of this study have several critical implications for both public health policy and digital innovation strategies aimed at addressing nutrition-related health challenges in rural areas. First, the study underscores the importance of strengthening digital infrastructure in rural communities to ensure equitable access to e-commerce solutions. Addressing the digital divide through investments in internet connectivity and digital literacy training is essential for maximizing the effectiveness of such platforms. Second, the positive impact on local producers highlights the potential of e-commerce in fostering economic resilience in rural areas. Policymakers should explore the integration of such digital platforms into broader national stunting reduction programs to support sustainable local food systems.

Moreover, the success of this e-commerce initiative calls for further research into the scalability and sustainability of digital solutions for rural public health interventions. Future studies should investigate the long-term impact of e-commerce on stunting rates and food security, as well as assess the potential of other digital health interventions in similar contexts. The platform's ability to enhance access to affordable and nutritious food, combined with the economic empowerment of local producers, offers a promising model for addressing not only stunting but also broader public health and socio-economic development goals in rural Indonesia and similar regions globally.

POLICY IMPLICATIONS

1. **Investment in Digital Infrastructure**: Governments and development agencies should prioritize investments in internet connectivity and digital infrastructure to bridge the digital divide in rural communities, ensuring equitable access to digital health solutions.
2. **Promotion of Digital Literacy**: To facilitate widespread adoption of e-commerce platforms, targeted digital literacy programs should be implemented to empower rural populations to effectively navigate and utilize online services.
3. **Integration with National Health Initiatives**: E-commerce platforms like the one developed in this study should be incorporated into national stunting prevention strategies, with a focus on enhancing food security and access to nutritious foods in underserved regions.
4. **Sustainable Development of Local Food Systems**: Policymakers should support the integration of e-commerce with local food production systems, ensuring that local farmers and

food producers are able to capitalize on new market opportunities to improve both nutrition and economic outcomes.

By addressing both nutrition and socio-economic issues simultaneously, this research provides a model for leveraging technology to improve rural health outcomes, with implications for broader public health strategies globally.

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