



Adaptive Governance Based Social Media to Accelerate Stunting Reduction in Medan City

Siti Hajar^{1*}

¹Universitas Muhammadiyah Sumatera Utara, Sumatera Utara, 20238, Indonesia

Abstract

Background Stunting remains a multidimensional public health problem in Indonesia, including in Medan. It is influenced by factors such as nutrition, sanitation, parenting, food security, and the effectiveness of public policy governance. To date, stunting management has tended to be sectoral, top-down, and has not optimally utilized the potential of digital technology, particularly social media, as a tool for communication, education, and public participation.

Methods This research uses a qualitative approach with a case study design in Medan City.

Results Social media functions as an adaptive communication space that accelerates the flow of information, strengthens family nutritional literacy, and opens up two-way feedback between the government and the public. Social media-based adaptive governance practices are characterized by increased policy flexibility, strengthened cross-sector coordination, and growing digital community participation in stunting prevention. Furthermore, this study found that the successful use of social media is largely determined by actor capacity, public trust, and the sustainability of institutional learning. Adaptive Governance based social media is a relevant, innovative, and contextual approach to accelerating stunting reduction in Medan City. Social media has been proven to function not only as a means of disseminating health information but also as an adaptive communication space that enables two-way interaction, continuous policy learning, and strengthened community participation in stunting prevention programs.

Conclusions Stunting management in the digital era can no longer be understood solely as a technical health issue, but rather as an adaptive governance process based on learning, collaboration, and two-way communication. In this context, social media serves as a strategic medium that strengthens policy sensitivity to social realities while shortening the gap between policy formulation and implementation.

*Correspondence

*Name : Siti Hajar

Email : sitihajar@umsu.ac.id



Copyright: © 2026 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Keywords

Key words: Adaptive Governance; Social Media; Stunting; Policy Governance; Collaboration

Introduction

Stunting is a chronic, complex, and multidimensional public health problem that remains a major challenge to human development in Indonesia. Stunting not only reflects a long-term failure to meet children's nutritional needs but also has direct implications for the low quality of human resources, increased vulnerability to disease, decreased cognitive capacity, and weakened national competitiveness in the future (Sukmawati et al., 2025). Addressing stunting is a part of the Sustainable Development Goals (SDGs) agenda, particularly Goal 2 (zero hunger), Goal 3 (good health and well-being), and Goal 10 (reduced inequalities).

In Indonesia, the government has designated accelerating stunting reduction as a national development priority. Various nutrition-specific and nutrition-sensitive interventions have been implemented through cross-sectoral programs, spanning health, education, sanitation, and social protection. However, the effectiveness of these policies still faces various implementation challenges at the regional level, particularly in urban areas with high social complexity. Medan, as one of Indonesia's metropolitan cities, represents the dynamics of stunting issues typical of urban areas, where urban poverty, population density, limited sanitation in densely populated areas, and disparities in access to healthcare remain structural issues. The management of stunting in Medan demonstrates that this problem is not solely related to medical and nutritional aspects, but is also significantly influenced by public policy governance, government-community communication patterns, and the level of public participation in health programs. Various studies confirm that the failure of stunting reduction programs in many regions is often due to weak cross-sectoral coordination, low policy adaptability to local dynamics, and limited feedback mechanisms between the government and the community (Ansell & Gash, 2018; Brunner & Lynch, 2019). Therefore, addressing stunting requires a governance approach that is not merely administrative but also adaptive, collaborative, and responsive to social change.

The concept of adaptive governance is becoming increasingly relevant for application in public health policies, including stunting management. Adaptive governance is understood as a governance approach that emphasizes the ability of government systems to continuously learn, adapt policies to the dynamics of the social environment, and involve various actors in flexible and collaborative decision-making processes (Chaffin et al., 2014; Folke et al., 2016). This approach differs from conventional governance models, which tend to be hierarchical, rigid, and top-down. In adaptive governance, policy is seen as a continuously evolving process through feedback mechanisms, mutual learning, and continuous adaptation. On the other hand, developments in information and communication technology, particularly social media, have fundamentally changed the patterns of interaction between government and society. Social media is no longer simply a space for social expression but has transformed into a platform for policy communication, public education, health advocacy, and citizen participation in the development process (Kaplan & Haenlein, 2019; Mergel, 2020). In the context of health policy, social media has proven effective in improving health literacy, accelerating information dissemination, and building social support networks at the community level (Moorhead et al., 2018; Chen & Wang, 2021).

Stunting management practices in various regions, including Medan City, are underway. Local governments, community health centers (Puskesmas), integrated health post (Posyandu) cadres, and health communities are beginning to utilize social media platforms

such as WhatsApp, Instagram, Facebook, and YouTube as tools for nutrition education, program outreach, case reporting, and inter-sectoral coordination. However, this use of social media is generally instrumental and sporadic, not yet systematically integrated into an adaptive governance framework. Social media is often positioned as a one-way communication tool, rather than a policy learning mechanism and a space for adaptive interaction between the government and the community. Furthermore, a growing phenomenon is the rise of health disinformation on social media, including regarding child nutrition, parenting, and stunting interventions. Invalid information, health hoaxes, and narratives not based on scientific evidence often spread faster than official government information. This situation often undermines public trust in health programs and weakens stunting effectiveness interventions at the grassroots level (Cinelli et al., 2020; WHO, 2022). Thus, social media presents both a strategic opportunity in stunting management and a serious challenge in public communication governance.

Another issue that has emerged in urban stunting management is the low level of data integration and weak policy feedback mechanisms. Stunting programs often operate with an administrative approach based on formal reports, which tend to be slow to respond to field dynamics. In the context of highly dynamic urban communities, delays in policy responses have a domino effect to the effectiveness of interventions. Social media actually provides a space to build a real-time feedback system between the community and the government, but this potential has not been optimally utilized within the framework of adaptive governance. Based on this phenomenon, this study believes that stunting management in Medan City is not sufficient if approached solely through nutrition and health interventions, but rather needs to be examined as a digital communication-based adaptive public governance issue. Medan City, as a large city with high internet and social media penetration rates, has great potential to develop a social media-based adaptive governance model as an innovative strategy to accelerate stunting reduction. However, to date, there is no conceptual model that systematically explains how social media can be integrated into policy adaptation mechanisms, cross-sector coordination, and institutional learning in stunting management. Therefore, the main focus of this study is: 1) the role of social media in supporting the implementation of adaptive governance in the stunting management program in Medan City; 2) multi-actor interaction and collaboration patterns (government, health workers, communities, and society) through social media in Medan City.

Several studies have examined stunting, but they are still dominated by biomedical and community nutrition approaches, focusing on specific and sensitive nutrition interventions, maternal and child health, sanitation, and household food security (Victora et al., 2020; Ruel, et al., 2018). These interventions have proven effective in reducing stunting prevalence in various developing countries, but numerous studies also emphasize that program success is largely determined by the social context, institutional capacity, and the effectiveness of public policy governance (Hodge et al., 2019; Gillespie et al., 2021). Thus, stunting is increasingly understood as a multidimensional problem that requires a cross-sectoral and cross-actor approach. In the realm of governance, recent studies emphasize the importance of collaborative governance and network governance approaches in health policy, particularly in addressing complex (wicked) problems like stunting (Ansell & Gash, 2018; Emerson & Nabatchi, 2019). This approach positions the government, the private sector, civil society, and local communities as interconnected actors. However, most studies still view

governance from the perspective of formal institutional coordination, with the state remaining dominant. The dimension of policy adaptation to rapid social change has received relatively little attention in stunting policy studies.

The concept of adaptive governance has rapidly developed in environmental and climate change studies, emphasizing the system's capacity to learn, adapt, and respond to uncertainty through feedback mechanisms and collective learning (Folke et al., 2016; Chaffin et al., 2014). In recent years, this concept has begun to be adopted in public policy and health studies, particularly in addressing health crises and policy uncertainty (Termeer et al., 2017; Biesbroek et al., 2020). However, its application to stunting management remains very limited and is more conceptual than operational. Few studies have examined how adaptive governance is implemented in the context of local health policy. Similarly, social media in health policy has demonstrated its effectiveness as a means of risk communication, health promotion, and increasing public health literacy (Moorhead et al., 2018; Chen & Wang, 2021). Social media is also seen as capable of building public engagement and accelerating the dissemination of health information. However, most research still positions social media as a communication and education tool, rather than as an adaptive governance instrument integrated with decision-making mechanisms, policy learning, and cross-sectoral coordination.

In Indonesia, research on stunting management is still dominated by technical health approaches, nutrition program evaluation, and sectoral policy analysis. Some studies have begun to address the importance of cross-sectoral collaboration and the role of communities, but few link these to an adaptive governance framework, let alone integrating social media as a primary governance instrument (Pakaya et al., 2023). Research specifically examining social media-based adaptive governance in stunting management in urban areas is scarce, especially in large cities like Medan (Rahayu et al., 2023). Therefore, this study positions social media not merely as a means of health communication, but as a core mechanism in an adaptive governance system, encompassing policy feedback, institutional learning, and real-time cross-actor coordination.

Methods

This research uses a qualitative approach with a case study design. The qualitative approach was chosen because this research aims to deeply understand the processes, meanings, social interactions, and dynamics of adaptive governance in social media-based stunting management in Medan City. This approach aligns with the views of Creswell (2018) and Denzin & Lincoln (2018), who emphasize that qualitative research is used to explore complex, contextual, and meaningful social phenomena that cannot be comprehensively explained through quantitative approaches. The case study design was chosen because this research focuses on a specific context: social media-based stunting management within the framework of adaptive governance in Medan City, a unique and complex governance system influenced by social, institutional, and urban cultural factors. According to Yin (2018), case studies are highly appropriate for answering "how" and "why" research questions, especially when researchers have limited control over the events being studied and when the phenomenon being studied is situated in a real-life context. Within this framework, Medan City is positioned as a single embedded case, with the unit of analysis encompassing government actors, health workers, integrated health post (Posyandu) cadres, and the community beneficiaries of the stunting program. A qualitative approach also allows researchers to capture policy adaptation mechanisms, digital communication patterns, and

institutional learning processes that dynamically occur through social media. Therefore, this research design is relevant for uncovering adaptive governance practices that are not always visible in formal policy documents. This research was conducted in Medan City, North Sumatra Province, considering that Medan is a metropolitan city with high internet penetration and social media usage, and faces stunting issues influenced by social and economic complexities and urban population density. Medan City also actively implements various programs to accelerate stunting reduction involving various sectors.

Data collection is obtained through primary data such as in-depth interviews and observations, and through secondary data such as document analysis and social media content. The use of multiple techniques aimed to increase data depth and validity of findings through method triangulation (Creswell, 2018). The stages of this research were:

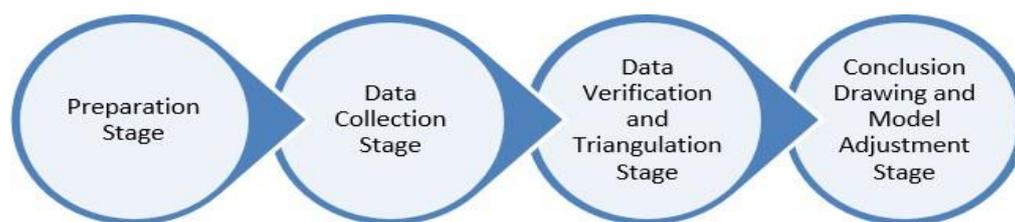


Figure 1. Research Stages
Source: Processed by researchers (2025)

The figure illustrates the stages of this research as follows:

1. The preparation stage includes literature review, conceptual framework development, interview instrument development, and research permit processing.
2. The data collection stage includes in-depth interviews, observations, document collection, and social media data.
3. The data verification and triangulation stage, comparing interview, observation, and document results to increase data validity.
4. The conclusion drawing and model development stage, linking empirical findings to the adaptive governance theoretical framework.

Results and Discussion

The application of adaptive governance to accelerate stunting reduction through social media in Medan City has evolved as a form of adaptive government response to social dynamics, advances in digital technology, and the complexity of public health issues. Social media serves not only as a means of public communication but also as a strategic instrument for building cross-actor collaboration, accelerating information dissemination, and strengthening real-time policy feedback systems. The Medan City Government, through the Health Office, the Communication and Information Office, and the Stunting Reduction Acceleration Team (TPPS), has utilized various social media platforms such as Instagram, Facebook, WhatsApp Groups, and YouTube as primary channels for stunting education campaigns. Content

delivered includes information on nutrition for pregnant women, the importance of the First 1,000 Days of Life (HPK), parenting, environmental sanitation, and access to healthcare services.

The use of social media within the framework of adaptive governance to accelerate stunting reduction reflects the government system's ability to learn and adapt to changing consumer behavior in an increasingly digital society. The government no longer relies on conventional one-way communication patterns but instead adopts a two-way, interactive, participatory, and contextual communication approach. This is in line with the main character of adaptive governance which emphasizes policy flexibility, continuous learning and responsiveness to changes in the social environment.

Social Media as an Adaptive Policy Communication and Feedback Mechanism in Stunting Governance in Medan City

Social media serves as a key enabler of policy feedback mechanisms, providing information on toddler conditions, service access constraints, and community responses to stunting programs, all of which can be directly accessed through digital interactions. This strengthens the capacity of government and health workers to quickly adjust strategies based on field dynamics. This aligns with [Folke et al., \(2016\)](#) assertion that one of the key pillars of adaptive governance is the availability of an information system that enables continuous learning and dynamic policy adaptation. The findings of this study also align with research by [Moorhead et al. \(2018\)](#) and [Chen & Wang \(2021\)](#), which states that social media in the public health context functions not only as a medium for health promotion but also as a means of interaction that shortens the distance between service providers and the community. However, this study goes further by demonstrating that social media in Medan City has begun to function as adaptive governance, not simply as one-way communication.

Furthermore, social media plays a significant role in strengthening multi-actor collaboration in addressing stunting in Medan City. Through cross-sector WhatsApp groups, intense interaction occurs between village officials, health workers, integrated health post (Posyandu) cadres, and family caregivers at risk of stunting. Social media has become an informal coordination space that complements formal bureaucratic coordination. From an adaptive governance perspective, collaboration fostered through social media reflects a shift from hierarchical coordination patterns to more flexible and responsive networked governance. The government is no longer the sole source of information, but rather shares roles with community actors as producers and distributors of health information. This finding aligns with [Emerson & Nabatchi \(2019\)](#), who emphasized that adaptive governance requires interconnectedness between actors through dynamic collaborative networks.

Compared with previous research, which generally places collaboration in stunting management within the realm of formal coordination (e.g., cross-sectoral meetings and technical meetings), this study shows that social media has shifted much of this coordination function to a more fluid and rapid digital space. This reinforces [Mergel \(2020\)](#) finding regarding the shift in the character of modern governance toward digital collaborative governance. However, this study also found that the effectiveness of digital collaboration is largely determined by the capacity of actors and institutional leadership. In some regions, obstacles remain, such as low digital literacy among some cadres and limited initiative from work unit leaders to optimize the strategic use of social media. These findings confirm

the research of Biesbroek et al. (2020) stated that institutional adaptive capacity is a key factor in the success of adaptive governance.

The acceleration of stunting reduction through the use of social media in Medan City has become a platform for horizontal policy learning, both among health workers, among cadres, and between the government and the community. Thus, through digital discussions, the exchange of experiences, and the sharing of best practices, a collective learning process occurs, enabling actors to reflect on the effectiveness of stunting interventions and adapt them to local conditions.



Figure 2. Stunting Campaign Through Instagram
Source: BPOM Medan (2024)



Figure 3. Stunting Prevention Advertisement in Medan City Through Online Media
Source: Ministry of Health of Indonesia (2025)

In today's digital era, the use of social media as a strategic communication tool offers the potential to raise public awareness and educate the public about the importance of balanced nutrition. [Irawan et al., \(2024\)](#) said that social media has become an increasingly important platform for disseminating information. The We Are Social 2023 report ([Masya & Salim Alatas, 2024](#)) noted that more than 170 million people in Indonesia actively use social media, with the majority of users being in the productive age group, and this creates a significant opportunity to educate the public about health issues, including stunting. Digital-based communication strategies on social media can include educational campaigns, data-based information dissemination, and direct interaction with the public. With the right messaging, social media can encourage positive behavioral changes related to children's health and nutrition. According to ([Hidayat, 2022; Pourkarim et al., 2022](#)), campaigns to accelerate stunting reduction through social media are a key strategy for increasing public awareness and understanding of the importance of good nutrition for child growth. Therefore, in this context, a community-based communication model is crucial for the campaign to accelerate stunting reduction through social media in Medan City, ensuring that important messages and information are effectively conveyed, particularly regarding the importance of nutrition for children in preventing and managing stunting.

Social media has become a dominant platform for disseminating health information and campaigns. [Fahri & Sayekti \(2024\)](#) and [Rawat et al., \(2017\)](#) show that health campaigns conducted on social media can increase public knowledge by 30-40%. This approach can help address the problem of information apathy often faced by the public, especially in densely populated urban areas like Medan. Interactive communication strategies engage the public in the learning process. For example, campaigns involving quizzes, polls, or live sessions on social media can increase user engagement. [Astuti et al., \(2025\)](#) and [Christian et al., \(2020\)](#) found that interactive patterns can improve information retention compared to traditional outreach methods. Disseminating messages to the public about the importance of nutrition and stunting management can also be expanded by partnering with local influencers or community leaders to disseminate the message. For example, research by ([Chioma et al., 2022; Sanusi et al., 2025](#)) shows that recommendations from trusted individuals (influencers) have a greater impact on shaping healthy behaviors than information from official sources. Meanwhile, the use of multimedia content such as infographics, short videos, and engaging stories can convey information effectively. A study by ([Onsu et al., 2023](#)) showed that the use of visuals in health communication can increase public understanding by up to 50% compared to text-based information. Furthermore, research by ([Christian et al., 2020; Dearden et al., 2023](#)) shows that social support can improve adherence to recommended health programs. Therefore, building communities on social media where parents and community members can share experiences and information related to child nutrition can create important social support.

Multi-Actor Digital Collaboration and Networked Interaction in Adaptive Stunting Governance.

Stunting is a serious public health problem in developing countries, including Indonesia. Stunting is a nutritional problem that affects a child's physical growth and development, often caused by chronic malnutrition during the first 1,000 days of life. According to data from UNICEF and the Indonesian Ministry of Health ([Report on Monitoring and Evaluation of RAD PANGAN and GIZI Medan City, 2023](#)), the prevalence of stunting in Indonesia

reached 30.8% in 2021. Stunting not only impacts a child's physical growth but also negatively impacts cognitive development and future productivity. Therefore, addressing stunting is a top priority in health development in Indonesia, including in Medan City. According to the outcome performance indicators which are indicators of results or impacts achieved in an activity program, there are 4 outcome indicators in food and nutrition development in Medan City, namely 1) prevalence of stunting (short and very short) in toddlers in 2022, based on the results of the Indonesian Nutritional Status Survey (SSGI) which is 15.4% and the government's target in 2024 is 14% while the results of monitoring carried out by the Medan City Health Office through the EPPBGM data application are 0.31% which means the number of stunted toddlers is smaller than the total toddlers measured; 2) prevalence of wasting (thin and very thin) in toddlers through SSGI data obtained 9.2% while the government's target in 2024 is 7%, the data recorded through the EPPBGM application of 0.20% is far below the national target; 3) the prevalence of obesity in the population aged >18 years in 2022 was 14.25% data from the Medan City Health Office and the government's target for 2024 was 21.8% meaning it was below the national target; 4) the prevalence of overweight in toddlers in 2022 was 1.8% data from SSGI results and EPPBGM data was 0.18% while the government's target in 2024 was 1% which means based on SSGI data Medan City was slightly above the national target but based on EPPBGM data it was below the national target.

In accordance with the explanation above, the problem of stunting has a close correlation with the national development vision reflected in Nawacita II or better known as Asta Cita, namely the eight national development priorities proclaimed in the National Medium-Term Development Plan (RPJMN) 2020-2024. Stunting as a strategic issue that cannot be separated from several main pillars in Asta Cita which emphasize the importance of holistic and sustainable human development. The Asta Cita in question are as follows: First, Asta Cita 1, namely strengthening economic resilience for quality and equitable growth, emphasizing the importance of fulfilling the basic needs of the community, including nutritious food and equitable health services. According to (Chandra et al., 2022; Sari, T Mila; Hajar, 2023) that overcoming stunting requires strengthening food security at the household level, especially for vulnerable and poor groups, through program support such as food assistance, family farming, and specific nutrition interventions. Second, the 3rd Asta Cita, namely building quality and competitive human resources, is directly related to the agenda of accelerating stunting reduction. Ndagjimana et al., (2024) emphasized that children who experience stunting have a higher risk of cognitive impairment, low productivity, and weak competitiveness in the future. Therefore, stunting is a major obstacle in the development of superior human resources that are the foundation of national progress. Third, the 5th Asta Cita, namely strengthening infrastructure to support economic development and basic services, is also highly relevant. Basic infrastructure such as sanitation, clean water, maternal and child health facilities, and adequate transportation play a crucial role in creating a healthy growth and development environment for children, while preventing infections that trigger stunting. Furthermore, the 6th Asta Cita, namely building a sustainable living environment, increasing disaster and climate change resilience, has an important dimension in reducing food and health vulnerability due to disasters and climate change, which indirectly impacts the prevalence of stunting, especially in disaster-prone or underdeveloped areas. Thus, stunting mitigation is not solely the responsibility of the health sector but rather a cross-sectoral agenda aligned with all pillars of Asta Cita (Government's Goals). This effort

requires policy integration, strengthened central-regional synergy, and the active involvement of the community and business sector to create a healthy, intelligent, and productive golden generation of Indonesia in 2045.

Stunting is not only manifested in less than ideal physical shape but also indicates nutritional problems and inadequate parenting. According to (Adinda et al., 2024; Salsabila et al., 2024), stunting contributes to long-term declines in human productivity. This indicates that addressing stunting must be comprehensive, involving various sectors, including education, health, and communications. The use of digital-based communication in stunting campaigns targets young people, who are the target group for stunting prevalence, namely adolescents (prospective brides/grooms). This is consistent with research (Astika et al., 2023; Widiastuti et al., 2024) that shows that young people receive more health information through social media than through traditional channels. However, research by Ridho et al. (2024) notes that health communication programs in Indonesia often focus on informational materials that are not well integrated across digital platforms. Recognizing this behavioral shift, health interventions that rely on social media offer a significant opportunity to reach a large audience. Stunting is a complex and multidimensional public health problem characterized by growth failure in toddlers due to chronic malnutrition and recurrent infections, particularly in the first 1,000 days of life, from pregnancy to age two (Ndagijimana et al., 2024). Stunting reflects the accumulated inability of social, economic, and health care systems to provide an optimal growth and development environment for children. Therefore, this research can be used as a solution to reduce stunting rates in Medan City.

To accelerate stunting reduction efforts in Medan City, a multi-actor interaction pattern is needed in handling stunting in Medan City through horizontal, dynamic, and network-based social media. Social media, especially WhatsApp, Instagram, and Facebook, function as cross-sector communication spaces that transcend bureaucratic hierarchies. Interactions are no longer dominated by formal top-down command lines, but rather take place in two-way and even multi-directional (many-to-many communication). Within the framework of adaptive governance, this pattern reflects a shift from a state-centered governance model to collaborative and network governance, where each actor has an active role as: 1) a transmitter of information; 2) a recipient of feedback; and 3) a driver of field action. Local governments (Health Offices, Villages, and Sub-districts) interact with health workers (Community Health Centers, Midwives, and Integrated Health Post (Posyandu) cadres, through: 1) WhatsApp coordination groups; 2) distribution of digital circulars; and 3) rapid reporting based on photos, videos, and short messages. Furthermore, interactions are established through coordinating integrated health post (Posyandu) schedules and home visits, real-time reporting of cases of toddlers at risk of stunting, and the consolidation of initial data before entering it into the formal reporting system.

These interactions can establish a rapid response system that allows for flexible program adjustments, decision-making based on actual field conditions, and streamlining bureaucratic processes. This demonstrates that social media has served as an adaptive coordination instrument for local governments. Furthermore, other interactions are also conducted within communities through social media, including strengthening nutritional norms through digital community campaigns, sharing childcare experiences, community-based advocacy related to sanitation, clean water, and social assistance, as well as mobilizing community participation in Posyandu activities. Therefore, these interactions demonstrate

that the implementation of an adaptive governance model will develop community self-organizing capacity and increase social ownership of stunting.

The Medan City Government also interacts directly with the public through official government accounts, social media comment sections, direct messages, and digital educational broadcasts. Through these interactions, the Medan City Government communicates policies and programs, handles public complaints, clarifies issues and information, and advocates for healthy lifestyles. This interaction is expected to reflect the transformation of governance toward digital participatory governance, so that the public is no longer merely an object of policy but becomes part of an adaptive decision-making ecosystem. Interaction patterns through multi-actor collaboration utilizing social media in Medan City can be classified as:

- a. Operational collaboration, which includes mentoring families at risk of stunting, coordinating integrated health posts (Posyandu), and distributing supplementary food. Furthermore, social media can accelerate micro-decision-making and the allocation of field resources.
- b. Informational collaboration, which includes informal data exchange, digital education, and rapid reporting, creating an adaptive information ecosystem that is crucial for adaptive governance.
- c. Advocacy collaboration, which occurs when a community voices specific needs, pushes for government intervention, and advocates for service improvements.

Although the multi-actor interaction and collaboration patterns in addressing stunting through social media in Medan City demonstrate a collaborative and adaptive character, this study also uncovers a number of structural challenges that could potentially hinder the effectiveness of digital collaborative governance. One key challenge is the digital literacy gap between actors, including health workers, cadres, and the target community. Differences in ability to access, understand, and utilize digital information lead to unequal participation in digital collaboration spaces. This situation aligns with the findings of [Van Dijk \(2020\)](#) and [Helsper \(2021\)](#), who emphasized that the digital divide is no longer limited to physical access but also encompasses gaps in skills and understanding of digital information.

Furthermore, this study found an increase in the digital workload of health workers as a result of the intensification of communication through social media. Health workers are not only required to perform medical services but are also required to respond to messages, conduct online education, and monitor public reports outside of formal working hours. This phenomenon reinforces the findings of [Mergel \(2020\)](#) and [Tornberg et al. \(2022\)](#) found that digital transformation in the public sector is often not accompanied by workload adjustments and adequate institutional support, potentially leading to digital fatigue. Another challenge is the proliferation of disinformation and nutrition hoaxes on social media, which disrupt the stunting education process. Information not based on scientific evidence regarding children's diets, supplements, and alternative treatments often spreads faster than official information. This situation has implications for declining public trust in formal health messages and has the potential to trigger incorrect decisions in childcare. It is consistent with research by [Cinelli et al. \(2020\)](#) and a [WHO report \(2022\)](#), which emphasized that health disinformation is one of the greatest threats to the use of social media for public health policy.

Another structural challenge is the lack of integration of informal digital platforms, such as WhatsApp groups for cadres and the community, with official government health data systems. As a result, important information quickly obtained through social media is often not systematically documented in formal reporting systems. This hinders data integration, evidence-based policy evaluation, and the continuity of institutional learning. This situation aligns with the findings of [Kettunen & Kallio \(2019\)](#) and [Gil-Garcia et al. \(2018\)](#), which emphasize that the success of digital governance is largely determined by the interoperability between formal information systems and informal digital communication channels. Furthermore, unequal internet access in marginalized urban areas is also a significant obstacle to optimizing digital collaboration. Families at risk of stunting living in densely populated and impoverished urban areas do not always have stable internet access or adequate digital devices. As a result, they are potentially excluded from the flow of digital information related to health services and stunting programs. These findings reinforce the arguments of [UN-Habitat \(2020\)](#) and [ITU \(2021\)](#) that unequal digital access in impoverished urban areas poses a serious challenge to the implementation of technology-based public policies.

These challenges demonstrate that digital collaboration within an adaptive governance framework cannot be allowed to develop organically without strong institutional support. Formal policy support is needed that clearly and standardizes the use of social media in health services, including communication ethics, data protection, and workload allocation. Furthermore, standardizing digital communication is crucial to ensure the consistency of health messages, the validity of information, and integration with official government data systems. Furthermore, strengthening human resource (HR) capacity through digital literacy training for health workers, cadres, and the community is a key prerequisite for effective, inclusive, and sustainable digital collaboration ([OECD, 2020](#); [World Bank, 2021](#)). Thus, challenges in digital interaction and collaboration patterns are not only technical, but also structural and institutional. Without systematic policy intervention, digital collaboration risks widening the participation gap, increasing the workload of field actors, and weakening the effectiveness of adaptive governance in addressing stunting.

Conclusion

This study concludes that accelerating stunting reduction in urban areas such as Medan requires an adaptive governance approach that goes beyond conventional bureaucratic and sectoral models. The multidimensional nature of stunting, shaped by social, economic, environmental, and behavioral factors, demands flexible governance systems capable of continuous learning and broad multi-actor engagement. The findings demonstrate that social media has functioned as a core governance instrument by enabling policy communication, real-time feedback, and collective learning. Through digital interactions, the relationship between government and citizens has shifted from a predominantly instructional model to a more dialogic and participatory one, allowing policies to be adjusted more responsively to community needs while strengthening cross-sectoral networks and shared responsibility for stunting reduction.

Despite its contributions, this study has several limitations. It focuses on a single urban context, limiting the generalizability of the findings to other settings, and it does not quantitatively measure the direct impact of social media use on stunting outcomes. In

addition, gaps remain between informal digital interactions and official data systems, which constrain the use of digital information for evidence-based policymaking. Future research should adopt comparative and mixed-methods designs to assess the effectiveness of social media-based adaptive governance across different contexts and to examine how digital platforms can be better integrated into formal policy and data infrastructures to support sustainable and equitable stunting reduction.

References

- Adinda, R. G., Windah, A., Kartika, T., Nurhaida, I., Aryanti, N. Y., Lampung, U., Lampung, U., & Author, C. (2024). Online Health Navigation: Study Case of @leonavictoria_ahligizi's Instagram's Impact on Information Fulfilment for Stunting Prevention. *International Journal of Health, Engineering and Technology (IJHET)*, 2(5), 215–225. <https://doi.org/https://doi.org/10.55227/ijhet.v2i6.196>
- Ansell, C., & Gash, A. (2018). Collaborative platforms as a governance strategy. *Journal of Public Administration Research and Theory*, 28(1), 16–32. <https://doi.org/10.1093/jopart/muw038>
- Astika, T., Permatasari, E., Turrahmi, H., Gizi, P. S., Jakarta, U. M., Kebidanan, P. S., & Jakarta, U. M. (2023). EDUKASI KEMANANAN PANGAN DAN GIZI BAGI KADER POSYANDU PADA MASA PANDEMI COVID-19. *Aptekmas: Jurnal Pengabdian Kepada Masyarakat*, 6(1), 64–71.
- Astuti, S. J. W., Suindyah Dwiningwarni, S., & Atmojo, S. (2025). Modeling environmental interactions and collaborative interventions for childhood stunting: A case from Indonesia. *Dialogues in Health*, 6(December 2024), 100206. <https://doi.org/10.1016/j.dialog.2025.100206>
- Biesbroek, R., Dupuis, J., Jordan, A., Wellstead, A., Howlett, M., Cairney, P., & Rayner, J. (2020). Opening up the black box of adaptation decision-making. *Nature Climate Change*, 10(6), 493–498. <https://doi.org/10.1038/s41558-020-0775-9>
- Brunner, R. D., & Lynch, A. H. (2019). *Adaptive governance and climate change*. Springer.
- Chaffin, B. C., Gosnell, H., & Cosens, B. A. (2014). A decade of adaptive governance scholarship: Synthesis and future directions. *Ecology and Society*, 19(3), 56. <https://doi.org/10.5751/ES-06824-190356>
- Chandra, B. R., Darwis, R. S., & Humaedi, S. (2022). Peran Pemberdayaan Kesejahteraan Keluarga (Pkk) Dalam Pencegahan Stunting. *Focus : Jurnal Pekerjaan Sosial*, 4(2), 107. <https://doi.org/10.24198/focus.v4i2.35060>
- Chen, J., & Wang, Y. (2021). Social media use for health purposes: Systematic review. *Journal of Medical Internet Research*, 23(5), e25638. <https://doi.org/10.2196/25638>
- Chioma, Ogor Uzoamaka; Uygun, Hayri; Gujrati, R. (2022). New Media and Digital Mums : The Role of Social Media in Promoting Healthy Dietary Practices amongst Pregnant Women in Enugu State , Nigeria. *VIMARSH*, 13(2), 16–27.
- Christian, P., Hurley, K. M., Phuka, J., Kang, Y., Ruel-Bergeron, J., Buckland, A. J., Mitra, M., Wu, L., Klemm, R., & West, K. P. (2020). Impact evaluation of a comprehensive nutrition program for reducing stunting in children aged 6-23 months in rural Malawi. *Journal of Nutrition*, 150(11), 3024–3032. <https://doi.org/10.1093/jn/nxaa236>
- Cinelli, M., Quattrociochi, W., Galeazzi, A., Valensise, C. M., Brugnoli, E., Schmidt, A. L., Zola, P., Zollo, F., & Scala, A. (2020). The COVID-19 social media infodemic. *Scientific Reports*, 10(1), 16598. <https://doi.org/10.1038/s41598-020-73510-5>
- Creswell, J. W. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.
- Dearden, K., Mulokozi, G., Linehan, M., Cherian, D., Torres, S., West, J., Crookston, B., & Hall, C. (2023). The Impact of a Large-Scale Social and Behavior Change Communication Intervention in the Lake Zone Region of Tanzania on Knowledge, Attitudes, and Practices

- Related to Stunting Prevention. *International Journal of Environmental Research and Public Health*, 20(2). <https://doi.org/10.3390/ijerph20021214>
- Denzin, N. K., & Lincoln, Y. S. (2018). *The SAGE handbook of qualitative research* (5th ed.). SAGE Publications.
- Emerson, K., & Nabatchi, T. (2019). *Collaborative governance regimes*. Georgetown University Press.
- Fahri, M. S., & Sayekti, R. (2024). Stunting Literacy Strategy of the Library and Archives Office: Increasing Public Awareness and Understanding. *Journal La Edusci*, 5(3), 152–161. <https://doi.org/10.37899/journallaedusci.v5i3.1504>
- Folke, C., Biggs, R., Norström, A. V., Reyers, B., & Rockström, J. (2016). Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society*, 21(3), 41. <https://doi.org/10.5751/ES-08748-210341>
- Gil-Garcia, J. R., Dawes, S. S., & Pardo, T. A. (2018). Digital government and public management research. *Government Information Quarterly*, 35(1), 1–4. <https://doi.org/10.1016/j.giq.2017.11.002>
- Gillespie, S., van den Bold, M., Hodge, J., & Herforth, A. (2021). Nutrition and food systems in low- and middle-income countries. *Food Policy*, 101, 102048. <https://doi.org/10.1016/j.foodpol.2021.102048>
- Helsper, E. J. (2021). *The digital disconnect: The social causes and consequences of digital inequalities*. SAGE Publications.
- Hidayat, R. (2022). Use of Twitter for Public Education on Stunting in Indonesia. *Sustainability Science and Resources*, 3, 17–31. <https://doi.org/10.55168/ssr2809-6029.2022.3002>
- Hodge, J., Herforth, A., Gillespie, S., Beyero, M., Wagah, M., & Semakula, R. (2019). Is there an enabling environment for nutrition-sensitive agriculture in East Africa? *Food and Nutrition Bulletin*, 40(1), 34–50. <https://doi.org/10.1177/0379572119828666>
- International Telecommunication Union (ITU). (2021). *Measuring digital development: Facts and figures 2021*. ITU Publications.
- Irawan, Septia Anggi; Alistina, Dwi Arie; Laili, Dzariyani Rizky; Amalia, Nuke; Tewabe, Walelign; Dobrossy, Bence; Girasek, E. (2024). Unveiling Peak Detection, Sentiment Analysis and Post Engagement: Social Media Listening Discourses on Stunting in Indonesia. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4888137
- Kaplan, A. M., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*, 62(1), 15–25. <https://doi.org/10.1016/j.bushor.2018.08.004>
- Kettunen, P. & Kallio, J. (2019). Digital government evolution: A holistic approach. *Government Information Quarterly*, 36(4), 101403. <https://doi.org/10.1016/j.giq.2019.101403>
- Laporan Monev RAD PANGAN Dan GIZI Kota Medan, 1 Forum Koordinasi Penyelenggaraan RAD PANGAN dan GIZI Kota Medan 195 (2023).
- Masya, H., & Salim Alatas. (2024). Social intervention as a communication strategy in reducing stunting in Sidoarjo East Java. *Communicology: Journal of Communication Sciences*, 12(1), 104–124.
- Mergel, I. (2020). Digital service teams in government. *Government Information Quarterly*, 37(1), 101389. <https://doi.org/10.1016/j.giq.2019.101389>
- Moorhead, S. A., Hazlett, D. E., Harrison, L., Carroll, J. K., Irwin, A., & Hoving, C. (2018). A new dimension of health care: Systematic review of the uses, benefits, and limitations of social media for health communication. *Journal of Medical Internet Research*, 20(4), e85. <https://doi.org/10.2196/jmir.1933>
- Ndagijimana, A., Nduwayezu, G., Kagoyire, C., Elfving, K., Umubyeyi, A., Mansourian, A., & Lind, T. (2024). Childhood stunting is highly clustered in Northern Province of Rwanda: A spatial analysis of a population-based study. *Heliyon*, 10(2). <https://doi.org/10.1016/j.heliyon.2024.e24922>

- OECD. (2020). Digital government index 2019: Results. OECD Publishing.
<https://doi.org/10.1787/4de9f5bb-en> Pourkarim
- Onsu, R. R., Waleleng, G. J., & Sondakh, M. (2023). Public Health Behavior Change Communication Strategies in Accelerating the Reduction of Stunting in North Minahasa Regency. *Journal La Sociale*, 4(3), 140–148. <https://doi.org/10.37899/journal-la-sociale.v4i3.858> Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). SAGE Publications.
- Pakaya, Y., Kadir, S., & Kasim, V. N. A. (2023). Implementasi kebijakan intervensi gizi sensitif dalam penanganan stunting di Kabupaten Gorontalo. *Health Information: Jurnal Penelitian*, 15(2), e1244.
- Pourkarim, M., Nayebzadeh, S., Alavian, S. M., & Hataminasab, S. H. (2022). Digital Marketing: A Unique Multidisciplinary Approach towards the Elimination of Viral Hepatitis. *Pathogens*, 11(6), 1–22. <https://doi.org/10.3390/pathogens11060626>
- Rahayu, B. P., Guntoro, B., & Wati, R. I. (2023). Peranan media sosial dalam membangun literasi stunting ibu rumah tangga. *Jurnal Ilmu Komunikasi*.
<https://doi.org/10.24002/jik.v22i2.10164>
- Rawat, R., Nguyen, P. H., Tran, L. M., Hajebehoy, N., Van Nguyen, H., Baker, J., Frongillo, E. A., Ruel, M. T., & Menon, P. (2017). Social franchising and a nationwide mass media campaign increased the prevalence of adequate complementary feeding in Vietnam: A cluster-randomized program evaluation. *Journal of Nutrition*, 147(4), 670–679.
<https://doi.org/10.3945/jn.116.243907>
- Ridho, F. M., Fauzan, M., Faisal, A., & Hanafi, H. (2024). The Effectiveness of Health Communication in Preventing Stunting. *Jurnal Studi Ilmu Sosial Dan Politik*, 3(2), 99–107.
<https://doi.org/10.35912/jasispol.v3i2.2609>
- Ruel, M. T., Alderman, H., & Maternal and Child Nutrition Study Group. (2018). Nutrition-sensitive interventions and programmes: How can they help to accelerate progress in improving maternal and child nutrition? *The Lancet*, 382(9891), 536–551.
[https://doi.org/10.1016/S0140-6736\(13\)60843-0](https://doi.org/10.1016/S0140-6736(13)60843-0)
- Salsabila, O. L., Hastjarjo, S., & Satyawan, I. A. (2024). Government public relations strategy in the digital age: Social Media Influencer (SMI) collaboration in building community participation in Madiun Regency. *Informasi*, 54(1), 89–104.
<https://doi.org/10.21831/informasi.v54i1.70577>
- Sanusi, B. O., Amusan, O. G., & Dada, D. O. (2025). Social Media and Sustainable Development: Thematic and Sentiment Analysis of Twitter (X) Conversations on Zero Hunger in Nigeria. *African Journal of Social and Behavioural Sciences (AJSBS)*, 15(1), 391–409.
<https://journals.aphriapub.com/index.php/AJSBS/article/view/3035>
- Sari, T Mila; Hajar, S. F. T. (2023). Peningkatan Pemahaman Ibu PKK tentang Pola Hidup Sehat dan Bersih (PHBS) Sebagai Upaya Penanganan Stunting di Desa Hamparan Perak. *Abdiraja*, 6(2), 21–26. <https://doi.org/http://dx.doi.org/10.24929/adr.v6i2.2887>
- Sukmawati, S., Hermayanti, Y., Fadlyana, E., Maulana, I., & Mediani, H. S. (2025). Health cadres' experiences in detecting and preventing childhood stunting in Indonesia: a qualitative study. *BMC Public Health*, 25(1), 2987.
- Termeer, C. J. A. M., Dewulf, A., & Biesbroek, R. (2017). Transformational change: Governance interventions for climate change adaptation from a continuous change perspective. *Journal of Environmental Planning and Management*, 60(4), 558–576.
<https://doi.org/10.1080/09640568.2016.1168288>
- Tornberg, P., Manea, A., & Della Rossa, F. (2022). Digital fatigue and public sector digital transformation. *Public Management Review*, 24(6), 889–910.
<https://doi.org/10.1080/14719037.2021.1963646>
- UN-Habitat. (2020). *World cities report 2020: The value of sustainable urbanization*. United Nations Human Settlements Programme.

- Van Dijk, J. (2020). *The digital divide*. Polity Press.
- Victoria, C. G., Christian, P., Vidaletti, L. P., Gatica-Domínguez, G., Menon, P., & Black, R. E. (2020). Revisiting maternal and child undernutrition in low-income and middle-income countries: Variable progress towards an unfinished agenda. *The Lancet*, 397(10282), 1388–1399. [https://doi.org/10.1016/S0140-6736\(20\)32131-3](https://doi.org/10.1016/S0140-6736(20)32131-3)
- Widiastuti, T., Al-shami, S. A., Mawardi, I., Zulaikha, S., Haron, R., Kasri, R. A., Mustofa, M. U. Al, & Dewi, E. P. (2024). Capturing the barriers and strategic solutions for women empowerment: Delphi analytical network process. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(3), 100345. <https://doi.org/10.1016/j.joitmc.2024.100345>
- World Bank. (2021). *GovTech maturity index 2020: The state of digital transformation of governments*. World Bank Publications.
- World Health Organization (WHO). (2022). *Infodemic management during COVID-19: Key principles*. WHO Press.
- Yin, R. K. (2018). *Case study research and applications: Design and methods (6th ed.)*. SAGE Publications.