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Investigating Coordination Models for Integrated Hypertension Management in Public Health Facilities

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ABSTRACT

Fragmented management of hypertension in public health facilities remains a significant challenge in health care systems, especially in developing countries with an increasing burden of non-communicable diseases. This study aims to investigate the coordination model applied in integrated hypertension management in public health facilities, focusing on linkages between service actors, communication mechanisms, and role sharing across service levels. This study used a qualitative-descriptive approach with data collection techniques in the form of in-depth interviews and participatory observation of 24 informants consisting of primary health workers, facility managers, and regional level policy makers. Data analysis was carried out through a thematic method with a grounded theory approach to identify effective coordination patterns. The results show that a collaborative network-based coordination model supported by digital information systems and cross-sectoral forums on a regular basis is able to improve the consistency of hypertension management, accelerate referrals, and strengthen patient monitoring on an ongoing basis. In conclusion, structural and functional integration between service units through adaptive and responsive coordination mechanisms makes an important contribution to strengthening the primary health system. These findings provide a theoretical basis for the development of chronic services coordination frameworks at the policy level as well as practical implications for system-based intervention design in public health facilities.

Key Word
Hypertension Management, Cross-Sector Coordination, Public Health Facilities, Integrated Services, Primary Health System

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INTRODUCTION

Hypertension is one of the most burdened non-communicable diseases (NCDs) in the world which is a major risk factor for heart disease, stroke, and kidney failure (Upadhyay, 2022). The World Health Organization notes that more than one billion people worldwide have hypertension, and most of them are unaware of the condition because they do not show obvious symptoms in the early stages (Al-Makki et al., 2022). This phenomenon shows that hypertension is not only a medical problem, but also

concerns the health service system that is not optimal in carrying out early detection, monitoring, and management in a sustainable manner. In Indonesia, this situation is reflected in Basic Health Research data which shows an increase in the number of hypertension sufferers in the last five years (Khasanah, 2022). The number of visits by hypertensive patients to health facilities also does not reflect the real needs, which indicates structural and functional barriers in the public service system.

One of the main challenges in managing hypertension in public health care facilities is the lack of coordination between service actors, both at the primary and referral levels (Xiong et al., 2023). Service fragmentation, overlapping authority, and lack of an integrated information system are significant obstacles to creating effective chronic disease management. In many cases, patients do not get consistent follow-up due to the absence of a structured coordination mechanism. This situation leads to episodic and incomplete treatment. In fact, hypertension management requires a long-term approach that includes detection, early intervention, patient education, and continuous monitoring across sectors (Elendu et al., 2024).

Various previous studies have highlighted the importance of integrating systems in hypertension control, but most research is still focused on aspects of clinical intervention and healthy lifestyles. Research by (Cohn et al., 2022), for example, shows that the success of hypertension management is largely determined by the effectiveness of service coordination at the primary level, but the study has not explained in detail how the coordination model is formed and functions in the context of resource-constrained public health facilities. Meanwhile, (Vaagan et al., 2021) emphasized the importance of institutional structures and health policies that support the handling of chronic diseases, but have not touched on the micro dimension of the interaction of service actors practically in the field. Another study by (Layani et al., 2024) revealed that the success of community-based hypertension services requires cross-sector engagement and synergy between actors, but does not systematically describe a coordinated model that can be replicated. Thus, there is still a research gap regarding coordination models that can be applied effectively in complex public service systems.

This research explicitly aims to investigate the coordination model applied in the management of hypertension in an integrated manner in public health facilities. The focus of the analysis is directed at how relationships between service actors are built, the communication mechanisms used (both formal and informal), strategies for the division of roles and functions between units, and how all these elements support the continuity of hypertension services. This study also pays attention to contextual dimensions such as the role of local governments, digital infrastructure, and the culture of health organizations that affect the effectiveness of coordination in the field. By tracing the patterns of coordination that emerge, this study seeks to build a

comprehensive understanding of the dynamics of interaction in the hypertension service system.

The theoretical contribution of this study is to strengthen the systems approach in the study of health service management, particularly in the context of chronic diseases in public facilities. This study expands the literature on collaborative network-based coordination models that have not been discussed in depth in the context of developing countries. In addition, from a practical point of view, the results of this research can be used by policy makers, health facility managers, and service actors to design an adaptive, efficient, and data-based coordination system. By prioritizing structural and functional integration between service units, this research is expected to make a real contribution to strengthening the primary health system and improving the quality of hypertension services that are more sustainable and responsive to the needs of the community.

The coordination of services in the public health system has become an important focus in the study of health management, particularly related to the management of chronic diseases such as hypertension (Mbata et al., 2024). The complexity of treating hypertension requires continuity of services across units and service levels, from early detection to long-term monitoring. However, weak integration between health service actors often leads to fragmentation of management and low effectiveness of interventions. Highlights that most people with hypertension in developing countries do not receive consistent services, mainly due to the lack of adequate coordination systems between primary care providers (Otieno et al., 2023). In Indonesia, this challenge is exacerbated by limited human resources, data disintegration between health facilities, and lack of structured collaborative mechanisms in the public service system (Pottier, 2023).

Various studies show that the success of hypertension management is greatly influenced by the effectiveness of internal and external coordination systems. A study by (Khatri et al., 2023) revealed that coordination between primary service units plays an important role in ensuring the continuity of therapy and comprehensive treatment of hypertension. However, this study has not identified in detail a coordination model that can be replicated in the context of public facilities in developing countries. In contrast, (Trein et al., 2021) highlight the need to strengthen institutional structures and coordinating policies, but their studies tend to be at the macro level, without examining the dynamics of operational coordination in the field. Meanwhile, (Hansen, 2022) show the importance of community roles and cross-sectoral involvement in strengthening hypertension management, but have not examined how such integration occurs structurally in the health care system.

Previous studies have also shown that the coordination dimension in hypertension management has not been fully examined multidimensionally, especially in linking

organizational aspects, information technology, and work culture across professions. Theoretical approaches such as Mintzberg's Organizational Coordination and the Chronic Care Model emphasize the importance of integration between system elements, but their application in the context of public health facilities in Indonesia is still limited in study (Pratici, 2022). In addition, there is little research that combines the analysis of the relationship between actors and local policy structures and operational realities on the ground, including how the role of health information technology can be leveraged to strengthen service coordination systems.

In terms of methodology, previous studies have used more quantitative and evaluative survey approaches, focusing on medical outcomes, but less explored the dimensions of processes, collaboration dynamics, and institutional roles in service coordination. (Gioia, 2021) used a qualitative approach but have not yet reached a comprehensive systemic framework. Therefore, this study adopts a qualitative-descriptive approach with in-depth interviews and participatory observation to explore the coordination model that runs in public health facilities in a contextual manner. This strategy is expected to contribute to the development of a coordination model based on chronic service systems, as well as answer gaps in the literature that have not yet detailed descriptions of the relationships between actors, communication mechanisms, and coordination structures in hypertension services.

Taking into account various previous studies, this study offers a systemic and contextual approach to understand the coordination of hypertension management in an integrated manner. This approach not only describes the ideal coordination structure, but also explores actual practice on the ground, implementation challenges, and potential replication of the model in other public health care systems. Thus, the findings of this study are expected to strengthen the basis of more responsive, adaptive and evidence-based hypertension management policies and interventions.

RESEARCH METHOD

Types and Approaches to Research

This research uses a qualitative-descriptive approach with an exploratory case study design (Ayton, 2023). This approach was chosen to understand in depth and contextually how the coordination model is applied in the management of hypertension in public health facilities, as well as to explore the dynamics of relationships between service actors, communication mechanisms, and organizational structures that play a role in service integration. The case study was chosen because it allows researchers to observe coordination phenomena intensively in complex real-world contexts (Cleland et al., 2021). The main focus is directed at the depiction of the processes and coordination mechanisms that take place, rather than on quantitative measurements of the clinical outcomes of hypertensive patients.

Population and Sampling Techniques

The population in this study includes all parties involved in hypertension management in first-level health facilities (Puskesmas), including medical personnel (doctors, nurses), health facility managers, non-communicable disease program officers, and local health office officials. The sampling technique is carried out by purposive sampling, which is a non-probability technique that considers the direct involvement of informants in the process of coordinating hypertension services. The total participants in this study were 24 people, consisting of 12 primary health workers, 6 facility managers, and 6 health office officials in three districts/cities selected based on the level of hypertension burden and variations in service coordination structures. The selection of informants is carried out by considering the representation of strategic functions in the coordination system, active involvement in service management, and at least two years of work experience.

Data Collection Techniques and Instruments

Data were collected through three main methods: (1) semi-structured in-depth interviews, (2) limited participatory observations, and (3) documentation studies on policies, technical guidelines, and activity reports related to hypertension management. Interview guidelines were developed based on theoretical indicators from Mintzberg's coordination mechanisms and the Chronic Care Model (CCM) (Wolf, 2022), which includes aspects of roles, communication, information systems, and division of tasks across units. To ensure the validity of the content, the interview guidelines were first tested through expert judgment by two academics in the field of public health policy and one primary service practitioner. Source triangulation techniques and methods are used to improve internal validity, while data reliability is maintained through interview recording, reflective logging, and trail audits of the analysis process (Awan et al., 2023).

Research Implementation Procedure

The research was carried out in four main stages. The first stage is the identification of the location and mapping of the service structure in each region. In the second stage, field data collection was carried out for three months through scheduled interviews and observations focusing on coordination routines, cross-sector meetings, and referral mechanisms. The third stage, transcription and qualitative data processing is carried out as soon as the data collection is completed. The final stage is thematic analysis and report preparation, where the findings are compared with previous theoretical and literary frameworks to ensure the linkage between empirical data and theoretical concepts.

Data Analysis Techniques

The data were analyzed using a thematic analysis approach based on the Braun and Clarke procedure, which included initial coding, theme development, theme

review, theme naming, and narrative writing of findings (Byrne, 2022). The entire analysis process is carried out with the help of NVivo 12 Plus software, which facilitates the organization of qualitative data, systematic coding, and visualization of relationships between themes. Data from observations and documentation were used to reinforce and confirm the results of the interviews. Validation of results was carried out through member checking with some informants and discussion of findings with substance experts. With this approach, the research is expected to be able to develop a coordination model that is contextually relevant and has the potential to be replicated in other public health care facilities.

RESULTS AND DISCUSSION

Coordination Pattern in Hypertension Management

The main findings of this study show that the majority of primary health care facilities at the Puskesmas level still rely on informal coordination patterns in hypertension management. This pattern is characterized by the absence of a standard coordination mechanism, undocumented communication flows, and the dominance of personal communication channels such as direct verbal conversations and the use of instant messaging applications such as WhatsApp. Of the total 24 informants interviewed, as many as 16 informants came from facilities that used an exclusively informal approach. This means that almost two-thirds of the facilities studied do not have a formal institutionalized coordination structure, and rely heavily on interpersonal trust between officers in sharing information and responding to hypertension cases. A PTM program officer confirmed:

"*If there is a new case of hypertension or a patient that needs to be followed up, we usually coordinate directly through the WA group. There are no regular official meetings, so it all depends on who happens to be active and responds quickly*", (IN-07, Interview May 23, 2025).

This statement suggests that personal relationship-based coordination tends to be flexible but does not guarantee information continuity, especially when there is staff turnover or structural changes. This reliance on informal coordination shows the weak managerial coordination function in primary health services. In many cases, this kind of coordination proves to be flexible and fast, but it is particularly vulnerable to personnel turnover and service inconsistencies. For example, when officers who have been active in informal communication are transferred, knowledge transfer does not run due to the absence of a documentation system. This strengthens the hypothesis that the absence of standardization of coordination processes can result in disruption of hypertension services, especially in the follow-up and monitoring phases.

Meanwhile, as many as 6 informants reported the existence of periodic formal coordination in the form of regularly scheduled cross-unit internal meetings, although

the implementation is still limited. This meeting has not been accompanied by a fixed agenda, official minutes, or clear evaluation indicators. This pattern of coordination is semi-formal—where there is an intention to institutionalize, but it has not been followed by the institutional capacity building that supports it. In some locations, even the meeting agenda depends on the initiative of the head of the Puskesmas or other structural position holders, not on the standardized work system.

In contrast, a small number of facilities are beginning to establish a formal, albeit not yet systematic, pattern of coordination. Six informants reported that they had held regular cross-unit coordination meetings, although they had not been accompanied by supporting documents such as minutes or evaluation indicators. One of the heads of the Puskesmas revealed:

"*We have started holding cross-unit coordination meetings every month, although it is not always routine because it adjusts the time of all officers... But since there have been meetings, teamwork has become more open.*", (IN-12, June 6, 2025 interview). These findings show an intention to institutionalize the coordination system, although it is still hampered by institutional and resource limitations.

Only 2 informants stated that their units had adopted an integrated health information system, particularly those based on applications developed by the provincial health office. The system allows blood pressure reporting, control schedule reminders, and referral tracking to be done electronically, which is in line with the principles of health data interoperability. However, the use of this digital system is still very limited geographically and has not been used as a basis for comprehensive cross-unit coordination. The following table summarizes the distribution of coordination patterns by number of informants and their main characteristics:

Table 1.
Cross-Unit Coordination Pattern in Hypertension Services

Coordination Pattern	Number of Informants	Characteristics
Informal Collaborative	16	Undocumented, personal relationship-based
Periodic Formal Coordination	6	Cross-unit meetings, not yet systematic
Integrated Information System	2	Digitization of hypertension reporting and monitoring

These patterns reflect variations in the maturity level of coordination systems between facilities, from those that are highly dependent on interpersonal relationships (initial level) to those that have begun to implement e-health coordination (advanced level). This variation indicates that the implementation of system-based service

integration policies in the context of chronic disease management has not been evenly implemented.

Furthermore, this disparity also shows a gap in managerial capabilities between facilities. Facilities that are able to carry out formal coordination and digitization of services tend to be led by managers who have transformational leadership traits, are able to build synergy between units, and are open to technological innovation. On the other hand, facilities that rely only on informal relationships are at risk of institutional fragility, which is the weakness of institutions in maintaining the sustainability of good practices if they are not supported by strong formal structures.

In terms of the national health system, these findings also show that the non-communicable disease control (NCD) policy that has been launched since 2016 has not been fully internalized into the operational work system at primary level facilities (Low et al., 2021). In fact, managing hypertension as one of the main burdens of NCDs requires continuity of care that relies heavily on referral linkages and shared care protocols between service units.

The existence of a strong and documented coordination pattern is not just an administrative complement, but is a major prerequisite for the effectiveness of sustainable and system-based hypertension management. Without a clear coordination mechanism, each service risks working in silos, ultimately leading to low patient compliance, suboptimal monitoring, and failure of long-term preventive efforts.

Structural and Cultural Barriers in Coordination

The implementation of effective coordination in the management of hypertension in primary health facilities cannot be separated from structural and cultural challenges. These barriers not only hinder the flow of information and communication between units, but also systemically contribute to the disintegration of services that should complement each other in the process of screening, diagnosing, managing, and referring hypertensive patients.

From a structural aspect, the absence of specific Standard Operating Procedures (SOP) for the coordination of hypertension services is the most crucial problem. Most healthcare facilities do not have written guidelines explaining how cross-unit communication is conducted, who is responsible for case reporting and tracking, and how patient follow-up is organized between promotive, preventive, and curative units. This ambiguity results in overlapping roles on the one hand and an empty coordination function (coordination vacuum) on the other. As expressed by one of the PTM officers:

"*I myself have never received SOPs or special instructions on how to coordinate between units. It all depends on who we know, so sometimes there is no clarity on who should follow up if there is a new hypertension patient.*", (IN-04, Interview May 17, 2025).

Without SOPs, coordination relies heavily on individual initiative and informal relationships between officers. As a result, coordination becomes unstandardized and unsustainable. This phenomenon illustrates weak internal governance and lack of institutional accountability, where important activities such as coordination meetings, cross-unit reporting, or validation of hypertension data do not have a control mechanism or audit system.

Furthermore, the high workload of health workers is a serious obstacle to the implementation of formal coordination. The informants in this study said that they were required to carry out various administrative roles and clinical services simultaneously—from general patient services, immunizations, nutrition monitoring, to reporting on various national programs. In such conditions, coordination activities are seen as an additional burden that is not offset by a reduction in workload or special incentives. An informant confirmed:

"*Sometimes we want to hold a coordination meeting, but we don't have time because the road service continues. Weekly reports, data inputs, vaccinations, not to mention patients come indefinitely.*", (IN-11, Interview May 29, 2025).

In such conditions, coordination activities are seen as an additional burden that is not offset by a reduction in workload or special incentives. In fact, coordination is often sacrificed because it is considered not a direct service (non-service delivery task).

This problem shows the weak human resource (HR) planning at the Puskesmas level, where there are no specific functional or structural positions for the coordination of NCD services, including hypertension. The absence of specially assigned personnel resulted in the absence of cross-unit points of contact, which is a prerequisite for effective organizational coordination (Mintzberg, 1983).

In addition to structural constraints, this study also identifies a number of obstacles in terms of work culture and digital readiness of human resources that play a major role in the low effectiveness of coordination. One of the important findings is the resistance to digital information systems, especially among senior health workers or those from non-technical educational backgrounds. They feel unfamiliar, even anxious, about the use of digital applications in recording hypertension data, making reports, or monitoring the results of patients' blood pressure tests.

This resistance is exacerbated by the lack of ongoing training and the lack of onsite technical support. Some informants said that information system training is usually carried out once at the time of application launch, without any refreshment training or troubleshooting support. In many cases, only one or two staff members attend the training, resulting in a dependency on a particular individual. When this individual takes leave, mutates, or resigns, the knowledge of the system is also lost (knowledge attrition).

This condition reflects the lack of a sustainable and collective capacity building approach, as well as the weak transfer of knowledge between staff within the organization. In fact, some officers still prefer to record hypertension data manually and submit it offline to the health office, indicating a reluctance to transform to a digital system despite the availability of basic infrastructure.

However, the infrastructure constraints themselves cannot be ignored. In some areas, unstable internet access, lack of computers/laptops, and unavailability of IT (information technology) technical support hinder the use of online reporting and coordination applications. The absence of an information system that is interoperable between programs—for example, between P-Care BPJS, SIMPUS, and the Health Office's hypertension system—also results in officers having to enter duplicate data into various platforms, thus draining time and energy. In general, these cultural barriers suggest that digital transformation in the healthcare sector cannot succeed without organizational culture changes. A managerial approach is needed that not only prioritizes the provision of systems, but also accompanies changes in mindset, skills, and reward structures for officers (Baker & Prince, 2025).

The Impact of Coordination on the Sustainability of Hypertension Services

This study shows that cross-unit coordination in primary health care facilities has a fundamental role in ensuring the continuity of hypertension services. The sustainability of services in this context includes important aspects such as the regularity of patient visits, the consistency of blood pressure monitoring, the timeliness of referrals, and the accuracy and completeness of medical documentation of patients with hypertension.

From the results of field observations and in-depth interviews, it was found that facilities that routinely carry out formal coordination and utilize digital reporting systems have better quality hypertension services compared to facilities that still rely on informal coordination. In Puskesmas that have a structured internal coordination schedule, each unit (promotive, preventive, curative) knows its role clearly. The promotive unit is able to convey the results of hypertension risk education to the clinical team, while the curative team can follow up on patients who fail therapy more systematically because the data is monitored. An informant stated:

"*If we meet every month, we know who has not been controlled, who has risen blood pressure again. We also divide the task, so that someone reminds the patient, some check at home*", (IN-06, Interview May 26, 2025).

This kind of coordination also allows for planned scheduling of revisits, using an app-based reminder system or a patient control book tailored to the SOPs. In practice, facilities that have formal coordination tend to have an updated list of active hypertension patients, periodically tracked medication adherence indicators, and a monitoring mechanism for patients prone to drop out. This has a direct impact on

strengthening patient retention in the treatment cycle. In fact, according to one of the heads of the PTM service unit:

"*Patients who used to often skip control can now be monitored because we have a cross-service coordination group. If someone doesn't come, we will immediately follow up together.*", (IN-13, interview May 30, 2025).

On the other hand, in facilities that implement informal coordination, data discontinuity between units was found, information missynchronization between screening officers and clinicians, and lack of updating of patient control records. This results in a loss of service footprint for most hypertensive patients, especially in those with comorbidities or limited physical and social access. The informant stated that in this kind of condition, the patient is often considered "missing" when in fact it is simply not recorded in the referral or re-control flow.

Patient retention—i.e., the ability of the service system to retain patients in the long-term care cycle—is an important indicator in evaluating the sustainability of hypertension management (Ouma et al., 2025). Well-coordinated, integrated facilities show higher retention rates, as evidenced by the presence of follow-up records, recent blood pressure reports, and medication compliance records from the pharmacy team or health counselor (Mundagowa et al., 2024).

In contrast, the rate of loss to follow-up patients is higher in facilities with poor coordination. Some of the factors that cause this include the absence of a visit reminder system, the unclear who is responsible for tracking absent patients, and the lack of integration of data between units (for example, between clinic units and laboratories). In many cases, patients don't come back not because they refuse treatment, but because the system doesn't actively call back or schedule.

This reinforces the theory of "Continuity of Care" in chronic disease services (Cechinel-Peiter et al., 2022), which emphasizes that sustainability can only be achieved when there is continuity of communication, information, and relationships between service providers and between service providers and patients. Without structured coordination, the continuity fails to form.

Digitization of reporting, if utilized optimally, contributes directly to the sustainability of hypertension services. In this study, two health centers that implemented a digital hypertension reporting system based on local applications showed higher efficiency in patient tracking, indicator data processing, and distribution of responsibilities between teams. Information such as last blood pressure, medication consumption, referral schedule, and laboratory results can be viewed by more than one unit without the need for re-recording.

However, this digitalization is only effective if it is supported by formal coordination and SOPs. Without a clear coordination structure, digital applications become an additional burden for officers, especially if the applications are not

interoperable with other systems such as P-Care or SIKDA. Therefore, digitalization is only effective when it is integrated with organizational workflows that are well communicated between units. Coordination is not just an administrative complement, but is a key determinant of the effectiveness and sustainability of hypertension interventions. Poor coordination not only impacts internal operations, but also affects patient health outcomes and overall system efficiency.

Discussion

The findings of this study consistently strengthen the theoretical framework in the Chronic Care Model (CCM) which emphasizes the importance of integrating coordination between health service elements in the management of chronic diseases, including hypertension (Harrison & Jordan, 2022). In the context of CCM, the effectiveness of the service system is highly determined by the existence of an integrated flow of information, synergistic cross-unit planning, and continuous collaboration between service providers at the community level, primary facilities, and secondary referrals. However, the reality on the ground shows that coordination is still highly dependent on informal communication between personnel, such as through verbal conversations or non-structural digital messaging groups. This dependency shows a gap between the concept of ideal systemic coordination and operational practices at the grassroots level.

Informal coordination does provide flexibility and quick response, but it becomes particularly vulnerable to disruption in the event of staff rotation, changes in management structures, or a lack of individual capacity (Li & Song, 2023). This is in line with the organizational theory of Mintzberg (1983), which states that professional organizations such as healthcare facilities should develop coordination mechanisms based on standardization of workflows and formal supervision, rather than solely interpersonal relationships (Small, 2023). When coordination is not based on documented systems and standard procedures, the sustainability of services is threatened, as can be seen from the high number of hypertensive patients who miss follow-up in facilities with informal coordination patterns.

The results of this study also reinforce the empirical findings of several previous studies. For example, (Leger et al., 2025) revealed that in developing countries, healthcare communication is still dominated by non-formal forms of communication, which makes data and managerial processes difficult to control systemically. However, this study went beyond these findings by specifically mapping variations in coordination patterns in Indonesia's primary health facilities and explaining their impact on service sustainability, including the quality of reporting and consistency of patient blood pressure monitoring. Thus, this study expands the understanding of the international literature that has tended to highlight the issue of coordination at the

national system level, as done by (Lopez et al., 2025), by offering a perspective of practice-based microorganizations in health centers.

Theoretically, this study adds an important layer to the discussion of health system coordination by emphasizing that coordination issues cannot only be seen as policy weaknesses or lack of technical guidelines. It must also be understood as a product of internal organizational dynamics, a work culture that is resistive to innovation, and the uneven ability to adapt technology among health workers. By showing the relationship between coordination patterns, forms of digitalization, and service sustainability, this study shows that the success of hypertension service systems is largely determined by the organization's ability to manage structural and cultural changes simultaneously.

The practical contribution of this research lies in strategic recommendations that can be implemented to improve the existing coordination situation. The development of hypertension coordination SOPs that unite promotive, preventive, and curative elements is an urgent step, because all three have tended to run separately. This SOP should include reporting guidelines, patient tracking, scheduling of visits, and clinical escalation mechanisms. On the other hand, it is not enough to train health information systems only once at the beginning of the application launch, but it must be part of an ongoing training program, with a gradual approach tailored to the digital capabilities of health workers. Data interoperability between Puskesmas and referral hospitals is also very important, considering that currently the systems used such as SIMPUS, P-Care, and SIKDA are still partially running and are not interconnected. To ensure consistency in the implementation of coordination, the appointment of a hypertension coordinator in each health center is also an important recommendation, because it will provide a clear control point for communication activities across units.

Furthermore, this discussion suggests that the success of coordination is also influenced by broader contextual factors. Informants from several facilities said that the head of the Puskesmas who has an inclusive and adaptive leadership style is able to encourage coordination innovation despite limited resources. Leadership like this opens up space for collaboration, encourages fair division of duties, and creates a work culture that is open to system change. On the contrary, weak coordination is often rooted in a lack of human resources, lack of budget support for coordinating activities, and lack of synchronization of information systems between agencies. Weak local policy commitments are also a major obstacle, especially when coordination activities are not considered a priority and are not accommodated in annual budget planning.

Although it makes an important contribution in explaining coordination practices at the grassroots level, this research is inseparable from its limitations. The exploratory approach and limited research locations have resulted in results not being generalized nationally. In addition, the study has not evaluated the relationship between

coordination patterns and clinical indicators such as blood pressure control or the rate of revisits of hypertensive patients. Important systemic actors such as BPJS Kesehatan and referral hospitals have also not been part of the analysis, so the picture of coordination is still unidirectional in terms of primary facilities. Therefore, further research needs to be directed towards developing a more integrative coordination model based on a hybrid approach—combining a standard formal structure with the flexibility of informal adaptations in the field. Testing this model through a quasi-experimental approach will help assess the effectiveness of the intervention quantitatively. In addition, collaboration between researchers, policymakers, and cross-sectoral actors will be critical to formulate an integrated coordination framework that is not only administratively feasible, but also contextual and applicative across different types of healthcare facilities.

CONCLUSION

This study confirms that effective cross-unit coordination is a key pillar in ensuring the sustainability of hypertension services in primary health facilities. The findings show that the majority of Puskesmas still rely on informal coordination patterns that are not documented and are strongly influenced by interpersonal relationships between officers. While this pattern provides flexibility, the absence of formal structures and SOPs leads to role uncertainty, communication disruptions, and service fragmentation that impact low patient retention and continuity of care. Meanwhile, facilities that have begun to implement formal coordination and utilize digital information systems show a more stable and integrated quality of service, although their implementation is still limited and faces structural and cultural barriers.

This research also reveals that the success of coordination is highly determined by managerial capacity, human resource readiness, and adequate digital infrastructure support. Obstacles in the form of excessive workload, lack of training, resistance to technology, and limited interoperability of information systems are the main factors that hinder coordinated integration. Therefore, strengthening the coordination mechanism must be carried out through the development of cross-unit SOPs, the appointment of hypertension service coordinators, increasing the digital capacity of health workers, and institutional commitment in providing budgets and incentives for coordinating activities.

Conceptually, this study expands the understanding of the coordination of PTM services by offering a perspective of microorganizations based on field practice at the Puskesmas level. The practical contribution of this study lies in the identification of variations in coordination patterns, the mapping of multidimensional obstacles, and the preparation of contextual-based strategic recommendations. Further research is needed to develop and test an integrated coordination model based on a hybrid approach that

combines formal structures and local adaptations for the creation of a more responsive, sustainable, and health-oriented hypertension service system that improves patient health outcomes.

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