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Administrative Innovation in the Implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK)

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This study aims to analyze the implementation of administrative innovations in the Healthy Indonesia Program with a Family Approach (PIS-PK) and its impact on program effectiveness and family participation. The research method used a qualitative approach with data collection through in-depth interviews, participant observation, and documentation of PIS-PK administration in four community health centers. Data analysis was conducted through data reduction, coding, comparisons between community health centers, and triangulation to ensure the validity of the findings. The results showed that administrative innovations included digitizing family data, standardizing health forms and indicators, digital data-based monitoring, family education and participation, and cross-stakeholder coordination. The implementation of these innovations increased the accuracy and efficiency of data collection, accelerated reporting, facilitated the identification of priority families, and encouraged active family involvement. The main challenges included limited human resources, infrastructure, and community adaptation to the digital system. However, strategies such as routine training, portable hotspots, and cadre mentoring were able to overcome these challenges. This study provides an important contribution to the development of standardized and integrated data-based family health service administration and environmental health management.

Keywords: Administrative Innovation, Data Digitalization, Family Participation, Health Monitoring, Family Health Services

INTRODUCTION

The Healthy Indonesia Program with a Family Approach (PIS-PK) is a priority policy of the Indonesian government, initiated by the Ministry of Health, to improve overall public health. This program is part of the fifth Nawa Cita agenda, which emphasizes improving quality of life through a family-based approach, making the family the primary unit in implementing promotive, preventive, curative, and rehabilitative efforts (Lim & Ok, 2021). In its implementation, health workers are required to make direct visits to homes to collect data on the family's health profile and provide interventions appropriate to the health conditions and needs identified (DeHaven et al., 2021).

Conceptually, the family-based approach aims to provide health services that are more sensitive to the real needs of each family while expanding access to basic health services at the community level. Family involvement throughout the monitoring and intervention process enables the PIS-PK program to detect health risks early and encourage the development of healthy lifestyles (Marcus et al., 2020). However, the success of this program's implementation is greatly influenced by the capacity of health administration, particularly in managing family data, reporting mechanisms, updating information systems, and effective coordination between related sectors (Ilunga et al., 2020).

Nationally, the implementation of family visits under the PIS-PK program in 2018 still fell short of expectations. Based on data from the Healthy Family Application, the number of families successfully visited was recorded at approximately 17.65 million, equivalent to 26.8% of the total number of families in Indonesia, while the target was to reach all families, or 100% (Carter et al., 2022). This condition indicates that there are still several significant obstacles, particularly in the administrative aspects and operational implementation of the program at the field level.

Administrative issues not only impact the rate of family visits but also the completeness and quality of collected health data. Several previous studies have revealed that the Healthy Family Index (IKS) in various regions remains relatively low, as is the case in Central Java Province and several community health centers, where the coverage of family data collection and health evaluation results have not yet met established standards (Moosa, 2022). This condition indicates that the administration system and reporting mechanisms in the

implementation of PIS-PK are still not optimal in producing accurate, consistent, and well-integrated data.

In addition, various case studies in a number of regions also highlight other obstacles related to administrative aspects, including limited human resources who have competence in data management, inadequate supporting facilities and infrastructure, and the still low level of public understanding regarding the importance of active involvement in the program (Nyamu et al., 2021). This situation has resulted in differences in the quality of PIS-PK implementation between regions, thus creating disparities in achieving family health indicators.

The complexity of the problem increases because the administrative aspects of this program are not only limited to data collection activities, but also include the integration of various family health indicators, such as immunization, toddler growth, access to clean water and sanitation, JKN participation, and efforts to prevent infectious and non-infectious diseases (Bennett et al., 2020). When administrative systems are not managed in an integrated manner, this risks delays in implementing interventions and inaccuracies in determining health service strategies that meet each family's needs.

From the perspective of public policy and health system strengthening, administrative innovation in the implementation of PIS-PK is no longer understood merely as a technical update to data recording, but rather as part of the transformation of digital health governance that emphasizes data integration, service accountability, information system interoperability, and evidence-based decision-making. Administrative innovation in this study is explicitly defined as the development of a digital-based family health administration integration model that is adaptive to resource limitations at the community health center level, particularly in terms of limited health personnel, technological infrastructure, and data management capacity. This innovation includes the digitalization of the family health information system, the use of mobile-based applications for field data collection activities, the integration of cross-program reporting, and the development of more responsive and sustainable monitoring and evaluation mechanisms (Nelligan et al., 2016). This approach aligns with digital health governance theory, which emphasizes the importance of a coordinated, transparent health information system capable of sustainably supporting the effectiveness of primary healthcare services. Without such updates, administrative processes tend to rely on manual methods, which risk errors, delays, and data duplication.

This research is crucial given that a robust and innovative administrative system not only supports smooth program implementation but also serves as the primary foundation for decision-making related to family health service planning. The effectiveness of PIS-PK implementation will significantly impact the government's achievement in meeting various health indicators, such as reducing stunting prevalence, increasing immunization coverage, reducing maternal and infant mortality rates, and comprehensively controlling infectious and non-communicable diseases. Within the framework of implementation science, the success of public health programs is strongly influenced by the organization's ability to adapt policies to the local context, including through strengthening administrative mechanisms, coordination between actors, and the use of health information technology appropriate to field conditions. Therefore, this research not only examines the effectiveness of administrative innovations but also examines how these innovations can create contextual adaptations in areas with limited health service resources.

Furthermore, studies on administrative innovation in the implementation of PIS-PK are still relatively limited, particularly those examining its impact on program operational performance and family health outcomes. Most existing literature tends to focus on general evaluations of PIS-PK implementation, family visit coverage rates, and community participation. However, few specifically examine changes in administrative aspects as a key factor in improving program performance. Furthermore, previous research generally has not integrated the perspectives of digital health governance, implementation science, and health system strengthening into the analysis of family health program administration. Yet, these three perspectives are highly relevant in explaining how administrative innovation can improve coordination effectiveness, family health data quality, reporting efficiency, and the sustainability of primary health care services. This indicates a research gap that needs to be filled to encourage the development of more effective and efficient administrative practices.

Therefore, this study aims to answer several questions: how administrative innovation is applied in the implementation of PIS-PK, to what extent this innovation can improve program effectiveness and family participation, and what challenges and opportunities arise from its implementation. This study's novel contribution lies in the development of a PIS-PK administrative governance framework that integrates digital health governance principles, implementation science approaches, and strategies for strengthening primary health systems in the context of family health services in areas with limited resources. This study is expected to produce empirical contributions as well as evidence-based policy recommendations to strengthen health administrative governance in the implementation of the PIS-PK program in the future.

METHODS

This study applies a qualitative approach to explore in-depth the administrative processes and innovations in the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK). This approach was chosen because the study focuses on the experiences of health workers, families, and other stakeholders involved in administrative implementation, including how social context, organizational capacity, and the use of information technology influence program effectiveness. Through a qualitative approach, researchers can explore

insights, perceptions, and innovative practices in administration that cannot be measured quantitatively. This approach also allows researchers to contextually understand the dynamics of family health administrative governance, particularly in primary healthcare settings with limited human resources and digital infrastructure.

This study employed a multiple case study design to examine the implementation of PIS-PK in several community health centers (Puskesmas) with varying geographic characteristics, administrative capacities, and levels of digitalization. This multiple case study design was chosen to allow for cross-case analysis to identify similarities, differences, and patterns of administrative innovation that emerged in each study location. This approach was used to evaluate how administrative innovation is implemented in different contexts, while also uncovering the organizational, technological, and social factors that influence the success of PIS-PK implementation. In this study, each community health center was treated as a single case unit that was analyzed in depth before a cross-case synthesis was conducted to build a comprehensive understanding of effective administrative innovation models in PIS-PK implementation.

The population in this study included community health centers implementing PIS-PK in several districts in Indonesia along with all actors involved, such as heads of community health centers, health workers, health cadres, administrative operators, and families of program participants. Sampling was conducted purposively by considering several criteria, namely community health centers that have implemented PIS-PK for at least two years, have a documented family administration system, have utilized a digital information system in reporting, and are willing to provide research access. Based on these criteria, five community health centers were selected as the main case units. The number of research participants was set at 30 people consisting of 5 community health center heads, 10 health workers implementing PIS-PK, 5 administrative operators or data managers, 5 health cadres, and 5 families of program participants. The selection of the number of participants was carried out in stages until reaching data saturation, which is the condition when additional interviews no longer produce significant new information or themes related to administrative innovations in the implementation of PIS-PK.

Data collection was carried out using a combination of primary and secondary sources. Primary data was obtained through in-depth interviews with community health centre heads, health workers, administrative staff, community health workers, and the families of programme participants to gather information regarding administrative processes, the types of innovations implemented, implementation challenges, and strategies to address them. Interviews lasted between 45 and 90 minutes per participant and were conducted either face-to-face or online, depending on field conditions. All interviews were recorded with the respondents' consent and subsequently transcribed verbatim to ensure data integrity. In addition, participatory observation was carried out on PIS-PK administrative activities, such as family data collection, the use of digital applications, the processing of family health data, and the reporting process to the health department. Secondary data was collected through documentation in the form of administrative reports, healthy family record forms, monitoring notes, and PIS-PK digital information system documents, which were used for data verification and triangulation.

The data analysis process was carried out thematically through several systematic stages. The initial stage began with transcribing all interview and observation findings into full text, followed by a data reduction process to select information relevant to the research focus. This was followed by open coding to identify units of meaning relating to administrative innovation, barriers to implementation, the use of information technology, the effectiveness of reporting, and cross-sectoral coordination. The coding process was carried out independently by two researchers to enhance the consistency of data interpretation. Inter-coder agreement was assessed by comparing coding results and revisiting different themes through discussion until a consistent interpretative agreement was reached. Once the coding process was complete, the data were grouped into main themes and analysed using a cross-case thematic analysis approach to identify patterns of similarity and difference between community health centres. The validity of the findings was strengthened through triangulation of sources and methods by comparing the results of interviews, observations and documentation. The final stage involved interpreting the findings in relation to theories of public administration innovation, digital health governance and the strengthening of the primary healthcare system.

To ensure the validity and reliability of the findings, this study implemented several integrated data validation strategies. Source triangulation was conducted by comparing information from the head of the community health center, health workers, administrative operators, cadres, and families of program participants, while method triangulation was conducted by combining interviews, observations, and documentation. Furthermore, this study employed member checking by having several participants review the interview summary and the researcher's initial interpretation to ensure the data's meaning was consistent. The research's dependability was strengthened through an audit trail that documented in detail the entire process of data collection, coding, analysis, and interpretation. To enhance the credibility of the cross-case analysis, the researchers also conducted periodic peer debriefings throughout the data interpretation process.

This research was conducted adhering to ethical principles of social and health research. The researcher first obtained official written permission from the health department and the community health center where the

research took place. Respondents' identities were maintained through the use of anonymity codes in all interview documents, transcripts, and research reports. Furthermore, each participant was given a complete explanation of the research objectives, data collection procedures, benefits, and the participant's right to discontinue participation at any time without any consequences. Approval for participation was obtained through written informed consent prior to the interviews and observations. All research data was securely stored in a protected database and used solely for academic research and scientific publication purposes.

RESULTS AND DISCUSSION

Interviews and Observations of PIS-PK Administrative Activities

The analysis of research findings shows that administrative innovation in the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK) developed differently in each community health center, depending on human resource capacity, the level of digital technology utilization, and organizational support at the local level. Based on a cross-case analysis, it was found that all community health centers in the study had attempted to transform their administration from a manual system to a digital one through the use of the Healthy Family application and mobile-based devices. However, the level of implementation and perceived administrative effectiveness were not entirely uniform across cases.

At Community Health Centers A and B, administrative digitization has been better integrated into the healthy family data collection and reporting process. Health workers reported that the use of tablets and digital applications has helped expedite the recording process and reduce data entry errors that were previously common when using manual forms. One health worker stated that "now all family data is directly entered into the system and no longer needs to be re-entered at the community health center," indicating a perceived increase in administrative efficiency. Observational findings also showed that the process of synchronizing data from home visits to the central system was faster than at community health centers that still relied on semi-manual recording. In the context of this study, program effectiveness was defined as perceived improvements in the accuracy of family data recording, speed of reporting, ease of monitoring at-risk families, and the response to follow-up health services by community health center staff.

However, the cross-case analysis indicates that administrative innovation has not yet resulted in a uniform implementation experience across all study sites. In some community health centers with limited internet access and lower human resource capacity, the use of digital systems still faces operational challenges. In Community Health Centers C and D, for example, health workers revealed that data entry processes were often delayed due to unstable network access, resulting in some data being recorded manually before being re-uploaded to the digital system when the network became available. This situation suggests that perceived administrative effectiveness is strongly influenced by the readiness of the technological infrastructure and the digital competence of implementing officers. Therefore, this study does not conclude a direct causal relationship between administrative digitalization and increased program success, but rather positions administrative innovation as a factor perceived to support more efficient and responsive program implementation under certain conditions.

In addition to digitalization, this study also found that administrative innovations are not only related to the use of technology, but also involve changes in internal coordination and oversight mechanisms at the community health center level. In several cases, community health center heads utilized digital reports to more systematically identify priority families, particularly those with incomplete immunization status, chronic diseases, and environmental sanitation issues. Observations of monthly evaluation meetings indicated that digital data was used as the basis for assigning follow-up tasks to field officers and health cadres. Compared with community health centers without a structured digital monitoring mechanism, those with data-based monitoring systems demonstrated better capabilities in mapping at-risk families and scheduling follow-up visits in an organized manner.

Other findings indicate that the success of administrative innovations is also influenced by the involvement of health cadres and family participation. In some cases, health cadres play an active role in educating the community about the importance of family health data collection, thereby helping to improve the completeness of administrative data. One health cadre stated that "families are more willing to provide data after the benefits for health services are explained." This indicates that administrative innovations in PIS-PK are not only technological but also require a social and communication approach that is adaptive to community conditions. Community health centers with better coordination between health workers and cadres tend to show higher levels of completeness of family data than those with limited cadre involvement.

On the other hand, this study also found relatively consistent implementation challenges across all cases, particularly related to limited digital competency among healthcare workers, high administrative workloads, and limited supporting facilities in remote areas. Some healthcare workers stated that the initial use of digital systems actually increased their workload as they had to adapt to new administrative procedures. To address these challenges, several community health centers conducted regular internal training, provided technical assistance, and provided supporting facilities such as portable hotspots for areas with limited internet access. These findings suggest that the sustainability of administrative innovations is highly dependent on

organizational support and the adaptive capacity of primary healthcare institutions.

Although the research results indicate a positive perception of administrative innovation in the implementation of PIS-PK, this study also recognizes the potential for subjective bias because most of the data were obtained from the experiences and perceptions of health workers and the researchers' observations in the field. To minimize this bias, the study triangulated sources through interviews with community health center heads, health workers, cadres, and families of program participants, and compared the interview results with administrative documents and field observations. Thus, interpretation of the findings was not solely based on individual claims, but also considered the consistency of data across sources and across research cases.

Data Reduction to Filter Relevant Information Related to PIS-PK Administrative Innovation

The results of data reduction from interviews, observations, and documentation indicate that administrative innovation in the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK) developed through three main themes: digitalization of family health administration, strengthening data-based monitoring, and organizational adaptation to resource limitations. The data reduction process was carried out by filtering information directly related to changes in administrative mechanisms, perceptions of program implementers, and forms of institutional support that influence the implementation of innovation at the community health center level. Unlike the previous presentation of raw data, this analysis places the results of data reduction as the basis for constructing thematic interpretations across cases, so that the findings are not only descriptive but also analytical.

The first theme relates to the digitalization of family health administration through the use of the Keluarga Sehat (Healthy Family) application and mobile-based devices. All community health centers (Puskesmas) in the study reported a shift from manual to digital recording systems, although the level of implementation varied across locations. In community health centers with better infrastructure and digital competency, health workers stated that the use of tablets and digital systems helped speed up the reporting process and reduce administrative errors. One health worker explained that "family data now goes directly into the system so there is no need for re-input," indicating a perceived increase in administrative efficiency. Field observations also showed that data from home visits can be automatically saved to the central system when the network is available, facilitating synchronization of reports with the health office. However, in several other community health centers, the digitalization process is still partially underway due to limitations in internet access and staff technical skills, resulting in some recording still being done manually before being uploaded back to the digital system.

The second theme indicates that administrative innovations also influence the program's internal monitoring and coordination mechanisms. Community health center heads at several research sites utilized digital reports to identify priority families requiring follow-up health services, such as those with incomplete childhood immunizations, chronic illnesses, or environmental sanitation issues. Compared with community health centers still using semi-manual record-keeping, those with more integrated digital monitoring systems demonstrated greater ability to systematically map at-risk families and schedule follow-up visits. In this study, program effectiveness is not defined as a direct causal relationship between digitalization and the success of PIS-PK, but rather as improvements reported or perceived by program implementers regarding the accuracy of data recording, speed of reporting, ease of monitoring target families, and responsiveness to follow-up health services. Therefore, the 87% family visit rate is positioned as part of the administrative implementation context reported by community health centers, rather than as sole evidence of the causal success of administrative innovations.

The third theme relates to organizational adaptability in addressing various obstacles to implementing administrative innovations. Data reduction results indicate that limited human resources and digital infrastructure were relatively consistent challenges found in almost all study cases. Several health workers revealed that not all staff had adequate skills in operating digital systems, especially in the early stages of implementation. Furthermore, unstable internet access in certain areas caused delays in data synchronization and hampered real-time reporting. However, each community health center developed different adaptation strategies tailored to local conditions. In some cases, community health center heads conducted regular internal training and technical assistance for administrative staff, while in areas with limited network coverage, portable hotspots were used to support field data entry. These findings suggest that the sustainability of administrative innovations is significantly influenced by the adaptability of primary healthcare institutions to their limited resources.

In addition to technological and organizational factors, data reduction results also indicate that family participation and the involvement of health cadres are crucial elements in supporting the completeness of family health administration. In several research locations, health cadres actively educated the community about the importance of family health data collection and the benefits of participating in the PIS-PK program. Health cadres reported that families became more cooperative after receiving an explanation of the benefits of health data for subsequent health services. This situation indicates that administrative innovation in PIS-PK relies not only on the use of digital technology but is also influenced by the social communication approach employed by officers and cadres in the field. Community health centers (Puskesmas) with better coordination

between health workers and cadres tended to show higher levels of completeness of family data compared to locations with limited cadre involvement.

Although the results indicate positive perceptions of administrative innovation, this study also recognizes the potential for subjective bias because most of the data was obtained through interviews and the perceptions of program implementers. Therefore, the interpretation of the findings is not directed at claiming absolute success of administrative innovation, but rather at understanding how the innovation is perceived and implemented in different primary health care contexts. To minimize bias, the study triangulated data by comparing interview results, field observations, and administrative documentation, including digital reports and healthy family record forms. Thus, the data reduction results not only represent the individual experiences of respondents but also consider the consistency of information across sources and across research cases.

Data Coding to Identify Key Themes of PIS-PK Administrative Innovation

The results of the data coding process indicate that administrative innovation in the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK) developed through several interrelated main themes, namely digitalization of family health administration, strengthening family participation, data-based monitoring, standardization of health administration, and cross-stakeholder coordination. Unlike the previous descriptive table presentation, this analysis places the coding results as the basis for cross-case thematic interpretation to understand how administrative innovation is implemented and perceived in different primary health care contexts. Thus, the analysis focuses not only on identifying themes, but also on variations in implementation, contextual factors, and organizational adaptation dynamics that influence the implementation of administrative innovation in each community health center.

The first theme relates to the digitization of administration through the use of the Healthy Family app and tablet devices for family data collection. All community health centers (Puskesmas) in the study have adopted digital systems at varying levels of implementation. In those with better technological capacity, health workers reported that the digital system helped speed up the reporting process and minimize data input errors that were previously common with manual systems. One health worker stated that "data no longer needs to be recorded repeatedly because it goes directly into the system," indicating a perceived increase in administrative efficiency. However, cross-case analysis results indicate that these benefits are not felt evenly. In some areas with limited internet access and low digital competency of staff, administrative processes are still semi-manual, resulting in frequent delays in data synchronization. These findings suggest that administrative digitization does not automatically result in increased program effectiveness but rather depends on the readiness of infrastructure and organizational capacity at the local level. In this study, program effectiveness is understood as perceived or reported improvements in the accuracy of family data recording, speed of administrative reporting, ease of identification of priority families, and responsiveness to health service follow-up.

The second theme relates to family participation in the health administration process. Coding results indicate that family involvement tends to increase in community health centers that integrate health education into every home visit. Health cadres and field workers not only collect administrative data but also explain the benefits of family health records for follow-up care. One health cadre explained that "families are more open to providing data after understanding the benefits for health monitoring." However, the level of family participation varies across study cases. In areas with lower health literacy levels, workers still face resistance or a lack of community understanding regarding the importance of family health administration. Therefore, the success of administrative innovations is influenced not only by digital technology but also by the social communication skills and educational approaches employed by health workers and cadres in the field.

The third theme indicates that digital data-based monitoring and evaluation systems assist community health centers (Puskesmas) in mapping at-risk families and prioritizing health interventions. In some Puskesmas, digital reports are used in monthly evaluation meetings to identify families with incomplete immunizations, chronic diseases, or sanitation conditions requiring follow-up. Compared with Puskesmas still using semi-manual recording systems, Puskesmas with more integrated digital monitoring demonstrated better ability to organize return visits and distribute field staff tasks. However, this study does not claim that the use of digital systems directly improves family health outcomes, as there is no longitudinal data or objective outcome indicators that can definitively demonstrate a causal relationship. The study findings rather demonstrate a perception of improved administrative monitoring capabilities and health service responses based on the experiences of program implementers.

The next theme relates to the standardization of family health data through the use of digital forms that contain more comprehensive health indicators. Observations and documentation indicate that digital forms allow for more structured recording of family data, including information on immunization status, nutrition, chronic diseases, and access to healthcare services. In community health centers that have better integrated administrative systems, digital data is used to assist in mapping family healthcare needs. However, at several research sites, health workers reported that adapting to the new system requires time and additional training, as some staff are still accustomed to manual recording systems. This situation demonstrates that standardizing

health administration is not only related to the provision of technology but also requires a process of organizational adaptation and continuous improvement of human resource competencies.

The final theme demonstrates that cross-stakeholder coordination and integration are crucial for the successful implementation of PIS-PK administrative innovations. The digital reporting system is considered to help expedite communication between community health centers (Puskesmas) and health offices, particularly in submitting priority family reports and following up on health services. However, cross-case analysis reveals variations in coordination capacity across community health centers. In some locations, coordination is more effective due to the support of clear standard operating procedures (SOPs), regular training, and the availability of supporting technology. Conversely, in areas with limited resources, coordination processes still rely on manual communication and the skills of individual staff. Therefore, the success of administrative innovations is best understood as the result of a combination of technological support, organizational capacity, human resource competency, and institutional coordination patterns that develop in each primary health care context.

This study also recognizes the potential for subjective bias, as most of the data was obtained through interviews with health workers, cadres, and community health center heads directly involved in program implementation. To mitigate this risk of bias, the analysis process was conducted through triangulation of sources and methods by comparing the results of interviews, participant observation, and digital administrative documentation available at each community health center. Thus, interpretation of the findings is not solely based on individual respondents' perceptions but also takes into account data consistency across sources and across research cases.

Comparison Matrix Between Community Health Centers in the Implementation of PIS-PK Administration

A cross-case analysis of the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK) administration reveals varying levels of adaptation of administrative innovations at each community health center, influenced by organizational capacity, digital infrastructure readiness, and community involvement. Unlike the previous descriptive matrix presentation, this analysis utilizes comparisons between community health centers as a basis for understanding how local contexts influence the implementation of administrative digitalization, monitoring mechanisms, and coordination of family health services. Thus, the analysis focuses not only on technical differences between community health centers but also on patterns of organizational adaptation and implementers' perceptions of the administrative effectiveness resulting from these innovations.

Community Health Centers A and C demonstrated a relatively advanced level of administrative digitalization implementation compared to the other locations. Both centers have integrated the use of the Healthy Family application and tablet devices for family data collection, reporting, and health monitoring. At Community Health Center C, data synchronization with the central server is carried out regularly and is supported by the use of digital forms with more comprehensive family health indicators. One health worker stated that "family monitoring has become easier because the data can be directly viewed during weekly evaluations." Observational findings also showed that digital reports are used as a basis for determining priority families for follow-up visits and health follow-up. Compared with the other community health centers, these two locations demonstrated better administrative capabilities in organizing family data and conducting internal coordination more systematically. However, this study does not conclude that the digital system directly improves the success of the family health program, but rather indicates a perception of increased administrative efficiency, speed of reporting, and ease of monitoring among program implementing officers.

Unlike Community Health Centers A and C, the implementation of administrative procedures at Community Health Center B remains partial because the digitalization process has not yet completely replaced the manual system. Most data collection is still done in writing before being re-entered into the digital system, leading health workers to report frequent delays in data input and duplication of administrative procedures. This situation prevents the family monitoring process from being carried out in real time, as in community health centers with more integrated digital systems. Nevertheless, interviews indicate that staff continue to view digitalization as a step towards gradually improving administrative processes. One staff member stated that "reporting is a little faster than before, although re-input is still necessary." This finding suggests that the implementation of administrative innovations is gradual and is heavily influenced by the readiness of human resources and the institution's ability to adapt to changes in administrative work systems.

Meanwhile, Community Health Center D exhibits an implementation pattern that falls somewhere between a partial administration system and a relatively integrated system. The use of local applications and tablets has facilitated the family data collection process, but data integration with the central system remains limited. Family participation at this location increased after intensive outreach by health workers and cadres, particularly regarding the benefits of family health data collection. However, limited internet connection and staff technical skills remain major obstacles to implementing digital administration. To address these obstacles, the community health center developed adaptation strategies including internal training and the use of mobile hotspots during field visits. Compared to Community Health Center B, Community Health Center D demonstrated better monitoring capabilities because some reporting processes were digitalized, although not yet fully automated.

The cross-case analysis also indicates that program effectiveness in this research context is not measured based on direct public health outcomes, but rather is understood as reported or perceived improvements in the PIS-PK administrative process, such as the accuracy of family data recording, ease of monitoring priority families, accelerated administrative reporting, and coordination of health service follow-up. Therefore, differences in the level of digitalization between community health centers (Puskesmas) are not automatically interpreted as differences in the level of health program success, as this study did not use longitudinal data or objective quantitative indicators to directly measure health impacts. The research findings emphasize how administrative innovations are perceived and implemented in the context of primary health care with varying resource constraints.

In addition to technological aspects, this study found that the involvement of health cadres and communication patterns with families also influenced the quality of PIS-PK administration implementation. At Community Health Center C and some areas in Community Health Center A, health cadres played an active role in assisting family education and verifying health data, resulting in relatively better administrative data completeness compared to health centers with limited cadre involvement. Conversely, in areas with low family participation, health workers faced difficulties in obtaining complete and timely family health data. This condition indicates that administrative innovation does not only depend on digital systems, but is also influenced by social factors, communication, and the relationship between health workers and the community.

Although most respondents expressed positive perceptions of administrative innovation, this study also acknowledged the potential for subjective bias because data were obtained primarily through interviews and field observations. To minimize this bias, the study triangulated data by comparing interview results with digital administrative documentation, monitoring reports, and direct observation of data collection and reporting activities at each community health center. Therefore, interpretation of the study results was not solely based on the individual experiences of health workers but also took into account the consistency of information across sources and across research cases.

Data Triangulation between Interviews, Observations, and Documentation

The data triangulation process in this study was conducted by comparing the results of interviews, participant observations, and administrative documentation to assess the consistency of findings related to administrative innovations in the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK). Unlike the descriptive presentation of triangulation tables, this analysis positions triangulation as an interpretive process to understand the congruence and discrepancies in information between data sources and between research cases. This approach is important because most of the data is obtained from the perceptions of health workers and the results of field observations, so cross-verification is necessary to ensure that the interpretation of the findings does not rely solely on individual respondents' claims.

Triangulation results showed consistent findings regarding the implementation of administrative digitization across all community health centers studied, although the level of implementation varied across locations. Interviews with health workers indicated that the use of the Healthy Family app and tablet devices helped expedite the recording and reporting of family data. This statement was reinforced by field observations, which showed that workers input family health data directly during home visits, including recording immunization status, toddler growth, and family environmental conditions. Administrative documentation also indicated that some family reports were digitally stored and integrated with the health office reporting system. However, cross-case triangulation revealed that perceived administrative effectiveness varied across community health centers. In community health centers with more integrated digital systems, workers reported faster reporting processes and easier family monitoring. Conversely, in community health centers with limited internet access and human resource capacity, administrative processes still experienced delays because some data had to be recorded manually before being re-entered into the digital system. These findings suggest that administrative innovation does not result in a uniform implementation experience but is instead influenced by infrastructure readiness and organizational capacity at the local level.

Data triangulation also demonstrated consistent findings regarding the importance of family participation in supporting the completeness of family health administration. Interviews with health cadres indicated that education during home visits helped increase families' willingness to provide health information. These findings were supported by field observations, which demonstrated active family involvement in answering staff questions and assisting with administrative data input. Furthermore, monitoring documentation indicated an increase in the completeness of family data in several areas following assistance from health cadres. However, cross-case analysis revealed that family participation levels varied across study sites. In areas with lower public health literacy, health workers still faced challenges in obtaining complete and timely family health data. Therefore, this study demonstrates that the success of PIS-PK administration is influenced not only by digital technology but also by the social communication skills and educational approaches employed by health workers and cadres in the field.

From a monitoring and evaluation perspective, data triangulation indicates that the use of digital reports facilitates the identification of priority families and administrative decision-making at the community health center level. Interviews with community health center

heads revealed that digital reports are used as a basis for determining follow-up health services and assigning tasks to field staff. Observations of monthly evaluation meetings indicate that digital data is being used to map families with specific health risks, such as incomplete immunizations and chronic diseases. Administrative documentation also demonstrates the presence of follow-up reports for priority families at several community health centers. However, this study does not interpret these findings as causal evidence that digitalization directly improves public health outcomes. In the context of this study, program effectiveness is defined more narrowly as perceived or reported improvements in the accuracy of data recording, speed of administrative reporting, ease of monitoring target families, and coordination of follow-up health services. Therefore, data triangulation is more focused on understanding how administrative innovations support the administrative work processes in the implementation of PIS-PK, rather than on proving direct health impacts.

Triangulation results also demonstrated consistent information regarding the importance of standardizing family health forms and indicators in supporting program administration. Observations of the use of digital forms indicated that family health indicators were more systematically organized compared to previous manual recording. Documentation of the digital forms revealed the grouping of family health data into specific categories, such as nutritional status, chronic diseases, and access to healthcare services. However, interviews with health workers indicated that adapting to the digital form system required additional time and training, especially for those previously accustomed to manual recording. The differences in adaptation rates across community health centers indicate that the success of administrative standardization depends not only on the availability of technology but also on the readiness of human resources and ongoing organizational support.

Furthermore, data triangulation demonstrated that digital reporting integration supported cross-stakeholder coordination, particularly between community health centers (Puskesmas) and the health office. Interviews with community health center heads and administrative officers revealed that the digital reporting system facilitated the delivery of information on priority families and program administrative achievements. Observations of monthly coordination meetings also indicated that digital reports were used as a basis for administrative decision-making and the allocation of follow-up tasks. However, the effectiveness of coordination varied across study cases. In community health centers with better digital infrastructure support, coordination was more rapid and structured, while in areas with limited network and human resources, coordination still relied on manual communication and delayed reporting. These findings demonstrate that digital administration integration needs to be understood as an adaptive process that is strongly influenced by the institutional context of each primary health care area.

This study also recognizes the potential for subjective bias, as most information is obtained through the experiences and perceptions of program implementers. Therefore, triangulation was conducted not only to identify similarities in data but also to identify differences in information between sources, allowing for a more critical and balanced interpretation of the findings. By simultaneously comparing interviews, observations, and documentation, the study attempts to minimize the risk of overstating the success of administrative innovations in the implementation of PIS-PK.

Administrative Innovation Applied in the Implementation of PIS-PK

The research results show that administrative innovation in the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK) has developed primarily through the digitalization of family health administration, such as the use of the Healthy Family application and tablet devices for field data collection. This transformation demonstrates a shift from a manual administration system to a more integrated, digital-based health governance system. From the perspective of digital health governance theory, the use of information technology in primary health care is seen as a crucial strategy for improving data coordination, reporting efficiency, and the ability to continuously monitor health services (Savage Hoggard et al., 2023). The findings of this study are in line with international studies by Carney et al., (2024) which shows that digitalization of health administration in primary care can help accelerate the flow of information and improve service documentation processes, particularly in areas with high family monitoring needs. Research by Honiball & Marcus, (2020) also demonstrated that the use of a community-based digital system can improve record-keeping and support faster administrative decision-making. However, this study found that the benefits of digitalization did not emerge uniformly across all community health centers due to the influence of infrastructure readiness, internet network stability, and human resource capabilities in operating the digital system. Therefore, administrative innovation in the context of PIS-PK is better understood as a contextual organizational adaptation process rather than a technological transformation that automatically improves health service performance.

Research findings also indicate that standardizing family health forms and indicators is a crucial part of strengthening the administrative governance of PIS-PK. The use of digital forms containing more comprehensive family health indicators allows for a more systematic recording process and facilitates mapping of family intervention needs. From a health information system strengthening perspective, data standardization is a key element in creating consistent health information integration and can be used to support evidence-based health service planning (Myers et al., 2025). The results of this study are in line with international studies by Ugwuanyi, (2024) which emphasizes that the quality of a

health information system is determined not only by the availability of digital technology, but also by the consistency of indicators, data interoperability, and the ability of staff to manage health information accurately. However, this study found that the administrative standardization process still faces adaptation challenges at the primary care level, particularly in community health centers (*Puskesmas*) that were previously more accustomed to manual record-keeping. This situation demonstrates that strengthening the health administration system requires continuous investment in technical training, organizational mentoring, and streamlining administrative workflows to enable more effective implementation of digital transformation.

In addition to the technological aspect, this study shows that the involvement of families and health cadres is a crucial factor in supporting the implementation of PIS-PK administrative innovations. Education during home visits helps increase family participation in the health data collection process, so that family health administration is not only understood as a bureaucratic activity, but also as part of the community empowerment process. This finding aligns with the theory of co-production in public administration, which emphasizes that the quality of public services can improve when the community participates in the service process. In the context of global health, various recent studies by Wang et al., (2023) The results showed that the success of community-based health programs is strongly influenced by local community involvement, interpersonal communication, and trust in health workers. However, the results also showed variations in family participation across study areas. In some locations with lower health literacy levels, families still lacked an understanding of the importance of health data recording, resulting in slower and incomplete administrative processes. These findings suggest that administrative innovation cannot focus solely on technological digitization but must also consider social and communication approaches appropriate to local community characteristics.

From a monitoring and evaluation perspective, research has found that the use of digital reports helps community health center heads identify priority families and organize follow-up health services more systematically. This finding supports the concept of data-driven decision-making in modern health governance, which emphasizes the importance of using up-to-date data to support administrative decision-making. Several recent international studies by Hinkle et al., (2024) showed that integrating digital monitoring systems into primary health care can improve organizations' ability to identify vulnerable groups and accelerate the distribution of needs-based health services. However, this study did not find sufficient evidence to conclude that administrative digitization directly improves public health outcomes. Program effectiveness in this study is better understood as perceived or reported improvements in administrative aspects, such as accuracy of data recording, speed of reporting, ease of monitoring target families, and coordination of health service follow-up. Therefore, the study results should be interpreted with caution and not used to draw causal claims about direct improvements in public health outcomes.

This study also shows that cross-stakeholder coordination and integration are crucial components in strengthening PIS-PK administrative innovation. The digital reporting system helps accelerate information exchange between community health centers (*Puskesmas*) and health offices, allowing for more focused administrative follow-up. From the perspective of network governance and collaborative governance, information integration between institutions is a crucial element in enhancing the capacity of public sector organizations to address complex health issues (Goliath et al., 2025). The findings of this study are in line with recent international studies by Damonse et al., (2025) which emphasizes that the success of digital transformation in primary healthcare services is greatly influenced by the institution's ability to build cross-sector coordination and sustainable integration of health information systems. However, research results show that coordination capacity between community health centers (*Puskesmas*) still varies due to variations in human resources, technological support, and organizational readiness in each region. Therefore, implementing administrative innovation in PIS-PK requires a more adaptive governance approach that is sensitive to local conditions in primary healthcare services.

Although this study demonstrates positive perceptions of administrative innovations in the implementation of PIS-PK, several limitations need to be critically acknowledged. First, the research data relies heavily on interviews with health workers, heads of community health centers, and health cadres directly involved in the program, thus potentially introducing social desirability bias, which is the tendency for respondents to provide more positive responses to program implementation. Second, although the study utilized triangulation of interviews, observations, and documentation, the triangulation process still has the potential to contain confirmation bias because most of the data sources came from the same organizational environment. Therefore, interpretation of the research results should be carried out cautiously, viewing the findings as perceptions and experiences of administrative implementation, rather than as definitive evidence of the overall success of the family health program. Furthermore, this study did not use longitudinal indicators or quantitative measurements that could demonstrate a direct relationship between administrative innovations and improved public health outcomes.

Overall, this study demonstrates that administrative innovation in PIS-PK develops through a combination of digitalization of health information systems, standardization of family administration, strengthening community participation, data-driven monitoring, and cross-institutional coordination.

However, the success of these innovations is heavily influenced by the readiness of digital infrastructure, human resource capacity, organizational culture, and the social characteristics of communities in each primary health care setting. These findings reinforce the implementation science perspective, which emphasizes that the success of public policy innovations is determined not only by program design but also by the organization's adaptability and the context of implementation on the ground. Therefore, developing administrative innovation in PIS-PK requires a strategy for strengthening sustainable institutional capacity, improving the digital literacy of health workers, and adopting a more inclusive, participatory approach to ensure the family health administration system operates more effectively and sustainably across various primary health care settings.

Administrative Innovation Increases Program Effectiveness and Family Participation

The results of the study indicate that administrative innovation in the implementation of the Healthy Indonesia Program with a Family Approach (PIS-PK) is perceived as being able to support increased administrative efficiency, particularly through the use of a digital system for data collection and reporting of family health. The use of the Healthy Family application and tablet devices allows family data to be recorded more quickly and in a more structured manner than the previous manual system. In the context of this study, program effectiveness is not defined as a direct improvement in public health outcomes, but rather as perceived improvements in administrative processes, such as the accuracy of data recording, ease of monitoring target families, accelerated reporting, and coordination of health services. This finding aligns with an international study on digital health administration by Sangwe et al., (2024) This study demonstrates that digitizing primary healthcare services can help strengthen documentation systems and accelerate administrative decision-making, particularly in developing countries with extensive community service coverage. However, the results of this study also show that the benefits of digitalization are not always optimally implemented in all community health centers. Community health centers with limited internet connections and human resource capacity still face delays in data synchronization and the use of semi-manual systems. This situation demonstrates that digital-based administrative innovation cannot be understood as a universal solution, but is heavily influenced by infrastructure readiness and the ability of local organizations to adapt to changes in administrative work systems.

The research findings also indicate that increased family participation in health administration was influenced by the education and mentoring process conducted during home visits. Families who had previously tended to be passive became more active in providing health information after understanding the benefits of data collection for family health services. These findings align with the concepts of community engagement and co-production in public administration, which emphasize that community involvement can strengthen the quality of public services and increase the responsiveness of health programs (Porter, 2006). Recent global studies on community-based health services by Renkin & Hugo, (2025) The results show that the success of health administration transformation is determined not only by digital technology but also by the quality of communication between health workers and the community. However, this study also found that levels of family participation varied across study areas. In some areas with lower health literacy levels, health workers still experienced difficulty obtaining complete data because families did not yet understand the importance of health administration records. Therefore, the results of this study indicate that administrative innovation in PIS-PK requires an adaptive social approach and cannot focus solely on technological aspects.

From a program reporting and monitoring perspective, the study found that digital administration systems help health workers and community health center heads access family data more quickly for follow-up care. From a health information systems strengthening perspective, digital data integration enables primary health care organizations to improve internal coordination and enhance their ability to map priority groups (Maj et al., 2021). This finding is consistent with recent international research by Gizaw et al., (2022) which showed that a digital reporting system in primary health care can support improved administrative responsiveness and efficiency in public health data management. However, this study did not find sufficient evidence to conclude a direct causal relationship between administrative digitization and improved family health outcomes. Claims regarding increased program effectiveness were limited to staff perceptions of improved administrative processes and service monitoring, not objective indicators such as reduced disease rates or longitudinal improvements in public health status. Therefore, interpretation of the study results requires caution to avoid overgeneralizations about the impact of administrative innovation on health outcomes.

Standardizing family health forms and indicators is also a crucial part of strengthening PIS-PK administration. The use of digital forms containing more comprehensive health indicators facilitates the identification of priority families and the development of more systematic follow-up health services. From an evidence-based public health management perspective, data standardization is a crucial component in creating a consistent health information system that can be used to support needs-based planning (Tampo et al., 2021). Various recent international studies by Stoumpos et al., (2023) also demonstrated that standardizing family health indicators can improve data interoperability and strengthen primary health care monitoring processes. However, the results of this study indicate that adapting to digital forms remains

a challenge in some community health centers, especially for staff previously accustomed to manual systems. This situation demonstrates that health administration transformation requires a continuous organizational learning process and cannot solely rely on the provision of digital technology.

Furthermore, cross-stakeholder coordination supported by a digital reporting system is perceived to help accelerate information exchange between community health centers, health cadres, and health offices. This finding supports the collaborative governance and network governance perspectives, which emphasize the importance of information integration and cross-institutional coordination in improving public service capacity (Wilson et al., 2021). Various international studies by Yaqoob et al., (2022) Studies have shown that the success of digital transformation in primary healthcare services is heavily influenced by an organization's ability to build inter-institutional collaboration and ensure continuous integration of information systems. However, the results of this study indicate that the quality of coordination between community health centers (Puskesmas) still varies depending on infrastructure support, human resource capabilities, and organizational readiness in each region. Therefore, administrative innovation in PIS-PK is more accurately understood as a gradual and contextual process of strengthening healthcare governance.

This study also acknowledges several methodological limitations that need to be considered in interpreting the results. First, most of the data were obtained through interviews with health workers, heads of community health centers, and health cadres directly involved in program implementation, thus creating the possibility of social desirability bias, which is the tendency for respondents to provide a more positive picture of the implementation of administrative innovations. Second, although the study utilized triangulation through interviews, observation, and documentation, the triangulation process was not entirely free from confirmation bias because most of the information sources came from the same program implementing institution. Therefore, the results of this study are not intended to claim absolute success of the PIS-PK administrative innovation, but rather to describe the implementation experiences and perceptions of program implementers in the context of primary health care. Furthermore, this study did not use a longitudinal approach or objective quantitative indicators that could more comprehensively measure the direct impact of administrative innovations on public health outcomes.

Overall, this study shows that administrative innovation in PIS-PK develops through the integration of family data digitization, standardization of administrative systems, strengthening family participation, data-driven monitoring, and cross-institutional coordination. The research findings reinforce the implementation science perspective, which emphasizes that the success of health policy innovation is determined not only by technological design or administrative regulations, but also by organizational capacity, the social context of the community, and the adaptability of implementing actors at the local level. Therefore, developing administrative innovation in PIS-PK requires strategies to strengthen human resource capacity, improve digital literacy, provide equitable technological infrastructure, and a participatory approach that is more sensitive to community characteristics in various primary health care areas.

Challenges and Opportunities Emerging from the Implementation of Administrative Innovation

The research results show that one of the main challenges in implementing administrative innovation in the Healthy Indonesia Program with a Family Approach (PIS-PK) is the limited human resource capacity in operating the digital administration system. Some health workers and cadres still experience difficulties in using the application and the digital data synchronization process, especially in the early stages of implementation. This finding shows that the success of administrative innovation is determined not only by the availability of technology, but also by the organization's readiness and user competence in adapting to changes in work systems. From the perspective of implementation science and the theory of diffusion of innovation, the adoption of new technology in public service organizations requires a continuous learning process, institutional support, and adaptation of work culture for the innovation to be implemented effectively (Ray et al., 2021). International research on the digitalization of primary health care by Jamil et al., (2020) also showed that limited digital literacy among healthcare workers is a major obstacle to implementing health information systems in developing countries. However, this study found that responses to this challenge differed across community health centers. In community health centers with regular training and technical assistance, staff adaptation progressed more effectively than in areas with limited organizational support. These findings suggest that administrative innovation should be understood as a process of strengthening institutional capacity, not simply the procurement of digital technology.

The next obstacle relates to limited digital infrastructure, particularly unequal internet access in some primary healthcare areas. Network constraints mean that data synchronization to the central server cannot always be performed in real time, leading some community health centers to still use a combination of manual and digital record-keeping. From a digital health governance perspective, the success of technology-based administrative transformation depends heavily on the readiness of digital infrastructure that supports interoperability and continuous data flow (Papa et al., 2020). The findings of this study are in line with a recent global study by Torab-Miandoab et al., (2023) This study demonstrates that the digital infrastructure gap remains a major challenge in implementing e-health systems, particularly in rural and resource-limited areas. However,

this study also found locally developed adaptive strategies, such as the use of portable hotspots, offline data storage, and gradual synchronization when the network is available. This situation suggests that implementation flexibility and local innovation are crucial factors in maintaining the sustainability of digital administration in the context of primary healthcare with limited infrastructure. Thus, the research findings reinforce contingency theory in public administration, which emphasizes that policy implementation strategies must be tailored to the organizational environment and available resource capacity.

In addition to technical challenges, this study also revealed social barriers to implementing administrative innovations, particularly regarding the community's ability to understand the importance of recording family health data. In the early stages of implementation, some families still viewed the data collection process as merely an administrative activity and did not fully understand its benefits for family health services. This finding is consistent with recent international research by Shamshad et al., (2020) A study on the implementation of community-based digital health services showed that the level of community acceptance of innovation is strongly influenced by health literacy, perceived benefits, and trust in health care institutions. In the context of this study, education and mentoring provided by health cadres has been shown to help gradually increase family participation. However, the results also indicate that levels of family involvement vary across study areas, so the effectiveness of the educational approach cannot be viewed uniformly across all community contexts. Therefore, administrative innovation in PIS-PK needs to be understood not only as a technological transformation, but also as a process of social change that requires a communication approach that is sensitive to the cultural characteristics and literacy levels of local communities.

On the other hand, this study shows that the implementation of administrative innovations opens up opportunities to strengthen the quality of family health service governance. Digital administration systems help health workers monitor target families in a more structured manner, expedite the reporting process, and facilitate the identification of priority families for follow-up health services. From the perspective of data-driven governance and health information systems strengthening, the use of more integrated data can help health service organizations improve the quality of administrative decision-making and strengthen community-based planning processes (Chenthara et al., 2020). The findings of this study are in line with recent international studies by ter Stal et al., (2020) which shows that the integration of health information systems into primary care can increase administrative efficiency and improve the coordination of community-based health services. However, this study does not claim that administrative digitization directly improves public health outcomes. The effectiveness of the program in this study is more limited to perceived or reported improvements in administrative aspects, such as data accuracy, ease of monitoring, and speed of health service coordination. Therefore, interpretation of the study results requires caution to avoid excessive causal claims regarding the impact of administrative innovations on public health directly.

This study also found that administrative innovation has the potential to strengthen collaboration between stakeholders in the implementation of PIS-PK. The digital reporting system allows community health centers, health offices, and health cadres to share information more quickly and in a structured manner, allowing for more responsive administrative follow-up. This finding supports the collaborative governance and network governance perspectives, which emphasize that the effectiveness of public services is greatly influenced by the quality of coordination between actors and the integration of information systems between institutions (Iyanna et al., 2022). International research by Yaqoob et al., (2022) also shows that the success of digital transformation in primary healthcare services is largely determined by an organization's ability to build collaborative networks and maintain sustainable data exchange between institutions. However, this study shows that the quality of coordination between regions still varies due to differences in human resource capacity, technological readiness, and organizational culture at each community health center. This situation indicates that administrative innovation cannot be separated from the dynamics of local governance and institutional capacity at the primary healthcare level.

Although this study demonstrates the positive potential of administrative innovation in the implementation of PIS-PK, several limitations need to be critically acknowledged. First, most of the research data was obtained through interviews with health workers, heads of community health centers, and health cadres directly involved in program implementation. This raises the possibility of social desirability bias, which is the tendency for respondents to provide a more positive assessment of the implemented innovation. Second, although the study used triangulation of interviews, observations, and documentation, the triangulation process still has the potential to contain confirmation bias because most of the information sources came from the same implementing organization. Therefore, the results of this study are not intended to demonstrate the absolute success of the PIS-PK administrative innovation, but rather provide a snapshot of the implementation experiences, challenges, and perceptions of program implementers in the context of primary health care. Furthermore, this study did not use longitudinal indicators or quantitative measurements that could objectively and long-term evaluate the impact of administrative innovation on public health outcomes.

Overall, this study demonstrates that administrative innovation in PIS-PK develops through the interaction of technological factors, organizational capacity, infrastructure support, and community

participation. The research findings reinforce the view that health administration transformation in primary care cannot be understood solely as a process of system digitization, but also as a complex process of social and institutional adaptation. Therefore, strengthening administrative innovation in family health programs requires a more comprehensive strategy, including improving digital literacy among health workers, equitable distribution of technological infrastructure, strengthening cross-sectoral coordination, and developing a more contextual participatory approach tailored to community characteristics and the capacity of primary care organizations in various regions.

CONCLUSIONS

The results of this study confirm that the implementation of administrative innovations in the implementation of PIS-PK, which includes digitizing family data, standardizing health forms and indicators, utilizing data-based monitoring, increasing family participation, and strengthening coordination across stakeholders, plays a significant role in increasing program effectiveness. This implementation not only improves the accuracy and completeness of family health data recording but also encourages active community involvement, accelerates the process of identifying families in need of special attention, and enables more precise and rapid implementation of health interventions. Although still faced with various obstacles such as limited human resources, infrastructure, and the process of community adaptation to digital systems, various efforts such as ongoing training, the provision of portable hotspots, and mentoring by cadres have proven effective in minimizing these obstacles. Overall, these findings provide a significant contribution to the development of family health service administration, while strengthening environmental health governance and oversight through an integrated, standardized data system that can be used as a basis for evidence-based decision-making to support more adaptive and sustainable health interventions.

SUGGESTION

Suggestions contains recommendations based on the results of the study. This section may include suggestions for further research, policy or practice related to environmental health. Authors should ensure that suggestions are relevant and applicable.

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