DOI: http://dx.doi.org/10.33846/sf16410

Multidimensional Challenges in the Implementation of the Acute Appendicitis Clinical Pathway

Firli Yan Arsil
Master of Public Health Program, Faculty of Medicine, Dentistry, and Health Sciences, Universitas Prima Indonesia, Medan, Indonesia
Ermi Girsang
Master of Public Health Program, Faculty of Medicine, Dentistry, and Health Sciences / PUI PHYTO Degeneratif and Lifestyle Medicine, Universitas Prima Indonesia, Medan, Indonesia
Sri Lestari Ramadhani Nasution
Master of Public Health Program, Faculty of Medicine, Dentistry, and Health Sciences / PUI PHYTO Degeneratif and Lifestyle Medicine, Universitas Prima Indonesia, Medan, Indonesia;
srilestariramadhaninasution@unprimdn.ac.id (correspondence)

ABSTRACT

Acute appendicitis is a common cause of acute abdominal pain that requires immediate intervention to prevent complications, especially among vulnerable groups such as children and the elderly. The clinical pathway is used to standardize care, improve efficiency, and reduce costs. This study aimed to analyze the implementation of the acute appendicitis clinical pathway at Pertamina Hospital Pangkalan Brandan. The research used a qualitative phenomenological approach involving six informants (two key, two main, and two supporting). Data were collected through observation, in-depth interviews, and document review, then analyzed descriptively through data reduction, presentation, and conclusion drawing. The results showed that the implementation of the acute appendicitis clinical pathway still faces challenges in unstructured interprofessional communication, limited human resources such as case managers and clinical pharmacists, and the absence of an adequate information and logistics system. Resistance also occurs due to low understanding, entrenched old practices, and lack of incentives. Internal evaluations have not significantly influenced behavioral change, while supervision and inter-unit coordination remain weak. As conclusion, the implementation of the acute appendicitis clinical pathway at Pertamina Hospital Pangkalan Brandan faces interrelated, multidimensional challenges across communication, resources, disposition, and bureaucratic structure aspects.
Keywords: hospital; clinical pathway; acute appendicitis

INTRODUCTION

Acute appendicitis is a leading cause of acute abdominal pain worldwide and remains a global health problem that requires prompt, appropriate, and standardized treatment to prevent complications.[1] According to the World Health Organization (WHO), approximately 7% of the population in western countries suffers from appendicitis. The global prevalence of acute appendicitis reaches 8.7%, with an incidence rate of 229.9 cases per 100,000 population. This condition is found to occur in both children and adults. In Asia, South Korea recorded the highest rate of appendectomy with 135 cases per 100,000 population, while developing countries such as India, Malaysia, and Thailand have lower rates of around 40-60 cases per 100,000 population per year.[2]

The incidence of appendicitis in Indonesia continues to increase. Studies show that cases of appendiceal perforation range from 20–30%, increasing to 32–72% in those over 60 years of age. Meanwhile, in North Sumatra province, particularly Medan, the incidence of appendicitis is also high, especially among those aged 20–30. Data shows that approximately 7% of the Indonesian population experiences appendicitis, equivalent to approximately 179,000 people. Management of patients with acute appendicitis requires an immediate and accurate response, as delays in treatment can increase the risk of complications related to both the disease itself and the appendectomy procedure. The severity and mortality rates tend to increase over time, particularly in children and the elderly. Although the diagnosis of appendicitis can be challenging, the decision to perform an appendectomy should be made within 3 hours of patient presentation, given the increased risk of complications with delay.[3]

One effective approach to reducing variation in the service process, both macro variations such as length of stay and patient flow, and micro variations such as diagnosis, treatment, and procedures, while also helping to reduce costs, is to implement clinical pathways.[4] Clinical pathways are a comprehensive healthcare service organization concept currently widely implemented in hospitals. Clinical pathways describe in detail each important stage in the patient care process, from the time the patient is first admitted to the hospital until they are declared cured and discharged. Their implementation involves collaboration across healthcare professions within the hospital to provide integrated and quality services.[5] The implementation of clinical pathways in hospitals aims to provide safe, quality, and effective services to patients while prioritizing their needs and rights in accordance with healthcare standards.[6]

Several studies have shown that the implementation of clinical pathways in Indonesian hospitals still faces challenges, such as low commitment from medical teams, inadequate training, and minimal monitoring and evaluation. This leads to variations in implementation between hospitals, resulting in suboptimal clinical outcomes. Implementing clinical pathways not only improves the quality of care but also contributes to cost efficiency.[7] Clinical pathways make a significant contribution to increasing cost efficiency in appendectomy procedures. By clarifying process flows, reducing unnecessary diagnostic tests, and encouraging the implementation of evidence-based practices, clinical pathways help optimize resource utilization.[8]

Compliance with the clinical pathway is a critical indicator of successful implementation. The compliance with the acute appendicitis clinical pathway was influenced by factors such as inadequate socialization, ineffective monitoring, and inconsistent evaluation. Furthermore, collaboration between doctors and nurses is crucial in implementing the clinical pathway.[9] In general, the implementation of the clinical pathway from a patient

perspective was successful, at 66.5%. However, some patients still felt that implementation was suboptimal, at 33.5%. From the perspective of healthcare workers, the implementation of the clinical pathway was also quite good, although several obstacles remained, particularly in aspects of communication, training, shared commitment, and the lack of ongoing monitoring and evaluation of the clinical pathway's implementation.[10]

Pertamina Hospital Pangkalan Brandan is a Type C Hospital with quite complete facilities. Appendectomy for appendicitis cases is one of the most frequently performed cases in the surgical installation at Pertamina Hospital. Based on data obtained from Pertamina Hospital Pangkalan Brandan Langkat Regency, it was found that the number of appendicitis cases is quite high each year. According to medical records, there were 166 patients with acute appendicitis cases in 2022, which then increased to 182 patients in 2023 and continues to increase every year. The number of acute appendicitis cases in 2024 reached 194 patients, while the period January 2025 to April 2025 the number of acute appendicitis cases was 69 cases. This shows that the number of appendicitis cases at Pertamina Hospital Pangkalan Brandan is increasing every year. Appendicitis cases that occur include acute appendicitis, chronic appendicitis, appendicitis with complications. Of all the cases of acute appendicitis, acute appendicitis is the most common case every year.

Based on initial observations at Pertamina Hospital Pangkalan Brandan, significant differences were found in clinical practices among medical personnel in treating acute appendicitis. These differences are evident in the diagnosis, initial therapy selection, surgical timing, and postoperative management. This inconsistency directly impacts patient outcomes, including an increased risk of complications such as bowel perforation, intra-abdominal abscess, and even peritonitis.

This phenomenon can be further analyzed using the policy implementation theory proposed by George C. Edward III, which states that the success of a policy implementation is greatly influenced by four main variables: communication, resources, disposition (attitude of implementers), and bureaucratic structure. In the context of implementing a clinical pathway for acute appendicitis, communication barriers among medical personnel, such as a lack of socialization or differing understanding of the pathway's content, can be a major trigger for differences in practice. Without effective communication, the clinical pathway will not be understood and implemented uniformly by the medical team involved. In addition to communication, resource factors such as the availability of experts, medical equipment, and information systems also play a crucial role. If supporting facilities and medical personnel are inadequate, the implementation of the clinical pathway will be distorted or even fail. Disposition factors, which reflect the attitudes and commitment of medical personnel to pathway implementation, also determine the extent to which the pathway is adopted in practice. Finally, a bureaucratic structure that is too rigid or does not support innovation will slow the adoption of the clinical pathway as part of the service system.

This study focuses on the implementation of the acute appendicitis clinical pathway at Pertamina Hospital in Pangkalan Brandan, a hospital that has not been previously evaluated. Furthermore, this study uses a qualitative approach to analyze and explore in-depth the factors influencing the implementation of the clinical pathway based on communication, resources, disposition, and bureaucratic structure, which will provide more comprehensive insights for policymakers. Therefore, the purpose of this study is to analyze and describe the implementation of the acute appendicitis clinical pathway at Pertamina Hospital Pangkalan Brandan based on the four variables of George C. Edward III's policy implementation theory, namely communication, resources, disposition, and bureaucratic structure.

METHODS

This research used a qualitative research method with a phenomenological approach and was conducted at Pertamina Hospital Pangkalan Brandan, Langkat Regency, from January 2025 to June 2025. Data collection took place in May 2025 until completion. The selection of informants was carried out using a purposive sampling technique, in which six individuals were chosen based on their relevance and expertise in the research topic. The sampling criteria consisted of employees involved in the creation, planning, preparation, and implementation of the clinical pathway, having more than two years of work experience, being able to communicate well, and being willing to participate as informants. The informants included the Head of Medical Services, Head of Case Managers, Surgeon, Surgical Room Supervisor, Head of Nutrition Installation, and Head of Pharmacy Installation. These six informants were further categorized into key, main, and supporting informants according to their respective positions, functions, and roles in the study.

The required data were collected through document review, direct observation, and in-depth interviews, focusing on four assessment aspects: communication, resources, disposition (attitude of implementers), and bureaucratic structure. In-depth interviews were conducted using an interview guide developed based on George C. Edward III's policy implementation theory to explore the factors influencing the implementation of the acute appendicitis clinical pathway. All collected data were analyzed using the Colaizzi method, which provides systematic and detailed steps for analyzing phenomenological data.

To ensure research integrity, this study also adhered to ethical research principles. Ethical clearance was obtained from the hospital's ethics review board, and all informants provided informed consent prior to participation. Each informant was given a clear explanation of the study's purpose, procedures, and their rights, including the freedom to withdraw at any stage. Confidentiality and anonymity were strictly maintained by coding informant identities, while the principles of autonomy, beneficence, non-maleficence, and justice were consistently applied throughout the research process.

RESULTS

Informants Characteristics

Based on the Table 1, it shows that the informants were aged between 36 and 51 years. A total of 5 informants were female and 1 was male. All informants had a health education background, namely Bachelor of

Public Health (SKM), Bachelor of Pharmacy (S.Farm), Professional Nursing (Ners), Master of Public Health (MKM), and a surgical specialist (Sp.B). Judging from the employment status, 4 people were on an Indefinite Term Employment Agreement (PKWTT) and 2 people are on a Fixed Term Employment Agreement (PKWT). The length of work of the informants ranges from 9 years to 21 years.

Table 1. The description of research informants

No.	Initials	Age (year)	Gender	Education	Employee status	Position	Length of work (year)
1	FDE	40	Female	MKM	PKWTT	Head of Education and Culture	13
2	AH	36	Female	MKM	PWTT	Head of Case Manager	10
3	ZA	45	Male	Sp.B	PWTT	Surgical Specialist	9
4	SY	46	Female	Nurs	PKWTT	Surgical Room Supervisor	20
5	RD	51	Female	SKM	PKWTT	Head of Nutrition Installation	21
6	ESM	43	Female	S.Farm	PKWTT	Head of Pharmacy	19

Communication

Based on the research results obtained with informants through interviews related to communication in the implementation of the Acute Appendicitis Clinical Pathway at Pertamina Pangkalan Brandan Hospital. This indicates that in terms of the socialization or information delivery process, the six informants stated that the approaches used in implementing the acute appendicitis clinical pathway at Pertamina Hospital Pangkalan Brandan varied, ranging from coordination meetings, direct explanations to work units, internal circulars, and medical committee forums. Although formal training was not yet available, socialization was still conducted routinely, especially by the Head of Medical Services. Doctors, nurses, pharmacists, and nutritionists received information through official forums or written instructions. However, the active involvement of all professionals from the start was not optimal, especially in ensuring a comprehensive understanding of the acute appendicitis clinical pathway.

The most prominent communication barriers were time constraints, staff rotation, delays in information delivery, and the lack of a centralized update system. Some new staff or those who did not attend the socialization had to receive additional informal explanations. Furthermore, differences in interpretation of the acute appendicitis clinical pathway, inconsistent use of medical terminology, and incomplete instructions presented challenges during implementation. This necessitated direct clarification with physicians, nurses, and pharmacists, especially when practices differed from the standard clinical pathway.

Communication between fields and professions has generally been ongoing, but requires systematic strengthening. Direct interactions, such as morning briefings, handovers, or cross-professional discussions, remain sporadic and have not been integrated into a centralized information system. Although interprofessional communication and coordination are conducted through medical records or communication groups, the involvement of nutrition and pharmacy professionals is often limited to specific stages. The lack of daily cross-professional briefings also impacts the effectiveness of the overall implementation of the acute appendicitis clinical pathway.

Resources

The data indicate that the availability of human resources and infrastructure is generally considered adequate by informants, although several obstacles are still felt at the operational level in the implementation of the acute appendicitis clinical pathway. The Head of Medical Services at Pertamina Hospital Pangkalan Brandan stated that supporting facilities such as laboratories and ultrasounds are available, while the Operating Room Supervisor and Surgical Specialists emphasized that basic surgical equipment and drugs are sufficient, although incidents such as delays in sterilization of equipment or limited types of drugs still occur. However, staff rotation, vacant positions, and high workloads cause imbalances in human resource availability, especially in the nutrition, pharmacy, and case manager units, which often have to carry out dual functions.

In terms of guidelines and training, all informants agreed that the acute appendicitis clinical pathway document is available and accessible in various units, such as inpatient wards, the emergency department, and the nutrition facility. However, formal training remains very limited. Socialization still relies on internal technical briefings or the sharing of experiences from doctors who have participated in audit training. A specific training module is not yet available, and some staff find it difficult to fully understand the document's contents, especially those unfamiliar with the format or technical terminology used. This highlights the need for the development of practical modules and systematic cross-professional training.

In terms of budget and logistical support, there has been no specific allocation of funds explicitly designated to support the implementation of the acute appendicitis clinical pathway. While some basic needs, such as document printing and team meetings, can still be facilitated with general hospital funds, the development of an integrated information system, regular training, and the provision of specialized medication stocks have not been optimally accommodated. The nutrition and pharmacy units also face logistical constraints when certain food items are unavailable or when prescribed medications are not on the Pertamina Pangkalan Brandan Hospital's medication list. This reality highlights the need for more structured budget planning to ensure the efficient and sustainable operation of the acute appendicitis clinical pathway.

Disposition

The results showed that most informants demonstrated commitment to implementing the acute appendicitis clinical pathway at Pertamina Hospital Pangkalan Brandan, although implementation in the field was not yet uniform. The Head of Medical Services and Surgical Specialists stated that the clinical pathway is seen as an important guideline, although in practice it still needs to be adapted to the patient's condition. However, there are still personal preferences among medical personnel that lead to deviations from the standard flow. Meanwhile,

the nursing and nutrition teams strive to implement the clinical pathway as part of accreditation and service quality, despite some technical confusion regarding the timing of actions or procedures. The pharmacy also stated compliance, but still considers flexibility according to the patient's clinical condition.

Bureaucratic Structure

The data showed that all informants stated that policies and Standard Operating Procedures (SOPs) related to the acute appendicitis clinical pathway were available in written form, including clinical guidelines, dietary guidelines, and action checklists. However, there remains a gap between official documents and technical understanding in the field. New nurses and non-medical staff, such as nutritionists, still require intensive guidance to understand the details of the pathway. Some physicians also rely more on clinical judgment than on the clinical pathway as a primary reference in emergencies. This demonstrates the need for a sustainable approach to strengthen cross-professional understanding of management-approved documents.

From a management perspective, structural support is evident through the provision of templates, standard operating procedures (SOPs), facilities, and standard formulations for nutrition and medication. Management also actively encourages the implementation of clinical pathways as part of quality improvement and accreditation standards compliance. However, oversight of consistent implementation remains uneven across all levels. Several informants noted that the lack of sanctions or rewards has resulted in weak compliance among some healthcare workers. Management support is considered positive, but more active and collaborative supervision is needed to ensure that implementation of the acute appendicitis clinical pathway is not merely administrative.

Evaluation and improvement mechanisms have been implemented through medical record audits, checklist monitoring, and internal evaluations per unit, such as nutrition and pharmacy. Audits are conducted periodically, whether daily, weekly, or quarterly. However, the effectiveness of the feedback loop remains a concern, particularly regarding follow-up on evaluation findings, which are not always promptly addressed. Some deviations in clinical pathway implementation are recorded as variances (differences or discrepancies recorded between actual practice and the standard plan within the clinical pathway), but not all have been used as a systematic basis for policy or SOP updates. Continuous integration of the cross-departmental feedback system is needed to ensure that evaluations result in tangible improvements in clinical service practices

DISCUSSION

Communication

Communication in the implementation of the acute appendicitis clinical pathway at Pertamina Hospital Pangkalan Brandan has taken place through various mechanisms, but it has not been fully optimized. According to informants, policy socialization was carried out through coordination meetings, in-person explanations in the room, and the distribution of official circulars. However, there has been no structured formal training, so implementation understanding relies heavily on informal communication methods. This situation has resulted in uneven knowledge standards among staff, especially for new healthcare workers or staff undergoing rotation. Other challenges that emerged include limited time for implementation to attend explanations, and the lack of media or communication platforms capable of disseminating information quickly and documented.

Interprofessional communication has been implemented in clinical pathway implementation, but it remains incidental and has not been integrated into routine workflows. The involvement of supporting professionals such as nutritionists and pharmacists often occurs only when needed, rather than as part of planned coordination. The absence of an integrated information system hinders real-time data and instruction updates, potentially leading to differing interpretations or delays in patient care. This situation suggests that strengthening communication strategies, including developing formal training and utilizing information technology, is a crucial step to ensure effective, consistent, and collaborative clinical pathway implementation across all service lines.

This finding is in line with a phenomenological approach also found suboptimal pathway socialization and limited inter-unit communication. Implementation has not yet achieved adequate cross-professional participation. Furthermore, a study also emphasized that delays in information and the lack of an electronic recording system are serious obstacles in implementing the acute appendicitis clinical pathway. The study at Royal Prima Hospital in Medan, barriers such as lack of staff understanding and internal communication were cited, despite high levels of completeness in the documentation of the acute appendicitis clinical pathway.[10] A research at Panembahan Senopati Bantul Regional General Hospital, older patients also reported that communication barriers such as forgetfulness and time constraints were the main factors in low compliance with clinical pathway implementation.[11]

According to George Edward III, communication is a key variable in policy implementation theory that determines the success of a public policy. Communication encompasses the process of conveying information, instructions, and explanations from policymakers to implementers in the field in a clear, consistent, and timely manner.[12] Clarity of message prevents distortion or misinterpretation, while consistency avoids confusion among both implementers and policy targets. Communication effectiveness is also influenced by the channel used, the recipient's level of understanding, and the messenger's ability to adapt language to the existing socio-cultural context. Without good communication, a well-formulated policy risks failure during the implementation stage because implementers lack proper direction or the public does not understand the policy's objectives and benefits.

Effective interprofessional communication is a key element in implementing clinical governance. According to Huber,[13] professional communication in healthcare organizations must be collaborative, systemic, and based on reliable information. Communication failure is a major cause of medical errors and deviations from service standards. Meanwhile, according to Robbins & Judge (2022), in the context of a service organization, communication must include clarity of message, appropriate channels, and recipients who are ready to receive and understand the information consistently.

Based on research results, communication in the implementation of the clinical pathway at Pertamina Hospital Pangkalan Brandan remains fragmented. Although inter-unit communication has occurred through medical records, WhatsApp groups, and morning briefings, this has not been sufficiently integrated to support efficient decision-making. The minimal involvement of all parties since the initial implementation of the acute appendicitis clinical pathway indicates a lack of a systematic communication structure. Furthermore, the decision-making process still relies heavily on individual initiative, rather than on an integrated information system or communication policy. Also noted that the lack of interprofessional communication training led to differing interpretations of the content and flow of clinical pathways. This resulted in variations in practice among staff and led to inconsistencies in medical procedures. Vertical and horizontal communication were suboptimal, particularly regarding patient progress updates and dietary instructions from physicians to the nutrition team. Even in emergencies, some healthcare workers relied more on personal experience than formal coordination, indicating a weak foundation for structured communication within the institution.

One of potential solution is strengthening digital information systems that allow real-time access to the acute appendicitis clinical pathway and patient medical records. Implementing a patient dashboard accessible to all healthcare workers will help expedite the communication process and prevent information delays. Furthermore, regular cross-professional discussion forums are needed to build shared understanding and unify perceptions of standard procedures. Management commitment to fostering a culture of open and systematic communication is also essential for fostering synergistic coordination. Through these forums, communication barriers can be identified and addressed early, minimizing the potential for misunderstandings. This proactive approach will ensure every team member feels heard and valued, ultimately improving overall work efficiency and quality.

Strengthening interprofessional communication isn't just about the technical aspects of information exchange, but also involves organizational culture and collaborative mindsets. Therefore, simulation-based clinical communication training is necessary to improve staff communication competency. A team-based care approach places all professionals as an integral part of patient decision-making. Strong communication is believed to improve pathway adherence, service efficiency, and patient safety.

Communication is a crucial factor that significantly influences the successful implementation of the acute appendicitis clinical pathway at Pertamina Hospital in Pangkalan Brandan. The findings of this study demonstrate the need for systemic improvements through training, the use of information technology, and the establishment of an integrated communication structure. The implications of these findings are not only important for Pertamina Hospital in Pangkalan Brandan but also provide lessons for other hospitals developing or implementing similar clinical pathways.

Resources

The availability of resources, both in terms of human resources and infrastructure, remains a significant obstacle to the implementation of the acute appendicitis clinical pathway at Pertamina Hospital Pangkalan Brandan. Although basic facilities such as a laboratory and ultrasound are available, continuity of service is hampered by frequent staff rotation, vacancies in key units such as nutrition and pharmacy, and a limited number of case managers. This situation results in a heavy workload and impacts the consistency of procedure implementation. This situation is exacerbated by the lack of a standardized training module for healthcare workers, so implementation relies on individual experience and informal communication in the field.

The lack of dedicated budget support for the acute appendicitis clinical pathway program hampers the procurement of supporting facilities and the strengthening of human resource capacity. Several informants emphasized that without adequate funding allocation, hospitals struggle to upgrade equipment, provide additional instruments, or systematically improve the skills of healthcare workers. These logistical limitations have the potential to reduce service quality, slow inter-unit coordination, and hinder the achievement of established clinical standards. This situation underscores the need for strategic planning that includes strengthening the workforce, filling vital positions, and providing ongoing logistical support to ensure the optimal implementation of the clinical pathway.

A systematic study noted that a lack of human resources and facilities is a common obstacle in implementing clinical pathways in Indonesia.[14] An evaluation conducted by Widyanita,[11] the compliance rate was 25%, and the main obstacles were limited staff and logistics, which resulted in poor clinical pathway documentation. A scoping review concluded that the initial investment in clinical pathway development including training and infrastructure was a real cost challenge in implementing the appendectomy clinical pathway.[8]

According to George Edward III's policy implementation theory, resources are an essential factor determining the success of policy implementation, including the availability of human resources, financial resources, infrastructure, and time. Without adequate resources, a well-designed policy runs the risk of not being implemented as planned because implementers lack the necessary capacity, facilities, or support. The quality of human resources encompasses competence, skills, and understanding of policies, while financial and material resources are needed to support operations, equipment procurement, and infrastructure maintenance. Furthermore, the appropriate and sustainable distribution of resources is key to ensuring each implementing unit is able to optimally fulfill its role, thereby achieving policy objectives effectively and sustainably.[12]

According to Alahmar & Alkhatib (2022),[15] the implementation of computer-based clinical pathways (CPMS) can minimize practice variability and facilitate more efficient resource allocation, provided adequate information technology is available. Clinical governance theory also emphasizes the importance of identifying and empowering appropriate resources to ensure quality and patient safety. This includes not only the allocation of skilled and trained staff, but also the provision of adequate medical equipment and optimal supporting infrastructure. Clinical governance ensures that every aspect of healthcare is based on best practices and supported by strong capabilities.

Researchers argue that the challenges at Pertamina Hospital Pangkalan Brandan are similar to general findings in the literature: a shortage of specialized human resources (nutritionists, pharmacists, case managers) and incomplete facilities (a digital clinical pathway information system) limit the systemic operation of the clinical pathway. Consequently, the administrative and coordination burden is distributed among untrained staff, and there is a lack of standardized training modules, leading to inefficiencies and high variability in implementation.

The lack of synchronization between written clinical pathway rules and the availability of supporting tools such as checklists or digital forms increases the likelihood of deviations. Staff who don't fully understand the process tend to improvise, and without additional guidance or supervision, the potential for service errors remains high. According to Miller (2021),[16] routine evaluations are limited because data is not yet centralized so audits cannot run smoothly and responses to logistical needs are slow.

The development of e-learning-based training modules, combined with interprofessional workshops, will enhance human resource capabilities at Pertamina Hospital Pangkalan Brandan. The addition of case managers, clinical pharmacists, and specialized nutritionists will improve coordination. The implementation of an integrated information system allows real-time access to Standard Operating Procedures (SOPs) and resource status, reducing reliance on manual methods.

Management needs to allocate a dedicated budget for human resources and facilities in the acute appendicitis clinical pathway. There should be a policy for procuring forms, printers, and digital systems, as well as a monitoring mechanism to support availability monitoring. With this support in place, adherence to the acute appendicitis clinical pathway will increase, and outcome measurements will become more reliable, in line with the findings of Renaningtyas & Nurwahyuni (2024) regarding the optimal cost efficiency of the acute appendicitis clinical pathway if resources are met.[8]

Overall, the study results underscore the importance of human resource and infrastructure availability in supporting the implementation of the acute appendicitis clinical pathway. These findings align with national studies and literature reviews, which emphasize that without adequate resource support, the acute appendicitis clinical pathway remains little more than an administrative document with no real impact on service quality. Therefore, increasing human resource capacity, integrating information technology, and allocating a dedicated budget are essential steps towards implementing an effective, evidence-based pathway.

Disposition

The attitudes and commitment of healthcare workers at Pertamina Hospital Pangkalan Brandan toward implementing the clinical pathway for acute appendicitis show interprofessional variation, influenced by their background, experience, and work habits. Most informants acknowledged that the clinical pathway serves as an important guideline that helps standardize care, but personal preferences and established clinical routines often lead to deviations from established procedures. This highlights the challenges in establishing uniformity in practice, particularly when implementers rely more on personal experience than on established guidelines.

Responses to feedback also varied, with some staff expressing openness to improvement, while others were resistant to change. The absence of a formal appreciation mechanism meant that efforts to improve performance received little positive reinforcement, thus limiting motivation to consistently follow the clinical pathway. Evaluations conducted through internal audits were primarily administrative in nature and did not directly impact individual morale. This situation highlights the need for a management strategy that combines coaching, rewards, and constructive evaluation mechanisms to increase compliance and commitment of all healthcare workers to optimally implementing the clinical pathway.

This study is supported by research conducted by Nuryadin et al. (2023),[17] that nurses' attitudes significantly influenced compliance with clinical pathway implementation. An integrative study by Thahirah et al. (2023) also concluded that the main obstacles to clinical pathways in Indonesia include a lack of training and staff unpreparedness, which impacts individuals' disposition to adhere to clinical pathways.[18] Furthermore, research conducted by Angkasa et al. showed that although pathway documentation was good, practice compliance was quite low because staff understanding and commitment were not optimal.[10]

In according to George Edward III's policy implementation theory, disposition refers to the implementer's attitude, commitment, and acceptance of a policy, which greatly influences the success of its implementation. Regarding the results of research at Pertamina Hospital Pangkalan Brandan, variations in disposition between professionals in the implementation of the acute appendicitis clinical pathway indicate that although some healthcare workers view this policy as an important guide, individual preferences, established work habits, and inconsistent responses to feedback are obstacles to uniform implementation.[12] Resistance from some staff to change and the lack of formal reward mechanisms further limit motivation to adhere to procedures. This situation emphasizes that strengthening implementer dispositions through coaching, rewards, and constructive evaluation mechanisms is a crucial step to ensure effective and consistent implementation of clinical pathways.

According to Miller (2021),[16] clinical pathways improve team practice and patient outcomes when supported by management and a conducive organizational culture. The relational coordination literature suggests that positive organizational attitudes and reciprocity are key determinants of staff commitment to new procedures. When staff feel operationally supported, motivation and compliance significantly increase.[19]

Field findings at Pertamina Hospital Pangkalan Brandan indicate that disposition often depends on individual perceptions of the acute appendicitis clinical pathway. Without incentives or close monitoring, many staff prioritize more familiar clinical practices over following SOPs. Resistance arises primarily among staff who do not yet understand the concrete benefits of the pathway. Initial stakeholder engagement was suboptimal, which reduced ownership of the policy. Internal evaluations and quality forums have not translated into concrete actions. Many recorded variances (deviations) are not discussed in depth or followed up. This situation reinforces the mindset that pathways are merely a formality, not a tool for clinical culture change. As a result, the disposition to change depends heavily on individual initiative, rather than on a supportive system across units.[15]

Researchers recommend implementing advanced interdisciplinary simulation-based training, tiered audits, and a reward system (certificates and public recognition) to increase the commitment of all stakeholders at Pertamina Hospital Pangkalan Brandan. Structural management support, such as formal feedback and non-financial rewards, can increase staff acceptance of the acute appendicitis clinical pathway.

Management needs to create open communication channels, cross-professional forums, and recurring evaluations with direct feedback to the line implementers. If staff feel their voices are heard and audit results are meaningfully addressed, positive attitudes toward the pathway are likely to increase, aligning with social exchange theory and studies in China showing that satisfaction with pathway implementation boosts performance and work engagement.[19]

In essence, staff disposition, including attitude, commitment, feedback response, and perception of incentives, significantly impacts the successful implementation of the acute appendicitis clinical pathway at Pertamina Hospital in Pangkalan Brandan. Although guidelines and policies are available, without individual commitment and systemic support, the acute appendicitis clinical pathway remains difficult to implement into practical and consistent clinical practice. Organizational culture reform, training, and systematic appreciation are key to shifting disposition toward more effective implementation.

Bureaucratic Structure

Regarding the bureaucratic structure, the management of Pertamina Hospital Pangkalan Brandan has provided a written policy and Standard Operating Procedures (SOPs) for the acute appendicitis clinical pathway as an official reference for all healthcare workers. However, technical understanding of the policy's contents remains uneven in the field, particularly in units not directly involved in primary medical procedures. Dissemination tends to be administrative in nature, such as document distribution and brief notification, without in-depth explanations or implementation simulations. As a result, field implementers rely more on personal interpretation, potentially leading to discrepancies between written procedures and actual practice.

Formal oversight of clinical pathway implementation is also considered suboptimal, as control and evaluation mechanisms remain weak and do not always result in concrete follow-up. Internal audits are not yet integrated with ongoing coaching or mentoring, resulting in recurring problems. Support units such as nutrition and pharmacy, which play a crucial role in ensuring smooth service delivery, often require additional guidance to understand their roles and responsibilities in accordance with SOPs. This situation demonstrates the need for a more proactive bureaucratic strategy, with systematic oversight, ongoing technical mentoring, and evaluation followed by corrective action to ensure the clinical pathway is implemented consistently and effectively across all relevant units.

Nearly 90% of clinical pathways were not based on official SOPs, and audit oversight was still retrospective and irregular.[20] The weak management commitment and a lack of pilot testing prior to the pathway's launch, resulting in suboptimal operational execution. Nationally, Helzainka (2021)[14] concluded that leadership and management factors were the main determinants of clinical pathway success, as were monitoring and user-friendly templates. A systematic study by Asmirajanti et al.[21] also stated that the unresponsive bureaucratic structure makes it difficult to evaluate and continuously improve the implementation of pathways in hospitals.

In George Edward III's policy implementation theory, bureaucratic structure includes mechanisms, procedures, and organizational arrangements that ensure policies can be implemented consistently at all level. Regarding the research findings at Pertamina Hospital Pangkalan Brandan, although written policies and SOPs for the acute appendicitis clinical pathway are in place, weak technical understanding in the field, suboptimal formal oversight, and evaluations that do not always result in concrete follow-up indicate that the bureaucratic structure is not functioning optimally. Administrative outreach without intensive support means that supporting units such as nutrition and pharmacy require additional guidance to implement the flow according to procedure. This underscores the importance of developing a systematic oversight mechanism, clear technical guidelines, and ongoing support as part of strengthening the bureaucratic structure to support the successful implementation of the policy.[12]

An effective bureaucratic structure should include accountability, clear role definition, and feedback loops, with active managerial involvement and tiered audits. In a clinical context, structures such as policies, staff, SOPs, and facility systems are the foundation for quality processes and outcomes. Meanwhile, in an evaluation of clinical governance implementation in Iran, it was found that unclear policies and lack of staff involvement often hampered the implementation of health quality programs.[22]

Findings at Pertamina Hospital in Pangkalan Brandan indicate that despite the existence of policies, the bureaucratic structure does not support implementation because SOPs are not understood across professions, and internal audits are not always promptly responded to. Routine audit evaluations and quality forums lack operational follow-up mechanisms, so systemic improvements are rare. Deviations from the pathway are often recorded as variances without subsequent SOP revisions or additional training.

The lack of a pilot implementation or pre-implementation simulation of the acute appendicitis clinical pathway led to differing interpretations between units at Pertamina Hospital Pangkalan Brandan. Furthermore, there was no clear delegation of authority; management only issued administrative orders but failed to provide operational responsibility at the clinical level. According to Behzadifar et al. (2021),[22] this can cause staff to feel that policies are top-down without participation, so that commitment to implementation becomes less strong.

Researchers recommend that management implement: (a) workshop and simulation-based SOP socialization; (b) assign pathway managers to each department (doctors, nurses, pharmacists, nutritionists); (c) formal internal audits, quarterly evaluations, and reporting of monitoring results to the quality forum; and (d) a feedback system for staff and units to respond to audit findings in real time. A responsive bureaucratic structure can strengthen the culture of implementing the acute appendicitis clinical pathway.

The bureaucratic structure at Pertamina Hospital in Pangkalan Brandan remains fragmented in supporting the acute appendicitis clinical pathway. Although policies and SOPs are in place, their effective implementation is limited by minimal oversight, weak accountability, and low cross-professional participation. Bureaucratic improvements such as role clarification, pilot testing, tiered audits, and operational feedback will enhance the uniformity of implementation and effectiveness of the acute appendicitis clinical pathway in improving the quality of patient care.

CONCLUSION

In conclusion, the clinical pathway for acute appendicitis has not been fully implemented as intended. A comprehensive improvement across communication, resource management, staff commitment, and organizational structure is needed to ensure its effective application and to achieve the ultimate goal of enhancing service quality and patient safety.

REFERENCE

1. Di Saverio S, Podda M, De Simone B, Ceresoli M, Augustin G, Gori A, dkk. Diagnosis and treatment of acute appendicitis: 2020 update of the WSES Jerusalem guidelines. World Journal of Emergency Surgery. 2020;15(1):27.
2. Lee JH, Park YS, Choi JS. The epidemiology of appendicitis and appendectomy in South Korea: national registry data. J Epidemiol. 2010;20(2):97–105.
3. Lotfollahzadeh S, Lopez RA, Deppen JG, Kendall BA. Appendicitis (nursing). In: StatPearls. StatPearls Publishing; 2024.
4. da Silva Etges APB, Ruschel KB, Polanczyk CA, Urman RD. Advances in value-based healthcare by the application of time-driven activity-based costing for inpatient management: A systematic review. Value in Health. 2020;23(6):812–23.
5. Malaekah H, Makhdoom F, Almedbal H, Aggarwal R. Acute appendicitis pathways: a systemic review. Surg Sci. 2021;12(5):143–59.
6. Sihotang WY, Sitepu EM, Girsang E. Analisis pelaksanaan clinical pathway berdasarkan perspektif pasien dan tenaga kesehatan. JUMANTIK (Jurnal Ilmiah Penelitian Kesehatan). 2024;9(2):131–9.
7. Firmansyah Y, Widjaja G. Pemberlakuan clinical pathway dalam pemberian layanan kesehatan dan akibat hukumnya. Cross-border. 2022;5(1):536–73.
8. Renaningtyas N, Nurwahyuni A. Analisis efisiensi biaya melalui implementasi clinical pathway tindakan appendectomy: scoping review. Jurnal Manajemen dan Administrasi Rumah Sakit Indonesia (MARSI). 2024;8(4):404–14.
9. Wijaya AI, Dewi A, Listiowati E. Appendicitis clinical pathway implementations compliance evaluation in hospital. Kes Mas: Jurnal Fakultas Kesehatan Masyarakat Universitas Ahmad Daulan. 2017;11(2):83–6.
10. Angkasa A, Girsang E, Nasution AN, Khu A, Nasution SLR. Analysis of acute appendicitis clinical pathways implementation in Royal Prima Medan General Hospital year 2020. Report. 2022;18(2):42-48.
11. Widyanita A, Arini M, Dewi A. Evaluasi implementasi clinical pathway appendicitis akut pada unit rawat inap bagian bedah di RSUD Panembahan Senopati Bantul. JMMR (Jurnal Medicoeticolegal dan Manajemen Rumah Sakit). 2016;4(2):43–53.
12. Purwanto EA, Sulistyastuti DR. Implementasi kebijakan publik: Konsep dan aplikasinya di Indonesia. Jakarta: Report; 2015.
13. Huber D. Leadership and nursing care management-e-book. Neteherland: Elsevier Health Sciences; 2017.
14. Helzainka AA. Challenges in the implementation of clinical pathway in Indonesia: A systematic review. Cermin Dunia Kedokteran. 2021;48(6):430–4.
15. Alahmar A, Alkhatib O. Computerization of clinical pathways: A literature review and directions for future research. arXiv Preprint. 2022;8(2):220300815.
16. Miller W. Strategies for clinical teaching in the health professions: A guide for instructors. Routledge; 2021.
17. Nuryadin AA, Olii MW, Rahmawati R. Pengaruh kepatuhan, pengetahuan dan sikap perawat terhadap penerapan clinical pathway di Rumah Sakit Khusus Daerah Ibu dan Anak Pertiwi Makassar Provinsi Sulawesi Selatan. Jurnal Penelitian Kesehatan Pelamonia Indonesia. 2023;6(1):1–6.
18. Thahirah T, Rachmawaty R, Erfina E. Analysis of obstacles in the implementation of the clinical pathway in Indonesia: Integrative review. Journal of Asian Multicultural Research for Medical and Health Science Study. 2023;4(1):20–32.
19. Li J, Ao L, Pan J. Satisfaction with clinical pathway implementation versus job performance of clinicians: empirical evidence on the mediating role of work engagement from public hospitals in Sichuan, China. BMC Health Serv Res. 2024;24(1):348.
20. Sujudi MM, Jati SP, Agushybana F. Analisis perilaku organisasi pada imlpementasi clinical pathway pasien dengan ST-elevasi miokard infark (STEMI) di RSUP Dr. Kariadi Semarang. Jurnal Manajemen Kesehatan Indonesia. 2022;10(2):185–90.
21. Asmirajanti M, Hamid AYS, Hariyati TS. Clinical care pathway strenghens interprofessional collaboration and quality of health service: a literature review. Enferm Clin. 2018;28:240–4.
22. Behzadifar M, Bragazzi NL, Arab-Zozani M, Bakhtiari A, Behzadifar M, Beyranvand T, dkk. The challenges of implementation of clinical governance in Iran: a meta-synthesis of qualitative studies. Health Res Policy Syst. 2019;17(1):3.