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ORIGINAL ARTICLE

Continuity of Care for Postoperative Patients Across Hospital and Community Settings in Thailand: A Qualitative Study

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Abstract

Background: Postoperative recovery after major neurosurgical, orthopedic, and abdominal procedures substantially affects the quality of life of patients and their caregivers. In Thailand, multiple strategies, such as referral systems, postoperative care plans, home follow-up, and patient and caregiver education, have been implemented to promote recovery and continuity of care from hospital to home. However, persistent challenges remain, particularly regarding community-based service models, access to care, and the provision of welfare and benefits.
Purpose: This study aimed to explore the continuity of care for postoperative patients across hospitals and community healthcare services in Thailand.
Methods: A qualitative study using an ethnographic approach was conducted, involving 86 informants recruited through purposive and snowball sampling. Key informants (n = 57) included postoperative patients (n = 7), caregivers (n = 8), healthcare providers (n = 35), and executives of relevant agencies (n = 7). An additional 29 general informants provided supplementary perspectives. Data collection methods included participant observation, in-depth interviews, focus group discussions, field notes, and document analysis. Data validity was ensured through triangulation, and analysis followed Creswell's thematic analysis approach.
Results: Three themes emerged: (1) organization of healthcare services, describing coordinated hospital and community systems for rehabilitation, referral, discharge planning, home visits, long-term care, and emergency support; (2) support for postoperative patients, including capacity building for patients and caregivers, shared information systems, and welfare, social, and financial support after discharge; and (3) management and coordination, facilitating community-based postoperative care through integrated data systems and shared governance arrangements.
Conclusion: Continuity of postoperative care in Thailand is strengthened through integrated hospital–community services, caregiver support, and coordinated management systems. Nurses play a pivotal role in follow-up care, information exchange, and patient support. Enhancing organizational integration, support mechanisms, and coordination may improve continuity of care and address existing service gaps.

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1. Introduction

Surgical procedures are increasingly common worldwide, with an estimated 310 million major surgeries performed annually (Dobson, 2020). While surgery is essential for treating various conditions, it carries substantial risks, particularly during the postoperative period. Mortality rates range from 1–4%, and approximately 15% of patients experience serious complications, with 5–15% requiring hospital readmission within 30 days (Soylu et al., 2023). Globally, an estimated 8 million deaths are attributed to major surgeries each year, making surgical complications a leading cause of mortality associated with cardiovascular diseases, strokes, cancers, and injuries (Dobson, 2020; Zhang et al., 2022).

The high rates of postoperative complications, mortality, and hospital readmissions indicate the need for coordinated and sustained care beyond the immediate surgical period and hospital

discharge, commonly framed as continuity of care. Continuity of care is a multidimensional process encompassing relational, informational, and management aspects that ensure coordinated and seamless care across settings (Saultz & Lochner, 2019). In this context, continuity of care plays a critical role in supporting patients during the transition from hospital to community settings and in reducing preventable postoperative complications.

In Thailand, the number of surgical patients has increased, with a demand rate of 243.89 surgeries per 100,000 population (Department of Medical Services, Ministry of Public Health, 2021). Although surgery can help patients recover from illnesses, complications may arise during the postoperative period and negatively affect recovery. Delayed recovery may lead to longer hospital stays. After discharge, patients may experience complications related to inadequate postoperative care at home, resulting in readmission, increased length of stay, higher bed occupancy rates, and greater healthcare costs and caregiving burdens. Each surgical patient has a different recovery period, depending on factors that affect postoperative recovery (Changyai, 2024). These challenges highlight the importance of continuity of care to ensure coordinated, consistent, and timely support across hospital and community settings, thereby facilitating optimal recovery and reducing preventable complications.

Research shows that factors influencing the recovery of postoperative patients may include: (1) physical factors, such as being over 70 years old, behavioral risks, blood loss during surgery, postoperative complications, nutritional status, and underlying diseases; (2) psychological factors, such as anxiety and pain management strategies (Priyanto et al., 2023); (3) surgical-related factors, such as nursing activities, preoperative knowledge, length of hospital stays before surgery, duration of surgery (average 68 minutes), intubation for more than 48 hours, and type of surgery (Ongun et al., 2024), and (4) environmental factors, such as noise, light, duration of ICU stay, history of smoking within the past three months, and corticosteroid use in the past three months (Xing et al., 2025). Moreover, postoperative recovery can be enhanced when patients receive continuous care, including structured ongoing care, evidence-based nursing interventions, home visits, follow-up consultations, symptom monitoring via telephone, and the use of digital applications for tracking postoperative symptoms (Lee & Choi, 2022; Nguyen et al., 2023; Smith et al., 2021). Such continuity of care supports patients' physical and psychological recovery, facilitates timely detection of complications, reduces hospital readmissions, and decreases the overall caregiving and healthcare burden. These strategies are particularly important in Thailand, where postoperative patients face challenges transitioning from hospital to home. Furthermore, during the postoperative phase, patients often face challenges in managing self-care after discharge, including wound care, medication adherence, dietary preparation, and stoma management (Chanpeng & Shokebumroong, 2023). Many patients experience anxiety and uncertainty regarding these responsibilities, which may contribute to complications, delayed recovery, and unplanned hospital readmissions. These challenges further highlight the importance of continuity of care, including structured follow-up, home visits, symptom monitoring, and patient education, to support safe and effective postoperative recovery.

Healthcare providers also face challenges in maintaining continuity of care for postoperative patients, particularly during the transition from hospital to home. Ward nurses responsible for continuity of care often encounter limitations in the use of electronic patient record systems (e.g., SmartCOCR9) and experience insufficient staffing at hospital-based continuity of care centers. Health Promotion Hospitals (HPHs) face shortages of nursing staff for home visits, gaps in staff expertise, limited medical equipment, and community health volunteers (CHVs) who may lack confidence in providing patient care (Pagaiya et al., 2021). Primary caregivers, typically family members, also experience economic burdens due to inadequate resources to support patient care at home.

In addition, gaps in community health care systems for postoperative patients have been reported in previous studies. These include (1) the lack of clear and standardized framework for managing community-based postoperative care (Chanpeng & Shokebumroong, 2023; Pagaiya et al., 2021); (2) welfare services for postoperative patients that do not cover all types of surgery across all levels of community healthcare services (National Health Security Office, 2024; Priyanto et al., 2023); (3) limited access to services or welfare benefits provided by government and local administrative organizations (Lee & Choi, 2022; Nguyen et al., 2023); and (4) barriers to accessing healthcare services covered under the universal healthcare system (Changyai, 2024;

Xing et al., 2025). These limitations underscore the need for improvements in infrastructure, coordination, and policy to ensure comprehensive and continuous postoperative care.

Despite extensive research on surgical outcomes, limited attention has been paid to how patients experience continuity of care after discharge, particularly during the transition from hospital to community settings. Previous studies have largely emphasized clinical outcomes and system-level metrics, leaving patients' experiences, perceptions, and the practical mechanisms that facilitate or hinder continuity of care insufficiently explored. In the Thai healthcare context, where coordination and service capacity vary across settings, the real-world processes through which continuity of care is enacted and sustained across hospital and community services remain inadequately understood.

Therefore, this study aimed to explore the continuity of care for major postoperative patients across hospital and community healthcare services in Thailand. Unlike previous studies that primarily focused on clinical outcomes or system-level indicators, this research examined the experiences of postoperative patients, their household members or caregivers, and healthcare providers at all levels, including administrators of related agencies. By capturing these perspectives, the study provides novel insights into how continuity of care is operationalized in the local context and identifies challenges, practices, and potential areas for improvement to inform policy development and the design of patient-centered postoperative care programs.

2. Methods

2.1. Research design

This study employed an ethnographic approach, a qualitative research method that investigates social practices, behaviors, and experiences in their natural cultural and community contexts (Hammersley & Atkinson, 2019). Ethnography is particularly suitable for exploring continuity of care for postoperative patients because it allows for an in-depth understanding of how care is organized, delivered, and experienced by patients, caregivers, and healthcare providers within the socio-cultural and organizational settings of local communities. By observing and engaging with participants in real-world settings, this approach captures the complexities of care transitions from sub-district health promotion hospitals to local administrative organizations, as well as how services are adapted to meet patients' needs and challenges (Streubert & Carpenter, 2011). This study adhered to the COREQ guidelines for qualitative research reporting (Tong et al., 2012).

2.2. Setting and samples

This study was conducted in southern Thailand in both hospitals and community settings. The inclusion criteria comprised two groups of informants (key informants and general informants) with specific characteristics. The key informant group included (1) postoperative patients aged 15 years and above who had undergone their first major surgery within the past 1–5 years, and (2) individuals involved in postoperative patient care, including household members, caregivers, relatives, and neighbors with experience in postoperative patient care; healthcare providers at all levels involved in postoperative patient care or with experience in this area; and executives of relevant agencies at all levels involved in postoperative patient care or with experience in this area. Meanwhile, the general informants included individuals who were able to provide information consistent with the research objectives, were identifiable and contactable, and were accessible within the study context. These informants served as primary data sources, providing direct insights into patient experiences, care practices, and organizational processes. Multiple groups were included to allow data triangulation, thereby enhancing the credibility and comprehensiveness of the findings. Informants were selected based on their relevance to the research objectives and their accessibility within the study context.

Initial recruitment was conducted using purposive sampling, with participants identified based on the inclusion criteria and their capacity to provide in-depth information. Subsequently, the sample was expanded through snowball sampling, in which initial participants referred others with relevant experience. This approach enabled the collection of diverse perspectives from patients, caregivers, healthcare providers, and administrators.

A total of 86 informants participated in the study. The key informants (n = 57) consisted of 7 postoperative patients, 43 individuals involved in the care of postoperative patients (including household members, caregivers, relatives, and neighbors; n = 8), healthcare providers (n = 35),

and executives of relevant agencies (n = 7). Meanwhile, the general informants (n = 29) included representatives of professional groups, financial organizations and funds, community groups or organizations, the Assembly of the People's Council, religious leaders, and municipal officials.

Systematic qualitative data collection procedures were employed to ensure that the findings were comprehensive and adequately represented the experiences of all participant groups. Purposive and maximum variation sampling were combined to capture key variations relevant to the research objectives, thereby enhancing data depth and contextual diversity (Patton, 2015). Data saturation was assessed in accordance with the guidelines of Guest et al. (2020), with saturation confirmed when core themes recurred consistently, and no new codes emerged during later stages of data collection, indicating that the dataset was sufficiently rich to support qualitative interpretation.

2.3. Data collection

Data collection was conducted from April 2023 to March 2024 using five methods: participant observation, in-depth interviews, focus group discussions (FGDs), field notes, and document analysis. Informants were accessed through gatekeepers, including local municipality personnel, village health volunteers (VHVs), and hospital nursing staff responsible for overseeing the study area. An overview of data collection methods and corresponding participant groups is presented in Table 1.

Table 1. Data collection methods and participant groups

Data Collection Method	Participant Group	Number of Participants/ Sessions	Purpose of Data Collection
Participant observation	Multiple patients; conducted in the outpatient department (OPD) and the postoperative ward	86 observation sessions	To understand everyday practices and social interactions in the community
In-depth interviews	Postoperative patients	7 participants	To explore individual experiences and perceptions related to the phenomenon
	Household members, caregivers, relatives, and neighbors	8 participants	To explore caregiving experiences, family and social support roles, and community interactions related to the phenomenon.
	Executives of relevant agencies	7 participants	To explore organizational perspectives, policy roles, and decision-making processes related to the phenomenon.
	Healthcare providers	21 participants	To explore professional perspectives on healthcare delivery in the study area
Focus group discussions (FGDs)	Community stakeholders; conducted at temples, VHVs, elderly clubs, and hospital meeting rooms	5 groups	To generate shared perspectives and collective experiences
Field notes/ Researcher reflections	Patients, caregivers, community, clinical settings	Throughout data collection	To record contextual information, reflections, and non-verbal observations
Document analysis	Local policies, reports, guidelines, health service units, subdistrict development plans, community development databases (JPA), civil registry	7 documents	To provide contextual and organizational background

Interview guides were developed through an iterative and systematic process consistent with qualitative research principles. Separate interview guides were created for each participant group based on the study objectives, a comprehensive literature review, and the researchers' academic and clinical experience in nursing and qualitative research. This differentiation ensured that questions were contextually appropriate and aligned with participants' roles and experiences.

Experts in qualitative research and nursing reviewed the initial interview guides to enhance content relevance, clarity, and methodological rigor. Revisions were made based on their feedback prior to data collection. During the early phase of data collection, initial interviews conducted within the same study setting were used to refine the wording, sequencing, and flow of the questions to facilitate participant understanding and elicit rich responses. This refinement process was embedded within the emergent design of the qualitative study rather than conducted as a separate pilot study. No participants were recruited solely for pilot testing, and no predefined sample size was established for guide refinement. All interviews conducted during this process were retained and included in the final analysis, thereby maintaining methodological coherence and avoiding an artificial distinction between pilot and main data.

In-depth interviews were conducted at the community health centre and participants' homes, using guiding questions (Table 2). Each interview lasted approximately 50-60 minutes and was audio-recorded with participants' consent. Field notes were taken concurrently. When participants preferred not to be recorded for certain topics, audio recording was paused, and detailed notes were used.

Participant observation was guided by a semi-structured observation guide and documented through detailed field notes. In this study, observations were conducted across multiple sessions and postoperative clinical settings. Participant observation was also undertaken concurrently during in-depth interviews with patients, allowing the researcher to gain direct insight into the patient care process and routine practices.

Focus group discussions (FGDs) were conducted at local temples, village community halls, and village elderly clubs, as well as in the hospital's meeting room, each lasting approximately 60–90 minutes. The FGDs aimed to review the postoperative patient care process and to address any gaps not captured during the individual interviews or observations.

Furthermore, the researcher documented the atmosphere, environment, and contextual details of each case study by maintaining daily field notes throughout data collection. These field notes included observations of interactions, environmental conditions, and relevant events, as well as researchers' reflections on their own emotional responses and interpretations of participants' reactions in various situations. The field notes served as a systematic instrument to capture contextual richness and support analytical rigor.

In addition, document analysis was conducted on materials related to the healthcare system for postoperative patients, including reports from health service units, subdistrict development plans, community development databases (JPA), and civil registry data. A document review guide was used to systematically extract relevant information, focusing on organizational structures, policies, and services that influenced postoperative care in the community.

To ensure rigor and trustworthiness during data collection and analysis, the researcher employed multiple strategies. Cross-case comparisons were conducted to verify the consistency of emerging themes across participant subgroups with differing characteristics. Triangulation across data sources and data collection methods was also applied to enhance interpretive rigor, in line with established qualitative research standards. Furthermore, member checking and the maintenance of a systematic audit trail were used to promote transparency, credibility, and traceability of analytic decisions throughout the research process. During the qualitative data collection process, the researcher prepared a set of main questions as a guide for interviews/FGDs and used probing questions when appropriate to further elaborate on participants' responses, seek clarification, and explore relevant issues in greater depth.

2.4. Data analysis

The data analysis was conducted using thematic analysis following the five-step qualitative data analysis process described by Creswell and Creswell (2022). The process involved managing and organizing data through careful preparation, in which all collected data, including interview transcripts, FGD notes, observation records, and field notes, were carefully organized, labeled, and stored. Audio recordings were transcribed verbatim, and preliminary memos were added to

capture initial reflections and observations. The researcher then thoroughly read and re-read the transcripts and notes to become immersed in the data, identifying initial ideas, patterns, and recurring concepts, while memoing was used to document insights, preliminary interpretations, and potential connections between codes.

Table 2. Interview guidelines

List of Questions for the Participants
For the postoperative patients
▪ What problems and needs do you think you require assistance with after surgery? ▪ How do you manage the problems in caring for yourself after surgery? ▪ In your community, who helps address these problems, and how do they help? ▪ Which groups or organizations are involved in addressing these problems and obstacles, and how do they operate? ▪ What is your opinion about the current postoperative care services?
For household members, caregivers, relatives, and neighbors
▪ What is the health condition of the postoperative patients under your care? ▪ What is your experience in caring for postoperative patients? ▪ What problems and needs do you think require support after surgery? ▪ How do you manage the problems and needs of the postoperative patients under your care? ▪ In your community, what roles do they play, and how do your family members and patients receive care or services from them? ▪ Which groups or organizations assist in addressing these problems and obstacles, and how do they operate? ▪ What is your opinion on the current provision of postoperative care services?
For healthcare providers
▪ What is the current health condition of the postoperative patient under your care? ▪ What has been your experience in providing care for postoperative patients? ▪ What challenges and needs do you think require support after surgery? ▪ How do you manage the problems and needs of the postoperative patient under your care? ▪ Within your department or organization, which individuals, social groups, or agencies are involved in addressing postoperative problems and needs, and what roles do they play? ▪ What is your opinion regarding the current provision of postoperative care services?
For executives of relevant agencies
▪ What is your experience in caring for postoperative patients? ▪ What problems and needs do you or your organization believe require support after surgery? ▪ How do you or your organization manage the problems and needs of postoperative patients under your care? ▪ In your community, which individuals, social groups, or organizations address postoperative problems and needs, and what roles do they play? How do patients and their families receive care or services from them? ▪ What challenges or barriers affect the provision of postoperative care by you or your organization? ▪ What factors have helped resolve problems and overcome those obstacles? ▪ Which groups or organizations have supported the management of these problems and obstacles, and how do they operate? ▪ What is your opinion on the current system of postoperative care services?
For general informants
▪ What is your experience in providing care for patients after surgery? ▪ What challenges and needs do you believe require assistance following surgery? ▪ How do you manage the postoperative problems and needs of the patients under your care? ▪ In your community, which individuals, social groups, or organizations are involved in addressing postoperative problems and needs, and what roles do they play? How do patients and their families receive care or services from them? ▪ Which groups or organizations assist in addressing these challenges and barriers, and how do they operate? ▪ What are your views on the current delivery of postoperative care services? ▪ What is your experience in providing care for patients after surgery?

Next, the data were coded by identifying meaningful segments of information and assigning labels that reflected their content; similar or related codes were grouped into broader categories

and themes that represented underlying patterns and concepts emerging from the participants' perspectives. The researcher subsequently developed and assessed interpretations by linking the themes to the research questions and the study context, examining relationships between themes, and considering alternative explanations, with credibility ensured through iterative review, reflective thinking, and consultation with academic supervisors when necessary.

The final step involved representing and visualizing the data through a coherent narrative presentation supported by direct quotations from participants to illustrate key themes. Mind maps, tables, and diagrams were used to visualize connections between codes, categories, subthemes, and themes. For example, data from transcripts, field notes, and memos were coded into meaningful segments, including home care, data collection, team collaboration, caregiver training, and resource coordination. Related codes were grouped into categories, such as Care Coordination and Patient and Caregiver Support, which were then synthesized into the subtheme Community Health Service System under Theme 1: Organization of Healthcare Services. A participant's quotation illustrated this system: *"For patients needing equipment like suction machines or oxygen, the community nursing team loaned items such as air mattresses. Beds were borrowed from hospital equipment centres" (Participant 27, Nurse, 54 years old)*. These visualizations highlighted how different components of the community health service system worked together to ensure continuity of care for postoperative patients.

The data analysis in this study was conducted by the principal researcher, who had undergone comprehensive preparation in qualitative research. This included developing a philosophical foundation for understanding phenomena, formulating research questions, designing qualitative inquiry, and gaining field experience to strengthen reflective and analytical thinking. The researcher also completed extensive field-based training under research program projects from August 26, 2021, to July 24, 2024, which enhanced skills in qualitative data collection, such as observation, in-depth interviews, focus group discussions, and field note documentation, as well as in various analytic techniques, including typological analysis, content analysis, debriefing with an academic supervisor, and reflective writing. In addition, the researcher reviewed the literature on community health service systems for postoperative patients, thereby deepening the understanding of the research context. The second researcher played a significant role in assisting with the analysis and interpretation of themes and sub-themes to avoid redundancy, resulting in rigorous data analysis and a thematic framework that clearly presents the research findings. She also played a role in ensuring the depth and quality of the analysis, as well as reviewing the written discussions of the results to ensure consistency with the study objectives.

2.5. Trustworthiness/rigor

Trustworthiness was ensured following Guba and Lincoln's (1994) criteria for qualitative research. Credibility was strengthened through multiple strategies, including triangulation across data sources (interviews, FGDs, observations, and documents) and methods; cross-case comparisons to verify the consistency of themes across participant subgroups; peer debriefing; reflexivity; and verification with experienced informants. Member checking and a systematically maintained audit trail further enhanced transparency and traceability of analytic decisions (Creswell & Poth, 2018; Lincoln & Guba, 1985). Prolonged engagement and persistent observation supported a deep understanding of the context. Transferability was achieved by providing rich contextual descriptions, detailing informant selection, data collection, and analytic procedures, and demonstrating empathetic understanding of participants' experiences. Dependability was maintained by adhering to the research plan, including the research design, data collection procedures, and ongoing evaluation of data access and quality. Confirmability was ensured through careful review of raw data, analytic decisions, conclusions, and alignment with study objectives and instruments, minimizing potential researcher bias.

2.6. Ethical considerations

This research was approved by the Human Research Ethics Committee of Khon Kaen University (Project Number HE662021, dated March 23, 2023) and the Human Research Ethics Committee of Maharaj Nakhon Si Thammarat Hospital (Research Project Code 014/2566, Certificate Number A011/2566, dated August 28, 2023). The researcher adhered to ethical principles in human research, including respect for persons, beneficence, and justice (Streubert & Carpenter, 2011). Given that primary informants included bedridden older adults, individuals

with chronic illnesses, and persons with disabilities, additional ethical safeguards were implemented to protect this vulnerable population. When appropriate, consent was also obtained from family members or caregivers. The researcher exercised heightened vigilance to prevent any physical or emotional burden, assessed and mitigated potential risks throughout the study, and coordinated with relevant healthcare personnel to ensure that participants received appropriate and continuous care. Participants were informed of the study purposes, procedures, confidentiality, and their right to withdraw at any time. Data were anonymized and reported in aggregate.

3. Results

3.1. Characteristics of participants

As shown in Table 3, a total of 86 informants participated in the study. The key informants (n = 57) included postoperative patients, caregivers, healthcare providers, and managers of relevant organizations. The postoperative patients were predominantly male, with a mean age of 64.57 years; most were married, and the majority had undergone only one surgery. According to the Barthel ADL index, most patients were bedridden. Caregivers were primarily household members, relatives, or neighbours, predominantly female, with a mean age of 46.57 years, mostly married, and with an educational background ranging from primary to lower secondary school; most were the patients' children. Healthcare providers (n = 35) were recruited from both tertiary care hospitals (n = 12) and primary healthcare settings (n = 23). Managers of relevant organizations (n = 7) included one from a tertiary care hospital and six from primary healthcare organizations. Meanwhile, the general informants (n = 29) consisted of representatives from professional associations, financial institutions and funds, community organizations, the Citizen Assembly, religious leaders, municipal officers, and other relevant stakeholders.

3.2. Analysis of findings

The analysis of findings is organized around three main themes that highlight key aspects of postoperative care (Figure 1). Theme 1: Organization of Healthcare Services focuses on how healthcare services are structured and delivered, including the roles of hospitals, clinics, and community health systems in providing surgical care and follow-up services. Theme 2: Support for Postoperative Patients examines the various forms of support provided to patients after surgery, encompassing both practical care systems and social and financial assistance to ensure recovery and well-being. Theme 3: Management and Coordination explores mechanisms for managing and coordinating care, including the development and use of data systems, agreements, protocols, and resource allocation to facilitate efficient, continuous postoperative care.

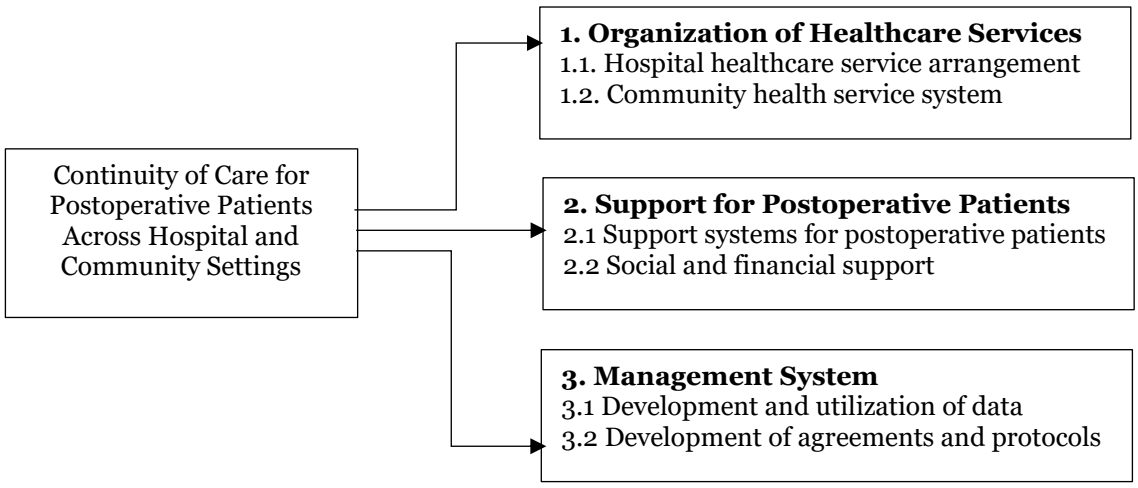

Figure 1. Themes and sub-themes of the study

The themes in Figure 1 provide a comprehensive understanding of how continuity of care is maintained for postoperative patients across hospital and community settings.

Table 3. Characteristics of participants

General information	Frequency (f)	Percentage (%)
Postoperative patients (n=7)		
Age in years (Mean±SD) = (64.57±19.12)		
Gender		
Male	4	57.14
Female	3	42.86
Marital status		
Single	2	28.57
Married	5	71.43
Surgical experience		
1 time	6	85.71
3 times	1	14.29
Barthel ADL index		
Socially Dependent Group (Score: 12 and above)	3	42.86
Homebound Group (Score: 5–11)	1	14.29
Bedridden Group (Score: 0–4)	3	42.86
Household members, caregivers, relatives, and neighbors (n=8)		
Age in years (Mean±SD) = (46.57±16.35)		
Gender		
Male	3	37.50
Female	4	62.50
Marital status		
Married	6	75.00
Widowed	2	25.00
Level of education		
Junior high school	4	50.00
Senior high school	1	12.50
Bachelor	3	37.50
Relationship		
Husband/wife	2	25.00
Child	4	50.00
Sister/brother	2	25.00
Healthcare providers (n=35)		
Age in years (Mean±SD) = (48.26±13.75)		
Gender		
Male	12	34.29
Female	23	65.71
Levels of Health Care Providers		
Tertiary health care providers	12	34.29
Primary health care providers	23	65.71
Administrators of relevant agencies (n=7)		
Age in years (Mean±SD) = (52.57±6.32)		
Gender		
Male	3	42.86
Female	4	57.14
Levels of Administrators of Agencies		
In tertiary-level hospitals	1	14.29
In primary-level hospitals	6	85.71
General informants (n=29)		
Age in years (Mean±SD) = (53.90±8.60)		
Gender		
Male	11	37.93
Female	18	62.07
Characteristics of General Informants		
Representatives of occupational groups	6	20.69
Representatives of financial organizations and community funds	7	24.14
Community groups, organizations, and civic assemblies	6	20.69
Religious leaders	2	6.90
Municipal officials	8	27.59

3.2.1. Theme 1: Organization of healthcare services

Organization of Healthcare Services primarily reflects system-level structures and processes, as reported by healthcare providers, community health volunteers, and other key stakeholders directly involved in organizing and delivering postoperative care. Although direct home-based observation was not conducted, patients and caregivers contributed through in-depth interviews and FGDs. Their perspectives informed other themes related to home care experiences, challenges, and support mechanisms. Therefore, while Theme 1 emphasizes systemic organization, patients' and caregivers' experiences are represented in complementary themes, ensuring a comprehensive understanding of postoperative care continuity. This approach aligns with the critical ethnographic methodology, integrating multiple perspectives while maintaining ethical standards and methodological rigor. This theme is divided into two subthemes.

3.2.1.1. Sub-themes 1: Hospital healthcare service arrangement

The hospital's postoperative care system included rehabilitation, patient referral, and continuous care. Rehabilitation involved providing assistive devices, such as wheelchairs and hospital beds, with support from community and NGO partners. Multiple participants across different roles (e.g., nurses, administrators) confirmed these practices, indicating consistency in the data. For example, one nurse stated:

> *Patients requiring home equipment, such as suction machines or oxygen, could borrow items from community* nursing *equipment centers or hospital equipment centers within the Maharaj Hospital network (23 hospitals).* (Participant 27, Nurse, 54 years old)

Patient referrals used the Smart COC program to share health information across healthcare levels, a practice consistently reported by multiple healthcare providers in hospital and community settings, indicating data saturation. For example, one nurse described:

> *Post-discharge data for selected postoperative patients requiring home care were entered into the Smart COC systems*. (Participant 23, Nurse, 32 years old)

Continuous care involved home visits by multidisciplinary teams to monitor discharged patients and certify eligibility for disability registration. Multiple participants reported this, such as Participant 22:

> *When high-risk or bedridden patients were scheduled for discharge, physical therapists were consulted to support home care planning. For bedridden patients, the team also assessed home readiness, including the availability of equipment such as air mattresses.* (Participant 22, Nurse, 27 years old)

3.2.1.2. Sub-themes 2: Community health service system

This sub-theme describes how community health services support post-discharge care for postoperative patients. Participants reported that care involved home visits, multidisciplinary team collaboration, assessment of patients' health status, caregiver support, and coordination of necessary resources. These practices were consistently described by multiple participants, demonstrating a standard approach to ensuring safe recovery and continuity of care after hospital discharge. Multiple participants reported this, such as Participant 27:

> *The community nursing team provided necessary equipment for patients after discharge, including air mattresses, suction machines, and oxygen. Hospital beds were also borrowed from equipment centers to support patients' home care needs*. (Participant 27, Nurse, 54 years old)

Dependent or bedridden patients received individualized care plans, were assigned care managers, and had their progress monitored and reported to the long-term care subcommittee. Multiple participants described similar practices, indicating a consistent approach to supporting long-term care needs after discharge. A participant reported:

> *Care managers in the long-term care program provided support for homebound and bedridden patients, including supplying wound care equipment and assisting with home wound care. Nurse assistants were sometimes sent to help patients at home, and family members were trained to manage wound care effectively*. (Participant 41, Administrators of relevant agencies, 46 years old)

Critical emergency care involved monitoring patients for potential complications and providing immediate support through emergency contacts. Multiple participants described similar practices, indicating a consistent approach to ensuring timely intervention and patient safety in emergencies. Participants described that:

> *When patients experienced sudden medical emergencies, family members promptly contacted local emergency services to transport them to the hospital. Free ambulance services were provided, and emergency contact numbers were made available to households to ensure timely intervention*. (Participant 9, relatives of patient, 48 years old)

3.2.2. Theme 2: Support for postoperative patients

Support for postoperative patients focuses on providing comprehensive support to patients after surgery, ensuring continuity of care and addressing both practical and social needs. It is divided into two subthemes:

3.2.2.1. Subtheme 1: Support systems for postoperative patients

The support system for postoperative patients is designed to provide continuous, comprehensive care for patients, their families, and other stakeholders. It consists of three main components. The first component, Capacity Building, involves providing knowledge and training to patients, caregivers, and relevant stakeholders to ensure safe and effective postoperative care. Multiple participants described similar activities, indicating that training and education were consistently implemented across settings to support recovery and prevent complications. A participant reported*:*

> *For postoperative patients with nutritional needs, nurses assessed patients' nutritional status and trained family members on preparing appropriate liquid diets at home. Training included calculating suitable portions and providing guidance for patients who might require feeding tubes, particularly for brain surgery patients*. (Participant 26, nutritionist, 54 years old)

The second component, the Integrated Database, consolidates essential information on surgeries, patient referrals, and personal data to support follow-up and coordination among service providers. Multiple participants reported similar practices, indicating that the database was consistently used across settings to facilitate seamless communication and patient care. A participant reported:

> *Patient information was entered into the Smart COC program according to specific criteria, such as cancer surgery or laparoscopic procedures. Most referrals were completed on the day of discharge and included details on home visits, patient referrals, wound management, colostomy care, and other relevant aspects of post-discharge care*. (Participant 22, nurse, 27 years old)

The third component, Welfare and Support Channels, encompasses public welfare assistance, equipment loan centers, and postoperative learning resources to support patients and caregivers. Multiple participants described similar practices, indicating that these support channels were consistently utilized to enhance convenience, confidence, and recovery after discharge. A participant reported:

> *Efforts to establish community-based equipment centers that provided essential items such as oxygen machines, beds, and walkers. These centers were set up across multiple local areas, and although equipment availability varied among communities, ongoing efforts*

were made to expand and improve access to necessary equipment. (Participant 27, nurse, 54 years old)

3.2.2.2. Subtheme 2: Social and financial support

Social and financial support for postoperative patients ensures that patients and their families have access to the resources and assistance needed for recovery. This subtheme includes three main components. The first component is the development of funds and welfare, which includes community welfare funds and services provided during normal circumstances, emergencies, and disaster situations. Multiple participants reported that these financial and welfare mechanisms played a key role in supporting postoperative patients and their families, particularly in ensuring continuity of care during unexpected crises. A participant reported:

Municipalities had established emergency preparedness plans, including adequate equipment such as fire trucks and boats, along with medical teams to support evacuations. Disaster relief funds, shelters, evacuation centers, and relief hubs were also organized to assist communities during and after emergencies. (Participant 72, Municipal officials, 54 years old)

The second component is capacity building for caregivers, volunteers, and community helpers. Participants consistently described training and skill development activities aimed at enhancing caregivers' abilities to provide safe and effective postoperative care at home, reflecting a shared emphasis on strengthening community caregiving capacity. A participant also described:

The role of community health volunteers is to provide practical support, such as coordinating access to medical equipment, including patient beds and suction machines, to assist families caring for patients at home. (Participant 12, relatives of patient, 25 years old)

The third component involves creating a supportive care environment. Participants reported that programs supporting postoperative patients' living environments included home and living space modifications, access to community-based medical equipment banks, and the establishment of community support groups. These initiatives were described across multiple settings, indicating a coordinated approach to creating enabling environments for recovery. A participant reported:

Welfare services supported patients living in unsafe housing conditions by assisting with home repairs to ensure safety and suitability for daily living. (Participant 44, Administrators of relevant agencies, 56 years old)

3.2.3. Theme 3: Management and coordination

Management and coordination are key mechanisms that enable postoperative care in the community to function effectively. They emphasize both data management and the development of agreements or shared protocols among various agencies to ensure that continuity of care proceeds in a unified and consistent manner. It is divided into two subthemes.

3.2.3.1. Subtheme 1: Development and utilization of data

A data system through annual surveys and emergency support systems was developed with community participation to support postoperative care. Village Health Volunteers conducted annual surveys and recorded data in the TCNAP system. Postoperative patient data were integrated with chronic disease records rather than being recorded separately. Multiple participants reported similar data management practices, indicating a consistent approach to patient information recording across services. A participant reported:

Annual village-level surveys were conducted, with volunteers recording data in the TCNAP system. Postoperative patients were not documented as a separate group but were instead included within chronic disease records. (Participant 69, Municipal officials, 37 years old)

Emergency and disaster support systems provided relevant patient information to responsible agencies to assist individuals during emergencies, abandonment situations, or disasters. These systems included patient home maps to facilitate timely response and coordination. Multiple participants described similar practices, indicating a consistent and integrated approach to emergency and disaster support across services. A participant reported:

> *Emergency units systematically recorded service data and updated it on an annual basis. In addition, the Social Welfare Department mapped the locations of patients who required assistance during disasters to support timely response and coordination.* (Participant 72, Municipal officials, 54 years old)

3.2.3.2. Subtheme 2: Development and agreement protocols

This subtheme describes the work and activities involved in developing agreements and protocols for postoperative patient care. Local ordinances and budget plans were established to support postoperative care, including the provision of services and community welfare funds. Multiple participants reported that these local policies and financial mechanisms played an important role in sustaining postoperative support and enabling community-based care. A participant stated:

> *A central budget was allocated annually; however, funding for postoperative care was not separated and was instead incorporated into the chronic disease budget.* (Participant 67, Municipal officials, 45 years old)

A health charter was used to guide the organization of postoperative services. Participants reported that, due to resource limitations, postoperative care was often integrated within existing chronic disease service systems rather than being managed as a separate program. This approach was consistently described across participants, indicating a shared organizational strategy. A participant described:

> *Limitations in human resources include shortages of medical personnel and volunteers. Due to these constraints, healthcare services prioritize staffing to support all patient groups rather than develop a separate system for postoperative care. As a result, postoperative care is commonly integrated into existing chronic disease service systems.* (Participant 40, Administrators of relevant agencies, 56 years old)

3.3. Findings from observations and environmental documentation

In addition to interview data, findings from non-participant observations and environmental documentation supported the reported practices. Observations during home visits indicated that postoperative care activities, including wound care, equipment use, and caregiver support, were implemented in accordance with the described care plans. Community environments varied in terms of housing conditions and availability of medical equipment; however, equipment loan services and home modifications were observed in several settings, reflecting efforts to adapt care to patients' living conditions.

Review of documents and records further confirmed that postoperative care was often integrated within existing chronic disease systems. Referral forms, care records, and database entries demonstrated that patient information was shared across services to support follow-up, emergency response, and coordination among healthcare and community agencies. Environmental maps and disaster preparedness documents also indicated systematic planning to support patients during emergencies and disasters.

4. Discussion

This study aimed to explore how healthcare service systems for postoperative patients are developed across hospital and community settings. The finding revealed that effective healthcare service systems for postoperative patients involved three interconnected approaches: the organization of healthcare services, support for postoperative patients, and management and coordination across hospital, community, and policy levels. These approaches were further

expanded into six interrelated domains that collectively illustrate how continuity of care is operationalized in community settings.

This study indicated that integrated patient databases and referral pathways facilitated continuity of care, consistent with a previous study on care coordination (Smith et al., 2021). Caregiver training, home modifications, and equipment loan programs were also found to enhance recovery, aligning with prior research on home-based support (Stark et al., 2020). Furthermore, local policies, budgets, and inter-agency collaboration enhanced responsiveness and sustainability, in line with earlier findings on governance in community health systems (Madden et al., 2024; Shankardass et al., 2018). Taken together, these findings reinforce the notion that continuity of postoperative care is not a single intervention but a system-level outcome that emerges from coordinated actions across multiple sectors and levels of care. Successful postoperative care, therefore, requires integration of hospital, community, and policy resources, emphasizing coordination, caregiver capacity, and supportive environments.

The organization of healthcare services and systems for postoperative patients in hospitals reflected the capacity of health service units at all levels to care for complex postoperative patients. This included post-surgical rehabilitation, patient referrals, and continuity of care. Structured home visit programs, through in-person or telephone follow-ups and data recording after each visit, ensured continuous care and contributed to improved self-care at home and a reduction in postoperative complications (Pluemsong, 2022). These findings suggest that organizational readiness and standardized follow-up mechanisms are critical in mitigating the risks commonly associated with care transitions, particularly during the early post-discharge period.

Healthcare service systems for postoperative patients in communities demonstrated how community-based services provided care for patients returning home after surgery, including home care, long-term care, and critical or emergency care. This is consistent with the study by Pankong et al. (2021), which found that patients benefited from volunteer support for health assessments and education. Volunteer networks foster mutual support, motivation, and continuity in care, assisting patients with daily activities, follow-up appointments, and access to medical equipment. Patients were visited at home by the Sub-district Health Promoting Hospital (SHPH) home visit team for condition monitoring, and coordination was made to register patients as long-term care recipients, especially those who were dependent or unable to care for themselves. Importantly, this layered service structure illustrates how community-based systems compensated for limitations in hospital-based follow-up by embedding care within the patients' lived environments. This approach is consistent with the study by Burawon et al. (2022), which emphasized preparing patients and their families before discharge to ensure continuity of postoperative care. It also aligns with the study by Liang et al. (2025), Shahzad et al. (2025), and Lin et al. (2024), which reported that structured referral systems from tertiary to primary and community care, combined with clear guidelines for continuous home-based postoperative care by nurses and multidisciplinary teams in both routine and emergency contexts, contributed to more comprehensive patient care. This study further extends these findings by demonstrating that such systems are most effective when nurses function as care coordinators who bridge institutional and community boundaries, rather than solely as clinical providers.

This study showed that a support system for postoperative patients is designed to provide continuous and comprehensive care, encompassing patients, families, and other stakeholders. Social and financial support provides holistic assistance by developing community welfare funds, enhancing caregiver and volunteer capacity, and creating a supportive environment for recovery. Initiatives included establishing community welfare funds, procuring medical equipment for disaster relief, setting up assistive device banks, and modifying home environments to facilitate patient care. These support mechanisms highlight that recovery after surgery is shaped not only by medical interventions but also by socioeconomic stability and environmental safety, reinforcing the importance of integrating social welfare into health service planning.

Furthermore, this study showed that management and coordination were enhanced through community data development and collective agreements. Community members actively participated in collecting, analyzing, and utilizing their data, with involvement from all stakeholders. Therefore, postoperative patients need a well-managed care system and access to support activities. These efforts improve the quality of care by enhancing data systems and fostering community collaboration. Such participatory governance structures strengthen accountability and ensure that services remain responsive to evolving patient needs. This aligns

with Nuntaboot (2016), who emphasized that when communities managed their own data, they were better able to plan, make decisions, and design interventions tailored to the needs of patients and their families. This included developing local ordinances, care plans, budget allocations, and health charters to guide postoperative care at the community level. The present study adds that data-driven decision-making is most impactful when coupled with formal policy instruments that translate information into sustained action.

This study also reveals that the development of healthcare service systems for postoperative patients within community settings is multidimensional, comprising six interrelated domains that collectively promote sustainable, effective, and patient-centered care. While each domain plays a distinct role, their integration underscores the importance of local participation, systems thinking, and policy alignment in advancing post-surgery healthcare outcomes.

The first domain, enhancing the capacity of postoperative patients and their families, emphasizes a shift from dependency to empowerment. Teaching patients and caregivers how to manage common illnesses, emergencies, and medication not only reduces reliance on health facilities but also fosters confidence and autonomy. These findings affirm the work of Oba et al. (2021), who concluded that informed caregiving significantly improves recovery outcomes. Beyond individual-level benefits, this empowerment contributes to redistributing care responsibilities across households and communities, thereby alleviating pressure on primary healthcare services. Nevertheless, the degree of caregiver preparedness may vary significantly depending on education levels, health literacy, and access to continuous training, factors not fully addressed in current programs and requiring further attention. Volunteer development emerged as the second vital domain. While corroborating earlier findings (Pankong et al., 2021), this study uniquely illustrates how volunteers function as social connectors who reinforce trust, reciprocity, and collective responsibility within communities. However, concerns remain about volunteer burnout, retention, and sustainability without consistent institutional or financial support. This indicates that volunteer-based support, although effective, requires structured supervision, recognition, and policy backing to ensure continuity and prevent over-reliance on informal goodwill.

The third domain, the development and application of surgical patient information systems, addresses a longstanding gap in community health management. The findings suggest that community ownership of data enhances not only accuracy but also legitimacy in local decision-making. However, adequate analytical skills and governance platforms are required to realize these benefits fully. Without sufficient technical capacity and formal mechanisms to use the data, the potential of community-generated information may not be fully utilized in improving postoperative care planning. The fourth domain, the community postoperative patient health care system, aligns with frameworks for chronic non-communicable disease management (Nuntaboot et al., 2023), indicating structural similarities between postoperative and long-term care systems. This convergence suggests opportunities for integrating postoperative care into existing chronic care infrastructures. Such integration may improve efficiency by avoiding service duplication while strengthening continuity for patients who require prolonged post-surgical monitoring.

The fifth domain concerns standardized public services implemented by local administrative organizations (LAOs). This aligns with the 2017 Constitution of the Kingdom of Thailand (2017), Section 50, which provides a legal foundation for sustained local investment in community-based postoperative care. This legal mandate means that postoperative care is treated as a formal responsibility within local governance rather than as a temporary program. Finally, the sixth domain reflects the emergence of decentralized local health service units. While decentralization enhances adaptability (Sapkota et al., 2023), it also raises concerns regarding equity and capacity disparities, underscoring the need for national oversight and targeted capacity-building. Differences in local resources and leadership may affect how well decentralized systems provide consistent postoperative support across regions.

Collectively, the six domains reflect a shift toward a resilient, participatory, and community-rooted healthcare system for postoperative patients. Nevertheless, challenges related to sustainability, equity, and institutional capacity remain, and future research should explore long-term outcomes and strategies to institutionalize cross-sector collaboration without diminishing community engagement. While this study affirms much of the existing literature, it also extends current knowledge by demonstrating how postoperative care systems can be built around networks of shared responsibility, local innovation, and policy integration. These insights have

practical implications for health policymakers, community leaders, and researchers seeking to develop health systems that are not only medically effective but also socially embedded and culturally responsive.

5. Implications and limitations

This study demonstrated that organizing community health services for postoperative patients requires collaboration among multiple organizations to ensure continuous and comprehensive care. The findings provide practical guidance for improving nursing service quality, including: emphasizing skill development for postoperative patients and their household caregivers, promoting coordination for patient referrals and integration of services across all levels of healthcare, and encouraging the establishment of support networks through other agencies to secure budgets, operational systems, and resource allocation. Therefore, nurses providing postoperative care must develop strategies to deliver appropriate, clear healthcare services to postoperative patients. These services should be effective, standardized, and aligned with the context and needs of patients, caregivers, and the community. This approach will contribute to developing a comprehensive healthcare system by improving policies specifically designed for continuous postoperative care, ensuring high-quality care.

Despite these insights, several methodological and context-specific limitations should be considered in this study. First, the study was conducted in southern Thailand, where language differences between standard Thai and the local southern dialect may have influenced participants' responses. To minimize misunderstanding, an interpreter was available during interviews to clarify words or expressions. Second, recall bias is a potential limitation due to the retrospective interviews. However, because the patients were within two years post-surgery, this bias was likely minimized, thereby improving the accuracy of the reported experiences. Third, the findings are context-specific, reflecting healthcare systems and community support structures unique to the studied region, which may limit the generalizability of the results to other settings. Future studies could enhance reliability by including patients with more recent postoperative experiences, conducting multi-site studies across different regions, and using triangulation of data sources (e.g., observation, document review, and interviews) to reduce recall and context-related biases.

6. Conclusion

This study highlighted key themes in the development of postoperative care across hospital and community settings. These themes included the organization of healthcare services, support for postoperative patients, and management and coordination. Coordinated collaboration among multiple agencies was central to ensuring continuity of care, alignment with patients' and caregivers' needs, and adaptation to community contexts. The findings also emphasize strategies such as integrated patient databases, structured home visits, caregiver training, and the establishment of support networks, which collectively facilitated comprehensive postoperative care. These insights support current guidelines on postoperative recovery, complication prevention, and quality of life enhancement. Future research is recommended to explore the role of caregivers in supporting postoperative health services, strategies for integrating postoperative care into routine primary healthcare, and the factors, management activities, and support mechanisms necessary to maintain high-quality services.

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Author contribution

All authors (MY, AJ) contributed equally to the study's conception and design, data acquisition, and data analysis. MY and AJ wrote the first draft of the manuscript, revised the final draft, and gave final approval of the version to be published.

Conflict of interest

The authors declared that there is no conflict of interest in this study.

Declaration of the use of Artificial Intelligence (AI)

The authors conducted the research and composed the original manuscript independently, but used ChatGPT to assist with detailed review, refining sentence structure and expressions for clarity, enhancing the quality of writing, and making it easier to read and understand. The authors accept all responsibilities related to this manuscript.

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