PCFM Vol 7 No. 3 Jul-Sep 2024: 80-88.

นิพนธ์ต้นฉบับ

การแพทย์ทางไกลและระบบส่งต่อผู้ป่วยปฐมภูมิ ส่วนที่ 1: บทเรียน 3 ปี ในการประสานงานระหว่างเครือข่ายการดูแลปฐมภูมิสู่แผนกฉุกเฉิน โรงพยาบาลแม่สอด จังหวัดตาก

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Received: March 31, 2024;
Revised: June 05, 2024;
Accepted: July 03, 2024

บทคัดย่อ

ที่มา: การดูแลผู้ป่วยก่อนถึงโรงพยาบาลรวมถึงการแพทย์ฉุกเฉินนั้นมีความสำคัญในการดูแลผู้ป่วยฉุกเฉินเป็นอย่างยิ่ง การนำเทคโนโลยีการแพทย์ทางไกลมาประยุกต์ใช้เข้ากับระบบดูแลผู้ป่วยฉุกเฉินได้ช่วยเพิ่มศักยภาพในการดูแลผู้ป่วยและลดอุปสรรคในการเข้าถึงบริการสุขภาพ สำหรับพื้นที่ห่างไกล หน่วยบริการปฐมภูมิเป็นบริการสุขภาพที่ใกล้ชิดชุมชนและเป็นด่านแรกที่ผู้ป่วยนึกถึงเมื่อเจ็บป่วย ในอำเภอแม่สอดจังหวัดตาก จึงมีการจัดตั้งกลุ่มให้คำปรึกษาการแพทย์ทางไกล ซึ่งประกอบด้วยสหวิชาชีพรวมถึงแพทย์เวชศาสตร์ครอบครัวและเวชศาสตร์ฉุกเฉิน เพื่อเพิ่มประสิทธิภาพในการดูแลผู้ป่วย การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาการใช้งานของกลุ่มให้คำปรึกษาการแพทย์ทางไกล ที่เรียกว่ากลุ่ม “FCT” (family care team) และศึกษาผลลัพธ์ของผู้ป่วยหลังได้รับคำปรึกษาและถูกส่งตัวไปยังแผนกฉุกเฉินโรงพยาบาลแม่สอด

วัสดุและวิธีการ: เป็นการศึกษาย้อนหลังเชิงพรรณนา จากฐานข้อมูลผู้รับบริการในแผนกฉุกเฉินของโรงพยาบาลแม่สอด โดยเก็บข้อมูลผู้ป่วยที่ได้รับการปรึกษาผ่านกลุ่มแพทย์ทางไกล “FCT” และถูกส่งตัวไปยังแผนกฉุกเฉิน ในช่วงเมษายน 2565 - ธันวาคม พ.ศ. 2567 เพื่อศึกษาการให้คำปรึกษา การรักษาเบื้องต้น กระบวนการส่งต่อผู้ป่วย และผลลัพธ์ของผู้ป่วย

ผลการวิจัย: จากจำนวนผู้ป่วย 1,265 คน ที่ได้รับการปรึกษาผ่านกลุ่มการแพทย์ทางไกล “FCT” พบว่ามีผู้ป่วยร้อยละ 18.2 ได้รับการส่งต่อไปยังแผนกฉุกเฉิน ในขณะที่กลุ่มอื่นได้รับการนัดติดตามอาการ ส่งต่อไปยังหน่วยบริการปฐมภูมิ แผนกผู้ป่วยนอก หรือจำหน่ายกลับบ้าน ในผู้ป่วยที่ถูกส่งต่อไปยังแผนกฉุกเฉิน ส่วนใหญ่ได้รับการรักษาเบื้องต้นที่หน่วยบริการปฐมภูมิและเลือกใช้วิธีส่งต่อเหมาะสม ผู้ป่วยจากหน่วยปฐมภูมิที่อยู่ในพื้นที่ห่างไกลมีจำนวนมากที่สุด เวลารอคอยในการรับคำปรึกษาเฉลี่ยอยู่ที่ 9.5 นาที ผู้ป่วยส่วนมากเป็นผู้ใหญ่ สัญชาติไทย และไม่ได้เจ็บป่วยจากอุบัติเหตุ ระยะเวลาที่อยู่ในแผนกฉุกเฉินมีค่ามัธยฐานอยู่ที่ 103 นาที โดยมีผู้ป่วยเข้ารักษาเป็นผู้ป่วยในร้อยละ 58 ซึ่งมีอัตราการจำหน่ายกลับบ้านร้อยละ 93.3 และอัตราการเสียชีวิตอยู่ที่ร้อยละ 5.2

สรุป: ผลการศึกษาแสดงให้เห็นถึงประโยชน์ของการนำระบบให้คำปรึกษาการแพทย์ทางไกล มาประยุกต์ใช้กับระบบดูแลสุขภาพปฐมภูมิและระบบการดูแลผู้ป่วยฉุกเฉิน โดยเฉพาะในการปรับปรุงกระบวนการดูแลผู้ป่วยและการจัดการทรัพยากร อย่างไรก็ตามการศึกษานี้ยังมีประเด็นที่ต้องพัฒนา อาทิเช่น ขอบเขตการเก็บข้อมูลและความเป็นส่วนตัวของข้อมูล การวิจัยระยะยาวและการวิจัยเชิงคุณภาพเพิ่มเติม

คำสำคัญ: หน่วยบริการปฐมภูมิ ระบบการแพทย์ทางไกล การแพทย์ฉุกเฉิน การส่งต่อผู้ป่วย การดูแลผู้ป่วยก่อนถึงโรงพยาบาล ระบบบริการสาธารณสุข

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ORIGINAL ARTICLE

Telemedicine Consultation and Referral System for Primary Care Patients Part 1: Three-year Experience in Coordinating Primary Care Network to the Emergency Department at Mae Sot Hospital, Tak

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Received: March 31, 2024;
Revised: June 05, 2024;
Accepted: July 03, 2024

ABSTRACT

Background: Prehospital care is crucial in providing timely assistance to individuals during emergencies. Integrating telemedicine into emergency care systems has shown promising results in improving patient outcomes. Primary Care Units (PCUs) are important entry points for patients seeking medical assistance, particularly in remote areas. In the Mae Sot District, Tak Province, telemedicine consultation groups, which include Family Medicine and Emergency physicians, facilitate remote consultations and referrals, potentially improving patient care processes and outcomes. This study aimed to evaluate the clinical utilization of a telemedicine consultation group, known as the "FCT" (Family Care Team) LINE group, in streamlining consultations and referrals for primary care patients accessing the Emergency Department (ED) at Mae Sot Hospital in Tak Province, Thailand.

Methods: A retrospective observational study was conducted at Mae Sot Hospital, a general hospital near the Thailand-Myanmar border. Data were collected from patients who received consultations through the FCT LINE group and were referred to the ED from April 2021 to December 2023. Patient demographic information, consultation details, and outcomes were analyzed.

Results: One thousand two hundred sixty-five patients received consultations via the FCT LINE group during the study period. Among them, 18.2% were referred to the ED, while others were directed to primary care clusters, outpatient departments, or discharged. Most patients referred to the ED received appropriate initial management, with suitable referral methods. PCUs in remote areas had the highest number of cases referred. The average consultation waiting time was 9.5 minutes. Among ED referrals, the majority comprised adults and Thai nationals, with non-trauma cases being predominant. The median ED stay was 103 minutes, with 58% admitted, exhibiting a high discharge rate of 93.3% and a mortality rate of 5.2%.

Conclusions: The findings highlight the significant advantages of integrating telemedicine consultation groups into healthcare systems, particularly in enhancing patient care processes and resource utilization. Despite certain limitations, such as data collection scope and privacy concerns, the study emphasizes the importance of continuous quality improvement initiatives and further research to optimize the integration of telemedicine into emergency care systems

Keywords: primary care, telemedicine, emergency, referral system, prehospital care, healthcare delivery

Intro

Prehospital care, known as Emergency Medical Services (EMS), encompasses a coordinated deployment of resources within a defined locality to aid residents in accessing urgent assistance during routine and catastrophic emergencies. This involves systems for incident reporting, onsite assistance, prehospital care, quality transport, and transfer of emergency patients to suitable hospitals, ensuring quality and swift service delivery 24/7.[1,2] Thailand's comprehensive EMS in every province offers services via land, water, and air transport. Within Mae Sot district, Tak Province, the primary EMS utilizes ground ambulances as its main service.

The Emergency Care System (ECS) is critical for emergency patients, linking community, primary care, and definitive care. It aims to increase access to emergency services, reduce mortality rates, prevent organ loss, and minimize functional impairment. According to the Ministry of Public Health policy, redesigning the ECS is necessary to ensure equal, timely, and proficient care for emergency patients. This strategic endeavor is referred to as the "Integrated Network of Emergency Care System" or "ONE ECS".[3]

Telemedicine has played an increasingly significant role in global healthcare services. It enables consultations, guidance, treatment, and follow-ups between one healthcare facility and another, such as homes, community clinics, health stations, or other network hospitals.[4] Additionally, it is an integral part of the Ministry of Public Health's Digital Health Strategy.[5] Moreover, telemedicine significantly aids the enhancement of prehospital care by allowing the transmission of images, sounds, vital signs, or electrocardiograms from outside hospitals. This enables immediate treatment orders or consultations with specialists, particularly for complex illnesses or fast-track disease groups. Studies have indicated a favorable influence of telemedicine on emergency medical care.[6-8]

Mae Sot Hospital, a 420-bed general hospital, is six kilometers from the Thai-Myanmar border, covering a population from five districts in the western area of Tak Province. The hospital's emergency service system includes an Emergency Department (ED) and an Ambulance Operation Center (AOC), this center manages both EMS and referred patients and is under the continuous supervision of the emergency physician acting as medical director. Moreover, Mae Sot Hospital's Primary Care Service oversees all 22 network healthcare centers in the Mae Sot District. The Ministry of Public Health's 2014 initiative of establishing the Family Care Team (FCT) embodies a comprehensive approach to healthcare, encompassing various professionals and community involvement.[9]

Before the establishment of the FCT in the Mae Sot District, the care process did not involve consultation from the Primary Care Units (PCUs). Decisions on whether to call EMS services or refer patients to the hospital were made directly by PCU staff without initial treatment guidance. This lack of standardized preliminary treatment often resulted in inconsistent care and delayed medical attention. To align with the Ministry of Public Health's policy, Mae Sot's Primary Care Team operates a LINE application via a consultation group called "FCT Mae Sot", offering round-the-clock consultations by Family Medicine physicians, Emergency physicians, pharmacists, and nursing supervisors. This platform facilitates preliminary treatment orders and various subsequent treatments, including referrals to the ED, primary health care, or specialized departments. With the introduction of the FCT LINE consultation group, the care process has become more standardized. Healthcare staff at PCUs can now consult with physicians before deciding on the appropriate course of action, ensuring better initial care and more informed decisions regarding the need for EMS services.

LINE consultation group FCT is in alignment with the redesign of the ECS services, which aims to create an "Integrated Network of Emergency Care Systems" (ONE ECS) as previously mentioned.[3] We aim to depict the clinical utilization of the LINE consultation group FCT in streamlining consultations and referrals for Primary Care Patients accessing the ED at Mae Sot Hospital in Tak Province.

Methods

Study design and setting

A single-center, retrospective observational study was conducted in Mae Sot Hospital, a 420-bed general hospital near the Thai-Myanmar border, covering a population from five districts in the western area of Tak Province.

This study was approved by the Human Research Ethics Committee of Mae Sot Hospital, following international ethical research guidelines, including the Declaration of Helsinki, The Belmont Report, the CIOMS Guidelines, and the ICH-GCP. (Register No. MSHP 1/2567, approved on 1 January 2024)

Study population

Patients who received consultations through the LINE group called "FCT Maesot" and referred to the ED from 1 April 2021 to 31 December 2023 (33 months) were studied. The exclusion criteria were patients who arrived at the ED from the PCU without prior consultation in the FCT LINE group.

The study initially collected data from exported LINE chat history, comprehensively reviewing each consultation originating from the PCU and the subsequent initial management provided before referring patients to the ED. Subsequently, patient data from those who visited the ED were thoroughly reviewed using the hospital's Electronic Medical Record (EMR) system. The gathered variables encompassed patient demographic information, mode of transportation, presenting symptoms, mental status, observational parameters, provisional diagnosis, and the hospital course.

Outcome and data analysis

The outcomes focused on three key aspects: coordination, prehospital management, and patient outcomes. Coordination assessment involved measuring the time taken between consultation initiation and receiving physician responses. Prehospital management evaluated the appropriateness of initial care and transportation methods. Patient outcome analysis encompassed the duration of ED stay, admission rates, hospital stay length, and mortality rates. These evaluations aimed to gauge the FCT LINE group's effectiveness in enhancing emergency care systems and patient outcomes at the hospital. This study investigated the impact of the FCT on coordination, prehospital management, and patient outcomes in the ECS at Mae Sot Hospital. Data analysis on these outcomes utilized descriptive statistics such as frequencies, percentages, mean, median, and standard deviation.

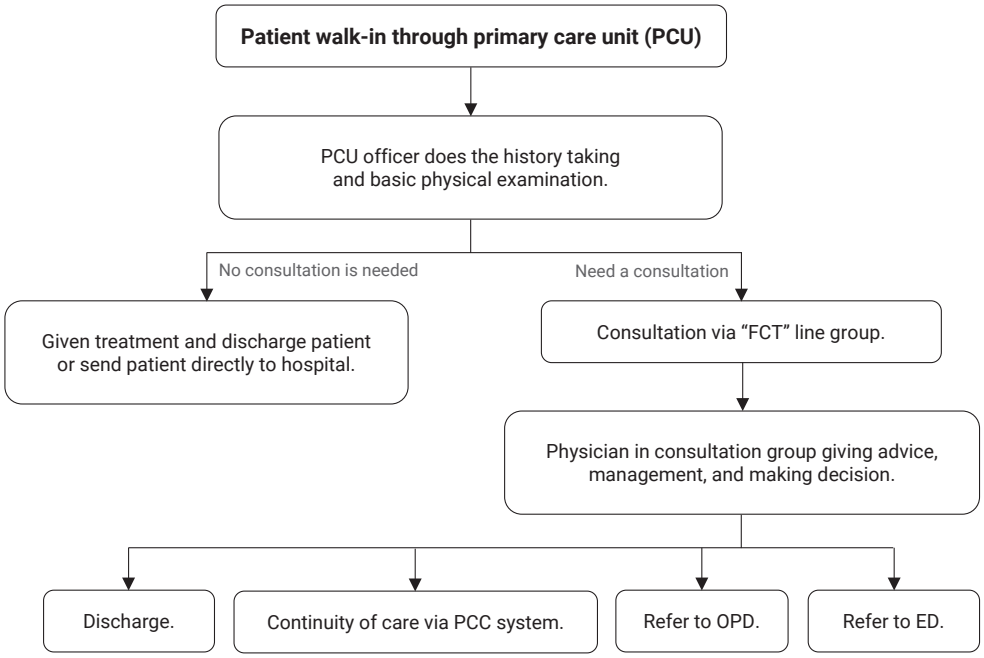
Overview of telemedicine consultation via >> the FCT LINE group

Mae Sot's primary care team has operated a consultation group called "FCT Mae Sot" via a LINE application since 2018 offering round-the-clock consultations by Family Medicine physicians, Emergency physicians, pharmacists, and nursing supervisors. This platform facilitates preliminary treatment orders and various treatments, including referrals to the ED, primary health care, or specialized departments.

Various types of patients visit the PCU in Mae Sot district, including those with non-communicable diseases (NCDs), minor illnesses, trauma, and occasionally emergency cases. Due to the distance between the PCU and the hospital, as well as challenges in transportation and communication, coupled with a lack of knowledge, emergency patients are often brought to the PCU first. Upon arrival at the PCU, nurses or public health officers provide initial patient management. However, if they are uncertain about the management or if the case requires immediate treatment before referral, they choose to consult the FCT LINE group. During the consultation, basic patient information such as age, sex, underlying conditions, vital signs, and problem lists are provided, after which the doctors (family medicine doctors and emergency physicians) offer advice, management plans, schedule follow-ups, and sometimes recommend referrals to the hospital (Emergency Department or Outpatient Department) (Figure 1).

Results

One thousand two hundred sixty-five patients consulted the FCT LINE group between April 2021 and December 2023. Following consultation, 18.2% of patients were referred to the ED, another 35.1% were directed to the Primary Care Cluster (PCC) for continuous treatment, 19.0% were sent to the OPD, and an additional 17.0% were discharged (Table 1). Among the 230 patients referred to the ED, 41.3% received appropriate initial management, while 56.5% were cases that did not require prior management. The selection of referral methods to the ED through EMS (Team ALS, BLS, FR) and self-transportation was appropriate at 92.6% (Table 2).



ED, Emergency Department; OPD, Outpatient Department; PCC, Primary Care Cluster

Figure 1: Overview of telemedicine consultation via the FCT LINE group's

Table 1. Telemedicine consultation data via the FCT LINE group's

	2021 n (%)	2022 n (%)	2023 n (%)	Total n (%)
Total consultation	492	363	410	1,265
Outcome				
ED	93 (18.9)	57 (15.7)	80 (19.5)	230 (18.2)
PCC	171 (34.8)	142 (39.1)	131 (32.0)	444 (35.1)
OPD	89 (18.1)	59 (16.2)	92 (22.5)	240 (19.0)
Discharge	77 (15.6)	69 (19.0)	69 (16.8)	215 (17.0)
Loss data	31 (6.3)	22 (6.1)	28 (6.8)	81 (6.4)
Others	31 (6.3)	14 (3.9)	10 (2.4)	55 (4.3)

ED, Emergency Department; PCC, Primary Care Cluster, OPD, Out-Patient Department

The PCUs with the highest number of cases referred were Chedi Kho (18.3%) and Huai Ya-u (10.4%), as well as small PCUs without Family Medicine physicians (Figure 2). The average waiting time for consultation was 9.55 minutes, with consultations primarily occurring during weekday morning shifts (77.0%) (Table 2).

Patients referred to the ED, were nearly equally distributed between males and females (48.3% and 51.7% respectively), with 82.2% being adults and 17.8% being pediatric patients. The majority were Thai nationals (81.3%). Most cases were non-trauma cases (84.8%), with the highest number triaged at ESI level 3 (44.8%), followed by Emergency severity index (ESI) level 2 (29.6%). The most common reasons for referral were respiratory symptoms (18.7%) and alteration of consciousness (11.7%) (Table 3).

The median length of stay in the ED was 103 minutes, with 40% of patients discharged and 58% admitted. The most common admissions were to the Internal Medicine Ward (65.7%), and the Pediatric Ward (18.7%). Almost all patients admitted to the hospital were discharged home (93.3%), with an average length of stay of 4.6 days and a mortality rate of 5.2% (Table 4).

Discussion

This study highlights the notable advantages stemming from the incorporation of consultation groups, which promote seamless coordination between Primary Care and ED services. Key findings emphasize the pivotal advantages as follows:

Table 2. Consultation data of patients referred to ED

	n (%)
Consultation time	
Weekdays-morning shift	177 (77.0)
Weekdays-evening shift	30 (13.0)
Holiday-morning shift	19 (8.3)
Holiday-evening shift	4 (1.7)
Time from consultation to answer	
0-15 minutes	187 (81.3)
16-30 minutes	16 (7.0)
> 30 minutes	18 (7.8)
No answer	9 (3.9)
Mean time, SD (minutes)*	9.5 (15.2)
Initial Management	
Not needed	130 (56.5)
Proper management	95 (41.3)
Improper management	5 (2.2)
Mode of transportation to ED	
Emergency medical service	138 (60.0)
Self transport	92 (40.0)
Transportation to ED	
Proper	213 (92.6)
Improper	17 (7.4)

*Mean SD; ED, Emergency Department

Table 3. Basic characteristics of patients referred to ED

	n (%)
Gender	
Female	119 (51.7)
Male	111 (48.3)
Age group	
Pediatric (< 15 year old)	41 (17.8)
Adult (≥ 15 year old)	189 (82.2)
Median age, IQR	45 (23-66)
Ethnicity	
Thai	187 (81.3)
Non-Thai	43 (18.7)
ESI triage	18 (7.8)
Level 1	31 (13.5)
Level 2	68 (29.5)
Level 3	103 (44.8)
Level 4	28 (12.2)
Type of case	
Trauma	35 (15.2)
Non-trauma case	195 (84.8)
Chief complaint in non-trauma case	
GI symptoms	22 (11.3)
Fever	15 (7.7)
Respiratory symptoms	43 (22.0)
Headache/dizziness	22 (11.3)
Rash	4 (2.0)
Chest pain/palpitation	22 (11.3)
Alteration of consciousness	27 (13.8)
Wound	1 (0.5)
Others	6 (3.1)

* Median, IQR
ESI, Emergency Severity Index; GI, gastrointestinal; ED, Emergency Department

Improving patient accessibility to healthcare services

The study demonstrates the importance of utilizing innovative approaches, such as the FCT LINE group, to enhance patient access to healthcare services. Telemedicine consultation for

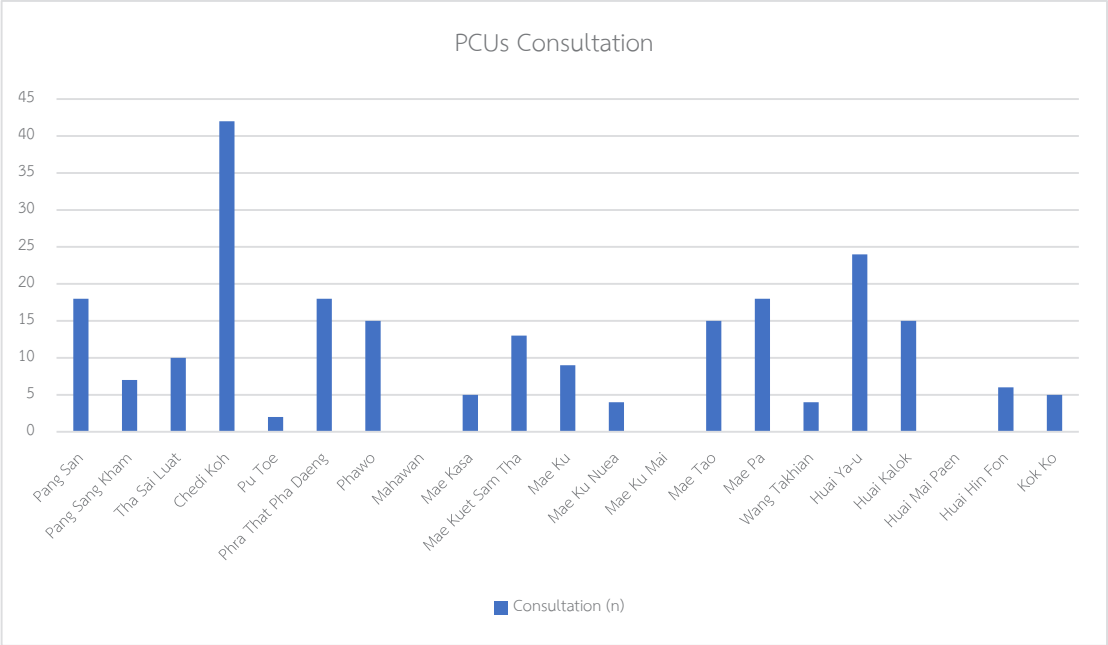


Figure 2. Primary Care Units (PCUs) consultation of patients referred to PCUs consultation of patients referred to Emergency Department.

Table 4. Outcome of patients referred to ED

	n (%)
Time in ED	
0-60 minutes	56 (24.4)
61-120 minutes	78 (33.9)
> 120 minutes	96 (41.7)
Median time*	103 (61-164)
Disposition from ED	
Discharge	92 (40.0)
Admit	134 (58.2)
OPD	2 (0.9)
Refer-out	0 (0.0)
Denied treatment	2 (0.9)
Admission ward	
Internal medicine	88 (65.7)
Surgical	14 (10.5)
Obstetric and gynecology	2 (1.5)
Pediatric	25 (18.7)
Orthopedic	3 (2.2)
Psychiatric	1 (0.7)
Eye	1 (0.7)
Outcome of admission case	
Discharge	125 (93.3)
Dead	7 (5.2)
Refer-out	0 (0.0)
Against advice	2 (1.5)
** LOS, mean, SD (days)	4.6

*Median, IQR, **Mean SD
ED, Emergency Department; LOS, length of stay

emergency patients in Latin America highlights the potential benefits of teleconsultation as a valuable tool for providing medical assistance and reducing barriers to accessing healthcare providers.[10] By leveraging technology, healthcare professionals can efficiently consult with patients, assess their needs, and determine appropriate courses of action. The significant proportion of patients directed to Primary Care Clusters (PCCs) highlights the effectiveness of this approach in providing continuous treatment and managing non-emergency cases closer to patients' homes. Moreover, the identification of PCUs with high referral rates, particularly those situated in remote areas, underscores the role of localized healthcare facilities in improving accessibility, reducing travel burdens, and ensuring timely access to medical assistance. The study's findings stress the importance of ongoing efforts to enhance healthcare infrastructure and service delivery models to address geographical and logistical barriers to effective healthcare access.

Enhancing patient care processes

The study highlights the importance of proper triage, initial management, and transfer protocols following consultation, underscoring the critical role of timely interventions in mitigating adverse health outcomes. Furthermore, the study emphasizes the significance of Emergency Medicine-Primary Care partnership models in delivering high-quality emergency care. Emergency Medicine providers offer clinical or procedural assistance to Primary Care providers for true emergencies. Primary Care providers can handle ambulatory-care-sensitive conditions, with appropriate backup available in case of escalation to urgent scenarios.[11] This collaborative approach optimizes patient care delivery, minimizes waiting times, and reduces unnecessary interventions, ultimately enhancing healthcare delivery. Additionally, recent research, including a systematic review of telemedicine in the ED, highlights the transformative potential of technology in healthcare. Telemedicine, especially in rural areas with limited access to specialist care and equipment, can significantly improve patient outcomes by providing access to specialist consultations, reducing mortality rates, and facilitating timely transfers to major hospitals. This innovative approach enhances patient care optimizing healthcare resource allocation, ultimately benefiting patients and healthcare systems.[8]

Optimization of emergency resource utilization

Most cases identified in the study were non-trauma and triaged at Level 2 or 3 according to the ESI. This observation suggests that cases requiring urgent attention or trauma are typically clear and prompt the activation of EMS services for hospital transfer. By effectively identifying and triaging non-trauma cases, healthcare providers can optimize emergency resource utilization,[12] ensuring that critical resources are allocated to patients in need of immediate attention. This targeted approach not only enhances the efficiency of emergency response systems but also facilitates smoother patient flow within healthcare facilities, reducing overcrowding and improving overall care quality.[8,10] Thus, the study highlights the importance of strategic triage practices in maximizing the effectiveness of emergency healthcare services.

Limitation and improvement points

We acknowledge that this study presents only cross-sectional data and lacks a direct comparison between the care processes before and after the implementation of the FCT LINE group. Consequently, while we observed improvements in coordination, prehospital management, and patient outcomes, we cannot conclusively attribute these enhancements solely to the FCT LINE group without pre-implementation data for comparison.

Despite this limitation, the rationale behind our conclusions is based on the observed benefits of having consultation before sending patients to the ED. Proper initial treatment guided by specialists, facilitated through the FCT LINE group, is logically superior to the previous practice where primary care staff made decisions without specialist input. This new approach ensures more informed and standardized initial care, likely leading to better patient outcomes.

The study also faced limitations in data collection, generalizability, and assessing patient outcomes. Primarily focusing on patients consulted via the FCT LINE group may overlook those accessing healthcare through other channels, leading to an incomplete understanding of demographics and healthcare patterns. Additionally, the study's regional specificity may limit its applicability. While it offers insights into referrals and triage processes, it lacks a comprehensive assessment of long-term outcomes.

Continuous monitoring and evaluation of consultation group processes and outcomes are essential for identifying areas of improvement and refining healthcare delivery models. Implementing mechanisms for feedback, quality assurance, and performance monitoring can facilitate ongoing improvement efforts and enhance the effectiveness of consultation groups in delivering patient-centered care.

An additional limitations arising from communication platforms like LINE application group chats for patient consultation, potentially compromise patient data privacy and confidentiality. Such platforms may not provide adequate security measures to protect sensitive patient information, raising concerns about data breaches and unauthorized access. To address this limitation, future studies should explore the development and implementation of secure and encrypted communication platforms tailored specifically for healthcare use. Additionally, healthcare organizations should establish clear policies and guidelines regarding communication platforms for patient consultations, emphasizing the importance of maintaining privacy and confidentiality standards.

Implications for future research and practice

In considering the future implications of this study for research and practice, several avenues for further enhancement emerge. First, incorporating longitudinal analysis to track patient outcomes over time would add depth and applicability to the findings. Additionally, conducting a comparison between the consultation group model and traditional care methods could offer valuable insights into their relative effectiveness. To gain deeper insights into patient experiences, qualitative assessments should complement quantitative data, addressing privacy concerns linked to communication platforms. Furthermore, a thorough cost-effectiveness analysis would shed light on the economic implications of implementing consultation groups. Ultimately, providing clear recommendations for policymakers and healthcare practitioners would optimize the integration of consultation groups into existing healthcare systems.

Conclusion

This study underscores the significant advantages of integrating consultation groups into healthcare systems to enhance patient care processes, improve resource utilization, and promote collaboration between primary care and emergency services. The findings highlight the effectiveness of consultation groups in streamlining patient care pathways, facilitating timely interventions, and optimizing resource allocation. However, certain limitations, including the limited scope of data collection and potential biases, underscore the need for further research and continuous quality improvement initiatives. Despite these limitations, the study contributes valuable insights into the potential benefits of consultation groups in healthcare delivery and emphasizes the importance of ongoing efforts to enhance healthcare access, quality, and efficiency. Moving forward, addressing these limitations, and leveraging consultation groups' strengths can significantly impact healthcare delivery, ultimately lead-

ing to improved patient outcomes and enhanced healthcare system performance.

Conflict of interest

We have no conflict of interest.

References

1. 1. Kanya Wongsri. The EMS system in Thailand. Srinagarind Med J. 2013;28(suppl):69-73. [in Thai]
2. Khruekarnchana P, Hatthirat S, Sirithongthaworn P, Kanchanasut S, Chakorn T, Sumetchotimaytha N, et al. Emergency Care System. In: Makornsarn C, editor. Thailand Medical Services Profile 2011–2014. Nonthaburi: Ministry of Public Health of Thailand; 2014. [in Thai]
3. Department of Medical Services. Guideline for ER Service Delivery. In: Klaisubun C, editor. Nonthaburi: Ministry of Public Health of Thailand; 2018. [in Thai]
4. Information and Communication Technology Center, Ministry of Public Health of Thailand. Q&A: Telemedicine Service [Internet]. 2023 [cited 2024 Jan 3]. Available from: https://ict.moph.go.th/th/extension/1315 [in Thai]
5. Information and Communication Technology Center, Ministry of Public Health of Thailand. Digital Health Strategy, Ministry of Public Health (2021–2025) [Internet]. 2021 [cited 2024 Jan 3]. Available from: https://ict.moph.go.th/upload_file/files/97c2287c8f04e13f81fec13e431e7a5e.pdf [in Thai]
6. Chinprasatsak S, Satthaphong S, Maporn K, Pre-hospi- tal Care by Telegraphic Medicine System for Advanced Emergency Medical Service at Maharat Nakhon Ratchasima Hospital. Journal of Health Science. 2016;25:714- 22. [in Thai]
7. Amadi-Obi A, Gilligan P, Owens N, O'Donnell C. Telemedicine in pre-hospital care: a review of telemedicine applications in the pre-hospital environment. Vol. 7, International Journal of Emergency Medicine. Springer-Verlag London Ltd; 2014.
8. Sharifi Kia A, Rafizadeh M, Shahmoradi L. Telemedicine in the emergency department: an overview of systematic reviews. Vol. 31, Journal of Public Health (Germany). Institute for Ionics; 2023. p. 1193–207.
9. Health Administrative Devision, Ministry of Public Health of Thailand. Family Care Team. In: Pawabutr P, editor. Bangkok: Printing House of the Agricultural Co-operative Federation of Thailand; 2014. [in Thai]
10. Libreros-Peña L, Quintero JA, Gelves A, Alarcón J, Morales S, Escobar MF, et al. Telemedicine consultation for emergency patients' attention: a clinical experience from a high complex university hospital from Latin America. BMC Health Serv Res. BMC Health Serv Res. 2023;23:559. PubMed PMID: 37254117
11. Greenwood-Ericksen MB, Tipirneni R, Abir M. An Emergency Medicine–Primary Care Partnership to Improve Rural Population Health: Expanding the Role of Emergency Medicine. Ann Emerg Med. 2017;70:640-7.
12. Williams D, Simpson AN, King K, Kruis RD, Ford DW, Sterling SA, et al. Do Hospitals Providing Telehealth in Emergency Departments Have Lower Emergency Department Costs? Telemedicine and e-Health. 2021;27:1011–20.