

Assessment of Telemedicine Needs and Stakeholders Satisfaction in Pediatric Healthcare Services at Suranaree University of Technology Hospital

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Abstract

Telemedicine shows promise in improving healthcare efficiency, reducing travel burdens, and expanding access to care. The purpose of this study was to (1) assess the problems and needs related to current pediatric services, (2) evaluate stakeholder satisfaction with existing pediatric services, and (3) examine the opinions of child caregivers regarding telemedicine services. Data were collected from 160 pediatric service users and 24 healthcare providers at Suranaree University of Technology Hospital (SUTH) through a questionnaire comprising four sections: (1) Personal Information, (2) Problems and Needs, (3) Satisfaction with Healthcare Services, and (4) Opinions on Telemedicine Services. The data were analyzed using frequency, percentage, mean, and standard deviation. The results indicated that child caregivers reported moderate needs for service improvements, particularly in the areas of online consultations, flexible appointment scheduling, and home medication delivery. Healthcare providers also reported moderate needs across all service dimensions. Child caregivers expressed high satisfaction with ease of access and the quality of care, whereas healthcare providers rated all areas at a moderate level of satisfaction. Caregivers' expectations of telemedicine services focused primarily on its potential to improve service accessibility (54.35%) and reduce waiting times (30.43%), with 15.22% expressing other expectations. The strong demand for telemedicine services among both caregivers and healthcare providers highlights a shared interest in addressing service inefficiencies and improving patient access. To further enhance healthcare accessibility and efficiency, SUTH should prioritize ongoing innovation and refinement of its service delivery systems.

Keywords: Pediatric healthcare, Patient satisfaction, Telemedicine

Introduction

Promoting optimal child health is fundamental to ensuring the future well-being of the child, with pediatric healthcare systems playing a critical role in supporting children's physical, mental, social, emotional, and intellectual well-being. The Ministry of Public Health evaluates the quality of pediatric healthcare using key indicators, including maternal and infant mortality rates, premature birth rates, incidences of low birth weight, oxygen deprivation at birth, age-appropriate nutrition, developmental milestones, and timely vaccinations (Ekplakorn et al., 2023). Delivering comprehensive and effective pediatric healthcare requires a multifaceted

approach encompassing infrastructure, personnel, service systems, procedural standards, equipment, and accessible technology (National Center for Health Statistics, 2020). E-health technologies—including mobile health apps, telemedicine, EMRs, and CDSS—have become integral to modern healthcare delivery. These tools enhance provider training, enable remote consultations in underserved regions, and support health surveillance systems, as evidenced during the COVID-19 pandemic (World Health Organization, 2021). Telemedicine, in particular, shows promise in improving healthcare accessibility, reducing travel burdens, and enhancing care coordination. Studies report high patient satisfaction, especially among users with reliable internet access, and in fields such as cardiology and orthopedics (Talal et al., 2020; Abdulwahab & Zedan, 2021). Despite these advantages, barriers to e-health adoption remain, including patient concerns about privacy, digital literacy, and service quality. Providers express reservations regarding increased workload, system reliability, and alignment with traditional practice, while administrators cite legal, financial, and security concerns (Talwar et al., 2023; Tisnanga & Kyongo, 2023). Factors promoting telemedicine adoption include organizational motivations, technological advantages and regulatory flexibility (Antonacci et al., 2023).

Telemedicine has achieved satisfaction rates in pediatrics of between 95% and 100% (Nguyen et al., 2023), attributed to reduced costs, travel time, and improved access. Satisfaction is higher among providers who are engaged in system development and receive adequate support and compensation. Nevertheless, limitations include the inability to perform physical exams and a perceived reduction in personal interaction (Kodjebacheva et al., 2023; Ferreira et al., 2023). Patient satisfaction specifically measures individual attitudes and perceptions of healthcare experiences (Smith & Jones, 2020), differing from broader medical beliefs that reflect social and cultural attitudes toward health (Khalife et al., 2023). The rise in telehealth usage during the pandemic highlights its value in maintaining care continuity (Williams et al., 2021). For pediatric populations, telemedicine supports chronic disease management, behavioral health services, inter-professional collaboration, and reduces unnecessary hospital visits (Curfman et al., 2021; Curfman et al., 2022; Esposito et al., 2023). Key telehealth requirements include secure data transmission, video consultations, access to patient records, and language support to reduce barriers. Stakeholders prioritize convenience and safety in telehealth while voicing concerns about potential reductions in care quality due to remote interventions (Zimmermann et al., 2023).

The Suranaree University of Technology Hospital (SUTH) employs 16 pediatricians, including both general pediatricians and specialists in fields such as neonatology, developmental pediatrics, nutrition, neurology, dermatology, infectious diseases, gastroenterology, and pulmonology. Between October 2022 and September 2023, the hospital's well-child clinic served a total of 4,085 patients. Due to the increasing patient load, the hospital is experiencing delays in service delivery, resulting in long waiting times. To address these challenges, the hospital is considering implementing telemedicine services in the Pediatrics Department, aligned with its E-health strategic plan. Despite the well-documented benefits of telemedicine—such as improved accessibility and patient satisfaction—its implementation in pediatric settings remains inconsistent, often hindered by stakeholder resistance and infrastructural limitations. This situation is particularly relevant at SUTH, where increasing patient volume highlights the urgent need for innovative service delivery models. While previous studies support telemedicine's potential in pediatric care, there remains a gap in understanding its local applicability, satisfaction determinants, and operational feasibility within Thai tertiary hospitals. Therefore, the purpose of this study was to (1) assess the problems and needs related to current pediatric services at SUTH, (2) evaluate stakeholder satisfaction with existing pediatric services, and (3) examine the opinions of child caregivers regarding

telemedicine services, as well as assessing the feasibility of incorporating telemedicine to enhance the hospital's Smart Well Child Center.

Materials and Methods

Study Design and Setting

This cross-sectional, mixed-methods study was conducted to assess the problems, needs, and satisfaction levels of stakeholders regarding pediatric healthcare services at Suranaree University of Technology Hospital (SUTH), located in Nakhon Ratchasima, Thailand. Data collection occurred between August 6 and November 13, 2023, within the pediatric department, specifically covering three clinical units: The Healthy Child Clinic, General Pediatric Clinic, and Specialized Pediatric Clinic.

Participants and Sampling Method

Participants included two distinct groups:

1. Caregivers of pediatric patients (n = 160), who were selected using stratified random sampling based on clinic type (Healthy, General, Specialized). Eligibility criteria included caregivers aged 18 and above, providing consent, and having at least one visit to the pediatric unit during the study period. Exclusion criteria included caregivers of critically ill children or those unable to provide informed responses.
2. Healthcare providers (n = 24), consisting of 10 physicians and 14 nurses working in pediatric units. All providers were full-time staff at SUTH during the study period.

The sample size was calculated based on a minimum population proportion approach for a finite population, aiming for 95% confidence and a 5% margin of error. An oversampling strategy was used to ensure representation across the clinic types.

Definition and Role of Telemedicine in This Study

In this context, telemedicine refers to the use of telecommunications technology to provide clinical healthcare services remotely, including virtual consultations, follow-up appointments, and caregiver education. Although telemedicine was not yet implemented in routine care at SUTH, the study included a structured assessment of perceptions, needs, and expectations related to potential telemedicine adoption.

Data Collection and Questionnaire

The questionnaire was designed to systematically examine the current status, challenges, and needs of primary caregivers for children receiving services at SUTH. Quality validation was conducted by having experts review the questionnaire's content validity and calculating the Index of Consistency (IOC). The questionnaire was then piloted, and its reliability was assessed using Cronbach's alpha, resulting in a reliability score of 0.92. It comprised four sections:

1) Personal Information: This section collected demographic and relational information concerning the caregivers of the child patients. Details included caregiver age, gender, occupation, average family income, relationship to the child, the child's age, purpose of visit, and frequency of visits. For healthcare providers, data collection focused on distinct professional attributes, including gender, occupational role, and years of professional experience.

2) Problems and Needs: This section assessed the challenges and needs associated with accessing pediatric healthcare services through a set of 10 items. Respondents provided their perspectives on current issues and

unmet needs regarding the healthcare services offered by the pediatric department. Responses were recorded on a 4-point Likert scale, with "4" indicating strong agreement and "1" indicating strong disagreement.

3) Satisfaction with Healthcare Services: This section evaluated satisfaction levels across five domains of service quality, covering 19 items. The domains included (1) ease of access to services, (2) quality of medical care, (3) service timeliness, (4) medical equipment and general environment, and (5) overall satisfaction with the pediatric department. Responses were rated on a 4-point Likert scale, where "4" indicated the highest satisfaction and "1" the low.

4) Opinions on Telemedicine Services: This section gathered insights into caregivers' experiences with telemedicine services, their expectations of these services, and their encounters with patient care technologies.

A data collection form was used by trained research assistants to administer the questionnaire face-to-face in waiting areas. Participants provided written informed consent, and ethical approval was obtained from the Human Research Ethics Committee of SUTH (COA No. 78/2566).

Statistical analysis

The researcher employed Version 26 of the Statistical Package for the Social Sciences (SPSS) to conduct the data analysis. The data encompassed both problems and needs and satisfaction with healthcare services, enabling the calculation of mean scores and standard deviations across each dimension for both child caregivers and healthcare providers. Furthermore, respondents' personal information and opinions on telemedicine services were analyzed using frequency and percentage distributions. The interpretation of mean scores was categorized as follows:

- 4.21 – 5.00: Indicates that the highest level.
- 3.41 – 4.20: Indicates a high level.
- 2.61 – 3.40: Indicates a moderate level.
- 1.81 – 2.60: Indicates a low level.
- 1.00 – 1.80: Indicates the lowest level.

Results

Personal Information of Child Caregivers and Healthcare Providers

The majority of caregivers accompanying pediatric patients to receive services were female (90.63%), predominantly within the age range of 20 to 40 years (73.12%). Occupationally, 30.00% of these caregivers were laborers, while 22.50% held positions as government officials. These caregivers were primarily the parents of the children in care. The primary motivations for seeking services included vaccination (40.00%) and follow-up treatment (11.88%). Service utilization patterns indicated that 31.87% of caregivers accessed services between one to three times, while 16.88% had visited between four and six times. The majority of healthcare providers were female, representing 87.50% of the workforce. Of these providers, 41.67% were physicians, 29.17% were nurses, and 20.83% were nurse assistants. Regarding professional experience, 41.67% of providers had over five years of experience, 29.17% had between three to five years, and 20.83% had less than one year of experience. These details are presented in Table 1.

Table 1 Personal Information of Child Caregivers and Healthcare Providers

Personal Information		Number	%
Child Caregivers			
Gender	Male	15	9.37
	Female	145	90.63
Age	Under 20 years	4	2.50
	20 – 30 years	57	35.62
	31 – 40 years	60	37.50
	41 – 50 years	8	5.00
	51 – 60 years	10	6.25
	Over 60 years	2	1.25
Occupation	Farmer	4	2.50
	Self-employed	21	13.12
	State enterprise employee	2	1.25
	Laborer	48	30.00
	Government official	36	22.50
	Housewife	27	16.88
	Not specified	22	13.75
Relationship	Father or Mother	147	91.88
	Grandfather or Grandmother	9	5.63
	Aunt	2	1.25
	Not specified	2	1.25
Purpose of Visit	Illness/discomfort	4	2.50
	Developmental follow-up	8	5.00
	Nutritional follow-up	12	7.50
	Follow-up treatment	28	17.50
	Vaccination	64	40.00
	Pregnant women care	19	11.88
	Others	25	15.63
Number of Visits	1 – 3 times	51	31.87
	4 – 6 times	27	16.88
	7 – 10 times	14	8.75
	Over 10 times	6	3.75
	Not specified	62	38.75
Healthcare Providers			
Gender	Male	3	12.50
	Female	21	87.50
Occupational Role	Doctor	10	41.67
	Nurse	7	29.17
	Nursing Assistant	5	20.83
	Other	2	8.33
Years of Professional Experience	Less than 1 year	5	20.83
	1 – 2 years	2	8.33
	3 – 5 years	7	29.17
	More than 5 years	10	41.67

Problems and Needs Regarding Current Healthcare Services

The perceived problems and needs regarding current healthcare services were examined from the perspectives of child caregivers and healthcare providers. For child caregivers, the most commonly identified issues rated at a low level included (i) the time it takes to travel to the hospital (2.18 ± 1.04), (ii) the long waiting time to receive medical treatment (2.28 ± 1.07), (iii) the cost of travel-related expenses (1.86 ± 0.98), and (iv) difficulty accessing hospital services (1.91 ± 1.04). Several factors were rated at a moderate level, including (i) the necessity of hospital visits for non-severe conditions (2.63 ± 1.15), (ii) the perceived similarity between online consultations and in-person visits (2.97 ± 1.12), (iii) the ability to schedule convenient appointment times (3.12 ± 0.98), (iv) the importance of in-hospital confirmation check-ups (3.03 ± 1.16), (v) the availability of medication delivery services (2.99 ± 1.16), and (vi) the implementation of telemedicine systems (3.16 ± 1.14). Healthcare providers also identified several needs and challenges at a moderate level, including (i) travel time to the hospital (3.00 ± 0.88), (ii) travel expenses (2.79 ± 0.77), (iii) difficulty accessing hospital services (2.63 ± 0.77), (iv) the similarity between online consultations and in-person visits (2.38 ± 0.87), (iv) appointment scheduling convenience (3.04 ± 0.85), (v) the availability of medication delivery services (3.00 ± 0.65), and (vi) the implementation of a telemedicine service system (2.83 ± 0.81). These details are presented in Table 2.

Table 2 Problems and Needs Regarding Current Healthcare Services of Child Caregivers and Healthcare Providers

Problems and Needs	Child Caregivers		Healthcare Providers	
	Mean±S.D.	Level	Mean±S.D.	Level
1) Takes a long time to travel to the hospital.	2.18±1.04	Low	3.00±0.88	Moderate
2) Takes a long time waiting to receive medical treatment.	2.28±1.07	Low	–	–
3) Incurs travel-related expenses for receiving healthcare services at the hospital.	1.86±0.98	Low	2.79±0.77	Moderate
4) The health condition of the patient is not severe enough to necessitate a hospital visit unless special tests or injections are required.	2.63±1.15	Moderate	–	–
5) Difficulty in accessing services at the hospital.	1.91±1.04	Low	2.63±0.77	Moderate
6) Online consultations and in-person visits at the hospital provide similar healthcare services.	2.97±1.12	Moderate	2.38±0.87	Moderate
7) Allows for selecting a convenient time for the doctor's appointment.	3.12±0.98	Moderate	3.04±0.85	Moderate
8) Undergoes in-hospital confirmation check-ups when deemed necessary by the doctor.	3.03±1.16	Moderate	–	–
9) There should be a service for delivering medications to the home.	2.99±1.16	Moderate	3.00±0.65	Moderate
10) The hospital should implement a telemedicine service system.	3.16±1.14	Moderate	2.83±0.81	Moderate

Satisfaction with Healthcare Services

The levels of satisfaction with healthcare services were assessed based on reports from child caregivers and healthcare providers across five key dimensions. Child caregivers expressed high satisfaction with the ease of access to services (3.46 ± 0.58) and the quality of medical care (3.51 ± 0.47), while healthcare providers

rated the ease of access to services (3.25 ± 0.63) and the quality of medical care (3.09 ± 0.32) with both aspects at a moderate level. Both groups reported moderate satisfaction with service timeliness (caregivers: 3.35 ± 0.67 ; providers: 3.04 ± 0.44), the adequacy of medical equipment and the general environment (3.67 ± 0.40 and 2.98 ± 0.38), and overall satisfaction with the pediatric department (3.63 ± 0.48 and 3.08 ± 0.40). These details are presented in Table 3.

Table 3 Satisfaction with Healthcare Services of Child Caregivers and Healthcare Providers

Satisfaction with Healthcare Services	Child Caregivers		Healthcare Providers	
	Mean±S.D.	Level	Mean±S.D.	Level
1) Ease of access to services	3.46 ± 0.58	High	3.25 ± 0.63	Moderate
2) Quality of medical care	3.51 ± 0.47	High	3.09 ± 0.32	Moderate
3) Service timeliness	3.35 ± 0.67	Moderate	3.04 ± 0.44	Moderate
4) Medical equipment and general environment	3.67 ± 0.40	Moderate	2.98 ± 0.38	Moderate
5) Overall satisfaction with the pediatric department.	3.63 ± 0.48	Moderate	3.08 ± 0.40	Moderate

Opinions on Telemedicine Services

A comprehensive overview of child caregivers' perceptions regarding telemedicine services shows that a significant proportion of respondents (79.05%) reported a lack of familiarity with telemedicine services, while only 20% indicated familiarity. A small fraction (0.95%) did not specify their level of awareness. In terms of utilization, a substantial majority (91.43%) had not previously used telemedicine services, whereas only 7.62% had prior experience with them. Caregivers' expectations of telemedicine focused primarily on its potential to enhance service accessibility (54.35%) and reduce waiting times (30.43%), with 15.22% expressing alternative expectations. Additionally, 43.44% of caregivers reported experience with patient care innovations through the LINE application, 36.07% utilized QR codes for educational content, and 20.49% accessed information via educational pamphlets. These details are presented in Table 4.

Table 4 Opinions on Telemedicine Services of Child Caregivers

Opinions on Telemedicine Services	Number	%
Awareness of Telemedicine Services		
Familiar with telemedicine services	32	20.00
Not familiar with telemedicine services	126	79.05
Not specified	2	0.95
Experience Using Telemedicine Services		
Has used telemedicine services	12	7.62
Has never used telemedicine services	146	91.43
Not specified	2	0.95
Expectations for Telemedicine Services		
Increases convenience in accessing services	25	54.35
Helps reduce waiting time	14	30.43
Other	7	15.22
Experience Using Patient Care Innovations		
LINE Application	53	43.44
QR code for educational content	44	36.07
Educational pamphlet	25	20.49

Discussion

Due to the increasing patient load, the hospital is experiencing delays in service delivery, resulting in long waiting times. To address these challenges, the hospital is considering implementing telemedicine services in the Pediatrics Department, aligned with its E-health strategic plan. To support comprehensive and effective pediatric care, the hospital surveyed and assessed issues, needs, and stakeholders' satisfaction levels related to its pediatric services, to enhance the Smart Well Child Center at SUTH. The findings revealed several key insights concerning the challenges, needs, and satisfaction levels associated with current pediatric healthcare services. Child caregivers reported relatively low levels of concern regarding travel time, waiting time, travel expenses, and access to hospital services. However, they expressed moderate needs for service improvements, particularly in the areas of online consultations, flexible appointment scheduling, and home medication delivery. In contrast, healthcare providers perceived travel-related challenges and access barriers as more significant, reflecting their deeper understanding of systemic limitations. Both groups acknowledged the need for telemedicine, although caregivers generally reported higher satisfaction across all five assessed service dimensions, including quality of care and ease of access. Furthermore, while most caregivers lacked prior experience with telemedicine, many anticipated its benefits and demonstrated a readiness to adopt it through familiar digital tools such as the LINE application, QR codes, and educational pamphlets.

The problems and needs regarding current healthcare services at SUTH were reported by child caregivers, at low levels of concern, to include travel time, waiting time, travel costs, and access to hospital services. However, they indicated moderate needs in areas such as online consultations, appointment flexibility, and telemedicine implementation. Healthcare providers, in contrast, rated travel-related challenges and access issues at a moderate level, reflecting a greater awareness of systemic barriers. Both groups expressed moderate support for service enhancements, including telemedicine systems and medication delivery services. The study's findings align with hospital data, which show long wait times. For example, the average wait time for pediatric vaccination services is 1 hr, 52 min, while waiting for examinations can take up to 1 hr, 32 min. Both caregivers and healthcare providers perceived challenges for patients in accessing services, such as high travel expenses, extended wait times, and difficulties with service access. As a result, both groups expressed a strong demand for telemedicine, along with clear preferences for online consultations, flexible appointment scheduling, and home medication delivery services. This is consistent with previous studies, which found that although patients and physicians agree that telemedicine cannot fully replace in-person care, it offers convenience and reduces travel time. However, challenges remain, such as platform quality and disparities in patients' access to technology. Additionally, healthcare service users have expressed concerns about technological limitations, challenges with online physical examinations, and potential quality issues in remote care (Raina et al., 2021; Antonacci et al., 2023; Zimmermann et al., 2023). Although telemedicine has been widely researched, real-world implementation remains challenging. Therefore, its adoption should include an assessment of stakeholders' needs to ensure sustainable telemedicine integration. Such an assessment would improve understanding of the issues, requirements, and impact of telemedicine on patient care (AlDossary et al., 2017; Kho et al., 2020; Blackburn & Nuzhat, 2024).

The study assessed satisfaction levels with pediatric healthcare services across five key dimensions: 1) Ease of access to services 2) Quality of medical care 3) Service timeliness 4) Medical equipment and general

environment and 5) Overall satisfaction with the pediatric department. Child caregivers reported high satisfaction with ease of access and quality of medical care. These findings suggest that caregivers perceive these aspects of healthcare more favorably. Overall, the data indicate that child caregivers have a positive perception of healthcare services in most areas assessed. These findings align with previous studies, which have also reported high satisfaction among caregivers; often attributed to reduced travel time, improved communication with healthcare providers, and the overall quality of care (Nguyen et al., 2020; Kodjebacheva et al., 2023). The consistently high ratings from caregivers reinforce the notion that user experience in pediatric healthcare is strongly influenced by perceived accessibility and the effectiveness of medical treatment. In contrast, healthcare providers rated these same areas at a moderate level, likely due to their direct involvement in care delivery and quality assurance. Both groups expressed moderate satisfaction with service timeliness, the adequacy of medical equipment and the general environment, and overall satisfaction with the pediatric department. This is consistent with previous studies, which have shown that healthcare providers often report lower satisfaction than patients or caregivers due to a deeper awareness of systemic limitations, workload pressures, and resource constraints (Zimmermann et al., 2023; Blackburn & Nuzhath, 2024). The moderate satisfaction among providers may reflect ongoing challenges in delivering timely and well-resourced care, highlighting the need for continued quality improvement efforts in pediatric service delivery.

The comprehensive overview of child caregivers' perceptions regarding telemedicine services explores dimensions such as awareness, utilization, expectations, and innovations. Only 20% of respondents reported being familiar with telemedicine services. A substantial majority had not previously used telemedicine, with only 7.62% having prior experience. This may be because the term 'telemedicine' is relatively new and unfamiliar to child caregivers. Additionally, 43.44% of caregivers reported engaging with patient care innovations through the LINE application, 36.07% utilized QR codes for educational content, and 20.49% accessed information via educational pamphlets. These findings suggest a general lack of familiarity with telemedicine among caregivers while emphasizing anticipated benefits and a willingness to adopt digital tools to enhance patient care. Consistent with previous studies, telemedicine interventions show high potential for pediatric patients with four clinical conditions: diabetes, asthma, epilepsy, and other chronic illnesses. Both patients and caregivers responded positively, reporting benefits despite limitations in measuring standard clinical outcomes (Southgate et al., 2022). A comprehensive telemedicine system enhances healthcare access for vulnerable groups, improves coordination between patients and medical personnel, addresses safety concerns, and builds trust in telemedicine (Talal et al., 2020).

In this study, child caregivers expressed concerns regarding travel time, waiting time, travel expenses, and access to hospital services. This is consistent with their reported high levels of satisfaction in areas such as ease of access and quality of care. In response to these challenges, most caregivers recognized the value and potential of appointment scheduling features in mobile applications and telemedicine services as primary solutions. They identified several advantages of telemedicine, including time savings, convenience, and reduced costs related to the treatment and care of children with special needs. The majority of caregivers were willing to adapt to and accept these changes (Fiks et al., 2021; Wang et al., 2020; Milne Wenderlich & Herendeen, 2021; Curfman et al., 2022). Healthcare providers also perceived travel-related challenges and access barriers as significant concerns, although they rated all areas at a moderate level of satisfaction. Telemedicine offers several advantages, including enabling remote assessment and monitoring of symptoms, improving care quality, and reducing the

workload on hospital staff (Esposito et al., 2023). It can also help reduce disparities in healthcare access, especially in areas lacking pediatric specialists. Telemedicine is a critical infrastructure that supports effective and cost-efficient pediatric healthcare in the long term (Curfman et al., 2021; Tisnanga & Kyongo, 2023). It presents an attractive option for advancing pediatric healthcare services by enhancing efficiency, reducing travel burdens, and promoting sustainable access to care (Abdulwahab & Zedan, 2021; World Health Organization, 2021; Ye & Beestrum, 2023). However, implementation challenges remain, including the lack of in-person interaction, concerns about data security, and the potential for diagnostic inaccuracies (Kodjebacheva et al., 2023). This study, while offering valuable insights into stakeholder perceptions of pediatric healthcare services and telemedicine at SUTH, has several limitations that should be acknowledged. First, it was conducted in a single hospital setting, which may limit the generalizability of the findings to other institutions with different patient populations or resource levels. Second, the use of self-reported questionnaires introduces potential response bias, as caregivers may have overstated their satisfaction or understated concerns due to social desirability.

Conclusion and Suggestions

In summary, this study identified several key challenges in pediatric service delivery at SUTH, including long wait times, travel-related burdens, and limited service flexibility. Although child caregivers expressed high satisfaction with the quality of care and ease of access, they also indicated a moderate need for improvements, particularly in areas such as telemedicine, flexible appointment scheduling, and home medication delivery. Healthcare providers, while moderately satisfied, pointed to deeper systemic barriers affecting service delivery. Despite limited prior experience, most caregivers demonstrated a strong willingness to adopt telemedicine, recognizing its potential to enhance convenience, reduce costs, and improve access. These findings support the strategic implementation of telemedicine in alignment with the hospital's E-health initiatives. To further improve healthcare accessibility and efficiency, it is crucial to continuously innovate and refine service delivery systems. Key areas for development include reducing waiting times, actively involving patients and families in care planning, and ensuring convenience throughout the care experience. Addressing these needs holistically can lead to higher patient satisfaction and better health outcomes.

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Author Contributions

Naporn Uengarporn: Provided the initial ideas and overall direction for the research. Designed the research framework and methodologies. Drafted the manuscript sections on the introduction and methodology. Conducted the final review and refinement of the manuscript.

Teerapat Saengthongpitak: Conducted key investigations and collected relevant data.

Poonyanuch Chongjaroenjai: Coordinated resources and facilitated access to the required materials.

Atcha Pongpitakdamrong: Coordinated resources and facilitated access to the required materials.

Wutthipong Sriratthnarak: Ensured access to essential research materials and reviewed drafts for coherence and clarity.

Phonpimon Rianterasak: Contributed input to the research objectives.

Kanyarat Mongkolkul: Assisted in refining methodologies to improve accuracy.

Paninun Srinuchasart: Supported data collection and management.

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Nicharee Mungklang: Supported data collection and management.

Raiwada Sanguantrakul: Supported data collection and management.

Pattama Tongdee: Conducted a critical review of the manuscript for technical accuracy.

Wichulada Kiatmongkol: Contributed to the discussion and conclusion sections.

Boonyanulak Sihaklang: Contributed to the discussion and conclusion sections.

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Conflict of Interests

All authors declare that they have no conflicts of interest.

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