Perceived Effectiveness, Financial Viability, Barriers, and Opportunities of a Pediatric Telemedicine Service in Negros Occidental

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ABSTRACT. Accelerated by the pandemic, telemedicine offers significant potential for pediatric care in Negros Occidental, yet it faces distinct implementation hurdles. This study evaluated its effectiveness, barriers, and financial viability through a survey of 160 pediatricians and a financial analysis of ten private clinics. Findings reveal that while physicians value telemedicine for its convenience and ability to reach remote patients, they consider it less effective for diagnosis than in-person examinations. Widespread adoption is further hindered by inadequate equipment, and legal concerns. Conversely, financial data indicates promising profitability and long-term sustainability for clinics. To unlock telemedicine's full potential, the study recommends prioritizing infrastructure improvements and advanced diagnostic training to bridge current gaps. Future research should focus on validating virtual diagnostic tools and establishing robust regulatory frameworks, ensuring that telemedicine becomes a reliable, sustainable model for expanding healthcare access in underserved communities.

1.0. Introduction

Telemedicine utilizes electronic and telecommunication technologies like phone calls, chat, SMS, and video conferencing to deliver healthcare remotely between patients and physicians (PPS, 2021). The COVID-19 pandemic significantly accelerated its adoption, with a 154% increase in US telemedicine usage in March 2020 compared to the previous year (Koonin, 2020), and a 766% surge in telemedicine encounters among privately insured working-age individuals in the initial three months of the pandemic (Shaver 2022; Coibion, 2020). While recent technological advancements have enhanced healthcare efficiency globally (Ting, 2020), telemedicine faces challenges such as clinical uncertainty, the need for robust technology infrastructure, cybersecurity risks, and regulatory limitations (McMaster, 2021).

In the context of Southeast Asia (ASEAN), pediatric practice is undergoing significant transformation. The adoption of electronic health records (EHRs) and patient portals, mirroring trends observed globally (Contemporary Pediatrics, 2021), is contributing to this evolution. This digital integration is particularly pertinent given Asia's surging population and the projected substantial increase in healthcare expenditures over the next decade (Raghavan, 2021), both of which are driving a rise in the pediatric patient population. Coupled with rapid advancements in internet speeds across Asia (Siriwardhana, 2020), these factors create a fertile ground for telemedicine. Telemedicine, by enabling remote communication without delay, emerges as a promising and viable solution to address the growing demands and challenges facing pediatric healthcare in the region (Macariola, 2021).

In the Philippines and other Southeast Asian countries, telehealth guidelines have been developed, acknowledging telemedicine as a crucial element for enhancing healthcare systems (Intan Sabrina, 2021; Fermin, 2021). Locally, the Universal Health Care Program (Republic Act No. 11223) of the Department of Health has established guidelines for telemedicine practice and standardization, directing local government units to integrate these technologies into their health systems for delivering individual-based services within their jurisdictions. Furthermore, the Philippine Pediatric Society (PPS) published a telemedicine manual in

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January 2021 specifically addressing the ethical considerations in pediatric practice, which guides pediatric residents in PPS Hospital Accreditation Board (HAB) accredited hospitals when implementing telemedicine for children and adolescents. These advancements in telemedicine have significantly enabled remote patient monitoring, expanding the reach and accessibility of healthcare (Malasinghe, 2019; Ahmad, 2021).

Locally, pediatric practice in Negros Occidental has been expanding, supported by a well-established organization with 150 members providing both general and subspecialty care across the province. Despite this growth and the local clinicians' appreciation for telemedicine, its use has been limited. A primary barrier is the inconsistent internet speed in the region (NEDA, 2019). While telemedicine has demonstrated its value in local applications like tele-audiology (Arriola, 2021) and tele-oncology (Cruz-Lim, 2021), and pediatricians have expressed their willingness to adopt it (PPS Manual January 2021), a lack of unified protocols and established guidelines from the Philippine Pediatric Society currently hinders its widespread and standardized implementation.

Despite the growing use and perceived benefits of telemedicine, a significant gap remains in understanding its full potential, particularly from the clinician's perspective regarding financial viability and sustainability. While studies have explored patient satisfaction and the general profitability from a patient or center-based view (Vargas, 2024; Arriola, 2021; Macariola, 2021), there is a notable lack of comprehensive research in medical literature addressing the specific cost-effectiveness and financial aspects for healthcare providers. Furthermore, while the rapid adoption of telemedicine in Southeast Asia has required swift adjustments to consultation practices (Vargas, 2024; Pengput, 2022), robust research establishing a high degree of evidence for its benefits in lower- and moderate-income countries is still crucial (Macabasag, 2016; Haynes & Marcin, 2022). Therefore, further research is needed to refine the application of emerging technologies, assess their financial implications for clinicians, and develop robust protocols for sustainable implementation (McMaster, 2021).

Hence, this study aimed to comprehensively assess pediatric telemedicine services in Negros Occidental from the perspective of medical doctors, specifically determining their effectiveness in terms of use, purpose, and consultation, as well as their financial viability regarding liquidity and profitability. By identifying local barriers and opportunities, the findings served as the basis for a proposed Strategic Plan designed to enhance current services and guide pediatricians in utilizing telemedicine as a sustainable supplementary income stream.

2.0. Theoretical Framework

This study theorized that the effectiveness and financial viability of pediatric telemedicine, along with the maximization of its opportunities and mitigation of its barriers, are directly tied to the acceptance and use of technology. A core assumption is that user adoption of new technological innovations like telemedicine hinges on a comprehensive understanding of the technology itself. It's expected that inherent resistance to new technologies will naturally diminish as more individuals progressively utilize them. Economically, the study posits that telemedicine can achieve viability if its overall effectiveness and benefits demonstrably outweigh its associated costs.

The theoretical support is anchored firmly on Venkatesh's Unified Theory of Acceptance and Use of Technology (UTAUT) and Dearing's (2018) Diffusion of Innovations Theory. These frameworks are crucial for understanding how patients embrace new technologies. The study anticipates that increased utilization of telemedicine by both physicians and patients will lead to greater user comfort and easier adoption. Furthermore, the introduction of telemedicine as a novel service will inherently expose existing barriers while simultaneously revealing new avenues for improvement and expansion. The widespread adoption and resulting benefits from this new technology are expected to propel its diffusion and foster further innovation.

These theories are particularly relevant as they explain the dynamics of telemedicine adoption and its economic implications. The study hypothesizes that patients will rapidly and fully embrace telemedicine services once they gain a complete understanding and familiarity with the underlying technology. This accelerated diffusion and expanded user base are directly linked to the eventual financial viability of telemedicine services. This theoretical underpinning guides the assessment of perceived effectiveness, the identification of barriers and opportunities, and the analysis of telemedicine's potential financial viability. Additionally, the study incorporates the concept of viability as the dynamic adaptation of uncertain evolutionary systems to their environments, suggesting that patients must adapt to constraints like resource scarcity and supply-demand imbalances to navigate healthcare challenges effectively through telemedicine.

The study is further anchored by Rogers' Diffusion of Innovations Theory (1962), which elucidates how new technologies are adopted and spread throughout a population. This theory explains the rapid uptake of telemedicine by patients as the technology progresses through various stages of absorption. It helps to

understand why patients, including the specific demographic of pediatric patients, might increasingly prefer telemedicine once it is fully introduced and firmly established within society. This theoretical framework is particularly useful for assessing and predicting the adoption of telemedicine services (Mahmoud, 2022), providing crucial insights into patient decision-making regarding its use.

Applied to telemedicine, the Diffusion of Innovations Theory predicts its swift transition from initial introduction to widespread adoption. This theoretical lens will also clarify patient preferences and approaches to utilizing telemedicine services in the local setting. As this new service is introduced, it is expected to reveal both existing barriers and new opportunities once the technology meets societal expectations. Understanding these dynamics is crucial for enhancing the financial viability of pediatric telemedicine, maximizing its potential, and addressing obstacles to its adoption. Ultimately, this will contribute to pediatric telemedicine becoming a vital consultation service in Negros Occidental, as it can explain patient responses to what is necessary for the survival of the social organization, aligning with how laws and cultural codes are devised to provide psychological and economic means of survival and conflict avoidance (Aubin, 2021).

3.0. Methodology

Research design. This study employed a descriptive research design to comprehensively assess pediatric telemedicine services in Negros Occidental. The primary objective was to assess the perceived effectiveness of these services from the perspective of medical doctors, specifically examining their use, purpose, and consultation modalities. Additionally, the study utilized this descriptive approach to analyze the financial viability of telemedicine services, considering both their liquidity and profitability, and to identify the key barriers and opportunities for their development within the local setting.

Respondents. The study employed purposive sampling to select 160 members of the Philippine Pediatric Society in Negros Occidental as respondents of the study. To ensure the relevance and expertise of participants, only active diplomate and fellow members of the society were included in the study.

Research instrument. To assess clinicians' perceptions of telemedicine's adaptability and effectiveness, this study utilized a researcher-developed questionnaire divided into three sections—use, purpose, and consultation service—which respondents completed in approximately 15 minutes. The instrument underwent rigorous psychometric testing, establishing content validity through Lawshe's (1975) Content Validity Ratio (CVR) with ten experts in Pediatrics and Business Administration, yielding an index of 0.80. Furthermore, reliability was confirmed through a pilot test with 30 non-participant individuals, resulting in a Cronbach's alpha score of 0.87.

Scale of Interpretation for the Perceived Effectives of Pediatric Telemedicine

Scale	Mean Range	Verbal Description	Verbal Interpretation
4	3.25 - 4.00	Very High	Pediatric medicine demonstrates exceptional perceived effectiveness with widespread and appropriate use, consistently achieving its intended purpose of promoting child health, and offering readily accessible and highly valued consultation services.
3	2.50 - 3.24	High	Pediatric medicine shows strong perceived effectiveness with generally appropriate use, typically fulfilling its purpose in child healthcare, and providing accessible and beneficial consultation services.
2	1.75 – 2.49	Low	Pediatric medicine exhibits limited perceived effectiveness with potential issues in appropriate use, inconsistent achievement of its intended health outcomes for children, and consultation services that may be infrequent or less helpful.
1	1.00 – 1.74	Very Low	Pediatric medicine displays minimal perceived effectiveness with significant challenges in proper use, rarely meeting its goals for pediatric health, and consultation services that are largely unavailable or ineffective.

Data collection procedure. Data collection commenced after securing consent from the Philippine Pediatric Society Negros Occidental Chapter president and obtaining ethics approval to access the member database in compliance with the Data Privacy Act of 2012. During a scheduled business meeting, a 15-minute orientation was conducted, after which members completed the validated questionnaire either physically or digitally via the Society's website. The Society's secretary then collected and transferred all submissions to the researcher using a double-encrypted USB drive to ensure security prior to statistical analysis. Additionally, financial statements were obtained from 10 local pediatric clinics providing telemedicine services, with strict adherence to signed consent and data privacy protocols.

Table 1

Distribution of Respondents

PPS Negros Occidental Members	N	%
Bacolod	135	84.30
North Negros	15	9.40
South Negros	10	6.30
Total	160	100.0

Data analysis procedure. Data from the study were subjected to rigorous descriptive and financial analyses with expert statistical guidance. To assess the effectiveness of telemedicine services, primary data were evaluated using a 4-point Likert scale, mean,

standard deviation, and percentage distributions, while barriers and opportunities were analyzed through frequency counts and ranking. Concurrently, the study determined financial viability by computing liquidity and profitability ratios using local financial data, which were benchmarked against national figures from the Economic Research Institute to accurately gauge the financial health of the local pediatric telemedicine sector.

Ethical considerations. Adhering to Philippine Health Research Ethics Board (PHREB) guidelines, this self-funded study by a qualified pediatrician and MBA student ensures high ethical standards while delivering significant social value by aligning pediatric telemedicine with Universal Health Care reimbursement policies (PhilHealth 2021-0001). With voluntary informed consent secured from non-vulnerable participants—specifically fellows of the Philippine Pediatric Society (PPS) Negros Occidental Chapter—the research prioritized privacy and confidentiality through strict data security and disposal measures. The study utilized purposive sampling to ensure relevance, presenting no physical risks while offering benefits such as service standardization and financial guidance for physicians. To foster transparency and community involvement, findings were shared with both local and national PPS bodies to update post-pandemic protocols, published for broader clinical application, and conducted with adequate resources and no conflict of interest.

4.0. Results and Discussion

Level of perceived effectiveness of pediatric telemedicine services in terms of use

As shown in Table 2, physicians rated the overall effectiveness of pediatric telemedicine services in terms of use as "high" (M=3.06, SD=1.22). Physicians in Negros Occidental specifically highlighted practical logistical benefits, rating the system's ability to "cater to the virtual consultation needs of the patient" (M=3.32, SD=1.10) and "save time traveling to the clinic" (M=3.30, SD=1.20) with very high effectiveness. Furthermore, respondents strongly agreed that telemedicine is a "useful way to reach patients" ($M=3.28, SD=1.10$). These findings indicate that physicians view telemedicine as highly effective for adapting to modern healthcare demands and extending access to care beyond traditional in-person visits.

This local perspective aligns with recent broader studies demonstrating the increasing acceptance of pediatric telemedicine due to convenience, time savings, and improved access to specialized care (Mateus et al., 2023; Love et al., 2022). While its value was proven during the COVID-19 pandemic by ensuring continuity of care (Choo et al., 2021), successful integration requires addressing provider biases and engaging staff in planning (Sauers-Ford et al., 2019). The appropriateness of telemedicine remains context-dependent, varying by clinical situation, caregiver demographics, and technological familiarity (Taylor & Portnoy, 2019; Bajwa et al., 2024; Ostrowski-Delahanty et al., 2022). Additionally, ongoing challenges include disparities in technology access, concerns regarding virtual examination thoroughness, and legal considerations (Tully et al., 2021; Bajwa et al., 2024).

Table 2

Level of perceived effectiveness of pediatric telemedicine services in terms of use

Items	M	SD	Interpretation
1. Telemedicine improves my access to my patients.	2.93	1.18	High
2. Telemedicine saves me time traveling to clinic.	3.30	1.20	Very high
3. Telemedicine caters for the virtual consultation needs of my patients	3.32	1.10	Very high
4. It was simple to use telemedicine.	2.98	1.33	High
5. It was easy to learn to use the system.	2.86	1.22	High
6. It is easy to adapt using this system.	2.86	1.24	High
7. The way I interact with my patient is pleasant.	3.08	1.20	High
8. It will definitely be a useful way to reach my patients.	3.28	1.10	Very high
9. The system is simple and easy for patients to understand.	2.92	1.21	High
10. The patient can easily be reached using the telemedicine system.	3.03	1.16	High
Whole	***3.06***	***1.22***	***High***

Note: 1.00-1.75 Very low, 1.76-2.50 Low, 2.51-3.26 High, and 3.27-4.00 Very high

Level of perceived effectiveness of pediatric telemedicine services in terms of purpose

As presented in Table 3, physicians rated the overall effectiveness of pediatric telemedicine services regarding purpose as "high" (M = 3.19, SD = 1.20). This positive assessment is particularly evident in accessibility; respondents rated the system as "very high" in effectiveness for saving time in hard-to-reach areas (M = 3.41, SD = 1.12), enabling check-ups when the doctor is in a different country (M = 3.39, SD = 1.12), and addressing physician shortages (M = 3.34, SD = 1.17). These findings indicate that physicians in Negros Occidental perceive telemedicine as a vital tool for overcoming geographical barriers, maintaining continuity of care across distances, and optimizing healthcare resource allocation.

These results align with broader research confirming that telemedicine significantly improves access and efficiency, especially in underserved regions (Chandler et al., 2020; Saleh & Alghaeed, 2025). The modality is effective in managing various pediatric conditions, including emergencies, facilitating real-time specialist consultations, and reducing unnecessary patient transfers (Barbosa et al., 2021; Saleh

Table 3

Level of effectiveness of pediatric telemedicine services in terms of purpose

Pediatric Telemedicine Purpose	M	SD	Interpretation
1. Telemedicine can reach more patients previously out of my scope.	3.10	1.15	High
2. Telemedicine saves patients time in hard-to-reach areas.	3.41	1.12	Very high
3. The service speeds up referral and laboratory result interpretations.	3.22	1.09	High
4. The system is useful for follow up and patient monitoring.	3.23	1.24	High
5. The visits provided over the telemedicine system can be financially rewarding to patients.	3.05	1.16	High
6. Telemedicine can be used to check on my patients even if I'm in the different country.	3.39	1.12	Very high
7. The system is useful in addressing physician shortage.	3.34	1.17	Very high
8. The service speeds up referral of patients for subspecialty consult.	3.18	1.20	High
9. The system is useful for early diagnosis and disease intervention.	3.04	1.28	High
10. Telemedicine can provide wide variety of service with Observance to data privacy and data breech.	2.95	1.23	High
Whole	***3.19***	***1.20***	***High***

Note: 1.00-1.75 Very low, 1.76-2.50 Low, 2.51-3.26 High, and 3.27-4.00 Very high

& Alghaeed, 2025). While challenges such as technical difficulties, provider hesitation, and licensing issues persist (Chandler et al., 2020; Tully et al., 2021), addressing these barriers is crucial for maximizing the system's benefits (Sauers-Ford et al., 2019; Tully et al., 2021). Despite some preference for in-person visits, overall satisfaction with well-implemented telemedicine services remains high among both providers and families (Tully et al., 2021; Alnasser et al., 2024).

Level of perceived effectiveness of pediatric telemedicine services in terms of services

Physicians in Negros Occidental generally regard pediatric telemedicine as highly effective for consultation services (M=2.75, SD=1.24), with most service aspects receiving positive average ratings between 2.58 and 3.00. However, data reveals a significant limitation regarding remote diagnosis; practitioners rated their ability to diagnose effectively via telemedicine compared to in-person visits as "low" (M = 2.25, SD = 1.33). This indicates that while the overall perception of telemedicine's utility and impact remains positive among these healthcare providers, the diagnostic component presents a persistent challenge that distinguishes it from other well-regarded facets of virtual consultation.

Broader research corroborates these mixed findings, showing that while pediatric telemedicine is well-received with high satisfaction rates (Sauers-Ford et al., 2019; Tully et al., 2021), the diagnostic limitations noted by local physicians are echoed in wider literature (Zenaz Zarir Sarkari & Corey Fish, 2023; L. Tully et al., 2021). Although some studies suggest telemedicine can offer diagnostic rates comparable to in-person visits (Szigety et al., 2022) and maintain patient safety (Haimi et al., 2020), it is widely acknowledged for its ability to increase access and reduce wait times, particularly during the COVID-19 pandemic (Schweiberger et al., 2020). Moving forward, the focus must shift toward standardizing evaluation methods and addressing access disparities to ensure equitable and effective use in pediatric care (Southgate et al., 2022; Burshtein et al., 2023).

Level of perceived effectiveness of pediatric telemedicine services as a whole

The perceived effectiveness of pediatric telemedicine is generally high (M=3.00, SD=1.23), driven by strong ratings for its "Purpose" (M=3.19, SD=1.20) and "Use" (M=3.06, SD=1.22). These findings suggest that users understand and value the technology's intent and application. However, the specific "Services" provided were perceived as less effective (M=2.75, SD=1.24). This discrepancy indicates that while the concept of telemedicine is well-received, the actual delivery mechanism—potentially regarding quality, accessibility, or specific features—requires improvement to meet user expectations.

Broader research supports this promising outlook, citing high user satisfaction, improved access to specialized care, and increased efficiency (Mateus et al.,

Table 4

Level of effectiveness of pediatric telemedicine services in terms of services

Items	M	SD	Interpretation
1. The patient clearly using the telemedicine system.	2.87	1.12	High
2. The visits provided over the telemedicine system are the same as clinic visits.	2.58	1.27	High
3. Using the telemedicine system, I can diagnose effectively as well as if we met in person.	2.25	1.33	Low
4. It was user friendly for patients to use telemedicine.	2.78	1.18	High
5. It was easy for the guardians to use the system and follow instructions clearly.	2.71	1.21	High
6. Telemedicine can provide comparable results using this system than face to face consult.	2.62	1.25	High
7. Telemedicine provides easy and smooth interaction with my patients.	2.92	1.11	High
8. The system is useful for early diagnosis and patient monitoring.	2.90	1.22	High
9. The system is simple and easy for patients to understand.	2.91	1.17	High
10. Telemedicine is an easy way to instruct and prescribe medicine to my patients.	3.00	1.23	High
Whole	***2.75***	***1.24***	***High***

Note: 1.00-1.75 Very low, 1.76-2.50 Low, 2.51-3.26 High, and 3.27-4.00 Very high

2023; Love et al., 2022; Sauers-Ford et al., 2019; Laheba et al., 2023). Despite challenges such as technological issues and legal concerns (Tully et al., 2021), diagnostic accuracy remains strong, with concordance rates between 70.1% and 89% in areas like teledermatology (Burshtein et al., 2023). Acceptance is further influenced by price, facilitating conditions, and hedonic motivation (Shi et al., 2021). To maximize potential, stakeholders must improve IT infrastructure and regulatory frameworks while prioritizing patient preferences and providing adequate training (Laheba et al., 2023; Ostrowski-Delahanty et al., 2022).

Table 5

Level of effectiveness of pediatric telemedicine services as whole

Areas	M	SD	Interpretation
Use	3.06	1.22	High
Purpose	3.19	1.20	High
Services	2.75	1.24	Low
Whole	***3.00***	***1.23***	***High***

Barriers to pediatric telemedicine in Negros Occidental

Survey results highlight significant barriers to the adoption of pediatric telemedicine in Negros Occidental, most notably a severe lack of adequate equipment—such as smartphones and computers—cited by 88% of respondents. Beyond this infrastructure gap, providers expressed strong concerns regarding clinical and legal reliability: 72% questioned data and treatment accuracy, 67% feared legal risks, and 65% noted difficulties in patient assessment. Further complicating adoption are issues with data transmission accuracy (62%), privacy vulnerabilities (60%), and hindrances to family-centered care (52%). These findings collectively underscore an urgent need for investment in technology and robust regulatory frameworks to ensure data integrity and effective virtual care.

These local challenges align with broader literature on telemedicine in developing regions, where inadequate equipment and limited digital literacy remain primary obstacles (Southgate et al., 2022; Cruz & Tolentino, 2021). Healthcare providers globally echo concerns regarding technology reliability, legal implications, and remote assessment difficulties (Tully et al., 2021; Makhni et al., 2020), while infrastructure deficits and funding constraints further hinder implementation (Arora et al., 2024). Although families often prefer in-person visits, convenience can drive acceptance (Tully et al., 2021). To overcome these barriers, experts recommend clear communication of goals, staff involvement, and comprehensive training (Tully et al., 2021), alongside process adaptations that actively include patients and families in consultations (Sauers-Ford et al., 2019; Dhyani et al., 2023).

Opportunities for pediatric telemedicine in Negros Occidental

Despite identified barriers, the survey reveals significant opportunities for the growth of pediatric telemedicine in Negros Occidental. Respondents highlighted the critical need to address internet connectivity (100%) alongside telemedicine's potential to minimize the environmental footprint through digitalization (87%). The technology is highly regarded for its clinical and research utility, particularly regarding post-discharge patient monitoring (83%), measuring access to care (83%), and expanding the evidence base for medical research (82%). Furthermore, telemedicine serves as a vital hub for professional development, facilitating referrals, learning,

Table 6A

Barriers of the pediatric telemedicine services

Pediatric Telemedicine Services	f
1. Lack of adequate equipment's such as smart phones, tablets, laptop computers, and desktop computers	88
2. Accuracy of data and treatment	72
3. Potential telemedicine legal risks and implications	67
4. Patient assessment	65
5. Accuracy of data transmission	62
6. Vulnerability to privacy and security risks	60
7. Family-centered care hindrances	52
8. Expanding recognition and detection of behavioral problems in childhood	48
9. Telemedicine is a powerful modality for chronically ill patients	39
10. Payment scheme	36
11. Patient comfort and confidentiality	35
12. Telemedicine reduces/avoids any perceived stigma attached to in-person visits with clinicians	33
13. Potential viability for long term utilization	31
14. Minimizing the clinician's clinic and patient regular visit	30
15. Easy access and availability for the patients	28
16. Expanding the evidence base population of medical research	26
17. Technology adaptation, education and training	25
18. Providing accessible fast and efficient front-line care	25
19. Telemedicine can reach its full potential is when offered as a covered benefit in a health plan	23
20. Addressing health equity and quality of care in pediatric practice	23
21. Adapting clinical workflows	22
22. New alternative way in engaging pediatric patients	20
23. Pediatric multidiscipline practice hub for patient referral and learning	18
24. Videoconferencing webinars and discussions benefiting knowledge sharing between clinicians	18
25. Telemedicine could be used to check on or monitor patients post-discharge	17
26. Measuring access to care of pediatric patients	17
27. Mitigating and lessening financial impact on pediatric health care	16
28. Decrease environmental footprint through digitalization	13
29. Accuracy of physical examination	8

and knowledge sharing among clinicians via videoconferencing (82%). Additional opportunities lie in adapting clinical workflows (78%), integrating telemedicine as a covered health plan benefit (78%), and addressing health equity (77%), all of which underscore its potential to foster sustainable, accessible, and collaborative healthcare in the region.

Table 6B

Opportunities of the pediatric telemedicine services

Pediatric Telemedicine Services	f
1. Slow internet connection and connectivity	100
2. Decrease environmental footprint through digitalization	87
3. Mitigating and lessening financial impact on pediatric health care	84
4. Telemedicine could be used to check on or monitor patients post-discharge	83
5. Measuring access to care of pediatric patients	83
6. Pediatric multidiscipline practice hub for patient referral and learning	82
7. Online webinars and discussions benefiting knowledge sharing between clinicians	82
8. New alternative way in engaging pediatric patients	80
9. Telemedicine can reach full potential when offered as a covered benefit in a health plan	78
10. Adapting clinical workflows	78
11. Addressing health equity and quality of care in pediatric practice	77
12. Technology adaptation, education and training	75
13. Providing accessible fast and efficient front-line care	75
14. Easy access and availability for the patients	73
15. Minimizing the clinician's clinic and patient regular visit	70
16. Potential viability for long term utilization	69
17. Telemedicine reduces any perceived stigma attached to in-person visits with clinicians	67
18. Patient comfort and confidentiality	65
19. Payment scheme	64
20. Telemedicine is a powerful modality for chronically ill patients	61
21. Family-centered care hindrances	48
22. Vulnerability to privacy and security risks	40
23. Accuracy of data transmission	38
24. Patient assessment	35
25. Potential telemedicine legal risks and implications	33
26. Accuracy of data and treatment	28
27. Accuracy of physical examination	14
28. Lack of adequate equipment's such as smart phones, tablets, laptop computers, etc.	13
29. Expanding the evidence base population of medical research	7
30. Expanding recognition and detection of behavioral problems in childhood	5

Broader literature supports these findings, indicating that pediatric telemedicine can significantly improve healthcare access, quality, and cost-effectiveness (Curfman et al., 2022). Although challenges such as limited technology access, digital literacy (Choo et al., 2021), legal concerns, and administrative burdens exist, they can be overcome through proper planning and stakeholder involvement (Tully et al., 2021). The benefits, including reduced environmental impact and improved monitoring (Haynes & Marcin, 2022), are evident across diverse settings like primary care (Schweiberger et al., 2020), physiatry (Sukhov et al., 2020), and chronic condition management (Southgate et al., 2022). While feasibility is well-supported, further research is needed to compare clinical outcomes with traditional care (Southgate et al., 2022), and integrating telemedicine into medical education remains essential to prepare future practitioners (Macwilliam et al., 2021).

Financial viability of pediatric telemedicine services

Driven by advancements in internet and communication technologies, the rapid expansion of telemedicine has fostered increased adoption among physicians and patients while attracting significant interest regarding its financial potential (Siriwardhana, 2020). Physicians have identified specific opportunities in developing local pediatric telemedicine services, including facilitating patient follow-ups (Snoswell, 2020), improving access (Abdel-Wahab, 2020), and establishing measures for long-term sustainability (Macariola, 2021), all of which underscore the critical need to assess the financial viability of such practices. To evaluate this, the study analyzed the profitability and liquidity of ten anonymous members of the Philippine Pediatric Society Negros Occidental Chapter by examining income and liability statements from their ten most recent months of practice. The analysis proceeds under the premise that these businesses function as sole proprietorships, relying on 100% equity financing from the practitioners' personal funds.

The profit ratio serves as a key indicator of operational profitability, revealing that in the first year, Clinics 1, 3, 4, 5, 8, 9, and 10 achieved positive results ranging from 15 to 81 centavos per peso of revenue—specifically 56 centavos for Clinic 1, 73 for Clinic 3, 15 for Clinic 4, 67 for Clinic 5, 68 for Clinic 8, 81 for Clinic 9, and 41 for Clinic 10. Conversely, Clinics 2, 6, and 7 recorded net losses with negative ratios of -0.17, -0.04, and -0.08, respectively, largely driven by low annual incomes and significant rental expenses that inflated service costs. Regarding liquidity, the business maintained a strong current ratio due to personal capital funding and a lack of liabilities; however, to maximize the value of excessive idle cash, surplus funds should be allocated to short-term liquid investments or government bonds. Ultimately, while the profitable clinics demonstrated a positive Return on Investment (ROI), the negative ROI observed in Clinics 2, 6, and 7 is typical for new ventures, suggesting that with proper assessment and strategic adjustments, the telemedicine initiative retains strong potential for long-term success and sustainability.

Overall Analysis

Physicians in Negros Occidental generally perceive pediatric telemedicine as highly effective in terms of its use and purpose, aligning with the Performance Expectancy and Effort Expectancy constructs of Venkatesh's Unified Theory of Acceptance and Use of Technology (UTAUT). The positive assessment highlights its ability to save patients time traveling to clinics, cater to virtual consultation needs, and serve as a useful way to reach patients. This indicates that users understand and value what telemedicine is intended for and how it can be utilized, suggesting a strong initial acceptance of the technology due to its perceived utility and ease of operation.

However, a significant concern exists regarding the "Services" provided through pediatric telemedicine, particularly the ability to diagnose effectively as if in person. This reservation is a critical area for improvement and points to challenges related to Facilitating Conditions and Social Influence in UTAUT, as well as the Complexity and Observability attributes of Rogers' Diffusion of Innovations Theory. The widespread adoption of pediatric telemedicine in Negros Occidental faces several significant barriers, prominently a slow internet connection and lack of adequate equipment. Concerns about the accuracy of data and treatment, potential legal risks, and challenges in patient assessment also represent substantial barriers. These issues highlight that while the concept and application of telemedicine are well-received, the actual delivery of services may not be meeting user expectations, potentially pointing to issues with the quality, accessibility, or specific features of the services offered through the platform.

Despite these barriers, numerous opportunities exist for the growth and development of pediatric telemedicine services in Negros Occidental, aligning with the *Relative Advantage and Compatibility* aspects of Dearing's Diffusion of Innovations Theory and Rogers' Diffusion of Innovations Theory. Telemedicine is recognized for its potential to minimize environmental footprint through digitalization, facilitate post-discharge patient monitoring, measure access to care, expand medical research, and serve as a multidisciplinary practice hub for patient referral and learning. These findings highlight telemedicine's transformative potential in improving access, enhancing research, fostering collaboration, and promoting equitable, sustainable healthcare practices in the region. The financial analysis, while showing some initial negative returns for certain clinics, generally indicates a promising outlook for overall profitability and long-term sustainability with proper assessment and strategic adjustments.

5.0. Conclusion

Pediatric telemedicine in Negros Occidental demonstrates a promising, albeit complex, landscape. While physicians perceive its overall use and purpose as highly effective, particularly in improving access and efficiency for patients , a significant concern remains regarding the thoroughness of virtual examinations and the ability to diagnose effectively as if in person. The widespread adoption of these services is hindered by critical barriers such as lack of adequate equipment , alongside concerns about data accuracy, legal risks, and patient assessment challenges. Despite these hurdles, numerous opportunities exist, including telemedicine's potential to minimize environmental impact, facilitate post-discharge patient monitoring, expand medical research, and serve as a multidisciplinary practice hub.

Financially, the outlook is generally positive, with several clinics demonstrating profitability, suggesting long-term sustainability with strategic adjustments. To fully realize the transformative potential of pediatric telemedicine in the region, future efforts must focus on addressing the identified infrastructure and diagnostic limitations while leveraging its clear benefits and financial viability.

6.0. Limitations of the Findings

Despite the generally positive perceptions of pediatric telemedicine's effectiveness in Negros Occidental, several limitations in the findings must be acknowledged. While physicians rated the overall effectiveness of use and purpose as high, a notable concern emerged regarding the ability to effectively diagnose through telemedicine compared to in-person interactions. This suggests a potential gap in the thoroughness of virtual examinations, which could impact patient care, especially in complex cases. Furthermore, the identified barriers, such as slow internet connectivity, lack of adequate equipment, and concerns about data accuracy, privacy, and legal implications, highlight significant infrastructure and systemic challenges that may limit the actual implementation and optimal functioning of telemedicine services, regardless of perceived effectiveness. These practical limitations, alongside a potential overestimation of opportunities given existing barriers, suggest that the perceived benefits may not fully translate into consistent, high-quality service delivery across the region.

7.0. Practical Value of the Findings

The findings on pediatric telemedicine in Negros Occidental offer significant practical value for healthcare providers, policymakers, and technology developers. The high perceived effectiveness in terms of "Use" and "Purpose" highlights that telemedicine is a

valuable tool for expanding access to care, particularly in reaching patients in remote areas and addressing physician shortages. This indicates a strong foundation for its continued implementation and suggests that efforts to promote its adoption should emphasize these clear benefits. However, the identified "low" effectiveness in remote diagnosis signals a critical area for improvement in service delivery. This necessitates investment in advanced diagnostic technologies and enhanced training for practitioners to improve diagnostic accuracy in virtual settings.

Furthermore, the pervasive barrier of slow internet connectivity and lack of adequate equipment underscores the urgent need for infrastructure development in the region to unlock the full potential of telemedicine. By addressing these specific challenges while leveraging the recognized opportunities, pediatric telemedicine can be optimized to deliver more comprehensive, equitable, and sustainable healthcare services in Negros Occidental and similar underserved areas.

8.0. Directions for Future Research

Future research on pediatric telemedicine in Negros Occidental should focus on addressing the identified barriers and enhancing areas of lower perceived effectiveness to maximize its transformative potential. Given the critical concern regarding the ability to diagnose effectively through telemedicine, further studies are needed to develop and validate virtual diagnostic methods and tools, especially for acute and urgent care settings. Research should also investigate strategies to improve internet connectivity and ensure access to adequate equipment for both patients and providers in underserved areas. Exploring robust regulatory frameworks and legal considerations for telemedicine, alongside methods to enhance data accuracy, privacy, and security, is crucial to build trust and facilitate wider adoption. Furthermore, while the financial viability appears promising, long-term studies on cost-effectiveness and patient financial benefits, as well as strategies to incentivize investment and optimize financial models for sustainable growth, would be beneficial. Finally, research into integrating telemedicine into medical education and training future practitioners is essential to ensure a skilled workforce capable of leveraging this evolving field.

9.0. Declaration of Conflict of Interest

The authors declare no potential conflicts of interest concerning the research, authorship, or publication of this article.

REFERENCES

Ahmad, R. W., Salah, K., Jayaraman, R., Yaqoob, I., Ellahham, S., & Omar, M. (2021). The Role of Blockchain Technology in Telehealth and Telemedicine. *Int. J. Med. Inform*. 148, 104399. doi: 10.1016/j.ijmedinf.2021.104399

Alhajri, N., Simsekler, M. C. E., Alfalasi, B., Alhashmi, M., Memon, H., Housser, E., Abdi, A. M., Balalaa, N., Al Ali, M., Almaashari, R., Al Memari, S., Al Hosani, F., Al Zaabi, Y., Almazrouei, S., &Alhashemi, H. (2022). Exploring Quality Differences in Telemedicine between Hospital Outpatient Departments and Community Clinics: Cross-sectional Study. *JMIR medical informatics*, *10*(2), e32373. https://doi.org/10.2196/32373

Alnasser, Y., Proaño, A., Loock, C., Chuo, J., & Gilman, R. H. (2024). Telemedicine and pediatric care in rural and remote areas of middle-and-low-income countries: narrative review. *Journal of epidemiology and global health*, *14*(3), 779-786. https://doi.org/10.1007/s44197-024-00214-8

Arora, S., Huda, R. K., Verma, S., Khetan, M., Sangwan, R. K., HUda Sr, R. K., & Sangwan, R. K. (2024). Challenges, barriers, and facilitators in telemedicine implementation in India: a scoping review. *Cureus*, *16*(8). https://doi.org/10.7759/cureus.67388

Arriola, J. R., & Padilla, N. D. (2021). Awareness, Acceptance, and Viability of Mobile Teleaudiology among Patients with Hearing Concerns in Negros Occidental, Philippines. *Technium Social Sciences Journal*, *24*(1), 853–864. Retrieved from https://techniumscience.com/index.php/socialsciences/article/view/4856.

Barbosa, W., Zhou, K., Waddell, E., Myers, T., & Dorsey, E. R. (2021). Improving access to care: telemedicine across medical domains. *Annual review of public health*, *42*(1), 463-481. https://doi.org/10.1146/annurev-publhealth-090519-093711

Bajwa, N. M., Perron, N. J., Braillard, O., Achab, S., Hudelson, P., Dao, M. D., ... & Mazouri-Karker, S. (2024). Has telemedicine come to fruition? Parents' and pediatricians' perceptions and preferences regarding telemedicine. *Pediatric research*, *96*(5), 1332-1339. https://doi.org/10.1038/s41390-024-03172-w

Burshtein, J., Buethe, M. G., Ghias, M. H., Stein, A. B., Glick, S., & Marmon, S. (2023). Efficacy, perception, and utilization of pediatric teledermatology: a systematic review. *JAAD international*, *12*, 3-11. https://doi.org/10.1016/j.jdin.2023.03.005

Chandler, A. L., Beavers, J. C., & Hall, R. W. (2020). Telemedicine in pediatrics: possibilities and pitfalls. *Pediatrics In Review*, *41*(7), 376-378.https://doi.org/10.1542/pir.2019-0171

Chang, J., Isaacs, D. J., Leung, J., & Vinson, D. R. (2021). Comprehensive management of acute pulmonary embolism in primary care using telemedicine in the COVID-era. *BMJ case reports14* (6), e243083. https://doi.org/10.1136/bcr-2021-243083

Chao, G.F., Li, K.Y., Zhu, Z., McCullough, J., Thompson, M., Claflin, J., Fliegner, M., Steppe, E., Ryan, A., & Ellimoottil, C. (2021). Use of Telehealth by Surgical Specialties During the COVID-19 Pandemic. *JAMA Surg*. 2021 Jul 1; 156(7):620-626. doi: 10.1001/jamasurg.2021.0979. PMID: 33769434; PMCID: PMC7998347.

Choo, Z. Y., Lenti, G., Castaneda, J., Hart, C., Young, S., & Alcocer Alkureishi, L. (2021). Effects of telemedicine on pediatric clinical care during COVID-19. *Pediatric Annals*, *50*(12), e503-e508.https://doi.org/10.3928/19382359-20211110-01

Cordero, D. A. (2023). Telehealth during the COVID-19 pandemic in the Philippines. *Family Practice*, *40*(1), 207–208. https://doi.org/10.1093/fampra/cmac078

Cruz-Lim, E. M., Co, H. C., Mendoza, M. J., Dumlao III, P., Lucero, J. A., Yap, B., & Garcia, C. V. (2021). Physicians' Perceptions on the Role of Telemedicine in Cancer Care During and Post-COVID-19 Pandemic. *Acta Medica Philippina*, 55(2). https://doi.org/10.47895/amp.v55i2.2836

Curfman, A., Hackell, J. M., Herendeen, N. E., Alexander, J., Marcin, J. P., Moskowitz, W. B., ... & Committee on Pediatric Workforce. (2022). Telehealth: opportunities to improve access, quality, and cost in pediatric care. In *Pediatric Telehealth Best Practices* (pp. 43-173). American Academy of Pediatrics. https://doi.org/10.1542/peds.2021-056035

de Guia, M.M, de Guzman, K. D., de Mesa, M. M., & Bitera, M. Z. (2022). Telehealth Nursing during the Pandemic. *Asia Pacific Journal of Allied Health Sciences* Vol. 5. No 1, pp 73-78 September 2022 ISSN 2704-3568

Dela Cruz, L. A., & Tolentino, L. K. S. (2021). Telemedicine implementation challenges in underserved areas of the Philippines. *International Journal of Emerging Technology and Advanced Engineering*, *11*(07). https://doi.org/10.2139/ssrn.3888889

Dhyani, V. S., Krishnan, J. B., Mathias, E. G., Hossain, M. M., Price, C., Gudi, N., ... & Zodpey, S. (2023). Barriers and facilitators for the adoption of telemedicine services in low-income and middle-income countries: a rapid overview of reviews. *BMJ Innovations*, *9*(4). https://doi.org/10.1136/bmjinnov-2022-001062

Elkbuli, A., Ehrlich, H., & McKenney, M. (2021) "The effective use of telemedicine to save lives and maintain structure in a healthcare system: current response to COVID-19." *The American Journal of Emergency Medicine* 44: 468.

Fermin, J. L., & Tan, M. J. T. (2021). The Need for the Establishment of Biomedical Engineering as an Academic and Professional Discipline in the Philippines: A Quantitative Argument. *IEEE Access* 9, 3097–3111. doi:10.1109/ACCESS.2020.3046655

Geneva: World Health Organization (2021). The 2021 Update: Global Health Workforce Statistics. Available at: https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/medical-doctors (Accessed July 1, 2021).

Haimi, M., Brammli-Greenberg, S., Baron-Epel, O., & Waisman, Y. (2020). Assessing patient safety in a pediatric telemedicine setting: a multi-methods study. *BMC medical informatics and decision making*, *20*(1), 63. https://doi.org/10.1186/s12911-020-1074-7

Haynes, S. C., & Marcin, J. P. (2022). Pediatric Telemedicine: Lessons Learned During the Coronavirus Disease 2019 Pandemic and Opportunities for Growth. *Advances in pediatrics*, *69*(1), 1–11. https://doi.org/10.1016/j.yapd.2022.04.002

Helsel, B.C., Williams, J.E., & Lawson, K. (2018). Telemedicine and Mobile Health Technology Are Effective in the Management of Digestive Diseases: A Systematic Review. *Dig Dis Sci***63**, 1392–1408. https://doi.org/10.1007/s10620-018-5054-z

Hong, Z., Li, N., Li, D., Li, J., Li, B., Xiong, W., Lu, L., Li, W., & Zhou, D. Telemedicine During the COVID-19 Pandemic: Experiences from Western China. *J Med Internet Res*. 2020 May 8; 22(5): e19577. doi 10.2196/19577. PMID: 32349962; PMCID: PMC7212818.

Intan Sabrina, M., & Defi, I. R. (2021). Telemedicine Guidelines in Southeast Asia: A Scoping Review. *Frontiers in neurology*, *11*, 581649. https://doi.org/10.3389/fneur.2020.581649

Laheba, T. R., Govindaraju, R., & Andriani, M. (2023, November). Improving the Effectiveness of Telemedicine Services: A Conceptual Framework. In *2023 IEEE International Biomedical Instrumentation and Technology Conference (IBITeC)* (pp. 181-186). IEEE. https://doi.org/10.1109/IBITeC59006.2023.10390961

Li, X., Rai, A., & Krishnan, G. (2020). "Designing cost-effective telemedicine camps for underprivileged individuals in less developed countries: A decomposed affordance-effectivity framework." *Journal of the Association for Information Systems* 21.5:3.

Love, M., Hunter, A. K., Lam, G., Muir, L. V., & Lin, H. C. (2022). Patient satisfaction and perceived quality of care with telemedicine in a pediatric gastroenterology clinic. *Pediatric reports*, *14*(2), 181-189. https://doi.org/10.3390/pediatric14020025

Macabasag, R. L. A., Albiento, K. K. A., Tabo-on, D. E. A., Barceñas, M. J. D. R., Batongbacal, C. A. E., Bonion, D. M. C., ... & Pascual, P. J. C. (2016). Leadership, management, and team competencies of Filipino nursing student manager leaders: Implications on nursing education. *International Journal of Nursing Science*, *6*(5), 10

Macaraig-Endaya, A. (2007). Pediatrics-on-line: Awareness & acceptability of telemedicine among pediatricians in a tertiary center. *Philippine Journal of Pediatrics*, 56(3), 199-208

Macariola, A. D., Santarin, T. M. C., Villaflor, F. J. M., Villaluna, L. M. G., Yonzon, R. S. L., Fermin, J. L., Kee, S. L., AlDahoul, N., Karim, H. A., & Tan, M. J. T. (2021). Breaking Barriers Amid the Pandemic: The Status of Telehealth in Southeast Asia and its Potential as a Mode of Healthcare Delivery in the Philippines. *Frontiers in pharmacology*, *12*, 754011. https://doi.org/10.3389/fphar.2021.754011

Macwilliam, J., Hennessey, I., & Cleary, G. (2021). Telemedicine: improving clinical care and medical

education in paediatrics. *Paediatrics and Child Health*, *31*(10), 388-396. https://doi.org/10.1016/j.paed.2021.07.004

Mahmoud, K., Jaramillo, C., & Barteit, S. (2022). Telemedicine in Low- and Middle-Income Countries during the COVID-19 Pandemic: A Scoping Review. *Frontiers in public health*, *10*, 914423. https://doi.org/10.3389/fpubh.2022.914423

Makhni, M. C., Riew, G. J., & Sumathipala, M. G. (2020). Telemedicine in orthopaedic surgery: challenges and opportunities. *JBJS*, *102*(13), 1109-1115. https://doi.org/10.2106/JBJS.20.00452

Malasinghe, L. P., Ramzan, N., & Dahal, K. (2019). Remote Patient Monitoring: A Comprehensive Study. *J. Ambient Intell. Hum. Comput* 10 (1), 57–76. Doi: 10.1007/s12652-017-0598-x

Mateus, L. A., Law, M. P., Khowaja, A. R., Orlando, E., Pace, A., Roy, M., & Sulowski, C. (2023). Examining perceptions of a telemedicine network for pediatric emergency medicine: a mixed-methods pilot study. *Frontiers in Digital Health*, *5*, 1181059. https://doi.org/10.3389/fdgth.2023.1181059

McMaster, T., Wright, T., Mori, K., Stelmach, W., & To, H. (2021). Current and future use of telemedicine in surgical clinics during and beyond COVID-19: A narrative review. *Annals of Medicine and Surgery (2012)*, *p. 66*, 102378. https://doi.org/10.1016/j.amsu.2021.102378

Meno, M., Abe, J., Fukui, J., Braun-Inglis, C., Pagano, I., &Acoba, J. (2021). Telehealth amid the COVID-19 pandemic: perception among Asian, Native Hawaiian, and Pacific Islander cancer patients. *Future oncology (London, England)*, *17*(23), 3077–3085. https://doi.org/10.2217/fon-2021-0136

Noceda, A. V. G., Acierto, L. M. M., Bertiz, M. C. C., Dionisio, D. E. H., Laurito, C. B. L., Sanchez, G. A. T., & Loreche, A. M. (2023). Patient satisfaction with telemedicine in the Philippines during the COVID-19 pandemic: a mixed methods study. *BMC health services research*, *23*(1), 277. https://doi.org/10.1186/s12913-023-09127-x

Nochomovitz, M., & Sharma, R. (2018). Is It Time for a New Medical Specialty? The MedicalVirtualist. *JAMA*, *319*(5), 437–438. https://doi.org/10.1001/jama.2017.17094

Nord, G., Rising, K. L., Band, R. A., Carr, B. G., & Hollander, J. E. (2019). On-demand synchronous audio-video telemedicine visits are cost-effective. *The American Journal of Emergency Medicine*, *37*(5), 890-894.

Olateju, A., Cervantes, M., Dowshen, N., Kuhns, L. M., & Dhar, C. P. (2022). Acceptability of Telemedicine among Parents of Adolescent Patients in an Adolescent Clinic: Cross-sectional Survey Study. *JMIR pediatrics and parenting*, *5*(4), e39704. https://doi.org/10.2196/39704

Orrange, S., Patel, A., Mack, W. J., & Cassetta, J. (2021). Patient Satisfaction and Trust in Telemedicine during the COVID-19 Pandemic: Retrospective Observational Study. *JMIR Human Factors*, *8*(2), e28589. https://doi.org/10.2196/28589

Osawa, I., Goto, T., Asami, Y., Itoh, N., Kaga, Y., Yamamoto, Y., & Tsugawa, Y. (2021). Physician visits and medication prescriptions for major chronic diseases during the COVID-19 pandemic in Japan: retrospective cohort study. *BMJ open*, *11*(7), e050938. https://doi.org/10.1136/bmjopen-2021-050938

Ostrowski-Delahanty, S. A., McNinch, N. L., Grossoehme, D. H., Aultman, J., Spalding, S., Wagoner, C., & Rush, S. (2023). Understanding drivers of telemedicine in pediatric medical care. *Telemedicine and e-Health*, *29*(5), 726-737. https://doi.org/10.1089/tmj.2022.0293

Payán, D., Frehn, J., Garcia, L., Tierney, A., & Rodriguez, H. (2022). Telemedicine implementation and use in community health centers during COVID-19: Clinic personnel and patient perspectives. *SSM - Qualitative Research in Health.* 2. 100054. 10.1016/j.ssmqr.2022.100054.

Pengput, A., & Schwartz, D. G. (2022). Telemedicine in Southeast Asia: A Systematic Review. *Telemedicine journal and e-health: the official journal of the American Telemedicine Association*, *28*(12), 1711–1733. https://doi.org/10.1089/tmj.2021.0516

Punzalan, J. K., Guingona, M., Gregorio, E., Ferraren, J., Sta. Elena, M. A., Valaquio, M., & Cristobal, F. (2024). Telehealth program for symptomatic COVID-19 patients in Mindanao, Philippines: a whole-of-system, pragmatic interventional study on patient monitoring from isolation facilities to community reintegration. *International Journal for Equity in Health*, *23*(1), 20.

Philhealth Joint Administyrative order 2021-0001 Guidelines _on the Implementation of Telemedicine in the Delivery of Individual-Based Health Services, 2021

Ramaswamy, A., Yu, M., Drangsholt, S., Ng, E., Culligan, P. J., Schlegel, P. N., & Hu, J. C. (2020). Patient Satisfaction with Telemedicine during the COVID-19 Pandemic: Retrospective Cohort Study. *Journal of medical Internet research*, *22*(9), e20786. https://doi.org/10.2196/20786

Saleh, F. B., & Alghaeed, Z. (2025). Clinical Applications of Telemedicine in Paediatric Emergency Care: A Systematic Review Study. *Libyan Journal of Medical Research*, *19*(2), 1-8. https://doi.org/10.54361/ljmr.19.2.01

Sauers-Ford, H. S., Hamline, M. Y., Gosdin, M. M., Kair, L. R., Weinberg, G. M., Marcin, J. P., & Rosenthal, J. L. (2019). Acceptability, usability, and effectiveness: a qualitative study evaluating a pediatric telemedicine program. *Academic Emergency Medicine*, *26*(9), 1022-1033. https://doi.org/10.1111/acem.13763

Schweiberger, K., Hoberman, A., Iagnemma, J., Schoemer, P., Squire, J., Taormina, J., ... & Ray, K. N. (2020). Practice-level variation in telemedicine use in a pediatric primary care network during the COVID-19 pandemic: retrospective analysis and survey study. *Journal of medical internet research*, *22*(12), e24345. https://doi.org/10.2196/24345

Sisk, B., Alexander, J., Bodnar, C., Curfman, A., Garber, K., McSwain, S. D., & Perrin, J. M. (2020). Pediatrician Attitudes Toward and Experiences with Telehealth Use: Results from a National Survey. *Academic*

Pediatrics, *20*(5), 628–635. https://doi.org/10.1016/j.acap.2020.05.004
Shaver J. The State of Telehealth Before and After the COVID-19 Pandemic. Prim Care. 2022 Dec; 49(4):517-530. doi: 10.1016/j.pop.2022.04.002. Epub 2022 Apr 25. PMID: 36357058; PMCID: PMC9035352.
Shi, J., Yan, X., Wang, M., Lei, P., & Yu, G. (2021). Factors influencing the acceptance of pediatric telemedicine services in China: a cross-sectional study. *Frontiers in pediatrics*, *9*, 745687. https://doi.org/10.3389/fped.2021.745687
Southgate, G., Yassaee, A. A., Harmer, M. J., Livesey, H., Pryde, K., & Roland, D. (2022). Use of telemedicine in pediatric services for 4 representative clinical conditions: scoping review. *Journal of medical Internet research*, *24*(10), e38267. https://doi.org/10.2196/38267
Sukhov, R., Asante, A., & Ilizarov, G. (2020). Telemedicine for pediatric physiatry: How social distancing can bring physicians and families closer together. *Journal of Pediatric Rehabilitation Medicine*, *13*(3), 329-338. https://doi.org/10.3233/PRM-200747
Szigety, K. M., Crowley, T. B., Gaiser, K. B., Chen, E. Y., Priestley, J. R., Williams, L. S., ... & Sheppard, S. E. (2022). Clinical effectiveness of telemedicine-based pediatric genetics care. *Pediatrics*, *150*(1), e2021054520. https://doi.org/10.1542/peds.2021-054520
Taylor, L., & Portnoy, J. M. (2019). Telemedicine for general pediatrics. *Pediatric annals*, *48*(12), e479-e484. https://doi.org/10.3928/19382359-20191119-01
Ting, D. S. W., Carin, L., Dzau, V., & Wong, T. Y. (2020). Digital technology and COVID-19. *Nature Medicine*, *26*(4), 459–461. https://doi.org/10.1038/s41591-020-0824-5
Tully, L., Case, L., Arthurs, N., Sorensen, J., Marcin, J. P., & O'Malley, G. (2021). Barriers and facilitators for implementing paediatric telemedicine: rapid review of user perspectives. *Frontiers in pediatrics*, *9*, 630365. https://doi.org/10.3389/fped.2021.630365
Vargas, A. M. O., & Arnibal, S. P. (2024). Perceived effectiveness of telehealth services among adult patients with healthcare needs in a highly urbanized city. *Technium Soc. Sci. J.*, *54*, 347.
Wang, H., Yuan, X., Wang, J., Sun, C., & Wang, G. (2021). Telemedicine may be an effective solution for the management of chronic disease during the COVID-19 epidemic. *Primary Health Care Research & Development, 22*, E48. doi:10.1017/S1463423621000517
West, H. J., Barzi, A., & Wong, D. (2022). Telemedicine in Cancer Care Beyond the COVID-19 Pandemic: Oncology 2.0. *Current oncology reports*, *24*(12), 1843–1850. https://doi.org/10.1007/s11912-022-01332-x
Wu Y. (2021). Utilization of telehealth and the advancement of nursing informatics during the COVID-19 pandemic. *International Journal of Nursing Sciences*, *8*(4), 367–369. https://doi.org/10.1016/j.ijnss.2021.09.004

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