

Integration Of Information and Communication Technologies (ICT) In the Monitoring and Management of The Prevalence of Anemia in Immediate Post-Mart Women Cared for At the Barranca Hospital – 2019

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Abstract

Immediate postpartum anemia is a critical condition that can seriously compromise both postpartum recovery and the long-term health of mothers. At the Barranca Hospital in 2023, this issue has been a constant concern, highlighting the need for more effective management strategies. The objectives of this study are to investigate the feasibility and effectiveness of implementing Information and Communication Technologies (ICTs) to manage postpartum anemia, with the aim of improving maternal health outcomes. A mixed-methods approach was employed, which was essential for investigating how ICTs can reduce anemia in postpartum women treated at Barranca Hospital, identifying the factors that affect their adoption and use in clinical settings. Through advanced data collection and analysis systems, ICTs enable continuous and personalized monitoring, facilitating early medical interventions tailored to each patient's specific needs. In conclusion, the integration of ICTs in the monitoring and management of immediate postpartum anemia offers a promising strategy for improving maternal health outcomes.

Keywords: Postpartum Anemia, Information and Communication Technologies (ICTs), and Continuous Monitoring

INTRODUCTION

Immediate postpartum anemia is a critical condition that can seriously compromise the postpartum recovery and long-term health of mothers. At Barranca Hospital during the year 2023, this issue has been a constant concern, highlighting the need to implement more effective strategies for its management. According to Shlash et al. (2024), the integration of Information and Communication Technologies (ICTs) in healthcare has emerged as a powerful tool to optimize monitoring and treatment of various medical conditions. This article examines how the implementation of ICTs at Barranca Hospital has enabled a more efficient and precise approach in monitoring anemia in immediate postpartum mothers. Through advanced data collection and analysis systems, continuous and personalized monitoring of patients has been achieved, allowing for more timely and effective interventions. The experience of this hospital underscores not only a decrease in the prevalence of postpartum anemia but also significant improvements in the quality of care and patient satisfaction.

The high incidence of anemia among women in the immediate postpartum period poses a significant challenge to public health, adversely affecting both physical recovery after childbirth and the quality of life of new mothers. This issue is particularly pressing at Barranca Hospital, where a notably high prevalence of this condition has been observed. According to Mendoza et al. (2023), deficiencies in data collection and inadequate monitoring of maternal health exacerbate this problem, limiting the effectiveness of traditional interventions. Key challenges include the lack of appropriate technological infrastructure and a shortage of trained personnel in the use of Information and Communication Technologies (ICTs), hindering continuous and personalized patient monitoring. Resistance to change and the lack of integration with existing healthcare systems further

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complicate the adoption of ICTs. Additionally, according to Montenegro et al. (2017), limited financial resources and unclear policies for technological integration present significant barriers. These limitations not only impede early detection and timely treatment of anemia but also perpetuate deficiencies in postpartum care quality.

The impact of postpartum anemia represents a significant public health issue, with potential serious complications such as extreme fatigue, postpartum depression, and increased susceptibility to infections. Studies like that of Aparicio et al. (2023) show that postpartum anemia not only hinders mothers' physical recovery but also adversely affects their ability to care for their newborns, with long-term negative repercussions on infant development. According to Cayo et al. (2021), the prevalence of postpartum anemia varies considerably among different regions and populations, with higher rates observed in areas with limited access to quality healthcare services, highlighting the need for more effective and accessible interventions in such contexts.

Information and Communication Technologies (ICTs) have revolutionized healthcare, optimizing data collection, communication among healthcare providers, and patient monitoring. Scientific literature emphasizes, as noted by Vásquez et al. (2024), that the application of ICTs can enhance the management of chronic diseases and other health conditions through remote monitoring and telemedicine. Studies such as that by Carvajal (2024) have shown that integrating ICTs into the healthcare sector not only leads to more efficient care but also optimizes resource utilization and significantly improves clinical outcomes.

The integration of Information and Communication Technologies (ICTs) in monitoring postpartum anemia has emerged as a crucial strategy in contemporary maternal care. According to Reategui et al. (2023), advanced tools such as mobile applications, telemedicine devices, and sophisticated data collection and analysis systems have revolutionized clinical practice by enabling continuous and precise monitoring of hematological indicators in real time. Ortiz (2021) argues that this integration not only facilitates early detection of anemia but also promotes timely and personalized interventions, thereby optimizing treatment and improving maternal health outcomes. Recent research consistently demonstrates that the use of ICTs in this context can significantly reduce both the prevalence and severity of postpartum anemia, highlighting their potential to enhance clinical management and increase patient satisfaction.

To support the research topic on the integration of Information and Communication Technologies (ICTs) in monitoring and managing the prevalence of anemia in immediate postpartum mothers, one may consider the following theories that underpin this field:

Technology Adoption Theory: According to Palos et al. (2019), the adoption of new technologies in an organizational setting depends on how users perceive their utility and ease of use. In the realm of healthcare ICTs, this theory suggests that healthcare professionals will effectively adopt and use technological tools for monitoring postpartum anemia if they perceive these technologies to improve clinical outcomes and increase efficiency in medical care. **Organizational Effectiveness Theory:** According to Montenegro & Díaz (2023), this theory examines how organizations implement technologies to enhance their performance and effectiveness. In the field of healthcare and the management of postpartum anemia, this theory emphasizes that the successful adoption of ICTs depends on the alignment between the organization's technological capabilities, staff competencies, and the effective integration of new technologies into established clinical processes. Furthermore, it underscores the need for ongoing evaluation of outcomes and adaptation of practices based on feedback, ensuring that ICTs contribute significantly to continuous improvement in care and health outcomes for postpartum mothers.

Theory of Socioeconomic Conditions and Access to Prenatal Care: According to Guedes (2024), this theory posits that socioeconomic conditions and limited access to quality prenatal care are significant determinants in the prevalence of postpartum anemia. In regions with limited resources such as Barranca, women may face challenges accessing adequate nutrition and iron supplements during pregnancy, thereby increasing the risk of developing postpartum anemia. Additionally, according to the Ministry of Public Health

(2014), barriers to timely medical care during pregnancy can limit early detection and management of medical conditions predisposing to postpartum anemia, such as thalassemia or conditions affecting erythropoiesis.

In this study, a variety of methodological tools will be employed to conduct a comprehensive and multifaceted analysis. According to Loomis et al. (2024), these tools will include surveys, interviews, and observation sheets. These techniques will enable us to comprehensively diagnose the current situation and meticulously review the proposal for implementing Information and Communication Technologies (ICTs) to address anemia in postpartum women treated at Barranca Hospital. Surveys will provide quantitative data on the perception and usage of ICTs, while interviews will offer a deeper qualitative understanding of the experiences and opinions of healthcare professionals and postpartum women. Additionally, observation sheets will allow us to gather objective and detailed information on the application of these technologies in clinical practice. According to Youri et al. (2023), the combined use of these tools will ensure a thorough and rigorous evaluation of the proposed intervention, facilitating the identification of areas for improvement and the formulation of relevant recommendations.

Research on the use of Information and Communication Technologies (ICTs) to address postpartum anemia is crucial for optimizing maternal health outcomes. The prevalence of postpartum anemia and its adverse impacts on the recovery and quality of life of postpartum women underscore the urgency of effective interventions. According to Reategui et al (2023), ICTs offer innovative tools that enable continuous monitoring and early intervention, thereby enhancing care with personalized and timely focus. This approach not only aims to optimize resources and efficiency in healthcare systems but also promotes critical research on the effective integration of ICTs in clinical settings, aiming to significantly advance maternal care and evidence-based clinical practices.

Research and implementation of Information and Communication Technologies (ICTs) to address postpartum anemia are crucial for advancing maternal health. According to Navarro et al. (2024), focusing on the application of ICTs for continuous monitoring and early intervention in this prevalent and critical condition enables more efficient and personalized care for women after childbirth. This approach not only aims to optimize healthcare resources but also fosters the development of evidence-based clinical practices, with the goal of continuously improving health outcomes and the overall well-being of postpartum women.

The objectives of this study are to investigate the feasibility and effectiveness of implementing Information and Communication Technologies (ICTs) to manage postpartum anemia, aiming to improve maternal health outcomes. This research will assess how ICTs can be effectively used for continuous monitoring and early intervention in cases of postpartum anemia, identifying factors that influence their adoption and use in clinical settings. Additionally, practical guidelines are sought to be developed for integrating these technologies into everyday medical practice, in order to optimize postpartum care and promote the well-being of postpartum women.

In line with these objectives, our research will focus on answering the central question: How does the implementation of ICTs impact early and continuous monitoring of hemoglobin levels in postpartum women to prevent postpartum anemia?

MATERIALS AND METHODS

The methodology was conducted using a mixed-methods approach, which proved pivotal in the research on the implementation of Information and Communication Technologies (ICTs) to mitigate anemia in postpartum women treated at Barranca Hospital. This allowed for combining the robustness of quantitative data with the depth of qualitative data. The quantitative component provided measurable and statistically significant results regarding the effectiveness of ICTs and patient satisfaction. On the other hand, the qualitative component, through interviews with obstetrics professionals and open surveys with postpartum women, offered a more detailed and contextual understanding of perceptions, experiences, and potential challenges in adopting these technologies. This integration of methods allowed for a more comprehensive and multifaceted evaluation of the intervention, facilitating the identification of patterns, trends, and practical recommendations that may not

be evident with a singular approach, and ensuring that the conclusions were both empirically sound and contextually and clinically relevant.

In the study, the descriptive approach was crucial for thoroughly detailing and characterizing the key variables related to the implementation of Information and Communication Technologies (ICTs). This methodology provided a clear and detailed understanding of the initial situation and how the key variables evolved throughout the study. Moreover, the descriptive approach facilitated the identification of emerging patterns, significant trends, and relationships between variables that were crucial for generating relevant insights and formulating specific recommendations aimed at improving postpartum care in the specific setting of Barranca Hospital.

The literature review and fieldwork were two complementary and essential methodologies in the research on the implementation of Information and Communication Technologies (ICTs) to reduce anemia in postpartum women treated at Barranca Hospital. The literature review provided a solid theoretical foundation and broad context for the research. Through the analysis of scientific literature, previous studies, health reports, and public policies, the most effective approaches and best practices in the use of ICTs for managing postpartum anemia were identified. Additionally, this review contextualized the study within the framework of existing research, facilitating the identification of knowledge gaps that the work could address. The literature review also contributed to formulating informed hypotheses and designing data collection instruments aligned with current trends and findings in the field of maternal health and ICTs.

Fieldwork was crucial for obtaining empirical data and a deep understanding of the reality experienced by postpartum women and healthcare professionals at Barranca Hospital. Through interviews, surveys, and the implementation of a data collection form, detailed information was gathered regarding the proposal's implementation suggestion. Fieldwork enabled the collection of first-hand quantitative and qualitative data, providing a comprehensive and contextualized view of the problem. This practical approach also facilitated the assessment of the applicability and effectiveness of ICTs in a real-world setting, identifying barriers and facilitators in their implementation, and adjusting interventions according to the specific needs and characteristics of patients and healthcare staff.

Population and Sample

For this research, 100 women treated at Barranca Hospital were selected. From this initial group, specifically 40 women were chosen to participate in the study, thus utilizing a finite population. This approach aids the study by providing a clear and defined framework, allowing for greater precision and relevance in the results. Additionally, it facilitates data collection and ensures the sample is representative, thereby reducing selection bias and enabling the application of appropriate statistical methods, thereby enhancing the validity and interpretability of the findings. Furthermore, 7 expert obstetrics professionals were selected to provide a critical and expert evaluation of the feasibility, effectiveness, and potential challenges of integrating these technologies into clinical practice.

The non-probabilistic sample in this study allowed for the specific selection of immediate postpartum women and obstetrics professionals who were directly involved and available at Barranca Hospital, thereby facilitating a more focused and contextually relevant data collection process.

Instruments

To ensure the accurate and systematic collection of relevant information in the research on the suggested implementation proposal of Information and Communication Technologies (ICTs), a data collection form was used. This tool proved essential for gathering detailed information on participants' sociodemographic and clinical characteristics such as age, educational level, marital status, number of previous deliveries, and hemoglobin levels, among others. The data obtained were crucial for establishing a baseline of the postpartum conditions before the intervention, facilitating the identification of relevant correlations and patterns. Additionally, the data collection form allowed for the segmentation of the study population, ensuring that participant selection was representative and that the results obtained were valid and reliable. This tool also contributed to tailoring intervention strategies according to the specific needs and characteristics of each patient, thereby enhancing the accuracy and effectiveness of the study.

A study was conducted through a survey targeting 40 immediate postpartum women with previously diagnosed anemia at Barranca Hospital. This study allowed for a critical evaluation of patients' perception and satisfaction regarding the integration of Information and Communication Technologies (ICTs). The investigative approach provided essential data on the perceived effectiveness of ICTs in monitoring and treating patients' condition, as well as detailed insights into the utility of tools such as mobile applications and connected health devices. Additionally, the survey identified specific barriers and facilitators that may have influenced the adoption of these technologies, thus informing the formulation of practical recommendations aimed at improving postpartum care and enhancing maternal health outcomes.

Interviews were also conducted with 7 obstetrics professionals to obtain a critical assessment from experts in the field regarding the proposed implementation of Information and Communication Technologies (ICTs). These interviews provided a deep understanding of how specialists perceive the potential of ICTs in monitoring and treating postpartum anemia, as well as their opinions on the feasibility, effectiveness, and potential challenges of integrating these technologies into obstetric practice. Additionally, they facilitated the identification of specific recommendations based on clinical experience to optimize the implementation of ICTs in the context of maternal care, ensuring research grounded in the realities and specific needs of the obstetric field.

PROPOSAL METHODOLOGY

To develop an effective methodology in the research on the implementation of Information and Communication Technologies (ICTs) in monitoring and managing the prevalence of anemia in immediate postpartum women treated at Barranca Hospital, a proposal was designed in clearly defined phases. These phases were designed to ensure systematic data collection and critical evaluation of both patients and healthcare professionals involved. Below, each phase of the study is detailed:

Phase 1: Initial Data Collection: A data collection form was developed, which was validated by experts in the field of obstetrics. This form was used to gather detailed information on the prevalence of anemia in immediate postpartum women treated at Barranca Hospital. Data from 100 patient women were collected, compiling essential sociodemographic and clinical information such as age, educational level, marital status, number of previous deliveries, and hemoglobin levels. These initial data provided a baseline for identifying the prevalence of anemia and facilitated analysis of common characteristics among affected patients.

Phase 2: Proposal for Integration of ICTs: Based on the data obtained in the first phase, a proposal for integrating ICTs in the management of postpartum anemia was formulated. This proposal was designed considering the specific needs and characteristics of the patients identified in the data collection form. The implementation of technological tools, such as mobile applications and monitoring devices, was suggested to be used by both patients and medical staff to enhance the monitoring and management of anemia.

Phase 3: Postpartum Satisfaction Survey: Forty women treated at the hospital were selected to assess their perception of the ICT integration proposal. These women underwent a satisfaction survey designed to measure their level of acceptance and expectations regarding the suggested technological tools. The survey allowed for direct feedback from postpartum women on the feasibility and utility of ICTs in managing their postpartum condition.

Phase 4: Obstetrics Experts Interviews: Finally, interviews were conducted with 7 obstetrics specialists. These experts were selected to critically evaluate the ICT integration proposal and provide their professional perspective on its feasibility, effectiveness, and potential challenges in clinical practice. The interviews yielded valuable insights into the acceptance of ICTs among medical staff and helped identify specific recommendations for the successful implementation of these technologies in the hospital setting.

RESULT AND FINDINGS

Data Sheet

The results obtained from this sample of 100 postpartum women are largely negative as they underscore the urgent need to improve access to maternal health education and services, as well as to implement ICTs for early detection and proper management of postpartum anemia, especially among vulnerable populations and those with significant obstetric complications.

Based on the data collection form provided, several significant problems and challenges were identified among the 100 postpartum women analyzed.

In terms of sociodemographic characteristics, a high proportion of young women under 19 years old (group A) was observed, which may indicate limited access to adequate sexual and reproductive education, as well as prenatal health services. Additionally, there was a significant prevalence of women with primary education (option B) or no formal education (option A), reflecting potential barriers in understanding the importance of prenatal and postpartum care.

In relation to marital status, there was a low representation of married women (option A), which could suggest a lack of stable family support during pregnancy and postpartum, affecting adherence to medical check-ups and management of postpartum anemia.

Most of the postpartum women came from urban areas (option A); however, it is important to note that rural areas (option B) host a larger population. This could indicate better access to healthcare services in urban areas compared to rural areas, but also raises questions about disparities in equitable access to specialized medical care and postpartum follow-up in rural communities.

In obstetric terms, there was a notable prevalence of women with anemia during pregnancy (option D), which is concerning due to its implications for maternal and neonatal health. Additionally, a significant percentage of women did not receive adequate prenatal care (option A), increasing the risk of complications during childbirth and postpartum, including severe postpartum anemia.

Regarding obstetric complications, several cases of prolonged labor (option B) and multiple previous cesarean sections (option D) were reported, indicative of serious obstetric complications that could be associated with a higher incidence of severe postpartum anemia. Additionally, the presence of episiotomies (option J) and postpartum hemorrhage (option K) was significant, highlighting additional challenges in the management of childbirth and immediate postnatal care.

Maternal Questionnaire

Based on the results obtained from the questionnaire on the implementation of ICTs in managing postpartum anemia, a generally positive perception was observed among the puerperae. Most participants indicated that ICTs have significantly enhanced their knowledge of postpartum anemia and its management, highlighting the usefulness of mobile applications and web platforms.

Do you think the implementation of ICTs has improved your knowledge of postpartum anemia and its management?

Response Option	Number of Postpartum Women	Frequency	Percentage (%)
a) A lot	18	18/40	45%
b) Somewhat	12	12/40	30%
c) Neutral	6	6/40	15%
d) A little	3	3/40	7.5%
e) Not at all	1	1/40	2.5%
Total	40		100%

Source: Own elaboration

Trend: The results indicate that the majority of puerperal women perceive that ICTs have had a positive impact on improving their knowledge about postpartum anemia and its management. This finding suggests a favorable trend towards acceptance and usefulness of technologies in educating and empowering women during the postpartum period regarding anemia. The minority who expressed neutral or negative opinions highlights the need to consider different perspectives and potential areas for improvement in the implementation and communication of these technologies in the context of postpartum care.

How do you assess the effectiveness of mobile applications and web platforms in tracking her postpartum hemoglobin levels?

Response Option	Number of Postpartum Women	Frequency	Percentage (%)
a) Yes, a lot	20	20/40	50%
b) Yes, something	12	12/40	30%
c) Neutral	5	5/40	12.5%
d) Not so much	2	2/40	5%
e) Not at all	1	1/40	2.5%
Total	40	40/40	100%

Source: Own elaboration

Note: The results showed a varied distribution in perceptions regarding the effectiveness of mobile applications and web platforms for tracking postpartum hemoglobin. While the majority perceived these tools as useful, a significant proportion also expressed neutral or negative opinions. This suggests that while many postpartum women see benefits in these technologies for health monitoring, there is also room for improvement in implementation and overall satisfaction with these technological tools in the context of postpartum care

Did she consider that the implemented ICTs facilitated communication with medical staff to discuss her hemoglobin results and treatment adjustments?

Response Option	Number of Postpartum Women	Frequency	Percentage (%)
a) Very effective	15	15/40	37.5%
b) Effective	10	10/40	25%
c) Neutral	8	8/40	20%
d) Somewhat effective	5	5/40	12.5%
e) Not effective at all	2	2/40	5%
Total	40	40/40	100%

Source: Own elaboration

Note: The results showed that the majority of postpartum women perceived that ICTs had facilitated communication with medical staff to discuss their hemoglobin results and treatment adjustments. This suggests a good acceptance and perceived utility of the technologies implemented in this context. However, a minority expressed neutral or negative opinions, indicating potential areas for improvement in implementation or user experience with these technological tools in the postpartum setting.

How did she evaluate the accuracy and reliability of the Hemo Check wearable device for measuring her hemoglobin levels?

Response Option	Number of Postpartum Women	Frequency	Percentage (%)
a) Very easy	18	18/40	45%
b) Easy	14	14/40	35%
c) Neutral	5	5/40	12.5%
d) Difficult	2	2/40	5%
e) Very difficult	1	1/40	2.5%
Total	40	40/40	100%

Source: Own elaboration

Note: The results revealed a variety of opinions regarding the accuracy and reliability of the HemoCheck portable device among surveyed postpartum women. While a majority perceived the device as functional and

reliable for hemoglobin measurement, a significant segment expressed neutral or negative opinions. This suggests that while the device may be useful for many, some have doubts about its accuracy and reliability, which could influence their confidence and continued use.

How did she rate the ease of use of the AnemiaCare web platform for managing her appointments and reviewing her medical history?

Response Option	Number of Positive Responses	Frequency	Percentage (%)
a) She definitely would	20	20/40	50%
b) She probably would	12	12/40	30%
c) I'm not sure	5	5/40	12.5%
d) Probably not	2	2/40	5%
e) Definitely not	1	1/40	2.5%
Total	40	40/40	100%

Source: Own elaboration

Trend: The majority of surveyed postpartum women perceive the AnemiaCare platform as accessible and easy to use for managing appointments and reviewing medical histories. This result suggests that most users find the platform user-friendly and effective for their postpartum health management needs. However, the presence of some neutral and negative responses indicates that there are areas for improvement that could be addressed to optimize the user experience and ensure broader and more effective adoption of the platform.

Would she recommend other postpartum women to use these technological tools such as the suggested mobile applications and web platforms for monitoring and managing the prevalence of anemia to maintain better control?

Response Option	Number of Postpartum Women	Frequency	Percentage (%)
a) Very accurate and reliable	15	15/40	37.5%
b) Accurate and reliable	12	12/40	30%
c) Neutral	7	7/40	17.5%
d) Not very accurate and reliable	4	4/40	10%
e) Not at all accurate and reliable	2	2/40	5%
Total	40	40/40	100%

Source: Own elaboration

Note: Based on these results, the majority of postpartum women show a positive inclination towards using mobile applications and web platforms for monitoring postpartum anemia. This suggests there is widespread acceptance and a positive perception of the utility of these technological tools in improving postpartum health management, providing greater control over the prevalence of anemia. However, it is important to consider the 'Not sure' responses and negative responses, as they indicate doubts or reservations among some postpartum women regarding the use of these technologies.

Interview for Obstetrics Specialist

Integrating Information and Communication Technologies (ICTs) into the monitoring and management of postpartum anemia in immediate postpartum women represents a significant opportunity to enhance care and health outcomes in hospital settings. The relevance of this interview lies in its potential to strengthen continuous medical monitoring, facilitate effective communication between patients and healthcare professionals, and improve accuracy in monitoring, as well as gauge the satisfaction of specialists with the suggested approach.

How did she assess the relevance of integrating ICTs in monitoring and managing postpartum anemia in immediate postpartum women?

After evaluating the relevance of integrating Information and Communication Technologies (ICTs) in monitoring and managing postpartum anemia in immediate postpartum women, it was found that the majority of the 7 consulted professionals deemed this integration 'highly relevant'. This consensus underscores the

importance of using technological tools to enhance postpartum medical care, providing more accurate and continuous monitoring of hemoglobin levels. The professionals highlighted that ICTs can facilitate more effective monitoring of postpartum women's health conditions, allowing early intervention in case of anemia-related complications. Additionally, they positively assessed the potential of these technologies to strengthen communication between patients and healthcare professionals, which is crucial for prompt treatment adjustments and improved management of postpartum medical care.

From her perspective, what could be the main benefits of using mobile applications and web platforms in monitoring hemoglobin levels in these patients?

After interviewing 7 professionals regarding the benefits of using mobile applications and web platforms in monitoring hemoglobin levels in postpartum patients, a significant consensus was found that these resources offer multiple advantages. The majority of professionals noted that these tools can substantially enhance compliance with medical follow-ups by enabling more regular and accessible monitoring of hemoglobin levels outside the traditional clinical setting. Additionally, they highlighted the facilitation of patient-doctor communication as a crucial benefit, as mobile applications and web platforms allow for more direct and efficient interactions, facilitating virtual consultations and the rapid transmission of results. They also emphasized that these technologies can improve the accuracy of hemoglobin monitoring by providing more advanced data analysis and reporting tools. In summary, professionals agree that mobile applications and web platforms not only improve the accessibility and efficiency of medical monitoring but also optimize communication and accuracy in managing postpartum anemia, thereby benefiting comprehensive care for postpartum women.

What challenges did she anticipate in the effective implementation of portable devices for measuring hemoglobin as part of this proposal?

When interviewing the professionals about the anticipated challenges in the effective implementation of portable devices for measuring hemoglobin, several key points were identified that underscore the preparation and consideration in this area. The majority of professionals emphasized patient acceptance and adherence as one of the main challenges. They noted that while the technologies are promising, their effectiveness largely depends on postpartum women's willingness to adopt and regularly use these portable devices. Additionally, they highlighted the importance of accuracy and reliability of the devices as another critical challenge. Precision in measuring hemoglobin levels is essential for making accurate clinical decisions, so ensuring the devices are reliable is crucial for successful implementation.

According to her experience, how could the training of postpartum women in the use of these technologies be optimized to ensure their effective implementation?

After interviewing 7 professionals on how to optimize training for postpartum women in using technologies to ensure effective implementation, several key strategies were highlighted. The majority of professionals agreed that personalized training by healthcare staff was considered the most effective option. They argued that direct and personalized interaction with postpartum women allows for addressing their specific needs and concerns, thereby promoting a thorough understanding of technology use and fostering greater confidence in its application. Additionally, they noted that in-person educational sessions are also important to provide an interactive environment where postpartum women can ask questions and receive immediate feedback.

How could the impact of ICTs on improving health outcomes related to postpartum anemia be measured in this hospital context?

After interviewing 7 professionals on how to assess the impact of ICTs on improving health outcomes related to postpartum anemia in a hospital setting, several positive perspectives were highlighted. The majority of experts agreed that using a combination of different evaluation methods would be crucial to gain a comprehensive and accurate view. Specifically, comparing health indicators before and after implementing ICTs was identified as essential to discern any significant changes in the management and control of postpartum anemia. This approach provides a quantitative way to directly measure improvements in patients' health following the adoption of these technologies.

What recommendations did she give to ensure successful and sustainable implementation of ICTs in managing postpartum anemia in immediate postpartum women?

After interviewing 7 professionals on recommendations for ensuring successful and sustainable implementation of ICTs in managing postpartum anemia in immediate postpartum women, several positive perspectives were highlighted. All experts emphasized the importance of actively involving all stakeholders from the project's outset. This approach not only ensures alignment of objectives and active participation of all stakeholders but also fosters a collaborative environment crucial for long-term success. Additionally, the majority of professionals suggested conducting a pilot evaluation before full implementation. This initial phase allows for identifying potential challenges and adjusting the system to fit the specific needs of the hospital environment and postpartum women. This iterative approach ensures that ICTs are properly tailored to the dynamics and requirements of the clinical context, thereby optimizing their effectiveness and acceptance.

Proposal

This proposal aimed not only to reduce the prevalence of anemia in immediate postpartum women but also to improve the quality of postpartum care through the integration of innovative technologies that facilitate monitoring and management of maternal health.

Title

Integration of Information and Communication Technologies (ICTs) in Monitoring and Managing the Prevalence of Anemia in Immediate Postpartum Women Treated at Barranca Hospital.

Introduction

Postpartum anemia is a common condition that can significantly affect the health and well-being of postpartum women. The integration of Information and Communication Technologies (ICTs) offers an innovative opportunity to enhance monitoring and management of this condition at Barranca Hospital. This proposal aimed to reduce the prevalence of anemia in immediate postpartum women through the use of technological tools that facilitate data collection, health monitoring, and communication between patients and healthcare professionals.

Overall Objective

To evaluate the effectiveness of Information and Communication Technologies (ICTs) in monitoring and managing anemia in immediate postpartum women treated at Barranca Hospital.

Specific Objectives

Developed a continuous monitoring system for hemoglobin levels using mobile applications and digital devices.

Evaluated the satisfaction and perception of postpartum women and healthcare professionals regarding the effectiveness and utility of the implemented ICTs.

Established a continuous feedback system to assess and enhance the implementation of ICTs in the management of postpartum anemia, based on the experiences and suggestions of postpartum women and healthcare professionals.

Methodology

Study Design: A prospective observational study was conducted at Barranca Hospital, focusing on the integration of Information and Communication Technologies (ICTs) for monitoring and management of anemia in immediate postpartum women.

Participant Selection: Immediate postpartum women treated at the hospital who presented with anemia were selected according to established clinical criteria.

Implementation of ICTs: A continuous monitoring system was developed and implemented using mobile applications and digital devices. This system allowed for efficient real-time data collection.

Data Collection: Data was collected on the effectiveness of the monitoring system, as well as on the adherence to the use of ICTs by postpartum women and healthcare staff.

Evaluation of Perception and Satisfaction: Data collection sheets, surveys, and structured interviews were used to assess the satisfaction and perception of postpartum women and healthcare professionals regarding the utility and effectiveness of the implemented ICTs.

Data Analysis: Descriptive statistical analysis was conducted to examine the survey results and feedback obtained. Additionally, qualitative analysis was performed to explore the experiences and improvement suggestions provided by the participants.

Implementation of Improvements: Based on the findings obtained, a continuous feedback system was established to enhance the implementation of ICTs in the management of postpartum anemia. This included adjustments to the technological system and care protocols according to identified needs.

Technological Resources

Mobile Health Monitoring Application (Hemoglobin Tracker)

Description: A mobile application designed for postpartum women to record and monitor their hemoglobin levels daily. It connects with compatible hemoglobin measurement devices (such as a pulse oximeter, portable hemoglobin monitor, etc.) through Bluetooth or USB.

Registration and Installation: Download and install the Hemoglobin Tracker application on your mobile device or access the web platform if available. Create an account and register with your basic personal and medical information.

Device Connection: Connect the compatible hemoglobin measurement device (such as a pulse oximeter, portable hemoglobin monitor, etc.) to the application, typically via Bluetooth or USB.

Measurement and Data Logging: Perform hemoglobin measurements using the connected device. The application will automatically record and store hemoglobin readings in your profile.

Continuous Monitoring: They regularly reviewed their hemoglobin levels. The application presented the data in easy-to-understand graphs and tables, showing trends over time.

Alerts and Notifications: Configure alerts and notifications to receive notices when their hemoglobin levels are outside the normal range or when it is time for a new measurement.

Interventions and Recommendations: Based on the collected data, the app could provide personalized recommendations for early intervention, such as dietary adjustments, iron supplementation, or medical consultations.

Sharing Information: Share your hemoglobin records with your doctor or healthcare professional directly from the app, facilitating more accurate and collaborative medical monitoring.

Review and Analysis: Utilize the application's analytical tools to review patterns and potential factors affecting their hemoglobin levels, aiding in better health management. These are the basic functions, but the exact experience may vary depending on the brand and specific features of the Hemoglobin Tracker being used.

Pedagogical Strategy: Postnatal mothers will be trained in the use of the application through training sessions and interactive tutorials, ensuring they understand how to input data and interpret the results.

Anemia Management Web Platform (AnemiaCare)

Description: A web portal that centralized clinical information for postnatal mothers, accessible to both patients and medical personnel. It was an online system designed to assist in the monitoring, management, and treatment of anemia. This platform offered various functionalities for both patients and healthcare professionals, facilitating more efficient and precise management of the condition.

Key Features of AnemiaCare

Patient Registration: Allowed patients to register and create personal profiles with their medical information and history.

Hemoglobin Level Monitoring: Patients could record their hemoglobin levels and other relevant parameters regularly. The platform stored and organized this data for easy access and analysis.

Medical History: Access to a complete medical history where all measurements, treatments, and relevant events related to the patient's anemia were recorded.

Alerts and Reminders: Configuration of automatic alerts and reminders for taking measurements, medications, or attending medical appointments.

Reports and Graphs: Generation of detailed reports and graphs displaying trends and patterns of hemoglobin levels over time.

Personalized Interventions: Customized recommendations based on patient data for managing anemia, including dietary adjustments, supplements, and other treatments.

Communication with Healthcare Professionals: Features allowing patients to share their data and communicate directly with their doctors or healthcare professionals. Doctors could review the information, provide recommendations, and adjust treatments as needed.

Resource Library: Access to a wide range of educational resources on anemia, including articles, videos, and practical guides to enhance understanding and management of the condition.

How AnemiaCare Was Used

Platform Access: Access the AnemiaCare platform through a web browser and log in with your credentials.

Data Entry: Enter your hemoglobin levels and other relevant data regularly. The platform may also be integrated with measurement devices that automatically sync the data.

Tracking and Analysis: Review your recorded data, view graphs and trends, and receive personalized recommendations for managing anemia.

Communication and Consultation: Use the platform to communicate with your doctor, share your medical history, and receive guidance and adjustments to your treatment.

Education and Resources: Access the resource library to learn more about anemia and how to manage it effectively.

Pedagogical Strategy: User manuals and training workshops were developed for medical staff and postnatal mothers, facilitating platform usage and promoting effective interaction.

Online Medical Consultation (MedConnect)

Description: MedConnect was a mobile application designed to connect users directly with doctors and healthcare professionals for online medical consultations. The platform provided various functionalities to ensure an efficient, secure, and accessible medical experience from anywhere. Características principales:

Registration and Profile Creation: Users could register and create a personal profile with their basic medical information and health history.

Appointment Scheduling: Users could schedule appointments with doctors from various specialties at times convenient for them.

Video Calls and Live Chat: The application allowed for medical consultations via high-quality video calls and live chat for quick discussions and clarifications.

Digital Medical History: Users had access to a digital medical history where all consultations, prescriptions, and recommendations were recorded.

Prescriptions: Doctors could issue electronic prescriptions that users could receive directly within the application and use at local pharmacies.

Secure Payment: Integration of multiple secure payment methods so that users could conveniently pay for their consultations.

• **Notifications and Reminders:** Users would receive notifications and reminders about their upcoming appointments, test results, and medications.

Access to Test Results: Patients could upload and share medical test results with their doctors, and receive analyses and recommendations based on these results.

Multilingual Support: The application provided support in multiple languages to cater to a diverse population.

Security and Privacy: Compliance with all medical data privacy and security regulations to protect users' information.

Workflow

Download and Installation: The user downloaded the MedConnect application from the App Store or Google Play and installed it on their mobile device.

Registration: The user registered by providing their basic information and creating a profile.

Consultation Scheduling: The user browsed through the list of available doctors, selected a specialist, and scheduled an appointment at a convenient time.

Medical Consultation: The user connected with the doctor via video call or live chat at the scheduled time for the consultation.

Receipt of Prescriptions and Advice: After the consultation, the user received the electronic prescription and any other recommendations or treatment plans in their profile.

Follow-up: The user could schedule follow-up appointments and stay in touch with the doctor for any additional queries.

Advantages of MedConnect:

Accessibility: Enabled users to access medical care without the need to travel.

Convenience: Facilitated scheduling consultations at flexible times.

Efficiency: Reduced waiting times and improved healthcare management.

Continuity of Care: Provided continuous record of medical history and easy access to specialists.

DISCUSSION

To address the discussion on the implementation of Information and Communication Technologies (ICTs) in monitoring and managing postpartum anemia in immediate postnatal mothers, it is crucial to consider the perspectives and findings of various authors who have researched topics related to maternal health and the use of technology in clinical settings.

Espinoza (2019) emphasizes that the integration of ICTs in healthcare can significantly optimize the monitoring and treatment of critical medical conditions such as postpartum anemia. Their research highlights that ICTs enable continuous and personalized tracking of hematological indicators, facilitating early and enhanced interventions. This approach not only aims to improve efficiency in healthcare delivery but also strengthens

responsiveness to the specific needs of postnatal mothers, thereby contributing to improved maternal health outcomes.

Exploring the adverse impacts of postpartum anemia on physical recovery and maternal caregiving capacity, as noted by Aparicio et al. (2023) in their study, reveals that this condition not only affects women's immediate health post-delivery but may also have long-term repercussions on infant development. The application of ICTs for continuous monitoring of hemoglobin levels could mitigate these effects by enabling early detection and more effective management, thereby improving the postpartum quality of life for new mothers.

Also, according to Ramirez (2021), the integration of ICTs in the healthcare sector not only leads to more efficient care but also optimizes resource utilization and improves clinical outcomes. Their research underscores that ICTs facilitate effective communication between patients and healthcare providers, as well as remote monitoring of medical conditions. This capability for remote monitoring could be particularly beneficial in contexts such as Barranca Hospital, where access to healthcare services may be limited.

Similarly, Rodriguez (2022) focuses their research on developing evidence-based clinical practices through the use of ICTs for continuous monitoring and early intervention in conditions such as postpartum anemia. Their work highlights that these technologies not only provide innovative tools for clinical management but also promote ongoing research into their effectiveness and adaptability in specific hospital settings. This is crucial for ensuring effective and sustainable implementation in maternal health management.

Palos' (2019) technology adoption theory suggests that the effective acceptance and use of ICTs in clinical settings depend on users' perceptions of usefulness and ease of use, including healthcare professionals and postnatal mothers themselves. Integrating this theoretical perspective into the discussion helps understand how factors such as adequate training and continuous technical support can influence the adoption and effectiveness of ICTs in the specific context of managing postpartum anemia.

Together, these approaches and perspectives provide a comprehensive framework for discussing the implementation of ICTs in the management of postpartum anemia. Research suggests that ICTs can be powerful tools for enhancing maternal care, offering continuous monitoring, early interventions, and more efficient resource management in hospital settings. However, challenges such as the acceptance of new technologies and effective integration into existing healthcare systems are also highlighted, necessitating carefully designed strategies tailored to local realities to maximize their positive impact on maternal health.

CONCLUSION

In conclusion, the integration of Information and Communication Technologies (ICTs) in monitoring and managing postpartum anemia among immediate postnatal mothers represents a promising strategy to improve maternal health outcomes. Through the application of advanced data collection and analysis systems, ICTs enable continuous and personalized monitoring, facilitating early medical interventions tailored to the specific needs of each patient. This capability for remote monitoring and efficient communication between patients and healthcare providers not only optimizes clinical care but also promotes more effective resource management and higher patient satisfaction at Barranca Hospital and similar settings.

The reviewed research underscores the importance of addressing barriers and challenges inherent in implementing ICTs in hospital settings. Resistance to change, inadequate training of healthcare staff in using new technologies, and limited integration with existing healthcare systems are factors that can hinder the effective adoption of ICTs for managing postpartum anemia. It is crucial to develop continuous training strategies and pilot programs before full implementation to ensure a smooth transition and optimal use of these technological tools in daily clinical practice.

The theories of technology adoption and organizational effectiveness provide a valuable theoretical framework for understanding how ICTs can be effectively and sustainably implemented in the management of postpartum anemia. These theories emphasize the importance of aligning

organizational goals with technological capabilities and the needs of staff and patients, thereby ensuring that ICTs significantly contribute to the continuous improvement of maternal health outcomes in hospital settings.

To ensure successful and sustainable implementation of ICTs in the management of postpartum anemia, it is recommended to adopt the following measures: It is crucial to actively involve all stakeholders from the initial stages of the project, including healthcare professionals, hospital administrators, and end-users such as postnatal mothers. This will ensure a comprehensive understanding of needs and expectations, as well as ongoing commitment to the project's success.

Performing pilot evaluations before full implementation will allow identification and addressing of potential obstacles and necessary system adjustments. This will also provide empirical data on the effectiveness and acceptance of ICTs among end-users, facilitating adjustments before large-scale expansion. Ensuring continuous technical support for users and healthcare staff is essential to maximize the use and benefit of ICTs in clinical practice. Regular training sessions, clear educational materials, and access to technical assistance will ensure that both patients and healthcare professionals feel comfortable and competent in using these innovative technologies.

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