

# Hospital information governance in the management of childhood malnutrition: a systematic review

*Gobernanza de la información hospitalaria en el abordaje de la desnutrición infantil: una revisión sistemática*

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## Abstract

This article analyzes the governance of hospital information systems in the approach to child malnutrition, considering the perspective of health workers. A systematic review of scientific literature published between 2010 and 2025 was carried out under a qualitative-descriptive approach. The process followed the PRISMA guidelines, identifying a total of 1248 records, from which 38 studies that met the inclusion criteria were selected. The analysis was organized around five axes: technical and functional failures in interoperability, health personnel perceptions, clinical data quality, institutional barriers and facilitators, and system strengthening strategies. The main findings reveal that deficiencies in interoperability, poor quality of clinical records and limited staff training hinder an effective response to malnutrition. However, in contexts where there is institutional leadership, continuous training and efficient use of technologies, information systems contribute significantly to improving the diagnosis, follow-up and prevention of child undernutrition. It is concluded that digital transformation in health requires not only infrastructure, but also sustained information governance, clear public policies and active participation of health personnel.

**Keywords:** Information governance, child malnutrition, hospital information systems

## Resumen

El presente artículo analiza la gobernanza de los sistemas de información hospitalaria en la acometida de la desnutrición infantil, considerando la perspectiva de los trabajadores de salud. Se ejecutó una revisión sistemática de literatura científica que se encuentra publicada entre 2010 y 2025, bajo un enfoque cualitativo-descriptivo. El proceso siguió las directrices PRISMA, identificando un total de 1248 registros, de los cuales se seleccionaron 38 estudios que desempeñaban los criterios de inclusión. El análisis se organizó en torno a cinco ejes: fallas técnicas y funcionales en la interoperabilidad, percepciones del personal de salud, calidad de los datos clínicos, barreras y facilitadores institucionales, y estrategias de fortalecimiento de los sistemas. Los principales hallazgos revelan que las deficiencias en interoperabilidad, la baja calidad de los registros clínicos y la limitada formación del personal obstaculizan una respuesta efectiva frente a la desnutrición. No obstante, en contextos donde existe liderazgo institucional, formación continua y uso eficiente de tecnologías, los sistemas de información contribuyen significativamente a mejorar el diagnóstico, seguimiento y prevención de la desnutrición infantil. Se concluye que

la transformación digital en salud requiere no solo infraestructura, sino también una gobernanza informativa sostenida, políticas públicas claras y participación activa del personal sanitario.

**Palabras clave:** Gobernanza de la información, desnutrición infantil, sistemas de información hospitalaria

## Introduction

Childhood chronic malnutrition (CCM) is one of the major public health challenges in Ecuador and Latin America. According to the National Survey of Childhood Malnutrition (ENDI, 2023), nearly 27% of children under five years old in Ecuador exhibit some form of malnutrition, compromising their overall development and perpetuating cycles of structural poverty that adversely affect quality of life, family well-being, and the country's future. This also negatively impacts the economy by generating losses in human potential and increasing the burden on health systems, reinforcing its priority status in national public policies (Rivera and Tamayo, 2024).

In Ecuador, CCM has a high prevalence in rural and indigenous areas, where adverse socioeconomic conditions exacerbate the structural determinants of malnutrition. The Ministry of Public Health (Ministerio de Salud Pública, 2021) has implemented monitoring, supplementation, and food education programs aimed at children and pregnant women. However, the COVID-19 pandemic intensified food insecurity, affecting both the availability and quality of food, which negatively impacted childhood nutritional patterns. Clinically, hospital malnutrition is defined as a disruption of nutritional requirements that may be related to inflammatory processes, anorexia, malabsorption, or excessive nutrient loss, leading to a rapid deterioration in the health status of pediatric patients (Lobatón, 2019).

In children under five years old, malnutrition limits physical and cognitive abilities, causing biochemical, immunological, and anthropometric deficiencies. Studies confirm that when it occurs during the early years of life, it can lead to irreversible damage to brain structure, with negative impacts that persist even if the condition is later reversed (Manosalvas, 2019). In fact, childhood malnutrition accounts for 45% of infant deaths in developing countries, where food scarcity is the most prevalent form (Suárez et al., 2024).

From both clinical and epidemiological perspectives, it is crucial to develop tools for early detection, continuous monitoring, and comprehensive treatment protocols, as malnutrition is associated with longer hospital stays, a higher risk of readmission, and increased pediatric mortality (De Mucio et al., 2023). However, Waitzberg et al. (2011) note that in many hospital settings, protocols still predominantly focus solely on critical nutritional recovery, without considering familial, social, or cultural variables in the child's environment.

To gain a broader understanding of this phenomenon, the study is grounded in the representation of political economy, which analyzes the configuration of public policies based on the relationships among the state, the market, and social institutions (Manosalvas, 2019; Rivera and Tamayo, 2024). Additionally, it incorporates policy sciences theory, which seeks to explain why some interventions fail despite having technical support and proposes integrating evidence and democratic contribution during public decision-making (Manosalvas, 2018). Concurrently, the new public management approach is considered, advocating for greater institutional efficiency, transparency, and intersectoral coordination as key reform axes for the state apparatus (Valencia M., 2022; Malo & Malo, 2014).

The governance of hospital information has been identified as a strategic element in improving the management of childhood malnutrition (Benítez, 2017). Nevertheless, various studies and health professionals report frequent failures in the interoperability of systems, data fragmentation, duplicate records, and insufficient training of healthcare personnel. However, it has been observed that in settings where effective governance exists, systems contribute to improved case detection, clinical decision-making, and the implementation of more effective prevention and treatment strategies (Pacheco et al., 1983).

In light of the identified problem, the study aims to analyze the governance of hospital information systems in addressing childhood malnutrition from the perspective of health workers, through a systematic review of research published between 2010 and 2025. Specifically, it seeks to identify technical and functional failures affecting interoperability and timely access to nutritional data; explore health personnel perceptions regarding institutional management of information systems and their clinical impact; determine the effect of data quality on monitoring malnutrition cases; examine barriers and facilitators for executing effective data governance policies; and recognize strategies for strengthening hospital systems.

## Methodology

This study was conducted using a qualitative-descriptive approach through a systematic literature review, in accordance with PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

The search was conducted in scientific databases such as PubMed, Scopus, Web of Science, SciELO, and LILACS. Combinations of keywords and descriptors in both Spanish and English were utilized, including:

"information governance," "hospital information systems," "childhood malnutrition," "child health," "health workers," "hospital management," among others. The following inclusion criteria were established:

- Studies published between 2010 and 2025.
- Research with qualitative, quantitative, or mixed approaches.
- Articles available in full text, in Spanish, English, or Portuguese.

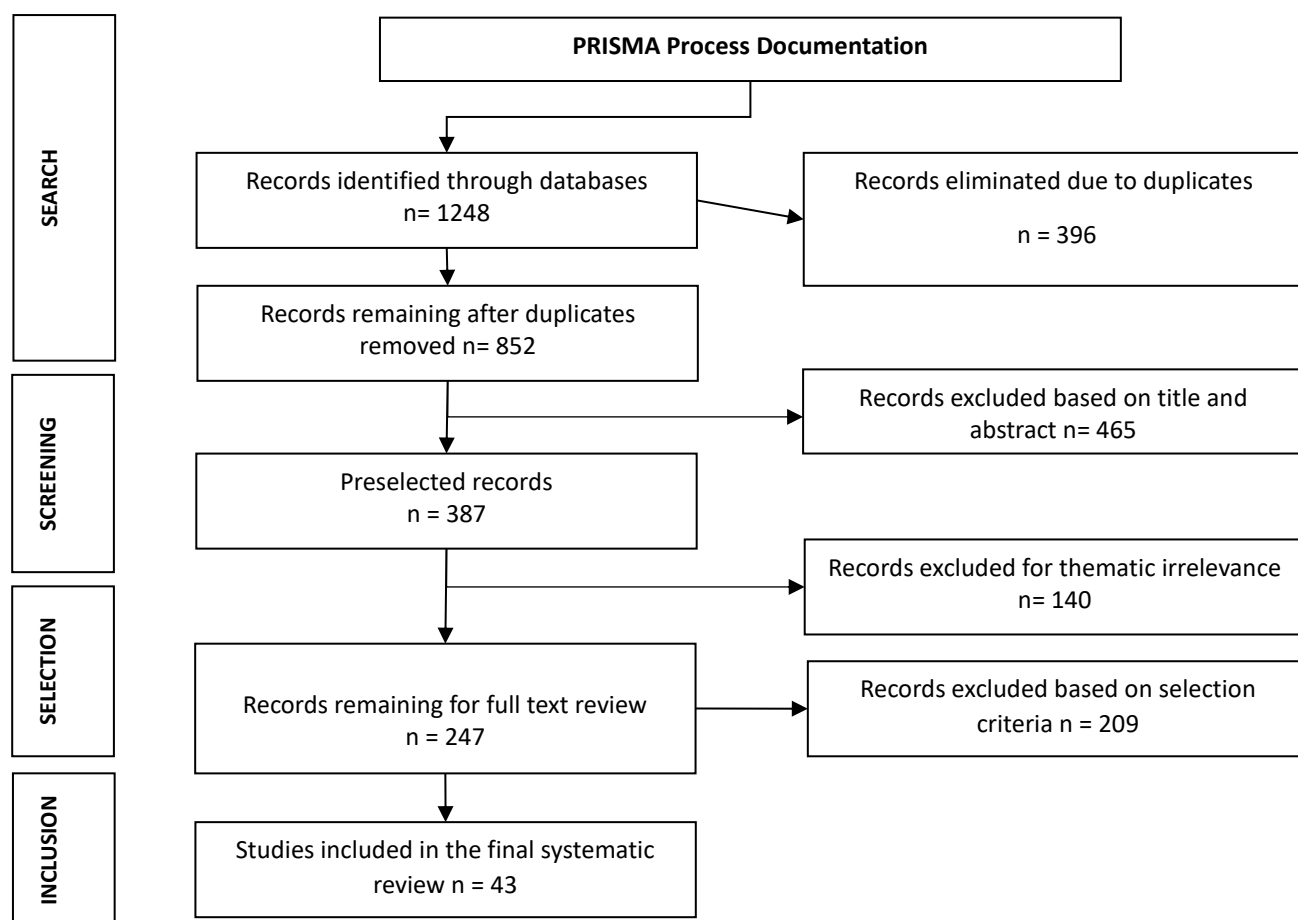
The following documents were excluded:

- Theoretical studies without practical application.
- Narrative reviews, non-peer-reviewed reports, editorials, or opinion pieces.
- Duplicate publications or those with evident methodological flaws.

Titles and abstracts were independently reviewed by two researchers, resolving discrepancies by consensus, which reduced the initial corpus to potentially eligible studies. Titles and abstracts were reviewed, followed by a comprehensive reading of the selected articles for evaluation and final eligibility. Figure 1 illustrates the flow diagram corresponding to the described process.

Finally, in the evaluation and analysis phase, 1,248 articles were examined, and after removing duplicates and applying criteria, 38 studies remained. The quality was assessed using CASP, STROBE, and MMAT, and thematic coding identified limitations, facilitators, personnel perceptions, and their impact on the management of childhood malnutrition.

**Figure 1**  
*PRISMA flow diagram*



## Results and discussion

**Table 1**

*Technical and functional failures affecting interoperability and timely access to nutritional data*

No.	Author(s) and Year	Country	Study Title	Identified Technical and Functional Failures
1.	Kester (2013)	Ghana	Using SOA with Web Services for Effective Integration of Hospital Information Systems via an Enterprise Service Bus	Isolated and incompatible hospital systems; technical barriers between local platforms.
2.	Chow et al. (2015)	USA	A Nursing Information Model Process for Interoperability	Lack of structured models in nursing and nutrition; risk of information fragmentation.
3.	Wiltz et al. (2017)	USA	Electronic Information Standards to Support Obesity Prevention...	Absence of prior standards; difficulty sharing BMI and nutrition data among providers.
4.	Mikles et al. (2017)	USA	Utilizing Standard Data Transactions...	Lack of integration of nutritional data in clinical records; poor

5.	Razzano et al. (2018)	USA	Case Study: Collaboration Fuels Success...	synchronization between systems. Interoperability failures between infusion pumps and clinical systems.
6.	Pylypchuk et al. (2020)	USA	State of Interoperability among U.S. Non-federal Acute Care Hospitals...	Systems unable to exchange data due to lack of common protocols.
7.	Manosalvas (2018)	Ecuador	When Policies Fail...	System fragmentation; absence of a national interoperable database; inadequate training.
8.	Lu et al. (2019)	Global	An Artificial Intelligence-Based System for Nutrient Intake...	Low data standardization and poor integration between AI and clinical records.
9.	Zhang et al. (2022)	Global	Local Partial Zero-Forcing Combining for Cell-Free Massive MIMO Systems	Unstructured databases; difficulties applying semantic technologies.
10.	Jayathissa & Hewapathirana (2023)	Global	Enhancing Interoperability among Health Information Systems...	Poor infrastructure; absence of technical leadership.
11.	Di Martino et al. (2023)	Global	Explainable AI for Malnutrition Risk Prediction...	Incompatibility between mobile platforms (m-Health) and hospital records.
12.	Solís et al. (2024)	Panama	Attention Deficits...	Lack of a unified platform to integrate health and nutrition data.
13.	Bria (2025)	Global	Challenges of Interoperability in Healthcare	Obsolete systems; no standards or inter-institutional connectivity.
14.	OPS (2025)	Peru	Digital Transformation: Peru Validates Interoperability...	Technical problems in validating interoperability; low level of semantic compatibility.
15.	OPS (2025)	Colombia	Connectathon for Interoperability...	Integration errors between platforms (HCE and SIIFA); necessary functional adjustments.

The results reveal common technical failures in the interoperability of hospital systems. Kester (2013) reports isolated and rigid systems in Ghana, which aligns with the findings of Chow et al. (2015) and Mikles et al. (2017), who describe similar problems in integrating nutritional data into clinical records. Pylypchuk et al. (2020) further reinforce this by pointing out that many hospitals are unable to share data due to the absence of common standards.

**Table 2**

*Health personnel perceptions regarding institutional management of information systems and their clinical impact*

No.	Author(s) and Year	Country	Study Title	Health Personnel Perceptions
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1.	Gallegos et al. (2014)	Ecuador	Status of Malnutrition in Hospitals in Ecuador	37.1% of hospitalized patients presented malnutrition; absence of nutritional policies and weakness in information systems reported.
2.	Sekoai et al. (2025)	Lesotho	Insights into Healthcare Workers' Perceptions...	87% of staff find the EMR system useful, but cite barriers like limited connectivity and lack of training.
3.	Jeilani & Hussein (2025)	Somalia	Impact of Digital Health Technologies Adoption...	Improvement in clinical performance and reduction of workload; positive perception towards digital technologies.
4.	Ghaffari et al. (2024)	Global	A Framework for Health Information Governance	Six dimensions of governance identified that impact clinical decision-making and quality of care.
5.	Menéndez et al. (2024)	Ecuador	Risk Management in Childhood Malnutrition...	Lack of interoperability and weak institutional coordination; strategies for strengthening proposed.
6.	Richemond & Huggins (2023)	USA	The Impact of Health Information Systems on Patient Outcomes	HIS improve efficiency and reduce medical errors, although challenges such as high costs and privacy concerns exist.
7.	Tello et al. (2023)	Mexico	Perceptions of Nursing Staff...	58.9% report lack of effective feedback on errors in clinical records, including nutritional data.
8.	Giménez & Rivas (2017)	Spain	Clinical Governance and Culture in Clinical Laboratory Safety...	Only 82.6% use electronic managers; variability in preventing nutritional errors.
9.	Rodó (2020)	Spain	Nursing Governance and Its Impact on Quality...	Positive correlation between information systems and patient satisfaction; resistance to digital tools also noted.
10.	Tufiño (2024)	Ecuador	Impact of Social Determinants on Childhood Malnutrition	70% of personnel believe that the systems do not predict nutritional risks or record social determinants.

Concerning health personnel perceptions, both Gallegos et al. (2014) and Menéndez et al. (2024) agree that institutional weaknesses and lack of system integration adversely affect malnutrition management. However, Jeilani and Hussein (2025) report a positive experience in Somalia, where digital technologies improved clinical performance. Conversely, Sekoai et al. (2025) clarify that although there is good acceptance, the lack of connectivity and training limits effective use. Collectively, this suggests that acceptance depends not only on technology but also on context and institutional support.

**Table 3**  
*Effect of data quality on monitoring cases of malnutrition*

No.	Author(s) and Year	Country	Study Title	Key Findings on Data Quality
16.	Lighterness et al. (2024)	USA	Data Quality–Driven Improvement in Health Care...	Customized reports (61%), automatic validations (54%), and training in standards (44%) improve the integrity and accuracy of records.
17.	Alemu et al. (2025)	Ethiopia	Quality of routine health and nutrition data...	Wide variability in the integrity and consistency of nutritional data; only 6% of studies showed internal coherence >90%.

18.	Maina et al. (2017)	Kenya	Improving nutrition information systems: lessons from Kenya	Establishment of standardized indicators, data clinics, and a centralized web database improved the nutritional information system. Incomplete records delay detection and monitoring; uniform records allow for trend monitoring and treatment optimization.
19.	Huicho et al. (2016)	Peru	Child health and nutrition in Peru...	Data improvement intervention raised the accuracy of neonatal indicators; statistically significant improvements ( $p < 0.001$ ). Lack of standardization and digital resources fragment records; uniform formats and automatic validations are proposed.
20.	Mulissa et al. (2020)	Nigeria	Effect of data quality improvement intervention...	
21.	Valencia et al. (2025)	Colombia	Addressing nutritional inequities in vulnerable communities...	

Regarding data quality, Lighterness et al. (2024) and Mulissa et al. (2020) highlight clear improvements when automatic validations and technical training are applied. However, Alemu et al. (2025) found that in Ethiopia, record consistency remains very low, indicating that data improvements depend not only on tools but also on standardization and ongoing monitoring.

**Table 4**  
*Barriers and facilitators for implementing effective data governance policies*

No.	Author(s) and Year	Country	Study Title	Identified Barriers and Facilitators
22.	Ghaffari et al. (2024)	Global	A Framework for Health Information Governance	Barriers: lack of structured models and institutional leadership. Facilitators: regulatory frameworks and ministerial standards.
23.	Cowie et al. (2020)	UK/USA	The Barriers and Facilitators Influencing Sustainability...	Barriers: shortage of human resources, discontinuous leadership. Facilitators: clear roles, local leadership, and institutional support.
24.	Paulsen et al. (2019)	Norway	Barriers and Facilitators for Implementing a Decision Support System...	Barriers: lack of interoperability and institutional routines. Facilitators: system reliability, staff motivation, and internal clinical leaders.
25.	Vasconez et al. (2025)	Ecuador	Digital Health Transformation in Ecuador...	Barriers: limited infrastructure and lack of standardized policies. Facilitators: Digital Agenda 2023-2027 and interinstitutional commissions.
26.	García et al. (2024)	Ecuador	The New Data Access Rules in Ecuador...	Barriers: fragmented norms and ambiguity in roles. Facilitators: unified rules that promote collaboration among institutions.
27.	Qian et al. (2025)	Global (LMICs)	Facilitators and Barriers to the Implementation of Digital Health Technologies...	Barriers: low digital literacy, lack of institutional awareness, doubts about diagnostic accuracy. Facilitators: ongoing training and positive past experiences.

As for barriers and facilitators, Ghaffari et al. (2024) and Cowie et al. (2020) agree that the lack of leadership and resources hinders sustainability. Vasconez et al. (2025) add that in Ecuador, the lack of standardized policies has been a limitation, although progress has been noted with the Digital Agenda. Paulsen

et al. (2019) and Qian et al. (2025) highlight staff motivation and ongoing training as facilitators, especially when internal leaders drive change.

**Table 5**

*Strategies for strengthening hospital systems by integrating ICT training, institutional leadership, and interoperable tools*

No.	Author(s) and Year	Country	Study Title	Identified Strategies
28.	Alotaibi et al. (2025)	USA	Enhancing Digital Readiness and Capability in Healthcare...	Ongoing training, organizational support, clinical leadership, and facilitating conditions like social influence and performance expectations.
29.	Vasconez et al. (2025)	Ecuador	Digital Health Transformation in Ecuador...	Digital Agenda 2023-2027 with seven pillars; promotion of interoperability, digital governance, and institutional training.
30.	Ghaffari et al. (2024)	Global	A Framework for Health Information Governance	Emphasis on institutional leadership, strategic vision, clear policies, data quality, and use of interoperability standards.
31.	Qian et al. (2025)	Global (LMICs)	Facilitators and Barriers to the Implementation of Digital Health Technologies...	Ongoing training, ministerial support, and internal leaders ("champions") as key to technological adoption success.
32.	Paulsen et al. (2019)	Norway	Barriers and Facilitators for Implementing a Decision Support System...	Targeted training, reliable system design, staff motivation, and backing from institutional clinical leadership.
33.	Pierre et al. (2016)	Global	m-Health Adoption by Healthcare Professionals...	Determinants: perceived usefulness, ease of use, and interoperability. The importance of specific training and institutional endorsement is highlighted.

Finally, regarding strengthening strategies, Alotaibi et al. (2025) and Ghaffari et al. (2024) agree that institutional leadership and ICT training are crucial. Pierre et al. (2016) and Paulsen et al. (2019) add that ease of use and perceived usefulness influence adoption. Overall, studies concur that strengthening systems must go beyond technical aspects and include institutional support and continuity over time.

## Conclusions

The reviewed results indicate that the governance of hospital information systems still faces numerous technical and organizational barriers that hinder effective management of childhood malnutrition. The lack of interoperability between platforms, insufficient data standardization, and absence of common protocols remain recurring issues across various contexts.

It was observed that healthcare personnel appreciate the benefits of digital systems; however, they also note that these systems often fail to function effectively due to a lack of training, limited connectivity, and absence of institutional feedback. This directly affects the quality of care and monitoring of malnourished children. Although some countries have implemented visible improvements, a structural and permanent solution to ensure efficient systems is still lacking.

Regarding data quality, it is clear that without complete and coherent records, adequate monitoring cannot occur. In other words, having technological tools is of little use if there are no defined processes to ensure the integrity of information. Furthermore, it is confirmed that improving systems depends not only on technological resources but also on institutional commitment and the leadership of decision-makers in health.

Finally, it was identified that effective governance requires not only clear legal frameworks but also ongoing training for personnel, committed technical leaders, and a long-term vision. Many successful strategies are based

on creating interinstitutional teams, designing interoperable platforms, and the presence of “digital champions” who motivate others.

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