



Handoff communication in intensive care: links with patient safety

Comunicação no handoff na terapia intensiva: nexos com a segurança do paciente

Comunicación en el handoff de terapia intensiva: nexos con la seguridad del paciente

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ABSTRACT

Objective: To gather scientific evidence about ICU handoff practices and their implications on the safety of communication among team members about hospitalized patients. **Method:** This was an integrative review conducted in the Medline, PubMed, Cinahl and Scopus databases with the descriptors *patient handoff*, *communication*, *patient safety*, *critical care*, *health communication* and *intensive care unit*. The adopted criteria were: full text, in Portuguese or English, in the last 10 years, with level of evidence over IV and compliance to the study question. Fifteen articles were submitted to a structured tool and analysis. **Results:** There is evidence of incompleteness, absence or errors in handoff information, caused by the lack of standardization and preparation for this activity, generating delayed, incorrect or non-performed procedures. The use of tools reduces the amount of omitted information, side talks, and errors, improving team satisfaction. **Final considerations:** It is necessary to promote safe communication in handoff, implementing practices that ensure care continuity.

Keywords: Health Communication; Critical Care; Patient Safety.

RESUMO

Objetivo: Levantar as evidências científicas sobre a prática do *handoff* na unidade de terapia intensiva quanto à segurança da comunicação entre os membros da equipe sobre o paciente hospitalizado. **Método:** Revisão integrativa, nas bases Medline, PubMed, Cinahl e Scopus, com os descritores *patient handoff*, *communication*, *patient safety*, *critical care*, *health communication* e *intensive care unit*. Adotou-se como critérios: texto completo, português/inglês, últimos dez anos, nível de evidência acima de IV e alinhamento à questão de pesquisa. Quinze artigos foram submetidos a um instrumento estruturado e análise. **Resultados:** Evidenciam-se informações ausentes, incompletas ou erradas no *handoff*, causadas pela falta de padronização e de preparo dessa atividade, gerando procedimentos atrasados, errados ou não realizados. O uso de instrumentos reduz a quantidade de informação omitida, conversas paralelas e erros, melhorando a satisfação da equipe. **Considerações finais:** É preciso promover a comunicação segura no *handoff*, implementando práticas que garantam a continuidade da assistência.

Palavras-chave: Comunicação em saúde; Terapia Intensiva; Segurança do paciente.

RESUMEN

Objetivo: Relevar las evidencias científicas sobre la práctica de *handoff* con respecto a la seguridad de la comunicación sobre el paciente hospitalizado de miembros del equipo de Unidad de Terapia Intensiva. **Método:** Revisión integrativa en las bases Medline, Pubmed, Cinahl y Scopus, con los descriptores: *patient handoff*, *communication*, *patient safety*, *critical care*, *health communication* e *intensive care unit*. Los criterios adoptados fueron: texto completo, portugués/inglés, últimos diez años, nivel de evidencia encima de IV y conformidad con la temática investigada. Quince artículos fueron sometidos a un instrumento estructurado y análisis. **Resultados:** Existen informaciones ausentes, incompletas o incorrectas en el *handoff*, causadas por la falta de estandarización y preparo para esta actividad, generando procedimientos atrasados, incorrectos o no realizados. El uso de herramientas reduce la cantidad de informaciones omitidas, conversas paralelas y errores, mejorando la satisfacción del equipo. **Consideraciones finales:** Hace necesario promover la comunicación segura en el *handoff*, con prácticas que garanticen la continuidad de atención.

Palabras clave: Comunicación en salud; Cuidados intensivos; Seguridad del paciente.

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INTRODUCTION

Intensive care units (ICUs) are places for patients in critical conditions that require complex and specialized care delivered by multiprofessional and interdisciplinary teams. This setting is marked by a dynamic and constant flow of health professionals, patient instability, and the need to manage therapies, information systems, and high-complexity equipment.¹ Thus, patient safety deserves special attention, because patients are more vulnerable to adverse events because of the severity of their diseases and the greater need for specific care.

The concept of patient safety refers to reducing risks of unnecessary harm associated with health care to the lowest acceptable extent. Harm occurs when there is damage to a body structure or function or any resulting effect, such as disease, disability, injury, suffering, or death, which are called adverse effects.²

In the ICU, several factors can influence patient safety, with risks of causing them harm, such as factors related to individual, team, work environment, organizational and administrative and institutional aspects.² The present study focuses on the influence of communication among professionals. Communication is defined as an ongoing process of sharing information composed of inter-related elements, giving meaning to the goal of messages.³

In the hospital environment, specifically, the sharing of information and experiences among professionals has the role of ensuring care continuity. To reach this objective, patient data must be clear, objective and complete, with information that allows for monitoring, assessment, and planning of care.⁴

Effective communication among members of ICU teams is considered a contributing element to promote a culture of safety.⁵ Flaws in such communication can compromise continuity of intensive care and place patient safety at risk.⁴ Such flaws have been increasingly indicated as contributors to the occurrence of adverse events,⁶ which has generated interest of researchers in the theme of safety in communication.

In a cohort study conducted for 18 months in the ICU of a private hospital, communication flaws among health professionals led to adverse events that could potentially increase the mortality rate in the sector, whether due to delays in administering antibiotic therapy or important procedures.⁷

In a reflection paper about effective communication from the perspective of interdisciplinary work in the quality of health care and patient safety, the authors considered that professionals had difficulties maintaining effective communication when working as a team, especially because of different educational backgrounds; hierarchy; and differences in communication frequency among categories.⁶

Handoffs are an important moment in intensive care in which communication is intensely present,⁷ involving three

characteristics: transfer of information, responsibility, and authority. This clinical activity ranges from the transfer of patient information between professionals from different shifts to patient transfer between different hospital sectors or from one hospital to another.⁷

Thus, handoffs consist of transmitting information relevant to the patient's continuity of care and should include their current health condition, recent changes, and the treatment being administered. It is a way of transferring responsibility for patients to another professional team during hospital care, admission and discharge.⁷

Empirical observations have shown that situations that involve joking, call buttons, side-talking, lack of clear information, lack of structure, professional difficulty in interpretation, and superficial and incomplete reports can hinder care. Such observations corroborate the findings of preliminary studies that have shown that handoffs are a challenge to the health area in terms of quality and safety.^{6,8}

These indications of the problems linked with communication during handoffs led the World Health Organization to prioritize clinical handoffs to decrease adverse patient events.⁹ In Brazil, effective communication among professionals in health services is also a critical issue, constituting one of the goals of the National Patient Safety Program, especially regarding verbal prescriptions, information about test results, and interlocution between pharmacy, nursing, and medical teams. Such aspects generate suspended procedures, delays in diet therapies, and adverse reactions to medications.²

In light of the above, the following research question was posed: What scientific evidence exists about communication among ICU professionals during handoffs and about their repercussions for patient safety? The study objective was to gather scientific evidence about handoff practices in ICUs regarding the safety of communication among team members about hospitalized patients.

METHOD

This was an integrative review with an exploratory nature. Integrative reviews are considered broad review methods, enabling the inclusion of experimental and nonexperimental studies to understand the analyzed phenomenon.¹⁰ In the case of this study, the review is justified due to the lack of clarity regarding the described phenomenon. Thus, it can help underpin how communication occurs in handoffs so that at a later moment, data production can be better oriented in field research and resulting interventions.

The present study was developed in four steps: formulating the guiding question and research objective; establishing article search criteria; organizing data; analyzing and discussing the

results and presenting the review.¹¹ The guiding question was: What scientific evidence exists about communication among ICU professionals during handoffs and about their repercussions for patient safety?

By considering the objectives of the study, inclusion criteria were structured to include articles in the evaluation corpus, namely: articles available in full text; in Portuguese or English; within the timeframe of 10 years: 2007-2016; which answered the guiding question, i.e., addressed handoff communication among different health professionals within the ICU from the perspective of safety; and presented strong levels of evidence, as standardized by the U.S. Agency for Healthcare Research and Quality. Studies classified between 1 to 4 were included: level 1: meta-analysis of multiple control studies; level 2: individual experimental design studies; level 3: quasi-experimental studies, such as studies without randomization with a single pre- and post-test group, time series or case-control; nonexperimental designs such as correlational descriptive and qualitative research or case studies.¹²

Data were collected through a survey of articles directly available in the Medline, Cinahl and Scopus databases. To expand the corpus of the investigation, a second search was conducted through direct access to the PubMed database. These searches were conducted with the following descriptors: patient handoff; communication; patient safety; critical care; intensive care units; health communication. These descriptors were cross-referenced among themselves using the Boolean operator AND, as shown in Chart 1.

The data were collected between January and March 2016. Based on the cross-referencing of the applied descriptors, an initial 1,200 articles were found. Exploratory reading of their titles and abstracts was conducted to verify whether they met the inclusion criteria. This led to the exclusion of 1,147 articles that did not answer the research question or did not meet the other criteria, and nine duplicates, with a preliminary number of 44 articles.

These articles were submitted to selective reading, which consisted of a full-text reading to obtain an overall view of the

study and verify whether it answered the research question. This process led to the exclusion of 29 articles, because after synthesizing and establishing a hierarchy of their main information, the reviewer concluded that the relevance of its content was not enough to answer the research problem and their methodological rigor and level of evidence compromised the validity of their information. When there were doubts about whether to include an article, two experienced researchers analyzed its content independently and reached a consensus.

The corpus comprised 15 articles, as shown in Figure 1. Analytical reading was performed using an instrument to gather information about the article, including their general characteristics, objective, methodological design, results, and level of evidence. The data collected from the selected articles were organized in a synoptic table (Chart 2), including title; year/country; methodological design; interventions; and outcomes.

The results of the studies were submitted to content analysis, resulting in confluent themes that indicated the units of evidence, based on which the discussion was developed, using the concepts of safety² and communication³ that underpin the study. The articles are identified using a numeric code A1, A2 (...).

RESULTS

Regarding the characteristics of the corpus, the final 15 selected studies were in English; published between 2008 and 2015 and produced mainly in the USA (seven articles) followed by Canada (three), and Australia (two). Of the total number of studies analyzed, ten were developed by professionals in universities and the others, in hospitals. Most of the studies adopted a quantitative methodological design (nine articles), followed by qualitative designs (five), and one qualitative and quantitative study.

The results of the content analysis were organized into two units of evidence. The first was: "Flaws in communication: cause, nature, and consequences"; and the second: "Handoff practices: instrument models and effects". The studies were presented descriptively.

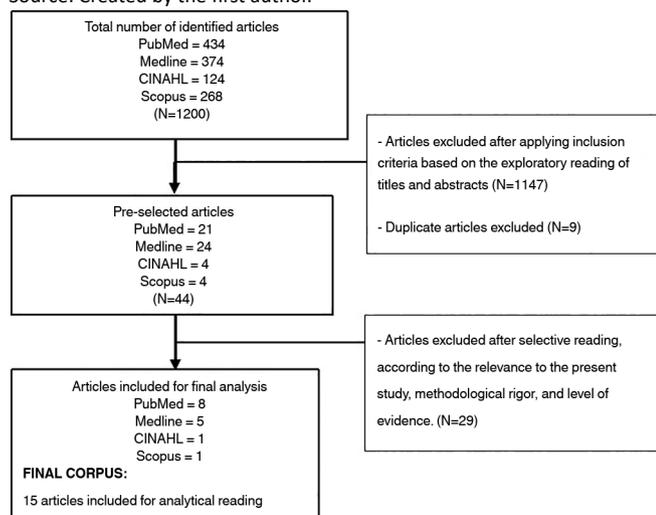
Chart 1. Articles included by crossing descriptors with databases

Crossings/databases	PubMed	Medline	Cinahl	Scopus
Handoff AND critical care	2	4	0	0
Handoff AND ICU	2	0	1	0
Handoff AND Health communication	1	1	0	1
Handoff AND patient safety	0	0	0	0
Handoff AND communication AND patient safety	3	0	0	0
Total	8	5	1	1

Source: Created by the first author.

Figure 1. Flowchart of article selection.

Source: Created by the first author.



Unit of evidence 1: Flaws in communication: cause, nature and consequences

This unit included studies that described communication breakdowns that occurred in the handoff practices of ICU professionals that could result in harm to patients: A2,¹⁴ A3,¹⁵ A5,¹⁷ A9,⁹ A10,²¹ A11,²² and A14.²⁵ Such communication breakdowns are characterized in terms of cause (A3¹⁵ and A5¹⁷); nature (A9,⁹ A10,²¹ A11,²² A14²⁵); and consequences (A2¹⁴).

Regarding causes, A3¹⁵ established two factors related to flaws in communication during transfers: lack of standardized format to present information throughout the transfer, pointing to a potential link between standardization and information breakdown; inadequate conclusion of activities in preparation for handoff, which are related to gathering information about the patient and updating care plans, such as examining patients; reviewing patient information and care plans, and recording this information before shift change. Not carrying out these activities resulted in information breakdown, which did not occur when both factors were adequately carried out.¹⁵

Study A5¹⁷ described the three phases of handoff to demonstrate their interdependence and importance when analyzing handoff communication flaws. The pre-handoff phase comprised gathering knowledge about patients; the handoff phase comprised communication events related to specific cases and was associated with preparatory efforts in the pre-turnover phase; and the post-turnover phase was made up of delivering planned patient care activities and reassessing patient information.¹⁷

In the handoff phase, the information presented can be rejected (information is ignored and a new decision-making cycle is initiated), accepted (incorporated into the final assessment and care plan) or require additional information

requested by the oncoming professional (new information assessed for its sufficiency and completeness). In the study, 52% of the information was accepted without any discussion, and 4% was rejected. Of the 44% that required additional information, 33% was resolved when one of the team members provided complementary information, while 11% was not immediately resolved and went into a team-based collaborative problem-solving cycle.¹⁷

Regarding the nature of communication flaws, they may be due to incomplete and/or erroneous information and handoffs that occur without any exchange of patient information. Absent, incomplete or wrong information could refer to care plans, current patient condition/status, in addition to clinical history, as shown in studies A9,⁹ A10,²¹ A11,²² A14.²⁵

In A10,²¹ the most prevalent communication failure types were those related to: transfer and discharge (29%), when there was no handoff during the transfer of patients between units; handoff omissions, in which communication about the patient's condition was incomplete (19%), and the care plan (14%). Handoff error types including wrong information about care plans occurred in 5% of cases, and about clinical conditions in 3%.²¹

Study A14²⁵ observed 40 handoff processes between anesthesiologists in a surgical unit and nurses in a postoperative ICU and found that communication between these professionals referred to: clinical history (21%), intraoperative events (20%), patient condition (19%), future care plans (13%) and others (27%). Providing information about patient history (42%) and intraoperative events (39%) was the most frequent verbal behavior adopted by anesthesiologists, while patient condition (8%) and care plan (9%) were less mentioned. In contrast, these topics resulted in highly interactive communication, involving nurses proactively asking questions, 46% and 29%, respectively, when compared to patient history (19%) and intraoperative events (5%).²⁵

This indicates that the type of information that is omitted in handoffs is different for physicians and nurses, as shown in A11,²² which investigated 290 nurses and 290 resident physicians involved in handoffs of patients admitted to and discharged from an ICU, classifying them as either providers or recipients, according to their professional category. Among the nurses and residents responsible for transfers, nurses were more concerned with the complexity of the patient's overall health (40%) than residents (25%), who showed more interest in overall management plans, communicated by 73% of residents and 54% of nurses. Among recipients of information, nurses (12%) believed that past medical history was more important, while only 1% of residents thought so. Forty-eight-hour management plans were considered more useful by residents (29%) than by nurses (19%).²²

Chart 2. Synopsis of articles included in the review

Title	Design	Interventions	Outcomes
A1-Improving handoff communications in critical care: utilizing simulation-based training toward process improvement in managing patient risk ¹³ 2008/Israel Evidence: III	Phase 1: retrospective, analysis of the causes of an adverse event Phase 2: prospective, intervention, quantitative N=390 handoffs (224 pre- and 166 post-intervention)	To describe common flaws in the handoff process based on a retrospective analysis of an event, creating a handoff protocol and nursing team training-based simulations.	After the intervention, the incidence of nurses communicating relevant information during handoffs increased, including patient name, events occurred in the last shift and treatment objectives for the following shift. No changes were found in the incidence of checking monitor alarms and mechanical ventilators.
A2-A prospective observational study of physician handoff for intensive-care-unit-to-ward patient transfers ¹⁴ 2011/Canada Evidence: IV	Observational, prospective and quantitative N=112 intensive-care-unit-to-ward patient transfers	To understand the methods and quality of communication in handoffs between physicians in the ICU.	Poor communication resulted in 13 medical errors and chaperone dissatisfaction relative to lack of knowledge about the patient's clinical condition.
A3-Falling through the cracks: information breakdowns in critical care handoff communication ¹⁵ 2011/USA Evidence: IV	Qualitative, multi method Audio recordings of 80 handoffs; monitoring work flow of 30-40 professionals;	To investigate communication flaws during handoffs	Two factors contributed to information breakdown: lack of standardized communication during handoffs; inadequate preparation for handoff in the pre-handoff phase.
A4-Standardized multidisciplinary protocol improves handover of cardiac surgery patients to the intensive care unit ¹⁶ 2011/USA Evidence: III	Prospective, interventionist, and quantitative N=69 handoffs	To assess pre- and post-intervention handoffs through direct observation based on a standardized instrument.	Technical errors during handoffs decreased from 6.23 to 1.52; omission of critical information during handoffs fell from 6.33 to 2.38. Teamwork and handoff content improved.
A5-Bridging gaps in handoff: A continuity of care based approach ¹⁷ USA/2012 Evidence: IV	Qualitative, multi method N=80 handoffs 30-40 ICU professionals	To identify the nature and intrinsic characteristics of handoff phases and develop a framework for handoff communication in critical care.	Three independent phases of the handoff process were identified: before, during, and after, which can result in the acceptance or rejection of information, or in the need for more information requested by information recipients. 52% of the information was accepted without any discussion, 4% was rejected. The remaining 44% required additional information, and of these, 33% was resolved when one of the team members complemented the information, whereas 11% was not immediately resolved and went into a team-based collaborative problem-solving cycle.
A6-In search of common ground in handoff documentation in an Intensive Care Unit ¹⁸ 2012/USA Evidence: IV	Observational, qualitative and documental N=22 instruments used by nurses and physicians	To understand the structure, functionality, and content of handoff documentation used by nurses and physicians in an intensive care unit setting.	There were overlaps in the documentation used by nurses and physicians. A user-centered semi-structured tool can help communication among professionals and improve patient safety.

Continued Chart 2.

Title	Design	Interventions	Outcomes
A7-Handover patterns: an observational study of critical care physicians ¹⁹ 2012/Canada Evidence: IV	Observational, prospective and quantitative N=21 handoffs	To describe handoff communication patterns used by the participating physicians in an ICU and compare them to widely promoted standardized handoff communication schemes.	Intensive care physicians did not follow the commonly recommended communication standards; i.e., they did not use the same schemes and some elements were scattered and others absent during handoff.
A8-Pilot implementation of a perioperative protocol to guide operating room-to-intensive care unit patient handoffs ²⁰ 2012/USA Evidence: III	Prospective, interventionist, and quantitative N=238 health professionals during 60 patient handoffs.	To assess the impact of implementing a standardized handoff protocol in patient care and team satisfaction.	After the intervention, the presence of all group members at the bedside increased from 0% to 68%. The percentage of lost information on surgery reports fell from 26% to 16%. The protocol reduced the risk of losing information and promoted satisfaction among the perioperative team.
A9-Understanding current intensive care unit nursing handover practices ⁹ 2013/Australia Evidence: IV	Observational, prospective and quantitative N=20 handoffs involving 40 nurses (20 transferring and 20 receiving)	To assess the content and completeness of the intensive care unit nursing shift-to-shift handoff.	Flaws in communication included: absence of current clinical condition at handoff; discharge and long-term plans were present in 40% of handoffs; reading over charts together with professionals receiving handoffs occurred in 35% of the cases, and cross-referencing data occurred in 40% of the analyzed handoffs.
A10-Failures in transition: learning from incidents relating to clinical handover in acute care ²¹ 2013/Australia Evidence: IV	Observational, cross-sectional, quantitative, descriptive N=459 events occurred between 2004-2008 in acute care units.	To analyze the characteristics, contributing factors and detection mechanisms of failures associated with handoffs in acute care settings.	The most common failures were: inadequate handoff (28%); omission of critical information about the patient's condition (19%); and omission of critical information about patient care plan (14%).
A11-Differences in the handover process and perception between nurses and residents in a critical care setting ²² 2014/Singapore Evidence: IV	Quantitative, descriptive N=580 (290 resident physicians and 290 nurses).	To identify differences in handoff practices and perceptions between nurses and residents in critical care units.	Among the providers, nurses were more concerned with the complexity of the patient's health condition than residents. Among recipients, nurses considered medical history the most useful information (12%), while among residents, the 48-hour care management plan was perceived as the most useful.
A12-Are attendings different? intensivists explain their handoff ideals, perceptions, and practices ²³ 2014/USA Evidence: IV	Qualitative, descriptive N=30 intensivists	To characterize attending intensivists handoff practices and determine the ideal aspects of handoffs from the perspective of attending physicians.	Standardized practices were rare. Handoff practices included: telephone conversations, in-person communications, e-mail or text messages. The "ideal handoff": succinct and organized, face to face, including verbal and written communication about patient trajectory.

Continued Chart 2.

Title	Design	Interventions	Outcomes
A13-Comparative evaluation of the content and structure of communication using two handoff tool: Implications for patient safety ²⁴ 2014/USA Evidence: III	Interventionist, prospective, quanti-qualitative N=82 handoffs (41 with each tool)	To compare two handoff tools: SOAP and HAND-IT. Groups of five professionals worked with one of the tools for 1 month and then switched.	Comparative assessment between the two handoff tools: SOAP and HAND-IT, showed that HAND-IT generated fewer communication errors.
A14-Transferring patient care: patterns of synchronous bidisciplinary communication between physicians and nurses during handoffs in a critical care unit ²⁵ 2015/Canada Evidence: IV	Qualitative, descriptive, observational N=40 handoffs	To characterize the flow of information during handoffs and identify patterns of communication between anesthesiologists and nurses in a postoperative critical care unit.	The presence of patient history (42%) and intraoperative events (39%) was more frequent, while patient condition (8%) and care plan (9%) were less so. Searching for information by asking questions was more common regarding patient condition (46%) and care plan (29%).
A15-Face-to-face handoff: improving transfer to the pediatric intensive care unit after cardiac surgery ²⁶ 2015/USA Evidence: III	Prospective, interventionist and quantitative N=79 handoffs	To develop and implement a handoff process, improving forms of communication, which begins in the operating room and ends at the ICU bedside.	Before the handoff instrument, 58% of the professionals believed the process was efficient; 53% felt comfortable asking questions; 19% believed the process improved care. After the intervention, these percentages were 69%, 75%, and 94%, respectively.

Source: Created by the first author.

Study A9⁹ showed that, in general, the content handed over by ICU nurses contained detailed clinical information, adhering to key principles; however, some principles were minimally addressed or even absent from handoffs: absence of current clinical conditions at handoff, discharge and long-term care plans, which were presented in 40% of turnovers; reading over charts to ensure understanding of receiving professional occurred in 35% of cases, and cross-referencing data, which involves verifying drug prescriptions, reviewing IV drugs and monitoring the drug chart by nurses involved in handoffs was present in 40% of the analyzed handoffs.⁹

A2¹⁴ showed the consequences of communication problems by analyzing the method and quality of communication during intensive-care-unit-to-ward transfers between physicians. The results showed that 75% of the ICU physicians were able to contact receiving physicians after requesting consult for transfer; 15% discussed recommendations and transfer opinions with the receiving physicians following consult. Of the receiving physicians, 65% did not receive verbal handoff from the ICU physician when a patient was transferred; 61% had a discharge summary available in the patient's chart during initial assessment; two patients were transferred without the knowledge of the receiving physician and spent 48 hours before being evaluated.¹⁴

Such communication problems led to 13 medical errors, including inappropriate medications or doses; important

medications suspended; acute medical conditions not recognized after transfer; ICU-specific investigations or treatments not given after transfer; patient monitor or nursing care not applied due to poor communication and parenteral nutrition delayed after transfers due to failure to reactivate the order.¹⁴

The Chart 3 presents the synthesis of the evidence obtained in Unit 1 and the studies in which these were identified:

Unit of evidence 2: Handoff practices: models and effects of the use instruments

This unit of evidence gathers studies about handoff practices, analyzing them in terms of communication models (A6,¹⁸ A7,¹⁹ A12²³) and recommending the standardization of handoff processes; in addition to presenting the effects of using handoff tools on the improvement of patient safety (A1,¹³ A4,¹⁶ A8,²⁰ A13,²⁴ and A15²⁶).

Among those that addressed models, A7¹⁹ compared communication patterns used by physicians during handoffs using the SBAR (Situation, Background, Assessment, and Recommendation), SOAP (Subjective, Objective, Assessment and Plan), and the medical admission note (MAN).¹⁹

For SBAR, most of the transfer content, or 56%, included Background elements. The Recommendation element was absent from 55% of patient transfers. For SOAP, Subjective elements comprised 40% and Assessment 26% of content,

Chart 3. Summary of unit of evidence 1

Unit of evidence 1: Flaws in communication: cause, nature, and consequences.	Studies identified
Causes of communication flaws: lack of standardization, inadequate preparation for handoff in pre-handoff phase;	A3 and A5
Nature of communication flaws: incomplete, misleading or missing information about care plans, current patient condition, and clinical history;	A9, A10, A14, A11
Consequences of communication flaws: wrong procedures, omitted procedures, and evaluations; delayed care delivery.	A2

Source: Created by the first author.

and the Plan element was absent from 7% of the transfers. For MAN, expressions of Assessment and History of Present Illness corresponded to 42% and 29%, respectively, of transfer contents. Except for Assessment, all MAN elements were occasionally absent from transfers.¹⁹

Regarding the order of information, when using SBAR, 77% of transfers were started with Background and only 14% with Situation information. Only 13% of transfers were concluded with a Recommendation. For SOAP, 66% of the transfers began with Subjective information and only 26% ended with a Plan. For MAN, 62% of transfers were started with identifying information and 80% were ended with Assessment and Plan.¹⁹

The physicians did not follow the recommended communication standards during transfers. Several of the mnemonic elements were scattered throughout the transfers without block structure or fixed order, and sometimes were completely absent.¹⁹

Study A6¹⁸ analyzed two types of handoff artifacts, one used by nurses (admission and discharge) and another used by residents and assisting physicians (computer-based and not integrated with the electronic record system). The results showed a high degree of structure as regards the content and functionality of the artifacts, which allowed for annotations and data entry standardization. However, there was a high degree of overlap between artifacts, as 92% of the handoff elements were interdisciplinary in content.¹⁸

In A12,²³ standardization of handoff practices was rare, and the main types of communication media were: telephone conversations (25), e-mails (9), in-person communications (11), or text messages (2). Handoffs lasted between 10 and 20 minutes for 5 to 42 patients. The "perfect handoff", according to the attending's role as team leaders, should provide a big Picture view about patients, avoiding irrelevant information, such as patient history, which can be obtained from the medical record, and is succinct, organized, structured, and included verbal and written communication. The main barrier to ideal handoffs was time limitations.

The positive effects of using instruments on patient safety were mentioned in A1,¹³ A4,¹⁶ A8,²⁰ and A15,²⁶ which were related

to: quantity and type of omitted information (A1¹³); number of errors, amount of omitted information (A4¹⁶); team presence and satisfaction, rate of side-talking, amount of lost information (A8²⁰); and professional perception (E15²⁶).

Study A4¹⁶ showed that applying a standardized checklist in the handoff process significantly reduced technical errors, falling from 6.24 preintervention to 1.52 after applying the checklist. The amount of omitted information decreased from 6.33 preintervention to 2.38 post-intervention.¹⁶

Study A8²⁰ analyzed the use of standardized tools in 60 handoffs and its results showed that the duration of handoff increased by 1 minute. The presence of the all handoff team members at the bedside increased from 0% at the baseline to 68% post-intervention, and the amount of side-talking fell from an average of 11% per handoff preintervention to 3% postintervention. The percentage of missed information in surgery reports decreased from 26% to 16%. Satisfaction among the professionals also improved with the standardized protocol.²⁰

Another study investigated the perception of professionals before implementing the handoff tool in a pediatric ICU: 58% of professionals believed the process was efficient, 53% felt comfortable asking questions, 19% believed the process improved patient care. After the intervention, 69% considered the process efficient, 75% felt comfortable asking questions; and 94% believed the handoff process improved care.²⁶

Study A13²⁴ conducted a comparative assessment between SOAP, based on a patient problem-based format, and the Handoff Intervention Tool (HAND-IT), based on a body system-based format. The use of HAND-IT resulted in a greater number of communication events, more ideal communication events, when information was considered precise and accurate, and fewer communication breakdowns. In contrast with SOAP, which required greater team participation to send additional information presented by providers and more information breakdown, when the information sent by the involved team was considered incomplete and imprecise.²⁴

Based on the studies that integrate this unit 2, we elaborated the Chart 4 that synthesizes its main evidences:

Chart 4. Summary of unit of evidence 2

Unit of evidence 2: Handoff practices: models and effects of the use of instruments	Studies identified
Models of handoff used in practice: without any given order or structure in relation to recommended standards; with overlaps of tools used by professionals from different areas; use of different handoff formats (bedside, telephone, text messages, emails);	A6, A12, A7
Handoff practices using instruments: positive effects on the amount and type of omitted information; decreased number of errors; team presence and satisfaction, reduced side-talking; perception of professionals about handoff.	A13, A1, A8, A4, A15

Source: Created by the first author.

DISCUSSION

The analysis of results showed that one piece of evidence referred to flaws in team communication due to incorrect or incomplete information about care or even absence of communication about a given situation. Such breakdowns are characterized by the absence of communication about care plans, handoffs that do not include the patient's condition, or includes information about the wrong patient, or that results in patients "lost" during handoff.

These results, specific to the ICU setting, can be compared with what happens in other sectors, such as the emergency department. In a study that identified and described communication errors between physicians during emergency department handoff processes, of the 992 handoffs observed, physical examination handoff errors and omissions were noted in 13% and 45%, respectively. These errors increased efforts of professionals to provide care and reduced understanding about patient's clinical condition.²⁷

Another study also conducted in an emergency department about vital sign communication errors during handoffs corroborates this conclusion. The authors observed a convenience sample of emergency department shift rounds, and the primary outcome was vital sign communication errors, identified as the failure to communicate an episode of hypotension or hypoxia. A total of 1,163 patient handoffs during 130 shift rounds were observed, and of 117 patients with episodes of hypotension, and 156 with hypoxia, 66 (42%) and 116 (74%), respectively, were not communicated. Vital sign communication errors of omission occurred in 166 handoffs.²⁸

In Brazil, handoffs have been discussed with a focus on one of its moments, which is the shift handoff process. This interest gave rise to a study that investigated the main factors related to patient safety as regards shift handoff between nursing teams, investigating 70 neonatal care unit professionals. The results showed that 38% of the participants mentioned delays or early departures as factors that negatively impacted shift turnovers. Furthermore, side-talking and noise were considered the main type of interference by nurses. The patient's clinical condition and

problems occurred during the previous shift were considered the most relevant information in shift turnovers.²⁹

Considering the concept of communication adopted in the present study, when a source has an objective to communicate, they seek the best encodings to ensure their message reaches receivers as faithfully as possible. Highly reliable encodings express exactly what the source intended to say. Similarly, highly reliable decodings are able to perfectly translate the message produced by the source, thus achieving the goal of communication. Therefore, communication analysis should focus on the elements that either enhance or hamper the reliability of information.³

The evidence found in the present study, corroborated by the supporting references, shows that one such element is the message. The message includes three components: the code, or a group of symbols that, when structured, present meaning; content, which is contained in a message; and treatment, regarding the speaker's choice of code and the content that will be delivered to the receiver.³

Absent or incomplete patient data, whether due to lack of attention during the pre-handoff phase or the type of information prioritized during handoffs, proved to be noise in the communication process. With such noise, receiving teams could not successfully grasp all the important data that was being shared. The greater the noise in communication processes, the less effective the source in expressing their objectives and obtaining the expected behavior from the receivers, thus reducing communication reliability.³

In intensive care units, communication noise negatively impacts monitoring patient, identifying their needs, and planning continuity of care. Last, it results in duplicate or inadequate care and technical errors, as shown by the evidence relative to the consequences of communication breakdowns.

Technical errors due to failure to communicate care plans are also seen in a study about medication errors in transitions of care. A search in the Medline database for articles published between 1946 and 2014 revealed that most medication errors originated from lack of effective communication among care providers during transitions of care, especially regarding medication reconciliation.³⁰

These results were corroborated by another study that observed the impacts of 200 handoffs, of which 23 presented discrepancies between medication doses, with only half of the dose administered. Delayed or omitted care occurred in 52% of cases, such as antibiotics being administered before meals, instead of after meals. Furthermore, in 33% of handoffs, medical orders to carry out lab tests, diet changes, or physical therapy were missing.³¹

The second unit of evidence pointed to the absence of standards for handoff practices and how tools can help improve the quality of information shared about patients among ICU professionals. Such instruments work as memory aids, so that no item is forgotten or misinformed.

These findings are in accordance with discussions about the future of intensive care, as interventions can help enhance the quality of ICU care in light of the advancements in information technology. One article made a prospection of ICUs in 2020, in which the authors present the checklist as a necessary intervention, a resource that helps memory and reduces mistakes.³²

Along these lines, another group of researchers proposed a checklist for intrahospital transport of critical patients. On analyzing situations involving the transportation of ICU patients, many incidents and adverse effects related to equipment and devices were verified. Thus, the use of checklists was emphasized as a strategy to organize transportation and ensure safe practices.³³

In the perioperative field, standardized, tested and uniformly-used tools have also been advocated for as a good practice that promotes communication during handoffs.³⁴ In a review about best practices in transfer-of-care communication, checklists were included as one of such communication tools. When using checklists, nursing team members, surgeons, and anesthesia professionals have an opportunity to ask questions related to the patient.³⁴

The effects of using these tools, especially decreased technical errors and information omission, has been shown to occur not only in the ICU, but also in other hospital settings.^{8,35} This was shown in a study that measured the rates of medical errors, preventable adverse events, miscommunication, and resident work flow.

Interventions included the standardization of oral and written handoff tools, handoff and communication training, development of the faculty and an observation program, and a sustainability campaign. Of 10,740 patient admissions, the medical-error rate decreased by 23% from the pre- to the postintervention period, and the rate of preventable adverse events decreased by 30%. Significant increases were observed in the inclusion of all the pre-defined key elements in written and oral communication during handoffs.⁸

From the theoretical perspective of patient safety, the personal approach to error is considered obsolete. Instead, the multifactorial nature of these errors must be understood. From the system approach, guilt and punishment is replaced by encouraging people to talk about breakdowns, analyzing the situations that preceded them, and identifying the weak points of the system that must be repaired.²

Based on this evidence, better practices should be created to promote effective ICU handoff communication, to reach the objective of communication, which is to cause an intentional effect. This involves conducting systemic analyses of each local reality, understanding what type of information is lost, underlying causes, and proposing safeguards to prevent errors and adverse events.²

Based on this understanding, creating safeguards that standardize handoff communication, such as ICU handoff tools, requires an analysis of the factors that impact communication in a given scenario. Some factors include: the value given by the team to the communication and its impact on care; hierarchy of communication, staff behavior regarding handoffs, in terms of late arrivals, early departures, side-talking, and lack of attention; the unit functional structure in terms of interruptions; and ICU characteristics, such as number of patients and complexity level.

Therefore, the successful use of instruments is linked with team involvement and their knowledge about the nature of information that must be valued in light of patient profile. Thus, professionals must be sensitized to team work and communication, which requires the implementation of education and training strategies to develop these nontechnical skills, involving all of those who are engaged in patient care, either directly or indirectly, to take co-responsibility for the impact of communication in patient safety.⁶

Simulation-based training can be effective to develop communication and teamwork skills, as well as training regarding the implemented tools, allowing professionals to practice in a controlled environment that mimics real life as much as possible, to identify the weak spots of professionals and improve them.⁶

Getting professionals involved in communication safety in the institutional context, thus creating a safety culture among them, leads them to a committed attitude towards the use of handoff tools, which can positively impact care.

This helps reduce the prevalence of missing or insufficient patient information, communication noise and interruptions that prevent messages from being clearly received, factors that place patients at risk when they are submitted to unnecessary procedures or when a procedure is not performed due to missing or incomplete information. Thus, the use of standardized instruments can contribute to the safety climate of hospitals, reducing healthcare-related harm, especially involving communication breakdowns.³⁶

FINAL CONSIDERATIONS

Problems in ICU communication processes relate to incomplete, omitted or misleading information transmitted about the care provided. Such information breakdowns affect quality of care, resulting in delayed, duplicated, or inadequate care. Using standardized tools to organize this process can optimize the work time of teams and ensure that essential information to continuity of care is not omitted.

A limitation of this study includes the scarcity of studies that answered the research question and their low levels of evidence, revealing the need for further field research on the theme, especially at the national level.

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