Tools for care transfer in intensive care units: Systematic review of observational studies

ABSTRACT

Objective: to evaluate the effectiveness of the use of tools for care transfer in patients admitted to an intensive care unit (ICU). Methods: Systematic review consulted in the databases PubMed, Embase, Cochrane Library, LILACS until August 2022. The descriptors “Patient Handoff”, “Continuity of Patient Care”, “SBAR”, “ISBAR”, “SBAR-R”, “ISBARR”, “ISOBAR”, “Communication” and “Intensive Care Units” were used. Observational studies use of any tools to transfer care in patients admitted to any ICU were included. Risk of bias using the Newcastle-Ottawa Scale. Results: the findings suggest that the professionals' perceptions are positive and that there was an improvement in multidisciplinary communication. As for the impact on patient care, the findings suggest that the use of transfer tools in care favors the complete completion of the medical record, as well as the notification of events in the medical records. Conclusions: no robust evidence was found regarding the use of ICU care transfer tools.
**RESUMO**


**Palavras-chave:** Transferência de Pacientes; Continuidade da Assistência ao Paciente; Comportamento de Utilização de Ferramentas; Unidades de Terapia Intensiva; Revisão Sistemática
INTRODUÇÃO

Patient safety and quality of care are considered public health issues in the world context (Pagnamenta et al., 2012). In 1999 a report was published by the IOM (Institute of Medicine), which is entitled “To err is human” (To err is human: building a safer healthcare system)” revealing that 44,000 out of 98,000 Americans died annually from medical and care errors. health and since then, patient safety has become a global concern and priority from the revealed data (Pagnamenta et al., 2012), (Serafim et al., 2017).

Ineffective communication is the known root cause of EDs in patients (Pagnamenta et al., 2012). The transfer of information between health professionals, whether during shifts or at handover (face-to-face communication at the bedside with the presence of all team members and the patient). Literature emphasizes that communication must be adequate and consequently efficient among health professionals, as it is one of the aspects that compromises client safety.

Data from the Joint Commission International (JCI) reveal that communication problems can influence up to 70% of EAs, with the main communication failures being: 1st. Information was never transmitted; 2nd. Information was given but received inaccurately and 3rd. Information transmitted but never received (Serafim et al., 2017).

Effective communication becomes essential in order to ensure the continuity and quality of care provided. The ICUs consist of a place for the hospitalization of patients in critical situations who need continuous specialized professional care, specific materials, advanced technologies aimed at diagnosing, monitoring and specific drug therapy (Pena & Melleiro, 2018). Thus, care in ICUs is considered one of the most complex in the health system, requiring the use of advanced technologies and, mainly, requiring trained personnel to make quick decisions and immediate actions (Gonçalves, Scarabelle, Diniz, Monteiro, & Takeshita, 2020).

At this time, however, there may be discontinuity of the care when information about the patient’s health status is not shared completely and efficiently. One can cite the occurrence of delay in treatment, inadequate treatment, increased length of stay, avoidable readmissions, increases in medical care costs, inefficiency and duplication of activities (Pena & Melleiro, 2018).

Effective communication is the second international goal to help minimize failures in communication, where JCI proposed the implementation of standardized protocols for the transfer of information in the health unit and thus guarantee fundamental ethical principles of information and reduce AE’s associated with communication failure, promoting the continuity of care. To assist in communication and make it safe and effective, one of the strategies is the use of standardized instruments, which allow the transfer of information effectively, objectively and synthetically between team members (Spooner, Aitken & Chaboyer, 2018).

The SBAR is the most structured communication instrument, known and used by health services due to its simplicity, which allows the transition of care to be structured according to its categories: Situation- Background- Assessment-Recommendation, where its translation means
Situation, Brief History, Assessment and Patient Recommendation. Its use allows all information to be provided in a systematic and sequential way, thus reducing the forgetfulness of relevant patient information and minimizing vulnerability to the occurrence of AE's and favoring the process of verbal and written communication between health professionals (Spooner et al., 2018), (Panesar, Albert, Messina, & Parker, 2016).

Given this context, this study aims to: Identify the effectiveness of the use of care transfer tools in patients hospitalized in ICUs.

**METHOD**

This is a bibliographic systematic review study written in the rules of the checklist MOOSE (Meta-analyses Of Observational Studies in Epidemiology) (Stroup, 2000) and had its protocol published in journal format (Van-dúnem, Freitas, Lima, & Kron-Rodrigues, 2021).

Eligibility Criteria:

Observational studies that assessed the impact of the use of care transfer tools in ICU patients were included. Observational studies following the "PICO" methodology described below were included.

Population: Patients admitted to any ICU; I: Use of tools to transfer care; C: Non-use of care transfer tools and O: actions for the health team and the patient hospitalized in the ICU. The systematic review assessed the effectiveness of the use of care transfer tools in patients admitted to the ICU. Observational studies reporting the use of any tools for transferring care in patients admitted to any ICU were included.

Inclusion and exclusion criteria:

Exposure of interest were the outcomes associated with the impact on the healthcare team and on patients hospitalized in the ICU. Exclusion criteria were: studies did not report any outcome associated with the health, safety team and/or hospitalized ICU patient, studies that applied the care transfer instrument in other hospital wards, studies that patients were in transit (being transferred or leaving the ICU to other units), studies that applied the instrument as a form of team training, integrative and literature review studies, books, chapters and book reviews, manuals, technical reports.

Search strategy:

Systematic literature review consulted in the electronic databases PubMed, Embase, Cochrane Library, LILACS until August 2022. The basic search strategy was developed for PubMed. Health descriptors available in Health Sciences Descriptors (DECs) and Medical Subject Heading (MeSH) were used.

The descriptors used included “Patient Handoff”, “Continuity of Patient Care”, “SBAR”, “ISBAR”, “SBAR-R”, “ISBARR”, “ISOBAR”, “Communication” and “Intensive Care Units”. There was no language restriction, but only human studies were selected. References from selected articles, including pertinent review articles, were reviewed to identify all relevant studies.
Gray literature was tracked through the Academic Google database and the Capes Theses & Dissertation catalog. This systematic review is exempt from ethical analysis as it is a secondary study.

**Table 1—Standard search strategy:**

<table>
<thead>
<tr>
<th>Search Strategy</th>
</tr>
</thead>
</table>
| #1 "Patient Handoff"[Mesh] or (handoff, patient) or (handoffs, patient) or (patient handoffs) or (patient hand over) or (hand over, patient) or (hand overs, patient) or (patient sign out) or (sign out, patient) or (sign outs, patient) or (patient signout) or (signout, patient) or (signouts, patient) or (patient signovers) or (signover, patient) or (signovers, patient) or (patient hand off) or (hand off, patient) or (hand offs, patient) or (patient sign outs) or (patient sign overs) or (nursing handover) or (handover, nursing) or (handovers, nursing) or (nursing handoffs) or (nursing hand off) or (nursing hand over) or (nursing handovers) or (nursing handovers, nursing) or (clinical handoffs) or (clinical handoff) or (clinical handovers) or (nursing hand off) or (nursing hand overs) or (nursing hand over) or (nursing handovers) or (nursing handovers, nursing).
| #2 "Continuity of Patient Care"[Mesh] OR (Care Continuity, Patient) OR (Patient Care Continuity) OR (Continuum of Care) OR (Care Continuum) OR (Continuity of Care) OR (Care Continuity)
| #3 SBAR OR ISBAR OR SBAR-R OR ISBARR OR ISOBAR
| #4 "Communication"[Mesh] OR (Personal Communication) OR (Communication, Personal) OR (Misinformation) OR (Communication Programs) OR (Communication Program) OR (Program, Communication) OR (Programs, Communication) OR (Communications Personnel) OR (Personnel, Communications)
| #5 "Intensive Care Units"[Mesh] OR (Care Unit, Intensive) OR (Care Units, Intensive) OR (Intensive Care Unit) OR (Unit, Intensive Care) OR (Units, Intensive Care)
| #1 OR #2 OR #3 OR #4) AND #5

Selection of studies and data extraction

For this review, two investigators (ASAV and MRKR) independently reviewed the titles and eligibility abstracts. Disagreements regarding the selection of articles were resolved by consensus or discussion with a third investigator (NOF). The study selection flowchart was created in accordance with the PRISMA guidelines.

Two researchers (ASAV and MRKR) independently extracted relevant data from each full-text article using a standardized form based on the Cochrane Handbook (Higgins JPT & Green S, 2011) with the following information: study site, authors, funded study, number of participants, study objective, study population, study, care transfer tool used, outcomes analyzed and follow-up. Selection was compared for accuracy, and any discrepancies were resolved by consensus or discussion with another investigator (NOF).

Bias risk assessment in observational studies

The Newcastle-Ottawa Scale (ENO) (Lo, CK-L., Mertz, D., & Loeb, M., 2014) was used to assess the methodological quality of observational studies by two independent reviewers. Some discrepancies were resolved by discussion with the third author. The scale consists of eight items covering three dimensions: 1) patient selection (four items); 2) comparability of the two branches...
of the study (two items); and 3) result evaluation (three items). Subsequently, the risk of bias graph was created using the RevMan software.

Ethical aspects

This systematic review is exempt from ethical analysis as it is a review of the scientific literature.

RESULTS

After reading in full, two studies met the inclusion criteria and were included in this systematic review (Stroup, 2000), (Lo, Mertz, & Loeb, 2014). Eight studies, (Caruso, Marquez, Gipp, Kelleher, & Sharek, 2017), (Schmidt, Kocher, Mahendran, & Denecke, 2019) were excluded, being two (Caruso et al., 2017), (Schmidt, Kocher, Mahendran, & Denecke, 2019) excluded because patients were in transit (one being transferred from the operating room to the ICU (Caruso, Marquez, Gipp, Kelleher, & Sharek, 2017) and another patients being transferred from the ICU to the operating room (Schmidt, Kocher, Mahendran, & Denecke, 2019). In three studies (Ducci, 2015), (Higa et al., 2020), (De Meester, Verspuy, Monsieurs, & Van Bogaert, 2013) the application of the care transfer instrument was applied as training for the team. A study (Valentin, 2012) reported the analysis of the instrument in sixteen hospital wards, a literature review study (Schmidt, Kocher, Mahendran, & Denecke, 2019) brings an approach to overcome human limitations in work processes in ICU’s and finally a study (Müller, 2018) was excluded for only presenting a mobile application that implements the ISBAR communication standard in the ICU. The gray literature did not report any findings according to the eligibility criteria (Figure 1).
Description of studies

The two observational cohort studies included in the analysis totaled 494 applications of the transition of care instrument used, with an Australian study (Stroup2000), carried out in an adult ICU and another study in the United States carried out in a pediatric ICU (Van-dúnem et al., 2021).

Tables 2 and 3 describe the publications/year, study site, authors, if there was funding, number of participants and total use of the scale, as well as the characteristics of the ICUs included in the analysis.

Table 2-Characterization of the studies included in the analysis:
<table>
<thead>
<tr>
<th>Publication/ year</th>
<th>Location of the study</th>
<th>Authors</th>
<th>Study with funding</th>
<th>Study number of participants and total usage of the scale</th>
<th>Characteristics of the ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of an Evidence-Based Practice Nursing Handover Tool in Intensive Care Using the Knowledge-to-Action Framework, 2018</td>
<td>Austrália</td>
<td>Spooner; Aitken; Chaboyer</td>
<td>Yes</td>
<td>65 professionals performed 322 applications of the instrument</td>
<td>Medical surgical intensive care unit 21 beds</td>
</tr>
<tr>
<td>The effet of an electronic SBAR communication tool on documentation of acute events in the pediatric intensive care Unit, 2016</td>
<td>EUA</td>
<td>Panesar; Albert; Messina; Parker</td>
<td>No</td>
<td>172 patients did not receive the instrument application</td>
<td>Pediatric ICU of a university hospital 12 beds</td>
</tr>
</tbody>
</table>

Wellspring: the authors, 2023

Table 3- Description of objectives, study population, care transition tool used, way of making the tool available to professionals, analyzed outcomes, follow-up time and the main results of the articles included in the analysis:

<table>
<thead>
<tr>
<th>Objective analyzed</th>
<th>Study population</th>
<th>Care transition tool used</th>
<th>Mode of availability of the tool</th>
<th>Outcomes</th>
<th>Follow-Up</th>
<th>Main results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement and evaluate a minimal set of evidence-based electronic data for the transfer of nursing care in ICUs.</td>
<td>ICU nurses</td>
<td>Instrument prepared considering the ISBAR items associated with the items available from the institutional electronic medical record (*alerts-&gt;allergies, infectious status, patient incidents and patient management strategies -&gt; end of life plan)</td>
<td>Online and Print</td>
<td>Professionals’ perceptions when using the care transition instrument; Advantages and disadvantages of using the implementation of care tools;</td>
<td>3 months</td>
<td>Perceptions were positive under work, where professionals felt comfortable asking questions to patients when necessary and they felt that the questions were timely and with content relevant to the patient. Advantages: 71% described the advantages, as follows: 48% that the instrument was suitable for the work environment, filled out briefly (18%) and saved the professional’s time (12%). Disadvantages: 86% of respondents recalled the disadvantages of using the tool. Nearly half of respondents thought the tool contained irrelevant information (eg, number of times dialysis was stopped and started), reported</td>
</tr>
</tbody>
</table>
Describe the impact of integrating the electronic medical record with the SBAR communication tool in a pediatric ICU

| Electronic medical record + SBAR | Complete medical record | Event notification in the medical record | Multidisciplinary communication between nurses and doctors | 3 months each period totaling 9 months, being: 1st period: only paper records; 2nd period: electronic medical record; 3rd period: electronic medical record + SBAR | During the 9 months of the study 542 patients were admitted to the Pediatric ICU; 173 patients with paper records, 197 electronic records with free text and 172 electronic records from the SBAR. On paper record, a total of 22 of 173 had documented event notes; 28 of 197 patients had event notes in the free-text electronic medical record. During SBAR's electronic documentation, 34 of 172 patients had documented event records. The SBAR yielded a significant increase in documentation ($P=0.07$) in the Pediatric ICU during the study.

The registration of multidisciplinary communication revealed that the nurse who takes care of the patient was hardly identified in the paper record, as well as the assistant physician. After the transition to the free text electronic medical record, the nurse's identification increased by 7% and the assistant physician's identification increased by 35%. After the beginning of the electronic identification associated with the SBAR of the nurse increased an additional 37% and identification of the attending physician increased another 26% ($P = 0.0001$).
The assessment of the risk of bias is summarized in Figures. The assessment of the risk of bias of the studies included in this study demonstrated that in the domain equality between the exposed and unexposed cohorts, they were drawn from the same population and confidence in the assessment of exposure, both studies were classified as low risk of bias (Stroup, 2000), (Van-dúnem et al., 2021).

Figure 2- Assessment of risk of bias in graph

In the domain of confidence in the assessment of exposure and confidence that outcome outcomes were not present at baseline, both studies were classified as low risk of bias (Stroup, 2000), (Van-dúnem et al., 2021).

In the item demonstration of the exposed and unexposed group for all variables are associated with the outcome of interest, both studies were considered uncertain (Stroup, 2000), (Van-dúnem et al., 2021), as the analysis of outcomes could be broader and more comprehensive, such as the collection of adverse events with the patients as well as patient satisfaction regarding the use of care information transfer instruments.

In the domain of trust in assessing the presence or absence of prognostic factors, one study was classified as low risk (Van-dúnem et al., 2021) and one as uncertain (Stroup, 2000), as the fact of not having a validated instrument and using data from the electronic medical record can be a confounding factor.

Finally, in the domains of confidence in the outcome assessment, adequate follow-up of cohorts, and similar co-interventions between groups, both studies were of low risk (Stroup, 2000), (Van-dúnem et al., 2021).

**DISCUSSION**

In the literature, this is the first systematic review that evaluated the effectiveness of the use of care transfer tools in patients hospitalized in ICUs. The results found demonstrate that there is weakness in the findings because there is no association between the outcomes analyzed in the studies, making their association quantitatively impossible (meta-analysis).
In the category of health professionals working in ICUs who used the transfer tool in care, the findings suggest that the professionals’ perceptions are positive and that there was an improvement in multidisciplinary communication, encompassing nurses and physicians.

As for the impact on patient care, the findings suggest that the use of transfer tools in care favors the complete completion of the medical record, as well as the notification of events in the medical records, thus reducing the underreporting of adverse events.

The findings also made it possible to identify the advantages and disadvantages of using the implementation of care tools in the ICUs. The identified advantages contemplated that 48% of the professionals reported that the instrument was suitable for the work environment, filled out briefly (16%) and saved the professional's time (12%). As disadvantages, almost half of the participants judged that the tool contained irrelevant information (for example, number of times dialysis was stopped and started), as well as difficulties in navigating and finding relevant information and missing content because the items were not automatically completed in the tool and 37% thought filling it out took too long.

A systematic review published in 2018 with the aim of summarizing the impact of implementing the SBAR on patient safety with the inclusion of eight observational studies and three controlled clinical trials carried out in different clinical contexts, identified that there is moderate evidence to improve patient safety through the implementation of the SBAR, however, there is a lack of high-quality research on this communication tool, as the studies were heterogeneous with regard to the characteristics of the study, especially the patient outcomes. The studies had different focuses such as improving team communication, patient transfer and communication in nurse-to-physician call (Müller, 2018)

Limitations
This systematic review has limitations, the first being related to the low number of studies included in the analysis. It is also worth mentioning the heterogeneity between the place of data collection in the studies, with one study in the pediatric ICU and the other in the adult. Another limiting factor may be the fact of including studies of any care transfer tools, not limiting only the validated scales.

Inclusion criteria focusing on the ICU can also be limiting, as their validation can be compromised to a restricted area of activity, making it difficult to expand the findings.

CONCLUSIONS
Implications for practice
No robust or high-quality evidence was found regarding the use of care transition tools in ICUs, thus not promoting their use with robustness.

Implications for future research
It is recommended to carry out studies including large populations and well-designed designs analyzing the use of care transition tools in ICUs to determine their real effectiveness, patient safety and feasibility for the health team.


