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Review

Emergency handover of critical patients. A systematic review

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A B S T R A C T

Background: Emergency handover of critical patients is used to describe the moment of union between prehospital and hospital health team. However, the literature shows several definitions leading to great heterogeneity.
Purpose: To study the emergency handover of critical patients between two critical-emergency care wards performed by emergency nurses worldwide and to identify the features of these processes.
Methods: We conducted an integrative review in eleven databases published from 2010 to 2019. Quality criteria and PRISMA checklist were applied. The protocol is registered with PROSPERO (CRD42020182335).
Results: A total of 22 studies included and the following factors were identified: variability vs standardization, identification, professionals' behavior, localization, environmental factors, patient participation, clinical records, education/training, responsability, and communication.
Conclusions: The actual emergency handover occurs under conditions quite contrary to those recommended by experts so that it is neither safe nor effective, leading a serious problem for patient safety and quality care.

1. Introduction

Health care is increasingly complex nowadays. Care processes involve a combination of actions, technology, and multiple interactions between professionals that cause an increased risk of adverse events to the patient, leading to increasingly fragmented attention[1,2]. Fundamental to ensuring care continuity is good communication about patient care between health professionals at all levels[3,4].

In the emergency field, the point of connection between pre-hospital and hospital health team members is during handover. Various definitions of handover are found in the literature[5–11], where it is usually described as the process that occurs when the responsibility for a patient's care is transferred from one health care provider to another, requiring an accurate and timely transfer of important information[12].

Handover between pre-hospital and hospital professionals usually occurs in chaotic and complex environments, where there is a need for rapid decision-making. Critically ill patients, with minimal physiological reserves, require higher levels of timely acute care[13,14]. Furthermore, the emergency handover is the only chance for the health professionals to transfer patient information[15].

For all these reasons, emergency handover is considered a worrying problem for patient safety by all researchers, emergency health professionals, national and international organizations. The World Health Organization (WHO) established the Global Patient Safety Collaborative (GPSC) in 2004, and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) published the International Patient Safety Goals (IPSGs) in 2006. The primary objective for these leader groups in patient safety was the standardization of communication during handover[16,17].

Despite the clear need for improving the emergency handover process, efforts to standardize it have yet to be identified and defined [6]. The literature regarding emergency handover is limited [5,18]; as a result, the measures required for an adequate emergency handover remain ambiguous. In addition, there is great heterogeneity in handover protocols in terms of varying methods, standards, and norms [18,19]. The failure to improve emergency handover is possibly due to this lack of consensus about emergency handover performance [13,20]. Therefore, given such differing views of the handover concept in the

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literature, there is an urgent need to study and deepen our understanding of emergency handover processes in order to homogenize and clarify this concept. The protocol for this study is registered with PROSPERO- International prospective register of systematic reviews (CRD42020182335). No modifications were made.

2. Methods

In order to conduct a systematic literature review, we followed part of the PICO framework. This included Population (pre-hospital and hospital nurses), Intervention (emergency handover of critical patients), and Outcomes (based on the recommendations of the WHO and JCAHO). Therefore, the research question formulated was "Do pre-hospital and hospital emergency nurses carry out the emergency handover of critical patients between two critical/emergency wards according to the recommendations of the WHO and JCAHO in their current clinical practice?" Thus, the objective of this systematic review was to study the emergency handover of critical patients between two critical/emergency care wards as performed by emergency nurses worldwide; and specifically, to identify the characteristics of these emergency handovers.

In order to answer these research questions, we compared the results in the available literature with the recommendations proposed by the WHO and JCAHO in Patient Safety Solutions (2007), in which the second field of action is Communication During Patient Hand-Overs [21,22].

2.1. Search strategy and study screening

The systematic literature search was performed from September to December 2019 on 11 national and international health sciences databases: PubMed, Cuidatge, Cuiden, Enfispo, Cinahl, Scopus, Web of Science, Joanna Briggs Institute Library, Cochrane Library, PsycINFO, and Google Academic. A combination of Keywords and Booleans was used, leading to the following search query: ((handover OR handoff) AND (emergency department) OR (prehospital emergency care)) AND nursing.

The selection process for articles included in this review was performed by the authors RTA, SRV, MBP, and EMS, and followed the four phases of Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) [23]. In the first phase, RTA identified all the available literature on the topic. In the second phase, after the application of filters, RTA did a quick read of the titles and abstracts, and rejected those articles that were duplicated or did not reach the inclusion/exclusion criteria. RTA and SRV conducted the third phase independently, in which they carried out another reading of the article abstracts to establish those in line with the aims of the study and classify them according to the inclusion/exclusion criteria. In case of any discrepancy, the article was reexamined by MBP and EMS until a consensus was reached. In the fourth phase, full-text articles considered potentially relevant were carefully read by RTA and included in a list to check their methodological quality. Primary research of qualitative, quantitative, and mixed methodology studies were included.

Table 1
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Emergency handover of critical patients	Emergency handover of non-critical patients
Definitive handover	Shift handover
Full texts English or Spanish	Full texts not in English or Spanish
Published between January 2010 and December 2019	Published before January 2010 or after January 2020
Primary research of qualitative, quantitative, and mixed methodology studies	Studies that not clearly outline methodology or study protocols, bibliographic and systematic reviews, scoping reviews, meta-analyses, and conferences.

2.2. Inclusion and exclusion criteria

The criteria for inclusion involved studies published in English or Spanish between January 2010 and December 2019, focused on emergency handover of critical patients in the emergency field, and whose full text was available. Studies that did not clearly outline methodology or study protocols, bibliographic and systematic reviews, scoping reviews, meta-analyses, and conferences were excluded. Furthermore, there are two types of handover that commonly appear in the literature – shift handovers (caused by changes in nurses shifts) and definitive handovers (due to transfers between units, wards or hospitals) [24]. Since emergency handovers are usually definitive, we included only studies on definitive handovers in our review. Table 1details our criteria.

2.3. Methodological quality appraisal

This systematic review was conducted using the method and quality standards established by the Critical Appraisal Skills Programme (CASP) [25] for qualitative studies and the Effective Public Health Practice Project (EPHPP) [26] for quantitative studies. The CASP Checklist consists of 10 questions, each with three possible answers: Yes, No, and Can't tell. The first two questions are focused on the clarity of study aims and the appropriateness of using qualitative research to achieve those aims. The next eight questions assess study design, sampling, data collection and analysis, as well as the clarity and applicability of the result [25]. The EPHPP provides a system of rating ranging from Strong to Moderate to Weak in eight sections: selection bias, study design, confounders, blinding, data collection methods, withdrawals and dropouts, intervention integrity and analyses [26]. In addition, the Centre for Evidence-Based Medicine (CEBM) [27] levels of evidence and the grade of recommendation were taken into account. Each article was independently assessed by two authors (Peer Review). Ethical approval was not required for this paper.

3. Results

3.1. Search results

A total of 22 studies were included for qualitative analysis in this systematic review: 8 qualitative, 9 quantitative, and 5 mixed-methods (Fig. 1).

3.2. Characteristics of the studies

Of the included studies, 7 were conducted in Europe: 2 in the Netherlands, 2 in Italy, 1 in Spain, 1 in Denmark and 1 in Belgium; 6 studies were performed in North America: 5 in the USA and 1 in Canada. Of the remaining, 4 studies were conducted in Australia, 3 in the UK and, 2 in SouthAfrica. The clinical and methodological characteristics, as well as the main results, are summarized in Tables 2 and 3.

3.3. Quality assessment of included studies

The quality of evidence from selected studies on the emergency handover of critical patients differs according to the methodology used. The quality of the quantitative studies was limited according to the EPHPP [26] scores (Table 2). However, the qualitative studies were rated higher according to the CASP [25] (Tables 2 and 3).

3.4. Identified factors of emergency handover

Drawing from the variety of handover results present in the literature, we identified a number of factors related to best practices. These

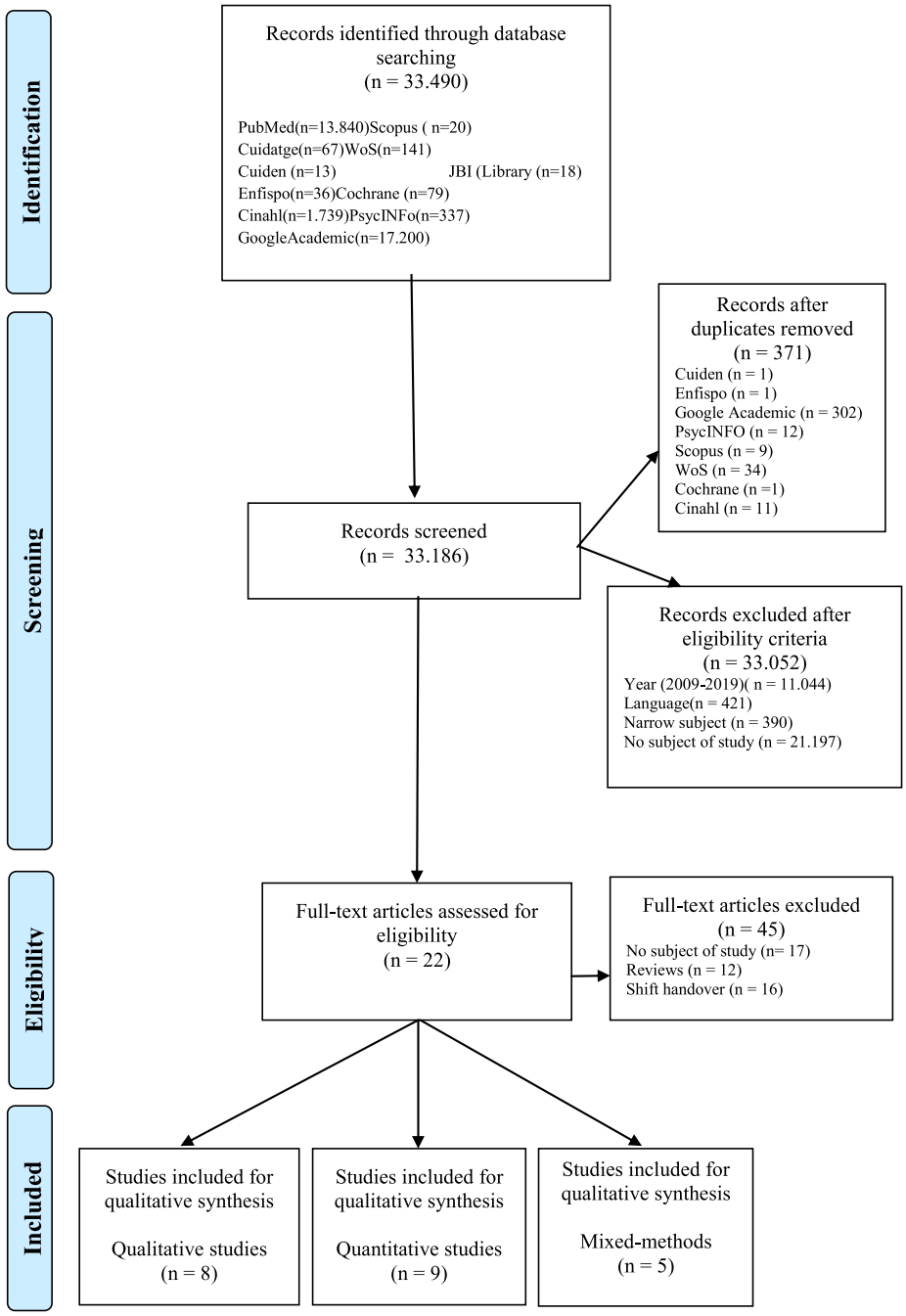

Fig. 1. Literature screening and selection based on PRISMA flowchart.

have been described in the following subsections [15,28].

3.4.1. *Variability vs standardization*

National and International organizations like the JCAHO or WHO have proposed handover standardization as a method to reduce errors and improve patient safety [19,29]. In addition, some studies show that the use of standardized measures along with check-list tools avoids data loss and reduces mistakes and potential harm [5,29–31].

VanGraafeiland et al. demonstrated an improvement in patient outcomes and clinical safety, as well as in staff members' satisfaction perception, communication, and understanding of their role and responsibilities when these tools were applied [14]. Furthermore, the standardization of communication improved relations between pre-hospital and hospital personnel [5,32].

Despite recommendations, standardized emergency handover is not the norm [5] and the best standardized method has not yet been established [8]. Nowadays, emergency handover occur in an irregular, careless and disorganized way, causing incomplete communication and the loss of important information that can pose a vital risk to patient safety [19,29,30,33].

3.4.2. *Identification*

Communication with the appropriate person is essential to ensure the correct transfer of information [5]. An improvement in communication starts with a clear identification of all team members [19]. Therefore, the hospital emergency nurse must be easily identifiable by the pre-hospital team [5].

In reality, the identification is considered virtually non-existent [31]. It has been observed that the professionals present during an emergency handover are often not the ones afterwards responsible for the patient's

Table 2
Characteristics and quality appraisal (EPHPP, CEBM and CASP) of the quantitative and mixed methods design studies.

Characteristics of the quantitative design studies sample (n = 9)

First autor Country, year	Aim	Design/methods	Sample (n =)	Main finding	Quality appraisal		
					Quality criteria (EPHPP)[1]	Level of Evidence (CEBM)[2]	CASP[3]
Hovenkamp Netherlands, 2018.	To determinate the factors influencing the satisfaction regarding handovers from ambulance and ED nurses.	Quantitative Prospective observational.	n = 186	The satisfaction is determined by differents factors. Ambulance: is mainly affected by the waititing time. ED: us of handover instruments.	WEAK	[A1b]	–
Gopwani Washington, DC, 2015.	To determinate if the quality of patent handoffs would improve after implementation of a structured handoff method.	Quantitaive Prospective, observational.	n = 638	It is feasible to standardize handoffs in the pediatric ED.	WEAK	[A1b]	–
Kessler EUA, 2013.	To present an angorithm for improving the safety and effectiveness of transitions of care in the ED.	Quantitative Delphi method and piloted in a survey.	n = 1.342	The algorithm consisted of five steps: 1) seting the stage, 2) assembling the team, 3) identification of high-risk patients, 4) sign-out and 5) closing the loop.	WEAK	[B2b]	–
Ebben Netherlands, 2015.	To evaluate the effectiveness of an eLearning program to improve adherence to the handover guideline in the chain of ambulance-EMD-ED.	Quantitative Prospective pre-test post-test.	n = 88	The tailored eLearning did not improve adherence to a handover guideline in the chain of emergency care.	MODERATE	[A1c]	–
Dojmi Di Delupis Italy, 2014.	To evaluate communication during the clinical handover between pre-hospital to ED staff, using realistic scenarios.	Quantitative Prospective, observational.	n = 240	Lack of communication standards, a lack of formal transfer of responsibility of patient care, and a marked inconsistency in information communicated. Only previously trained rescuers get successful results.	WEAK	[A1b]	–
Bergs Belgium, 2017.	To improve the quality of nursing handover from the ED to ward and ICU.	Quantitative A quasi-experimental non-equivalent control group pre-test – post-test.	n = 130	The applied intervention had a positive effect on teamwork and mutual understanding concerning nursing handover, but did not result in an improved perception of handover quality by ward and ICU nurses.	WEAK	[A1b]	–
Manser UK, 2010.	To develop a rating tool for handoff quality that goes beyond mere information transfer.	Quantitative Descriptive correlational design.	n = 126	This study provides insights into the multidimensional concept of handoff quality. This rating tool is feasible and comprehensive by including not only characteristics of the information process.	WEAK	[B2b]	–
Mamalelala South Africa, 2017.	To describe the opinions of nurses regarding the effectiveness of handover practices between nurses in the ED and ICU.	Quantitative Descriptive quantitative cross sectional survey.	n = 111	The shared perspective of the transmitting and receiving nurses includes meanings, beliefs, values and experiences.	WEAK	[B2b]	–
Matichko EUA, 2015.	To analyze the current handoff process and methods of communication.	Quantitative Descriptive correlational design.	n = 75	Prehospital-hospital handoff potentially affects patient safety. Effective communication and the implementation of a structured model could improve it.	WEAK	[B2b]	–

Characteristics of the mixed methods design studies sample (n=5)

First author Country, year	Aim	Design/methods	Sample	Main finding	Quality appraisal		
					Quality criteria (EPHPP)[1]	Level of Evidence (CEBM)[2]	CASP[3]
Bakon Australia, 2017.	To develop a form to assist ED nurses to provide a consistent structured handover.	Mixed methods Focus group and key stakeholder consultation Paper-based surveys and audits.	Nursing staff evaluations n=28 Form audits n=626	Patient handover form within the emergency setting was well received. Nursing handover should be structured and provide standardized content.	WEAK	[B2b]	9/10*
VanGraafeiland USA, 2019.	To determine barriers to the current handover and transport process and, develop a new protocol and evaluate staff satisfaction.	Mixed methods Focus group Pre- post-test.	Focus group n=36 Surveys n=35	Members reported improvements in their perceptions of satisfaction, safety, communication and role grasp associated with the new process.	WEAK	[B2b]	10/10*
Zakrison Canada, 2016.	To investigate the causes and frequency of information discrepancies with handover.	Mixed methods Focus group and individual	Focus group (6) n=46 Charts n=50	Trauma patient information was lost during handover from the ED to the ICU for multiple reasons.	WEAK	[B2b]	10/10*

(*continued on next page*)

Table 2 (*continued*)

Characteristics of the mixed methods design studies sample (n=5)							
First author Country, year	**Aim**	**Design/methods**	**Sample**	**Main finding**	**Quality appraisal**		
					Quality criteria (EPHPP)[1]	**Level of Evidence (CEBM)**[2]	**CASP**[3]
		interviews Chart audits.		Information discrepancies occurred in 48% of patients.			
Dojmi Di Delupis Italy, 2014.	To evaluate the handover communication between pre-hospital and hospital providers.	Mixed methods Handover simulations, nursing surveys and focus group Evaluation pre-post-training.	Simulation scenarios (12) n=59 Nursing surveys n=23 Focus group n=12 Handover assessment (12) n=4 Pre-training n=16 Post-training n=40	There are an absence of standardization of the handover communication process, marked variability in information communicated, and a lack of formal transfer of responsibility of patient care.	WEAK	[B2b]	9/10*
Iedema UK, 2012.	To identify the existing structure of paramedic-to-emergency staff handover. To design and evaluation handover protocol.	Mixed methods Video-reflexive ethnography Pre- and post-survey	6 Phases (Ph) Ph1: Focus group n=10 Ph2: Filmed handover n=73 Ph3: Reflexive focus group n=9 Ph5: Protocol implementation n=368 Ph6: Protocol trial n=416	IMIST-AMBO shows promise for improving the ambulance-ED handover communication interface.	WEAK	[B2b]	9/10*

*OCEBM Table of Evidence Working Group = Jeremy Howick, Iain Chalmers (James Lind Library), Paul Glasziou, Trish Greenhalgh, Carl Heneghan, Alessandro Liberati, Ivan Moschetti, Bob Phillips, Hazel Thornton, Olive Goddard and Mary Hodgkinson

[1] Effective Public Health Practice Project. (1998). Quality Assessment Tool For Quantitative Studies. Hamilton, ON: Effective Public Health Practice Project. Available from: https://merst.ca/ephpp/

[2] OCEBM Levels of Evidence Working Group*. "The Oxford 2011 Levels of Evidence". Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o = 5653

[3] Note. CASP, Critical Appraisal Skills Programme. CASP questions are adapted from Critical Appraisal Skills Programme (2013), "10 questions to help you make sense of qualitative research," retrieved from http://media.wix.com/ugd/dded87_29c5b002d99342f788c6ac670e49f274.pdf. Its license can be found at http://creativecommons.org/licenses/by-nc-sa/3.0/

* To consult the application of the CASP questionnaire, see the Annex I

care. In fact, they may not even know who the professional responsible will be. There are also cases when a written report sheet is delivered to the triage nurse without an oral presentation [19].

3.4.3. *Professionals' behavior*

Sanjuan-Quiles et al. report that individual behavior during handover proved to be the key to the correct reception of messages [5].

The literature shows that currently, professionals exhibit "task-orientated" behavior, involving a lack of greeting, inattentive listening, exclusion of other members of the care team (pre-hospital or hospital emergency nurse), and non-involvement with the patient and relatives identified as disrespectful behavior [34]. De Lange et al. affirm that such disrespectful behavior was so embedded in the day-to-day patient handover workplace culture, that it seemed 'normal'. Disrespectful behavior however can erode communication, professional relationships and collaboration, and negatively impact patient outcomes [34].

3.4.4. *Location*

The bedside has been indicated as the location where emergency handover ought to occur [8] Evidence shows that bedside handover improves patient safety, care quality, and nurse care continuity because patients' intimacy is maintained. However, in actual practice, the most popular locations for handover were the corridor and computer stations [8].

3.4.5. *Environmental factors*

The emergency field is an environment vulnerable to handover error due to stress, constantly changing conditions, and noise, among others. Moreover, constant interactions, discussions, and interruptions are the norm during emergency handover [7]. Environmental factors can have a great impact although there is little literature on their effects in the emergency handover [13,15]. Indeed, Meisel et al. were able to show that certain environmental factors improved patient outcomes, care quality, and safety [33]. Nevertheless, a "good handover" has been described as quiet, respectful, and organized [15], and one which takes place before patients' actual transfer [19]. Conversely, a "difficult handover" is described as chaotic and noisy, with multiple interruptions and with no clear leadership [19].

3.4.6. *Patient participation*

The ideal emergency handover involves healthcare professionals, patients, and relatives. Involving patients and relatives in the process provides an opportunity to rectify unclear information and allows them to contribute with additional information. This leads to a decrease in adverse events, improves communication, and enhances the continuity of patients' care [34]. Nevertheless, despite the known benefits of involving patients and relatives in emergency handover, they are not being involved possibly due to the mistaken belief that it breaches patient confidentiality [8,34].

Table 3
Characteristics and quality appraisal (CASP) of the qualitative design studies.

Characteristics of the qualitative design studies sample (n = 8)					
First autor Country, year	**Aim**	**Design/methods**	**Sample**	**Main finding**	**Quality appraisal**
					CASPE[1]
Calleja Australia, 2016.	To understand staff perceptions of best practice for information transfer for multitrauma patient from the ED.	Qualitative Focus group interviews.	Focus group n = 5	Best practice for information transfer to be clear, concise, relevant documentation that travelled with the patient and, to use standardized model that meets the needs of all involved.	10/10*
Sanjuan-Quiles Spain, 2018.	To explore the viewpoint of nurses on their experience of patient handovers.	Qualitative Theoretical framework of a content analysis.	Semistrucutured, face-to-face interviews n = 12 nurses	An organized method does no exit. Is necessary to standardize handoff between PEMS and ED professionals to improve communication, avoid data loss and adverse events and increase safety.	10/10*
de Lange South Africa, 2018.	To explore the existing patient handover practices between emergency care practitioners and healthcare professionals in the ED.	Qualitative Participant observation.	Participant observation n = 20	The 'what' of patient handover was not regarded as a concern, however the 'how' was identified as a challenge and diagnosed as 'disrespectful behaviour'. The task orientated behaviour and use of indigenous languages during patient handover practices affected the workplace culture negatively.	10/10*
Wong Australia, 2017.	To examine nursing handover in different wards.	Qualitative Observations, semistructured interviews and analysis notes and messages.	Observation n = 60 Interview n = 58	It present the similarities and differences in the handover among the three different wards and presents five key socio-technical insights to support safe nursing handover.	5/10*
Meisel EUA, 2015.	To identify issues and factors surrounding the EMS handoff process.	Qualitative Focus group	n = 48	Exist variations in methods, standards, and rules related to the handoff. Providers view their role as patient advocates, as well as caretakers, in the time of transition into the hospital, and that multiple barriers exist to effectively serving in that role.	10/10*
Siemsen Denmark, 2012.	To explore professional attitudes and experiences in critical episodes in handover. To elucidate factors that affect handover safety from ambulance to hospitals.	Qualitative Semi-structured individual interviews.	n = 47	The eight factors (communication, information, organization, infrastructure, professionalism, responsibility, team awareness and culture) indicate that handover are complex situation.	9/10*
Bost Australia, 2012.	To explore the clinical handover processes between ambulance and ED personnel of patients arriving by ambulance to the ED.	Qualitative Focused ethnographic approach	Handover setting observed n = 38 Participants observed n = 74 Interviews observed n = 20 Participants interviews n = 31	Quality of handover appears to be dependent on the personnel's expectations, prior experience, workload and working relationships. Lack of active listening and access to written information were identified issues.	10/10*
Murray UK, 2012.	To evaluate the accuracy of patient information transfer from pre-hospital reports to ED documentation.	Qualitative Documental synthesis.	n = 100	In notes of patients seen in the resuscitation room 26% either omit information reported by the ambulance crews or transfer it with changes.	8/10*

[1] Note. CASP, Critical Appraisal Skills Programme. CASP questions are adapted from Critical Appraisal Skills Programme (2013), "10 questions to help you make sense of qualitative research," retrieved from http://media.wix.com/ugd/dded87_29c5b002d99342f788c6ac670e49f274.pdf. Its license can be found at http://creativecommons.org/licenses/by-nc-sa/3.0/

* To consult the application of the CASP questionnaire, see the Annex I

3.4.7. Clinical records

As mentioned earlier, the emergency handover is the only chance that professionals have to exchange information [29,35]. However, as several studies have demonstrated, verbalized information during emergency handover is frequently not recorded [31,35], which later leads to doubts or lack of information required to offer quality and safe care. Thus, some authors identified the need to support verbal handover with a recorded clinical report that can be consulted when needed [5,36].

3.4.8. Education/training

Educating and training professionals to perform an effective information transfer can lead to an improvement in communication skills, care quality, and patient safety [8,31,37]. Training may help to develop emergency nurses' confidence, competence, and consistency in carrying out standardized and effective handovers [13]. Also, the literature shows that simulations are an essential instrument for continuing education and testing within training [29]. However, the dearth of handover education is also a concern as formal training opportunities are limited [38].

3.4.9. Responsibility

Emergency handover consists not only of the transfer of information but also the transfer of responsibility for patient care [29]. The lack of a formal transfer of this responsibility of care has previously been identified as a common factor influencing the effectiveness of handover between pre-hospital and hospital professionals [29].

In actual emergency practice, giving and taking responsibility for patients soon to be handed over is often ambiguous or difficult. As a result, no one clearly takes over responsibility for the patient [7].

3.4.10. Communication

Studies suggest communication is a significant issue during emergency handovers [10,29,30,38,39], identifying it as a key area for

improvement in a transfer strategy designed to reduce errors [19].

Iedema [30] suggests that effective communication during handover is crucial to guaranteeing care continuity and preventing adverse effects. Furthermore, San Juan-Quiles [5] states that good communication skills are necessary to ensure an efficient transfer of information.

According to De Lange [34], effective communication uses a structured and standardized format to transfer information. Calleja [39] too emphasizes this type of communication. However, current studies indicate that emergency transfers often occur in an inconsistent, confused and disjointed way [7,18,39].

4. Discussion

Most reviews have studied shift handovers in the emergency department, but few researchers have focused on emergency handovers between pre-hospital and hospital organizations. Furthermore, most studies available in the literature were qualitative, and in the few that followed a quantitative method, the results were nonetheless purely descriptive, giving the vast majority a weak EPHPP [26] score. In other words, the literature contains few studies – with doubtful quality of evidence – about emergency handover.

Our findings show that the limited literature available on emergency handover is unable to describe the concept of "effective handover" and cannot confirm the most appropriate procedure to employ. Thus, there is a lack of consensus regarding emergency hand-off with the consequent need for intervention and improvement [40].

We find that clear, consistent, and concise communication between pre-hospital and hospital professionals is indispensable to the emergency handover process [5,29]. However, emergency handover has been identified as a moment particularly vulnerable to error due to chaotic and complex environments, the uncertainty of patients' diagnosis, and the simultaneous management of multiple potentially ill patients [38]. In addition, the acute time constraints of this the single chance for the professionals to transfer patient information [15], leads to difficulties in communication.

Some authors claim standardization of communication during emergency handover improves patient outcomes and clinical safety [5,19,29–31]. In this line, Vangraafeiland et al. point out that standardizing communication during handover is not connected to an increase in handover times [14]. On the other hand, Bakon and Millichamp have suggested that standardization may not be possible because each specialty and ward have different needs [13]. Meanwhile, failures in communication continue to play a role in more than 60% of sentinel events reported to the JCAHO [7,14], which confirms that two out of every three in-hospital deaths are due to communication errors [19]. Faced with this reality, local and national policies like those formulated by the JCAHO and WHO identify improving handover communication as a key patient safety solution [21,22]. Their efforts have thus focused on standardizing the approach to patient transfer related communication [29,38].

Many studies mention "good" [36], "ideal" [19,34,41], "effective" [42], and "successful" [43] handover. However, none of them clearly defines the meaning of these qualifiers. In addition, the literature contains a variety of definitions for these concepts, and there is no consensus on what information should be transferred or the best method for doing so [8,11,38,44,45]. Handover quality is also mentioned by some authors although none of the studies describe what involves high or low-quality handover [29,46–50], neither do they offer standards that allow quantifying handover quality.

We also observed a great variability in handover evaluation tools [28,49–51] and identified the need for empirically proven and validated tools. All in all, this confirms that the efforts to universalize processes of emergency handover have yet to be consolidated [6], making emergency handover a huge problem to the safety of critical patients [15,18,29].

This review shows that emergency handover standardization remains in its initial phase. Emergency handover continues to be a vulnerable point for errors and is regarded a concern by both pre-hospital and hospital professionals as well as national and international organizations. Therefore, there is a need to study and deepen our understanding of the emergency handover process, based on the homogenization of concepts taken from the literature. It would also be convenient to have an evaluation of emergency handover tools that allow us to assess the process and identify practices associated with outcome improvement.

5. Limitations

The present study has some limitations. Few studies in the literature address emergency handover between pre-hospital and hospital organizations. Moreover, the results obtained from quantitative studies have to be considered with caution as most show a weak quality of evidence score according to the EPHPP [26].

6. Conclusion

In conclusion, this review shows the clear need for improvement in emergency handovers. To achieve this, it is essential to start by standardizing the concept of emergency handover using available literature to describe and confirm the ideal method for an effective and safe performance. Nowadays, a lack of consensus around the emergency handover concept and the low quality of evidence in the reviewed studies produce important deficiencies, variations in methods, standards, and rules regarding emergency handover. Thus improving such deficiencies is a potential way forward in the development of a standard method for emergency handover.

Accordingly, this systematic review identifies several aspects of the handover process that require improvement. The first is standardization itself, with a view to organize methods of information transfer. The next is clear identification, by which we mean professionals should introduce themselves, identify their counterparts in the hand-off and introduce the patient by name. In addition, it is important for the professionals to actively participate in the process and behave respectfully.

Location is another an important aspect, as bedside handovers are preferable. Other environmental factors, such as maintaining a calm and quiet atmosphere respectful of patient privacy, also play a role in successful handovers. Likewise, patients and their relatives should be able to participate in the process. We have found that accompanying verbal handovers with clinical records reduces potential information loss since such records can always be consulted again.

In addition, training professionals in effective handover methods is key, along with assuming responsibility for handing off or taking over care of each patient. Finally, handover performance would be improved by promoting clear, precise, and competent communication between professionals.

Thus, improving the above mentioned areas is a potential way forward to achieve a standardized method for performing emergency handovers.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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