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Abstract

Nursing complexity requires comprehensive tools for evidence appraisal and synthesis, able of taking into account several factors driving outcomes, resource use, and patient well-being. Umbrella reviews, overviews of reviews, and meta-epidemiologic studies offer a unique opportunity to capture and navigate such complexity, without disregarding the multiple evidence sources informing on nursing. In this chapter, a set of key umbrella reviews is presented on nursing which offer a poignant case study on the pros and cons of this kind of research design in this clinical and research discipline.

17.1 Introduction

Nurses are the largest group of clinical practitioners' workforce worldwide. They are positioned to make important contributions to improve health and quality of life. According to the International Council of Nurses (ICN), nursing includes

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“autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings” [1]. Moreover nursing encompasses “the promotion of health, prevention of illness, and the care of ill, disabled and dying people. Advocacy, promotion of a safe environment, research, participation in shaping health policy and in patient and health systems management, and education are also key nursing roles.”

For the American Nursing Association (ANA), “nursing is the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations” [2].

There are six essential features of professional nursing:

1. Provision of a caring relationship that facilitates health and healing
2. Attention to the range of human experiences and responses to health and illness within the physical and social environments
3. Integration of objective data with knowledge gained from an appreciation of the patient or group’s subjective experience
4. Application of scientific knowledge to the processes of diagnosis and treatment through the use of judgment and critical thinking
5. Advancement of professional nursing knowledge through scholarly inquiry and research

The majority of people are unaware that nurses conduct research. Fitzpatrick and Joyce in an editorial wrote that “the person in the street” has little understanding as to “what nursing research is or its benefits to the health and welfare of all citizens” and at same time “consider nursing to be a subset of medicine” [3]. However, nursing is not directed by physicians, even though nurses have less power in comparison to physicians.

In addition to extensive medical expertise, nurses have a unique, holistic patient advocacy focus, a unique scope of practice, and a unique body of knowledge, including special expertise in areas such as patient education, wound care, and pain management. Research priorities in nursing must take into consideration individual and collective needs in health (clinical and public health), both in macro and micro social environments. Studies should be focused on the social structure which generates health or disease, without neglecting the presence of the actor’s subjective world. The theoretical frameworks should be both inter- and transdisciplinary constructions.

However, “nursing is a human discipline that facilitates individuals and families wellbeing and communities using a scientific knowledge base within caring relationships” [4].

The future needs to reflect nursing’s unique contribution to care and related outcomes within an interdisciplinary environment; nurses need knowledge to inform and transform care delivery, improving quality and safety of care.

Nurses must be active participants in research and in the development of scientific knowledge.

This chapter presents two literature reviews: one is an umbrella review which aims to clarify some issues on handover during daily care routine, and the second is focused on e-learning its effects on learning environment (i.e., universities) and knowledge building within nursing education.

Handover is an important moment in the daily healthcare routine and a key aspect on healthcare delivery; this is because a wrong or confused handover can lead to a wide range of problems both from an organizational point of view and in terms of patient safety. As far as e-learning is concerned, the use of information and computing technology within the academia should be explored in depth as there is an overall need to evaluate its effectiveness per se and in comparison to traditional methods of learning and teaching; this is to have an evaluation and a possible implementation within nursing studies which are traditionally strongly based on relationships and therefore could potentially lose some important insights and features with the use of e-learning.

17.2 Case Study 1: Handover and Nursing

17.2.1 Synopsis

17.2.1.1 Introduction

Nursing handover means the exchange of information among nurses about patients' conditions. This process is essential for nursing practice in terms of quality of care, patient safety, and continuity of care. To date, there is no agreement with respect to the best way to carry out nursing handover. The purpose of this work was to synthesize the secondary literature with reference to evidence on nursing handover, methods, and tools used for handover process, paying attention for new research activities.

17.2.1.2 Methods

Comprehensive searches of scientific literature (systematic review and integrative review) were conducted in five electronic databases (PUBMED, SCOPUS, CINAHL, COCKRANE DATABASE, CRD DATABASE); no language restrictions were applied. The search strategy consisted of keywords and medical subject headings for handover (and related term, handover, hand-off, handoff, sign out, shift report) AND nursing as population. In addition, searches throughout reference lists were conducted to identify additional citations.

17.2.1.3 Results

Twelve revisions met the inclusion criteria.

17.2.1.4 Conclusion

Further studies should be carried out in this area given the lack of quality studies that may show which is the best way to carry out handover process in terms of styles, content, and tools. A key aspect to pay attention is the context since it affects

handover content. Structured handover through EHR systems together with face-to-face handover is crucial in providing a better communication process and easier data access as well as in improving quality of care; besides that, there is a need to develop educational tools on the topic currently absent in health professional curriculum.

17.2.2 Introduction

Clinical care is continuum that also involves all the information that the health professions and paramedics exchanged both at the referral of a patient in a hospital by a specialist or primary care patient discharge from hospital (hereinafter, “handover”); it is one of the most critical aspect of a patient care and involves some key aspects of the clinical care process: transfer of information, professional responsibility, and accountability for patient care from one clinical team to another either temporarily or permanently, as focused in definitions.

Literature suggests several definitions of handover. Australian Medical Association and UK National Patient Safety Agency give as definition of handover: “the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis” [5]. Cohen and Hilligross define handover as “the exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for, the patient” [6].

Handover represents an umbrella term of synonym terms or terms that can be traced to handover (i.e. hand-off, shift report, health record, shift change) or for area of transfer. Handover can refer to one of diverse transfers that exist in healthcare service context: from specific provider to similar provider (i.e., nurse to nurse) or for primary care service to secondary care or diagnostic department, between wards in similar department or in-hospital or for ambulance service to emergency department.

Handover is one of the main aspects in clinical governance, and it has been identified as one of the main concerns during patient’s hospitalization. Generally speaking, handover process is performed by different healthcare professionals as nursing or medical teams; handover is frequently pressured by time constraints, and it can lead to miss important information due to poor structure and process [7, 8].

Also another area of interest is the fact that the handover in most cases is paper based and at the same time is unstructured language, expressed in natural process languages. Some area of overlap and redundancy exist with different types of forms used for writing information: at the same time, the use of standardized languages appears as limited.

We carried out an umbrella review which aims to address related research questions to summarize the best evidence in the field, individuate standard methods, and clarify areas where it is necessary for new research activities to focus on.

The issues of the whole process are overemphasized by the overall use of similar words as well as the lack of use of standardized language.

17.2.3 Objective

The scientific literature on nursing handover has been documented in a number of systematic reviews in recent years. We aimed to conduct an umbrella review to provide a more comprehensive overview in the field as follows:

- Summarize the best evidence on handover for nursing practice.
- Explore standards and methods used for handover process.
- Clarify area which are important topic to explore in future research activities research activities.

17.2.4 Methods

17.2.4.1 Inclusion Criteria

1. Systematic review and integrative review
2. Focus on nursing handover (or related research)
3. Presence of abstract
4. English language publications only
5. No limits of year of publication

17.2.4.2 Exclusion Criteria

1. Reviews focused on handover for physician or other healthcare professional
2. Reviews without clear selection process flowchart
3. Reviews with other outcome than nursing handover

17.2.4.3 Quality Assessment

All eligible reviews were assessed independently by two researchers. The AMSTAR quality assessment tool (a measurement tool to assess systematic reviews) was used to evaluate reviews. AMSTAR is an 11-item tool to assess methodological quality of systematic reviews that has been found to have good reliability. A minimum score for inclusion is 7.

17.2.4.4 Data Analysis

We conducted dual, independent data extraction using a standardized form. Disagreements were resolved by consensus or consultation with a third researcher. Within a review, studies were included in the analysis if they addressed nursing handover, no context defined.

17.2.5 Result

Twelve reviews were included in the present study. The flow of studies through the selection process was presented in Fig. 17.1. Summaries and overall findings of the included reviews are reported for each review in Table 17.1.

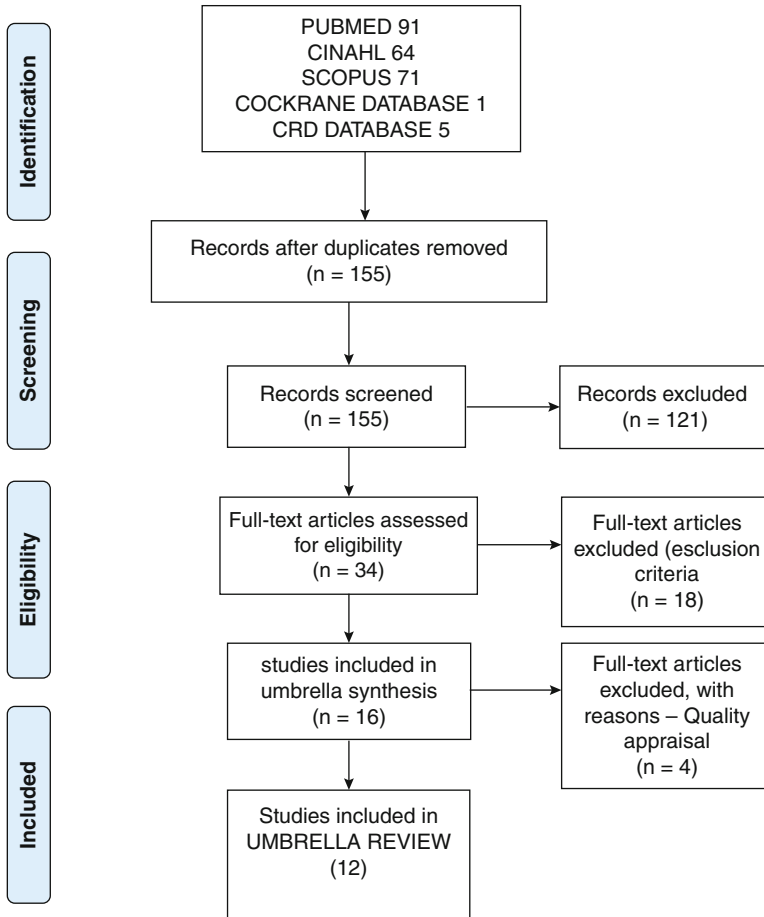


Fig. 17.1 Flow chart for case study 1

17.2.6 Discussion

Articles included in the review show handover process in a number of different settings. Among studies under analysis, there are some focused on ambulance and hospital handover [9, 10]; some on intervention effectiveness evaluation [11–15]; some which explain the topic before, then set up a new handover standardization as the electronic one [16, 17]; and some focused on the content to identify process issues [18]. It is worth underlining that the categorization used here is developed with the main purpose and aim to summarize findings of this review; however, there are several articles which do not fall completely and exclusively into one category.

Table 17.1 Key features of included reviews for case study 1

First author	Title	Year	Number of included studies	Population target	Aim	Setting	Overall findings
Abraham J.	A systematic review of the literature on the evaluation of handoff tools: Implications for research and practice	2014	36	Medical and nursing staff	Evaluation studies of handoff tools	Critical care, non-critical care	The majority of the studies show to have electronic handovers. Nearly all EMR integrated handovers are set up for specific wards. Due to the fact that standardized handoff is devised for the specific ward, there is a need for more research with a larger sample/settings Study design: most of the studies are observational studies with some limitations in terms of strength of evidences; furthermore almost all studies had very small sample sizes
Smeulers M.	Effectiveness of different nursing handover styles for ensuring continuity of information in hospitalised patients (Review)	2014	0	Nurses	To determine the effectiveness of interventions designed to improve hospital nursing handover	All teaching or university hospitals	The research question remains unanswered because none of the studies found was included in the review (no cluster RCT or RCT) which confirms the lack of quality nursing studies in this area

(continued)

Table 17.1 (continued)

First author	Title	Year	Number of included studies	Population target	Aim	Setting	Overall findings
Flemming D.	How to improve change of shift handovers and collaborative grounding and what role does the electronic patient record system play? Results of a systematic literature review	2013	60	Medical and nursing staff	What are the typical errors and their consequences in handovers? How can they be overcome by conventional strategies and instruments? Are there any instruments to support collaborative grounding?	Outgoing shift and oncoming shift in healthcare institution	Several studies display that electronic handover tools integrated into EPR systems providing more and better information with respect to paper based handovers. Quality of handovers depend on the structure, quantity, and quality of information as well as on type of information, i.e., anticipatory guidance and other subjective information and holistic information about the patient as a clinical case, (not contained in conventional electronic record systems.) Some studies provide recommendations on how electronic handover tools integrated into EPR systems should be designed. Recommendations should be implemented and evaluated

Jensen S.M.	Handover of patients: a topical review of ambulance crew to emergency department handover	2013	18	Physicians, nurses, and paramedics	To identify factors that influence handover process	Handover from ambulance crew to emergency department	<p>Information gaps – lack of active listening during handover, loss of information for more major injuries, due to the failure to deliver in two steps (at the ambulance arrival and after starting treatments for stabilization); there are too many handovers: ambulance/triage/nurse-in-charge</p> <p>Strategies to improve the process (tips) structuring the transfer of information with tools. Some studies suggest the use of computer to send information from the ambulance to the hospital</p> <p>Cultural differences and organizational aspects of some studies mention difficulties in verbal handover due to misunderstanding of health professionals</p>
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Table 17.1 (continued)

First author	Title	Year	Number of included studies	Population target	Aim	Setting	Overall findings
Kitson A.L.	What's my line? A narrative review and synthesis of the literature on registered nurses' communication behaviours between shifts	2013	29	Nursing staff (RN)	To identify gaps and inconsistencies in the handover process	Handovers in adult hospital settings	Overall lack of quality research on conceptual frameworks on complexities of handover. Article identifies seven consistent themes across seminal and empirical papers; however, the chronological evolution of these themes showed overall limited development Currently research has not been able to investigate the role of the unit that leads in determining nurses' communication attitudes
Foster S.	The effects of patient handoff characteristics on subsequent care: A systematic review and areas for future research	201	18	Medical and nursing staff	Assessing the empirical evidence on the relationships between handoff characteristics and outcomes was to identify recurring methodological problems in previous research by examining the studies' quality with particular regard to their potential for causal inference	Patient handoffs within hospitals, including those between paramedics and the emergency department	This article displays that research brings very different results on the subject, and there is an overall difficulty to pair the studies. Therefore, it is difficult to draw significant conclusion in order to develop projects on standardized form for handover (some studies found standardization form positive, some not); furthermore, standardized form varies among the different settings and is observational

Staggers N.	Research on nursing handoffs for medical and surgical settings: An integrative review	2012	30	Nurses	To synthesize the outcomes of nursing handoff research (for future computerizing handoff)	Medical and surgical units	Primary role of the nurse in the handover, also at bedside (patients do not participate for a number of reasons) Handover is crucial for nurses not only for the transfer of information but also for social, emotional (ritual), and educative aspects. Hence, the importance of preserving deliveries face- to-face (even with electronic systems) Structured data improves handover process overall
Gordon M.	Educational interventions to improve handover in health care: a systematic review	2011	10	Medical and nursing staff (students included)	Assessment of educational intervention on handover	The setting was inpatient medical establishments, no acute inpatient setting	Several studies are methodologically weak; there is an overall lack in quality of the studies and are not replicable Kirkpatrick model was used (only one study reaches level 3) At international level, there are no recognized competences for handover delivery; therefore, there is a heterogeneity in the educational intervention

(continued)

Table 17.1 (continued)

First author	Title	Year	Number of included studies	Population target	Aim	Setting	Overall findings
Collins S.A.	Content overlap in nurse and physician handoff artifacts and the potential role of the electronic health records: A systematic review	2011	36	Nurse and physicians	Content overlap between nurse and physician hospital-based handoff	Acute care	Interdisciplinary differences in handover information Interdisciplinary handover element list and its role in establishing common ground Missing inpatient handover elements EHR support of overlapping interdisciplinary handover information
Bost N.	Clinical handover of patients arriving by ambulance to the emergency department – A literature review	2010	8	Physicians, nurses, and paramedics	Critical review of research on clinical handover between the ambulance service and emergency department	Emergency department	BARRIERS TO DELIVERY TRANSFER Lack of a common language and/or understanding between the different disciplines Inattention during handover Disproportionate amount of information exchanged Lack of leadership/lack of teamwork Staff perceived lack of a common language and framework for minimal information Three out of the eight studies included in this review have recommended to standardized handover

Riesenberg L.A.	Nursing handoffs:A systematic review of the literature	2010	95	Nurses	Identify strategies for effective handoffs	Nursing handoff	The research identified several strategies to improve handover process (7 categories) Communication skills, standardization strategies, technologic solutions, environmental strategies, educational and training leadership staff involvement
Arora V.M.	Hospitalist handoffs: A systematic review and task force recommendations	2009	10	Staff, patient, and system	To develop recommendations for hospitalist handoffs	During shift change and service change in same wards	Supports the use of a verbal handoff supplemented with written documentation or a technological solution in a structured format Lack of studies able to build type A recommendations (all are of type C, except one of a B type) Almost all studies have small samples, without control group and none are multicenter Nonetheless, recommendations were drawn and divided into guidelines and recommendations for verbal handover and content delivery

17.2.6.1 Special Context (Ambulance to Emergency Department)

According to the articles under analysis, there is a high interest around handover issues between ambulance service and emergency department (articles come from the USA); this could be due to the fact that paramedics are not felt as highly qualified professionals. Several aspects make handover under this setting particularly challenging such as the large amount of information, the timing of communication, as well as the number of individuals involved (i.e., ambulance/triage/nurse).

Bost et al. state to use for their review Cochrane protocol to evaluate quality of articles; however, due to the lack of RCTs and intervention studies, this is impossible [9]. Therefore, the Polit and Beck model was used [19]. This is the same for Jensen, who decides to not rate in any way articles under analysis. Both revisions agree on the need, within this context, of developing an organizational culture that ensures the use of a common language, respect for hierarchy, and teamwork structure [10]. In the light of that, it would be important to develop educational modules in order to enhance communication among different professionals (physicians, nurses, paramedics).

Some studies included by Jensen recommend to use ICT facilities to send information directly from the ambulance to the emergency room in order to give a more rapid and straightforward answer to patients. In this way, there will be a significant reduction in time waste and transcription errors, and there will be a construction of a common language.

Authors emphasize relevance of the teamwork; although in this context, it is hard to build it due to the lack of recognition of the skills of other health professionals which leads to a challenging collaboration. Furthermore, these scholars recognize that it is timely to develop a standard handover process through tools as IMST-AMBO which are promising, seen that all health professionals in this peculiar handover process have been involved in validation.

17.2.6.2 Tools and Intervention to Improve Handover Process

Several studies among those in analysis are focused on intervention evaluation targeting different aspects useful to improve handover process. The results of Cochrane review of 2014 are quite relevant; this study, carried out rigorously with respect to studies selection, aims to identify “the effectiveness of interventions designed to improve hospital nursing handover” (pag. 4). The study according to inclusion criteria (RCT or cluster RCTs) did not find any work which could be included [12].

Interventions under evaluation can be focused on wide range of aspects, e.g., content delivery (use/absence of form-template-checklist), verbal, written, recorded, mix model, and venue (nurses' room, bedside, and so on). According to that intervention, analysis could be focused on written handover in different venues (i.e., bedside vs office) or verbal vs nonverbal or recorded or on the type of content (use/absence of form-template-checklist). Evaluation results are carried out following well-known indicators for the assessment of adverse events, medication errors, complications, mortality, or sentinel event. Although authors conclude on the

absence of reliable evidence, there are several examples of researchers who have tried to assess the effectiveness of the styles of nursing handover in order to improve the safety and quality of care. This review (18 of 28 studies identified) pays attention to the introduction of new tools within local experience with a pre- and post-assessment in order to improve quality; these aspects leads to a difficult replicability. Other articles were excluded considering that they did not assess their effectiveness in terms of results but simply on the perception of satisfaction process by nurses and in some rare cases of patients (two).

Similar to that of Smeulers from a methodological rigor point of view are the works of Foster and Monser [20] and Abraham et al. [15], who conduct a systematic review to identify the relationships between the characteristics of handover and healthcare results through a search for evidences. The two studies, which were focused on handover between physicians and nurses, have similar conclusion; results are inconclusive as studies are really different, and it is difficult to pairing to drawn an overall conclusion.

Arora et al. [11] and Riensberg et al. [14] strive to develop recommendations and guidelines which could help nurses to improve handover process; the two studies have similar conclusion. Staff involvement (also found in Bost 2010 and Jensen et al.) [9, 10] and education training on handover process (both for physicians and nurses), across all studies, are the main points to work on. There is an overall call to introduce innovative ICT solutions, structured template checklist, and mnemonics standardized (e.g., SBAR, ISOBAR, etc.) together with verbal handover which is seen as key in order to assure data completeness (interactive – process) [16, 21]. Riensberg also highlights how environment represents a fundamental role in handover process to limit distractions, interruptions, and noises that can influence the final result and privacy during handover.

A particularly interesting study is that of Gordon et al. which analyzed the literature (handover) of medical and nursing with the specific aim to identify the effectiveness of the training in this process; the author used the Kirkpatrick model and one study was rated 3 [13].

In this study once more an element (common to all studies) is the lack of quality, characterized by studies with methodological weaknesses together with the lack of publication of educational material used during interventions (therefore not reproducible). More used methodologies are simulation, role playing, and the use of library materials to discuss and develop skills in handover process.

Emergед themes were information management, team working, communication, leadership, error awareness, and professional behavior. It should bear in mind that handover process among health professionals is not included in the curricula in universities which leads to a heterogeneity of educational interventions. In the light of the above, education in this area probably is taught during clinical practice, the observation of colleagues, first as a student and then as a newly hired, becoming a teaching tool for communicating data.

In the light of the above, there is an inherent complexity in having suggestions to develop new tools for handover; for instance, there are mixed and conflicting results on the use of form-template-checklist with some authors who recognize the

usefulness of standardization and some who do not; studies are overall weak as are observational studies with no control. Scholars point out that there is an overall lack of studies focused on nursing of theoretical construction both on handover and handover standardization.

17.2.6.3 Handover Content

Flemming et al. identify more common errors associated with handover and their consequences [18], whether such errors could be overcome through the use of traditional or electronic tools. They evaluate different structured handovers, both oral and written with checklist and oral mnemonic highlighting that using structured handover there is less data loss.

The sample considered included both physicians and nurses, and a huge overlap was found in the information between the two groups (also in Collins et al.) [17]; therefore, a possible solution could be use a common EHR system. This can be differentiated in some aspects for the two groups where necessary. From a purely nursing point of view, this suggests a difficulty in EHR systems to give room to the holistic nature of information (attention to the quality of information as well as the amount and structure). The loss of important information during patient care is found to be the most common issue; among analyzed studies, 43 out of 60 show that this issue can be sorted out by introducing the use of traditional instruments (SBAR, ISOBAR, etc.) as well as ICT-based tools.

With a different focus, Stagger and Blaz in 2012 conducted an integrative review aimed at identifying outcomes of nursing research handover (for future computerizing handover) to identify critical content for an EHR system [16]. The study started with the identification of the main handover purpose which are transfer of patient information, building a team, and knowledge on actions of care which have to be communicated to a new shift. Several inconsistencies were found between handover and patients' real conditions. Recorded handover has more omission with respect to the unrecorded ones, but also more consistent with the real state of the patient.

There are several ways to carry out handover although many authors do not declare the type. Given the methodology used, which included qualitative studies, the importance of handover as ritual moment, which relieves anxiety and gives a sense of protection for nurses, emerged. According to Riensenberg et al., several problems were identified during the delivery as communication barriers, repeated interruptions, and high levels of noise [14].

Kitson et al. conducts a narrative review that aimed to understand how handover is developed in acute care by meta-narrative review and synthesis, in order to "tell a story" about handover, as part of a healthcare performance [21]. Using the metaphor of care settings, they described each key issue identified in both empirical studies and in seminar work included in the study.

Similarly the studies of Smeleurs et al. [12], Foster and Manser [20], Gordon and Findley [13], Arora et al. [11], Abraham et al. [15], and Flemming and Hübner [18] determines that the low quality of the studies is the main deficiency together with an inherent challenge in research in determining the correct communication/handover

among nurses. Different authors with different paths come to similar conclusions about the fact that handovers are subject to errors; omissions of important information determine errors in decision-making. Furthermore, there is an overall call to identify strategies to develop handover [16, 18, 21].

17.2.7 Conclusion

Handover in healthcare facilities is a high-risk moment in terms of patients' safety; indeed this moment entails several dangers such as interruption during care, adverse events, and legal issues. In 2006, the WHO identified handover as one of the five biggest issues for patient safety; the issues became even more serious when the legislation on employment timetable and schedule changed both in Europe and in the USA; with this change, shifts are shorter and there is an increase of handover in daily routine. Besides that, handover is strongly influenced by perceptions, personal characteristics, health professional's knowledge of who are those who exchange the information, as well as by organizational context and ward.

In the light of the above, nurses can potentially play an important role in the loss of data/information about the patient's needs. This loss exposes the patient to a risk for his/her health in terms, for instance, of treatment delay or wrong treatment.

Nursing handover is key in the healthcare process; nevertheless, there are not as yet unique recommendations or guidelines in the literature with respect to what and how nurses should communicate in nursing handover. This leads to a huge challenge in developing a standardized methodology.

All studies included in this review agree with the need of future research in this area, especially given the lack of strong evidences which can support the effectiveness of a way/methodology to transfer (through handover process) healthcare treatment information/data during daily routine.

The review carried out displays some suggestions which can be drawn from the studies analyzed (those with pre- and post-intervention) which however show weak results. For instance the need to keep face-to-face handover even when electronic handover are used to have a more inclusive number of information. Furthermore it should be take into account the setting and specific clients (i.e. older people) in order to evaluate if there is an inherent difficulty in communication, since patients may not be able to answer willingly to health professionals' questions. Indeed in hospital settings, there are several communication barriers due to interruptions, noise and lack of ICT system.

Even in setting where handover is ICT oriented, although the introduction of these tools (SBAR, MIST, and so on) was positive, there is an overall lack of identification of a handover methodology because setting were so different (nurses and patients) as well as different kind of tools leads to a wide range of different standardization handover tools which are not easily replicable in different context. There is furthermore a little presence of multicenter studies that would allow evaluation of broader intervention not just in one unit and an overall lack of educational specific content.

17.3 Case Study 2: E-Learning in Nursing Education in Academic Fields

17.3.1 Synopsis

17.3.1.1 Introduction

The increasing use of an online learning explosion is kind of revolution that has deeply modified the traditional way of education. The aim of this overview is to conduct an overview of reviews about e-learning in nursing and other healthcare students' education in academic environment, by reviewing reviews.

17.3.1.2 Method

A comprehensive database search was conducted using two electronic database: PubMed/MEDLINE, Ebsco/CINAHL, for the period 2004–2014. The search strategy consisted of keywords and medical subject headings for e-learning (and related terms like distance education, online learning, distance learning, mobile learning, Web-based learning) and nursing (or healthcare students) as population. In addition, searches throughout reference lists were conducted to identify additional citations. Two review authors independently screened results and extracted data from included studies, with any discrepancies settled by a third author.

17.3.1.3 Results

Seventeen reviews were included for this overview of review. Three areas were identified: population (faculty and members), methodologies (blended learning, game/3D, PBL, and situated learning), and evaluation (comparison of e-learning with the traditional method, performance, students' satisfaction)

17.3.1.4 Conclusions

This overview demonstrates that e-learning in nursing is a valid alternative to traditional learning. This study shows that there is a lack of robust evidence on this topic and that the field is constantly under development, especially in some areas as simulation or game/3D activities, although not strong there are evidence of reduction in the cost of education (in terms of management for instance) as well as a more efficient management of the time for students and lecturers which reduce overall the economic effort afforded by universities and facilitate the management of education environment.

17.3.2 Introduction

E-learning education within the academia means new organizational issues. Universities, particularly in healthcare education sector, should have a clearer understanding of the impact of technology on learning. What can be seen as a problem at a first sight can become a formidable challenge for traditional academic institution, especially in healthcare education.

E-learning used in academia for nursing and healthcare professionals' education could be represented like a speeding train. Online learning explosion, just as a revolution, has deeply modified the traditional way of education [22], also in terms of necessity of sharing space and time, that during the years constituted an archetype of the formative moment [23].

Nowadays, there is no commonly accepted and clear definition for e-learning, but it generally refers to distance-based forms of learning rather than face-to-face interaction and every time traditional methods of learning are supported by online resources. The European Union (EU) defines e-learning as "the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration" [24]. E-learning is an umbrella term in the literature; there are several terms which have similar meaning such as distance learning, digital learning, distance education, electronic learning, online learning, Web-based learning online education, and now mobile learning.

The key features as stated by Ganino of e-learning are the use of an internet connection and a technological device (computer, tablet, smartphone); enhancement of multimedia; independence from the constraints of physical presence and specific times (always and everywhere); continuous monitoring of the level of learning through self-assessment; interactivity with teaching materials, faculty members, tutors, and other students; and enhancement of social and collaborative learning [25].

In 2010, the American Nurses Association (ANA) recognized e-learning's benefit: "As the nurse of the future evolves, so must nursing educations. Curricula must be designed to adequately prepare competent entry-level nurses. The nurse shortage and program capacity limits demand efficient education process. Online, virtual, simulated, and competency-based learning are attempts to expand opportunities to students and increase efficiency" [26].

In a few years, distance learning has become central in the academic debate for health professional education. In the literature, there are doubts both with respect to the extensive application of e-learning in terms of job market and in terms of relationship and emotional closeness as is a key element for the success of education. Other concern are focused on infrastructure, security, and reliability. Research and extensive analysis can help to clarify direction and identify drop points.

17.3.3 Objective

To conduct an overview of reviews about e-learning in nursing and other healthcare students' education in academic environment.

17.3.4 Methods

The methodology used for this overview of reviews is aimed at identifying, appraising, and synthesizing evidence from systematic and integrative reviews in order to

synthesize and analyze the evidence generated focusing on e-learning for nursing students and students of other health professions.

17.3.4.1 Search Strategy

The search was made up by text words and index terms into three domains: (1) E-LEARNING (and related terms: e-learning, distance learning, digital learning, distance education, electronic learning, online learning, Web-based learning online education, and now mobile learning.), (2) nursing, and (3) reviews and literature reviews. The Boolean operator “OR” was used to consolidate each domain; furthermore, “AND” operator was employed to cross-reference the three domains.

The search was conducted in August 2014 using the database EBSCO, CINAHL, and Pubmed.

17.3.4.2 Inclusion Criteria

Only integrative and systematic reviews focused on e-learning within the academic environment for nursing and healthcare professionals were included, as indicated below:

- Period: 2003–2013
- Language: Italian – English
- Integrative or systematic review or systematic review with meta-analysis
- Only based within the academic environment
- Only focused on nursing and healthcare students
- Other outcome of review

17.3.4.3 Exclusion Criteria

- Other review than integrative or systematic review
- Review focused on e-learning and CME (continuing medical education)
- Review without clear selection process
- Other language than English

17.3.4.4 Quality Appraisal

The eligible reviews were evaluated for quality appraisal by two reviewers; independently, the quality of each review was assessed according to AMSTAR criteria. Minimum score for the inclusion was 7 (seven) in a maximum grade of 11 (eleven)

17.3.5 Result

The first stage of searching was conducted in the two databases, and relevant titles/abstracts were retrieved (780). After the duplicate studies were identified and deleted, two reviewers screened separately the title and abstract of candidate articles

for potential articles. After the full texts of potential studies had been obtained, two reviews (41), working independently, evaluated and selected the articles according to the inclusion criteria and select 27 eligible for inclusion. During the processes, any disagreements between the two reviewers were resolved through consensus. If consensus could not be reached, a third reviewer was consulted for a final decision.

After evaluation of quality criteria appraisal (AMSTAR), 17 were included in this overview, as indicated in Fig. 17.2 and in Table 17.2.

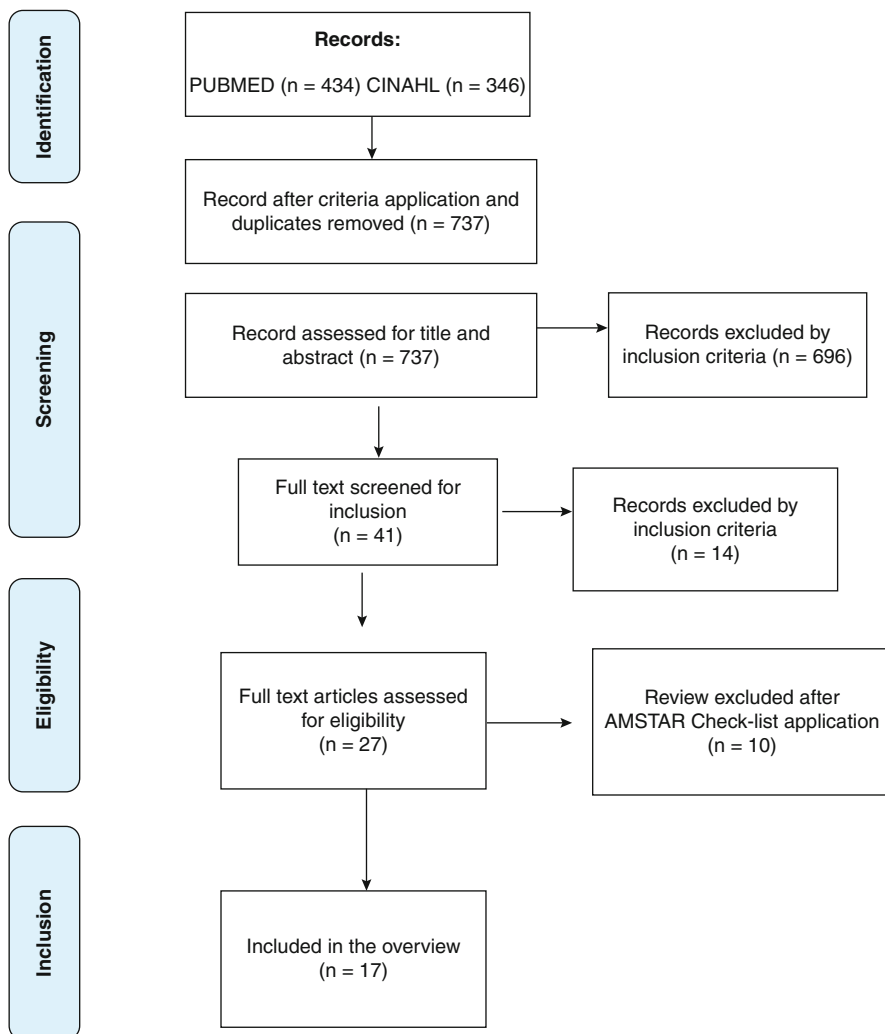


Fig. 17.2 Flow chart for case study 2

Table 17.2 Key features of the included reviews for case study 2

Authors	Titles	Years	Studies	Population – focus	Key findings
Wilkinson et al.	Measurement of information and communication technology experience and attitudes to e-learning of students in the healthcare professions: integrative review	2008	49	Nursing student and faculty	Information literacy is a key aspect for reducing gaps in e-learning education Necessity to develop and validate instruments to explore e-learning perspective
Cook DA et al.	Internet-based learning in the health professions: A meta-analysis	2008	201	Health professional student	Internet-based learning compared with no intervention has a consistent positive effect Necessity for more trial to standardize application
Bloomfield JG et al.	Using computer assisted learning for clinical skills education in nursing: Integrative review	2008	12	Nurses and nursing student	Computer-assisted learning has potential as a method of teaching clinical skills in nursing Necessity for more robust methods to investigate
Carroll et al.	UK health-care professionals' experience of on-line learning techniques: A systematic review of qualitative data	2009	19	Health care professional students	Flexibility as key element Improve regular testing or assessment is necessary for evaluate acceptance and performance
Mancuso JM	Perceptions of distance education among nursing faculty members in North America	2009	72	Nursing Faculty	Necessity to establish rules for workload, compensation, support, development, and role of the faculty
Booth et al.	Applying findings from a systematic review of workplace-based e-learning: implications for health information professionals	2009	29	Physician, nurses, and health care students	Need to design and develop new application for support Development of innovative methods of assessment as element to improve application

Table 17.2 (continued)

Authors	Titles	Years	Studies	Population – focus	Key findings
Cook DA et al.	What do we mean by web-based learning? A systematic review of the variability of interventions	2010	50	Physician, nurses, and health care students	Exit too much variation in the technology to permit generalizable statements Need more and better research to clarify our use of WBL
Cook DA et al.	Instructional design variations in internet-based learning for health professions education: A systematic review and meta-analysis	2010	51	Nurses and nursing students	Interactivity, practice exercises, repetition, and feedback improve learning outcomes and that interactivity, online discussion, and audio improve satisfaction for health professionals
Cook DA et al.	Time and learning efficiency in Internet-based learning: A systematic review and meta-analysis	2010	20	Health care professional students	Great variability of course delivery Choice to use e-learning provides a logistic advantage for learner groups
Lathi M.	Impact of e-learning on nurses' and student nurses knowledge, skills, and satisfaction: A systematic review and meta-analysis	2012	11	Nurses and nursing students	No difference between e-learning or traditional learning Develop and evaluate methods for education among nurses
Graafland m. et al.	Systematic review of serious games for medical education and surgical skills training	2012	25	Physician, nurses, and health care students	Blended and interactive learning – serious games may be applied to train both technical and nontechnical skills Games need validation before integration into teaching curricula
Petty J.	Interactive, technology-enhanced self-regulated learning tools in healthcare education: A literature review	2012	11	Physician, nurses, and nursing students	Educators do not have to remain stagnant, and there is the need to develop new resources and curriculum delivery E-learning engagement can be variable

(continued)

Table 17.2 (continued)

Authors	Titles	Years	Studies	Population – focus	Key findings
Patterson BJ	Student outcomes of distance learning in nursing education: an integrative review	2012	33	Nursing students	Clear orientation to e-learning and consistent use of the Web-based learning platform are also essential to facilitate effective student use of the Web-based classroom
Rowe M et al.	The role of blended learning in the clinical education of healthcare students: A systematic review	2012	14	Nursing students	Further research is necessary before educators make assumptions about the long-term effects of blended learning in clinical education
Button D. et al.	E-learning & information communication technology (ICT) in nursing education: A review of the literature	2013	28	Nursing faculty and nursing students	Development of preregistration nursing curricula for e-learning and ICT technology is compulsory Information (ICT) literacy is an essential learning skill for nurses Nurse educators need more training; computer information technology is needed for nurse faculty
Feng JY et al.	Systematic review of effectiveness of situated e-learning on medical and nursing education	2013	14	Physician and health care professional students	Situated e-learning is an effective method to improve novice health professionals' performance
Du S et al.	Web-based distance learning for nurse education: a systematic review	2013	69	Nurses and nursing students	Web-based distance education has equivalent or better effects in improving knowledge and skills performance for nursing students

Reviews are being widely heterogeneous in structure and content. However, revisions could be identified and some recurring themes could be grouped: population (students and faculty) evaluation (in terms of acceptance, performance, comparison with traditional system, and evaluation) and e-learning methodologies (i.e., blended, game/3D, situated learning).

17.3.6 Population

The World Health Organization and the American Nursing Association suggest that the use of e-learning can be efficient in reducing healthcare professional shortage [27]. For students, several reviews show positive elements such as flexibility of study, knowledge availability, design, and usability as well as communication with faculty, nevertheless no relevant advantages emerged with respect to the traditional way of delivering e-learning [27, 28].

At the same time, universities need to develop and validate instruments to explore students' experiences with e-learning and to develop models for engaging students. An interesting element, in line with the traditional academic learning, is that female students have better performance than male students [22]. E-learning methodologies for nursing students seem to fit better for graduate education, particularly in order to meet the needs of working students [29]. There is an overall agreement in the literature that in using e-learning more interaction and tutoring is required [30]. Web-/mobile-based learning for simulation-based education is the key element for the real placement of e-learning in nursing education offer [29, 31].

The faculty show some problems with respect to ICT literacy as well as in acceptance of e-learning for some courses (ethics, research); furthermore, e-learning is seen as more work to do [22, 30, 32–34]. Scholars and faculty should avoid to connote in terms of polarization and positive and negative e-learning activities. In the wide spectrum of e-learning in terms of content, delivery, interactivity it is not possible to consider it in a unique way, therefore currently e-learning analysis can be misleading. The most useful approach is to study how to use, in every single specific configurations, the most effective way of Web-based learning [32].

There are a number of issues which should be take into account, as the inherent difficulty for lectures and faculties to have a clear understanding of students' educational need as well as to deliver a basic training in order to use adequately e-learning systems provided [34].

In the light of the above, there is a need to rebuild the traditional approach in terms of:

- Different time consumption
- Necessity of large pre-programming activities
- Different interaction activities
- Different type of evaluation (especially progress evaluation)

17.3.7 Methodology

E-learning delivery courses are heterogeneous; indeed it ranges from, for instance, simple remote support (i.e., teaching materials) to a type training with high levels of interaction, both synchronous and asynchronous (i.e., forum, chat audio-video, social. and so on), until simulated scenarios and the game/3D.

Most differences are present, for example, in terms of learning management system digital environment, platform format, either mobile (tablet, smart phones) or desktop [32, 35, 36]. The blended learning approach is the most widely used e-learning approach that combines “face-to-face” presence and online training activities. This approach has benefit for the university (less need of space), faculty (simultaneously face-to-face and online instruction), and for student (preserving social and educational interactions) [22, 29, 32, 37].

In 2011, Keyte et al. showed that in a number of studies, the necessity to provide paper copies of education material to the student to ensure the completion of learning activities had been highlighted. Some issues are connected to evaluate the level of attention payed by students during online sessions, technological difficulties at home and ability to read on screen literature in printed form (as Pdf) [37]. For student participation and consolidation of knowledge, Button et al. [22], recognizing the benefits offered by e-learning, have shown a better performance with the use of this mixed methodology like blended learning [22].

Gaming, simulation, and situated learning are used as educational approaches to motivate students to learn by using video interactivity game and game elements within learning environments. The main aim is to maximize engagement by capturing the interest of learners as well as inspiring them to continue learning. High cost of development, presence ICT specialists, and innovative skills can be a serious limitation to the use and dissemination of these instruments in the field of health education, where in any case should be used along with traditional learning methodology [31, 38, 39].

Several reviews compare traditional methods of education with e-learning strategies. Lahti et al. has shown that there is no significant difference between e-learning and traditional methods with regard to knowledge, skills, and satisfaction; however, e-learning represents an important way of the delivery of nursing education to be implemented time by time with respect to specific courses [28]. Even Wolbrink et al. and Cook et al. (2008) found no significant differences between the media and the traditional methods in terms of efficacy; at same time other scholars display equivalent or slightly better results in terms of gained knowledge, compared to traditional education [40, 41] and higher values of satisfaction with online courses. To sum up, e-learning with an high level of interactivity show to have a better performance in comparison to a simple way of delivering (i.e. only textual material in electronic format) [35, 42]. E-learning is, conversely, optimal for the post-university training base, because they often have limited time and possibilities to follow a traditional teaching [29]. In terms of graduation or course conclusion, e-learning does not show better time performances with respect to traditional approaches. The

teaching strategies of e-learning, with the highest presence of feedback and interactivity, typically extend the time needed for the completion of learning activities, but in many cases improve the results [43].

Students who have difficulty with the traditional method can have greater confidence in the technical e-learning in our main virtue of the flexibility of this training, special support mechanisms and rapid assessment of learning [27].

17.3.8 Evaluation

Many reviews are related to assessments and evaluations on e-learning course delivery. Although the importance of this education is widely acknowledged as being important, there is no strong evidence for evaluating its process, as well as about the effects of new models or approaches [30]. Internet is full of Web resources on e-learning courses, divided by areas of specialization (e.g., informatics, intensive care). However, no organic framework exist allowing their maximum use by the students. The use of Web-based learning reports encouraging results to improve the knowledge, performance, and competence of the participants in specific nursing activities, with a high rate of satisfaction [42].

Information literacy is a key aspect in nursing practice and nurses' careers; a clear orientation to and consistent use of the Web-based learning platform are also essential to facilitate students in the development of their knowledge [22, 44]. At the same time, e-learning courses require the faculty for a training on information literacy especially for the "older generation" [44]. Button et al. have shown that 19 studies analyzed on 28 recommend to incorporate in the e-learning courses preliminary notions of ICT literacy; one of the major source of frustration, which hinders e-learning course appreciation, is the lack of clarity of the instructions for the use of e-learning courses [22]. This pre-training has an important impact on the outcome and performance of courses. Another element that must be taken into account is relative to synchronous interactions (chat or other real-time interaction): it is necessary to give priority to asynchronous activities (i.e., forum, homework) if the course is delivered in different countries distant in terms of time zone [35]. Visual, audio, and interactive contents can increase learning as well as to facilitate knowledge and satisfaction [22, 35, 45].

Some concerns persist for online degree programs about specific risks, due to the different methodology of control and progress of e-learning. According to the literature there is a overall need to establish a common understanding of e-learning in order to decide if use permanently in the academia elearning for nursing studies [28, 31, 34]. No statistical difference in terms of knowledge, skill, and satisfaction both for nursing (and health professional) students at undergraduate and postgraduate level emerged; in the light of that, there is an urgent need to develop robust quantitative instruments to measure the impact, effectiveness, and perceptions of students and educators [22, 28, 31, 41, 46].

17.3.9 Conclusion

This review clearly shows that currently there are multiple forms of e-learning in universities. However, no stronger evidence of best technologies/modality of e-learning exist currently in terms of impact on the acquisition of skills and knowledge for students and faculty. Common aspects that are key aspect for acceptance of e-learning are:

- Interactivity – necessity to synchronous and asynchronous interaction with other students and tutor/faculty
- Accessibility and flexibility – open access 24/7 is a key element for nurses and other healthcare professional
- Personalized feedback – encourage student involvement
- Tutoring – improving performance

The unresolved key issues are related to proper planning of activities, the specific training of faculty members, as well as the complexity of production of interactive-digital e-learning contents and practical laboratory activities. At the same time, specific control criteria should be defined for distance verification systems, comparing with the traditional systems.

The overview carried out shows that there is a lack of robust evidence on this topic and that the field is constantly under development. Nevertheless, the research analyzed displays that there is a reduction in the cost of education (in terms of management, for instance) as well as a more efficient management of the time for students and lecturers which reduce overall the economic effort afforded by universities and facilitate the management of education environment. Another key point is the overall need of guidelines and rules for knowledge assessment of e-learning students.

Beyond what was mentioned above, the main conclusion which can be drawn after this study is that further higher level research (i.e., RCT) is necessary in order to better understand and frame e-learning within nursing and healthcare profession, keeping in mind that e-learning is a very broad topic and that there are several e-learning tools; therefore, which tool can be used in which environment should be carefully analyzed.

17.3.10 Limitations and Strengths

The strength of this overview is to show that e-learning delivery is very heterogeneous, and this difference is certainly reflected in the literature, both for primary studies and reviews. In addition, the systematic and integrative reviews included in this study showed significant methodological differences in terms of analysis of population, e-learning methodology, and outcomes. Furthermore, this implies that ideally more in-depth consultation and systematization of the primary studies is required.

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