Improving the continuity of patient care through teaching and researching novel patient handover processes in Europe

WP2-Deliverable: Training Needs Analysis
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Patient Safety has emerged as a global concern in the provision of quality health care, including the European Union (EU), where it has received much attention recently. Recent studies consistently show, in an increasing number of EU countries, that between 8% and 12% \(^{(12)(3)(4)}\) of patients admitted to hospital suffer adverse events while receiving healthcare. Adverse events take place in all settings where healthcare is delivered, including different levels of care.

In many countries patient safety in healthcare has become a national priority, however the progress remains slow.\(^{(5)}\) It is also well known that many safety problems occur during handover procedures in different settings and different communication processes \(^{(6)}\).

Handover process is defined as “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” \(^{(7)}\).

Handover in healthcare is not just the exchange of patient-specific information but also a transfer of responsibility and accountability for a patient from one caregiver to another. The information usually concerns the patient’s current condition, recent changes in the patient’s clinical status, treatment, and any developments or complications.

Patient discharge following hospitalization presents a particularly important transition of care. A significant proportion of patients could experience a discharge-related medical error or adverse event during this phase \(^{(8)}\).

In healthcare, most handovers do not occur under ideal conditions, and clinicians may fail to allocate enough time to appropriately transfer patient data. Thus, healthcare workers taking over patient care may not get a full, accurate picture of a patient’s condition and this could trigger communication failures and preventable adverse events. A high percentage of handover related incidents result in malpractice claims, also results of surveys about the quality of handovers show the existence of dissatisfaction about handover practices among healthcare professionals \(^{(9)}\).

The goal of a medical education curriculum is to prepare students to address problems that affect health. Medical errors and patient safety problems have emerged as a global concern in the provision of quality health care.

In the report “Crossing the Quality Chasm”, the Institute of Medicine (IOM) calls for change in the education and training of physicians in order to address these problems \(^{(10)}\).

Healthcare students need to know how systems impact on the quality and safety of health care, how poor communication can lead to adverse events and a number of other important
Patient Safety issues. Students need to learn how to manage the different challenges posed by these issues.

It is a world-wide priority to reduce harm caused by health care error. Medical students need to be able to recognize unsafe conditions, to systematically report medical errors and near misses, to investigate and improve these systems, have a thorough understanding of human fallibility, and to disclose medical errors to patients. Incorporating all of this knowledge and related skills and attitudes into the medical curriculum is an urgent necessity (11).

There is a scarcity of published research detailing medical school curricula on handover or care transitions and handover. Aiyer et al reported that only 16% of Internal Medicine residency programs had a formal patient discharge curricula (12).

Bray et al tested the Transition in Care Curriculum (TICC) for 3rd-year medical students, which incorporates core elements of published curricula and aspects of an evidence based intervention that has been shown to reduce adverse events during transitions of care (13).

The PATIENT project aims to provide pioneering solutions to improve training on handover practices in undergraduate medical education. The Training Needs Assessment (TNA) is considered as a first step in the design and delivery of training in the medical schools. The primary goal of the TNA is to identify and prioritize the skills needed to be developed in medical training and to determine the specifications and resources necessary to make this training successful. The objective of this work package was to design and conduct a systematic survey of knowledge and practice in handover learning and teaching, as well as assessment of innovative teaching approaches in medical schools across three EU countries (Germany, Ireland, Spain).

The TNA survey was built up upon the information gathered from a variety of resources, which contributed to control the content and construct validity of the instrument. The final sets of questions were selected according to relevance and frequency of inclusion resulting from expert opinions and literature review. The final survey was structured under the umbrella of 4 handover related dimensions assessing the opinion of the respondents about the importance and skill abilities related to handover, their experience in clinical practice, curriculum content and preferences about handover and level of confidence related to learning environment.

The primary goal of the Training Needs Assessment (TNA) is to identify and prioritize the skills that need to be developed in training and to determine the specifications and resources necessary to make this training successful (14).

Our purpose was to design and conduct a systematic survey of knowledge and practice in handover learning and teaching, as well as assessment of innovative teaching approaches in medical schools across three EU countries (Spain, Germany and Ireland).
Design

This was a cross-sectional and cross-country questionnaire-based study involving undergraduate medical students from 3 medical schools located in the EU countries of Germany, Ireland and Spain. The aim of the survey was to assess, identify and analyse the educational needs of undergraduate medical students relating to the transfer of clinical information in key clinical situations.

**Setting of participants**
Initially, we obtained data from the participating medical schools to establish the contextual situation regarding number of students, and the academic year in which schools started clinical clerkships.

**Sample size**
The calculated required sample size for the undergraduate medical student survey was 600 surveys (200 per medical school).

**Inclusion and exclusion criteria**
All the undergraduate medical students of the participating site with more than two month clerkship (clinical) experience in hospital or community practice were approached. In Spain and Germany, students were in their 4th, 5th or 6th academic year. In Ireland, students were in 3rd, 4th and 5th academic year (the medical programme at UCC is a 5 year integrated curriculum).

Those undergraduate medical students not yet involved in or with less than two months experience of clinical rotations/clerkships/electives or first cycle medical students were excluded.

**Sampling method**
The target respondents were undergraduate students in their 4th, 5th or 6th year of medicine (in the case of Germany and Spain) and 3rd, 4th or 5th year (Ireland) with more than 2 months experience in clinical practice at time of survey. Considering that the average response rate for online surveys is low (30-40%), the consortium decided to send the survey to all students fulfilling the inclusion criteria, with the aim of achieving the required number of respondents from each country (200).

**Survey development**
*Gathering information:* The training needs analysis (TNA) survey design was built up upon the information gathered from a variety of resources which contributed to control construct and content validity of the instrument. Detailed literature review; experiences from previous related projects; interviews regarding handover and patient safety legacy systems (prior handover culture) and interviews with key stakeholders involved in Quality and Safety in healthcare. Input of PATIENT project partners and academic staff expertise in training methods and Quality and Patient Safety contributed to the TNS survey design. Expert consultation was carried out to decide statements that took into account the dimensions linked to good practice in handover identified by the literature review: Patient
safety culture, teamwork, situation awareness, leadership, on task allocation, prediction and planning, communication, decision-making, stress, and work-environment. Bibliographical sources and other existing questionnaires were revised for content related to these dimensions.

**Priority process:** The final sets of questions were selected according to relevance and frequency of inclusion in expert opinions and literature review. From each dimension a range of items were identified and transferred into questionnaire format. The aim was to determine the extent to which the conceptual definitions matched with the definitions at practical level and also to verify that the method of measurement actually measured what it is expected to measure

**Translation:** The survey was designed in English and back and forth translated into Spanish and German.

**Pre-test:** Additionally, a cognitive pre-test was carried out at the local sites in order to guarantee that the content had been correctly translated and intercultural remarks had been added. The purpose of the pre-test was to check the survey’s reliability and validity and to identify any final changes that might be necessary. The pre-test focused on time needed to answer the survey, adequacy and feasibility of rating scales, understanding of the content as determined from respondents’ answers, emotional reaction to questions and technical issues related to the platform which allowed us to identify amendments that needed to be made in survey content, scales, length of the survey or unsatisfactory questions. Pre-test responses were analyzed, allowing the refinement of the instrument into its most reliable and valid terms

**Survey Administration System:** Surveys were designed to be completed via an IT platform through an individual respondent access link. The link was coded per country, respondent type and participant number. To ensure a systematic approach, we recommended filling in the surveys directly on the online platform, instead of completing the survey in a printed version and later transcribing the results into the electronic format. Data was recoded for confidentiality reasons.

**Participation**
The data collection officially started mid January 2013 and ended 20th of March 2013.
The survey was targeted at staff and students fulfilling the inclusion criteria at each medical school. A total number of 1491 surveys were distributed to medical students. The amount of student surveys in each country was similar: 495 in Ireland, 515 in Germany and 481 in Spain. A total number of 677 student surveys were received from all 3 countries. From these, 91 were excluded for the training needs analysis because those were only completed for demographic and general information.

**Final survey content**
The final survey comprised 4 dimensions for the analysis of students’ training needs degree (TND), which are presented in 4 sections related to each one of the assessed dimensions.
Survey results

Dimension A. Students’ opinions on importance and confidence about handover process
All 12 items assessed in this dimension were considered important to successfully perform in clinical practice. However 4 areas were rated with lower confidence levels, resulting in higher priority training needs. Those areas were related to: developing a discharge plan, writing a complete and accurate discharge letter, reviewing a patient’s medication chart to reconcile this with the patient’s health care needs and making appropriate patient referrals.

It is important to highlight that the use of standard communication tools, was the lowest scored in terms of importance and skill ability, also this item obtained the highest percentage of ‘don’t know’ answers for both ‘importance’ and ‘confidence’.

The country comparison test reflects that the student responses are not homogeneous among countries; significant differences exist between countries in most areas of dimension.

The issues with lowest level training need degree (TND) coincided in all 3 countries being areas such as dealing with confidentiality issues. Also the areas such as communicating properly with patients and with other healthcare professionals in Ireland and Germany were the second and third activities rated with a lower TND. In Spain the item relating to communicating properly with patients was scored significantly higher than the other participating countries in terms of TND. No significant differences were found between countries in the item about communicating properly with other health care professionals. In Spain the third issue with lowest level of training need degree was about performing a complete assessment of the patient, including medication review on admission.

Dimension B. Students opinions about handover experiences in clinical practice
The students were asked to what extent they agreed with 20 different statements included in this part of the survey.

The scores resulting in higher needs were mainly related to student stress during clerkships due to unfamiliarity with the clinical environment, uncertainty about what is expected from them and an overwhelming amount of information. Also issues related to medical hierarchy and speaking up about patient problems, incident reporting and patient safety, key information being omitted and patients understanding of discharge instructions were identified.

All countries coincided on the first, second and third top scored items: a good clinical handover.
is essential for patient safety, use of checklists for ensuring that all clinical information is correctly transferred and adverse events are due to communication problems. Also, all countries coincided scoring within the top 10 highest rated items the following items: important issues are well communicated at shift changes, satisfaction about the support and cooperation received from doctors, and competent doctors do not make medical errors that lead to patient harm. The country comparison student results show that the student responses are not homogeneous among countries. At total 16 items showed significant differences among countries.

**Dimension C. Students Survey results regarding level training received on handover and level of importance of those issues to be included in medical training curriculum**

This dimension assesses if the student received training and the importance given on 11 items. Although all items were considered important, the amount of training received from each one of the items presents a very high variability among the different items. From the training perspective, it is remarkable that the highest percentage of training subjects received are related to communication skills, the role of patient safety in health care delivery and the impact of medical errors in health care.

The 3 areas with least training received coincided in all 3 countries: dealing with conflict resolution, the use of standardized tools and methods for handover processes. In the case of Ireland and Germany, how to perform a good handover, and in Spain how to deal with medical errors, were also identified as areas of improvement.

**Dimension D. Students results related to preferences and confidence about the learning environment**

The students were asked to what extent they agreed with the 10 different statements included in this part of the survey. In general all results presented with very high scores, except for the item asking about student preference for learning handover practices in an online course. Despite students mostly agreeing on having enough technical skills to undergo an online course and in terms of access they consider it advantageous, they prefer to learn handover in a clinical setting. The results related to preference and confidence regarding learning environment are very similar across the different countries.

The students among countries coincided in the highest and lowest scorings. The students highly rated the items related to: having technical skills to complete and online course, preferring to learn handover in clinical environment; they agree that the best handover techniques are learned from experienced clinicians; they also agree that e-learning, in terms of access is advantageous; they feel confident about using an online environment to learn parts of the medical curriculum; Students support the opinion that e-learning gives them flexibility for their studies and finally they feel confident in using social network features.
Discussion and Conclusions

This is the first large international quantitative study examining students’ and academics’ attitudes and skills relating to medical Handover.

Although the study was not designed to extrapolate results at country level, the aim was to represent different realities. These results will be used to inform Learning Outcomes and to develop comprehensive and innovative Handover teaching in medical schools across Europe.

The variability about medical curricula among countries was foreseen to get an in depth view of the needs of the students among countries with different contextual factors.

Relevance of the constructs to be included in the survey was determined considering the purpose of covering the dimensions related to handover (Patient safety culture, teamwork, situation awareness, leadership, on task allocation, prediction and planning, communication, decision-making, stress, and work-environment).

This study also has some limitations. A higher number of students than the expected were approached to answer the surveys, therefore, there is a possibility of participation bias in favor of those students who answered the study being more motivated.

The data collection period also offered opportunity to gather feedback on other areas that might be interesting to include in a training curriculum. Further analysis will be needed to explore if these statements or contents are valid and applicable to the rest of the student population.

Some students did not complete all questions from the questionnaire. When we sent out the reminders, we highlighted the need to complete all questions fully.

Training needs identified

The analysis, allowed us to identify the priority areas in handover education for medical students and best educational approaches to handover training.

We identified that all the items assessed in the section about importance and confidence in handover (dimension A), were considered important by the students despite not being optimally delivered during the learning process. In general, students’ perception about the level of importance of the items assessed is high whilst the confidence in their ability to perform these practices in the clinical area is much more variable.

The 4 items with the greatest lack of confidence were especially those concerned with the discharge process and patient referral such as use of standard communication tools, writing a complete and accurate discharge letter, developing a discharge plan and making appropriate referrals.
The use of standard communication tools was the item with the highest percentage of missing values in all countries, which could be attributed to the fact of not being familiar with this type of tool.

*From the perspective of handover experiences in clinical practice (dimension B)*, in general students showed awareness about relevance of most statements from the survey on clinical practice. The results show that students are largely motivated, interested and aware about general aspects relating to patient safety, communication and collaboration.

There is an agreement among respondents that it is difficult to speak up if a problem related to patient care is identified, also that the students experience stress in clinical practice due to being unfamiliar with the environment, not knowing what is expected of them during clerkship, feeling overwhelmed by the amount of information given and how this information is provided. Also aspects related to relevant patient information is often omitted and not much encouragement is given in clinical settings related to reporting adverse events.

According to the results we can objectivise that, although some of the highest and lowest rates coincide, there is currently variation between countries related to handover process among the 3 universities surveyed and this is must be taken into account at the time of the training, reinforcing those areas needing more development and targeted interventions.

In terms of Curriculum content about handover and related factors (dimension C), students prioritized training needs in areas such as conflict resolution and negotiation, conducting appropriate handover, or how to respond to a medical error. Students also consider that the use of standardized tools and methods are really necessary in handover processes at patient discharge, patient admission and medication review. The analysis of the differences between countries identified similar trends, except for content of the current training programs. Training is most addressed to communication skills, being the highest item in all three countries, and to patient safety.

The use of standardized tools was the item with most training need in all countries along with conflict resolution and negotiation. Also the items about how to perform a proper handover, how to deal with medical errors and the impact of psychosocial factors had a training need

Regarding the items related to Preferences and confidence about the learning environment (dimension D) the comparative data at country level allowed us to identify similarities and differences about students’ perspectives relating to their learning needs.

E-learning was considered advantageous by students although they expressed preference for learning handover processes in the clinical setting. The Handover Toolbox might therefore provide a suitable solution the implementation sites of the PATIENT project in Ireland, Spain, and Germany.\(^{15}\)

Although there appears to be an adequate proficiency in virtual learning environments, students agree that the clinical setting is the
most appropriate place to undergo a medical Handover training and learning.

Regarding training needs expressed by students, the most relevant aspects were related to practical issues, such as individual experiences in clinical settings where human factors are involved (such as controlling stress, management of critical situations).

Students expressed a greater preference for learning Handover in real clinical environments than by online courses, simulated cases or case-based scenarios. The question relating to simulation was poorly answered, indicating little experience of this type of training by the respondents. A large percentage of respondents selected “do not know”, and “I do not remember” for simulation training, indicating lack of familiarity with simulation training.

We can now identify key features integral to handover educational programs, which would contribute to the success development of the training module and its acceptability to students and staff.

Conclusions:

Safe and accurate Medical Handover is important for Patient Safety and good clinical practice. Medical students need to be taught Handover processes and to learn key skills important to Handover. There is good consensus among students on the skills and knowledge important for Handover training and some areas need to be prioritized. Students are keen to use e-learning resources for knowledge acquisition, but acknowledge that Handover training requires a certain amount of ‘hands-on’ experiential learning. Students identify team-working and interpersonal skills as areas they wish to receive instruction in, and we would be wise to address these concerns as problems in these areas are prime causes of medical mishap.

Simulation offers much scope in Handover training and students have limited experience in this area.

The skills acquired in Handover training are transferable into many areas in clinical practice, and will equip medical students with the knowledge, skills and attitudes necessary to make tomorrow’s doctors safe, skilled and careful clinicians.

From the overall areas of improvement identified it is remarkable to emphasize the importance of improving students’ induction into the clinical environment, encourage their adaptation, their knowledge of the policies and standards of clinical practice at local level and encourage and engage students to be more active in communicating with healthcare professionals during their clerkships. Also interventions should be addressed to improve students’ skills in the management of stress and critical situations, conflict resolution, and responding to medical errors. In terms of behaviors, activities addressed to conducting and monitoring a whole discharge process, patient follow-up with other providers and other levels of care, overall referrals processes, performing a correct (and safe) Handover, and communication with other team professionals (non-medical) should be addressed. From the
knowledge perspective, the curriculum should include improvement in areas such the use of standardized strategies for patient registration, patient referrals and medication review, correct handover protocol and procedure, and the use of standardized tools as checklists.

This analysis has enabled us to identify key features integral to handover educational programs, which would contribute to the success of the training module programs development and their acceptability to students.
References:


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