



**Methodological recommendations and guidelines for
organising and executing patient safety education courses
based on the MAP4E project's results**

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Project Context

Patient safety (PS) has become the most emphasised issue in healthcare policymaking as every 10th patient admitted to a hospital is harmed while receiving hospital care. For the providers, media, decision-makers and laymen the first reaction to a so-called adverse event is to look for the responsible person. However, it has been proven that for 85-90% of the cases, the weakness of the process is responsible for the error instead of individuals. Around 15% of hospital expenditures are produced by the additional tests and interventions needed to treat the effects of an adverse event.¹ The impact of adverse events on patients, professionals and organisations requires a comprehensive response so that the performance, quality and efficiency of healthcare are increased in order to prevent adverse events, make them visible and to mitigate their effects when they occur.²

Education with respect to patient safety is the first step in changing the mindsets of professionals and contributing to the improvement of PS culture in an organisation. Education and training should focus on the acquisition of knowledge and skills to support changes to behaviour that will deliver safer care to patients during the course of a day's work.³

Patient safety education is mandated by the EU (Recommendation on Patient Safety, 2009/C 151/01), and its patient safety expert group (Patient Safety and Quality of Care Working Group - PSQCWG) has written a summary study about educational activities in member states. The WHO also emphasises the importance of patient safety education, as it has developed curricula for graduate and postgraduate education as well. According to the PSQCWG study, there are only a few courses on the topic in the Member States, and they differ from each other in content and method. There is no information available regarding their effectiveness.

Based on our previous experiences, there is little to no real change in the clinical behaviour of professionals following a typical PS lecture, therefore most of the education programmes in this topic barely have any effect on patient safety practices. In addition to deepening and/or broadening the knowledge of providers, what is also important is to influence the organisational culture as much as possible through these courses. In order to achieve this goal, it is necessary to define the best method, (form and length of the training course, along with the most appropriate student group composition) in line with the content of the training course.

Therefore, the main goal of the MAP4E (Methodology Assessment of Patient Safety Education for Effectiveness) project⁽¹⁾ was to improve safety during care by developing and disseminating more effective educational courses for healthcare professionals. Our direct goal was to develop educational content and methods for handover based on the opinions of practising healthcare professionals, which can positively impact daily work in order to improve patient safety, and to also develop recommendations for best practices. The topic of handover was chosen since handover is a critical step in patient safety because the potential breakdown in communication during a transition in care is frequently associated with errors that can contribute to adverse events.⁴ The exchange of information and reassignment of responsibility that occurs during handover is critical for the continuity of care quality and patient safety, and can often determine the ultimate outcome for the patient⁵, especially during their discharge from hospitals. Culture, team climate and verbal communication have been identified as important factors leading to inadequate patient handover.⁶

Background

Definition of Patient Safety

According to the International Classification for Patient Safety (ICPS), "Patient safety" is the reduction of risk of unnecessary harm associated with healthcare to an acceptable minimum. An acceptable minimum refers to the collective notions of given current knowledge, resources available and the context in which care was delivered weighed against the risk of non-treatment or other treatment.

⁽¹⁾ MAP4E 16/1/KA202/23016 - The project has been supported by the European Commission.

Improving patient safety means reducing the probability of the occurrence of an adverse event and using prevention and control strategies at different levels, included systemic-, organisational-, and individual changes.

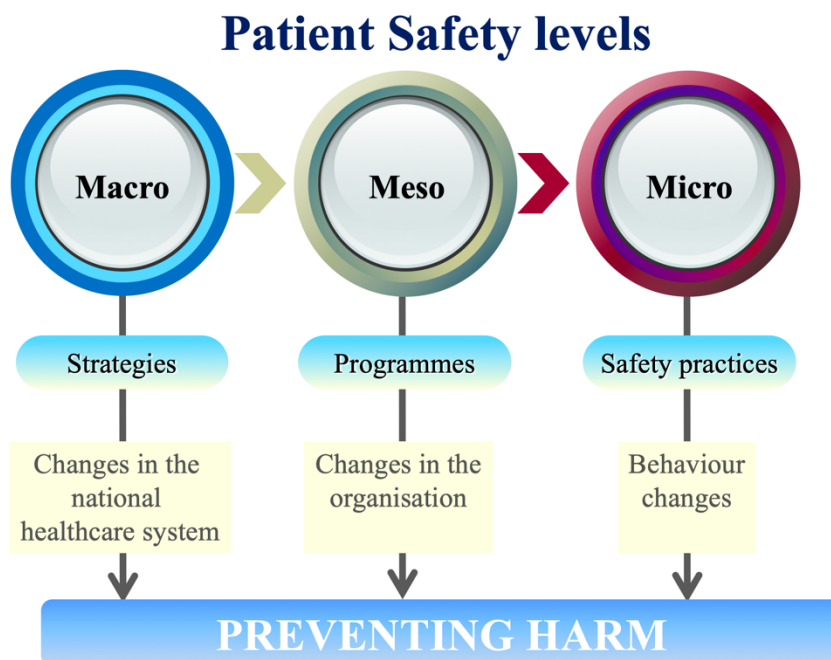


Figure 1 - Actions that promote patient safety at different levels

Main Causes of Unsafe Care

Unsafe care is related to human and organisational factors encompassing individual, organisational and systemic issues that impact patient safety.

Following the “To Err Is Human” study⁷, healthcare organisations shifted their focus from the individual level to system failures, as they became increasingly aware that most errors were not linked to an individual’s performance, but were instead mostly the result of a series of preventable systematic errors. Redesigning systems to prevent errors and unfortunate outcomes may help healthcare organisations improve their system so that the conditions under which humans work and are treated improves.

Different studies show that the most frequent factors associated with unsafe care are: a blaming culture, system limitations due to scarce human resources, problems with infrastructure, protocols, processes, documentation, devices, software, poor communication, resistance to change, poor knowledge, ineffective teamwork and a lack of leadership, all of which are important barriers to the safe provision of care.

Initiatives for Patient Safety Education and Training

Patient safety has entered WHO work through World Health Assembly (WHA) Resolution WHA 55.18 “Quality of care: patient safety”, which called upon member states “to pay the closest possible attention to patient safety” and “to establish and strengthen science-based systems necessary for improving patients’ safety and the quality of health care, including the monitoring of drugs, medical equipment and technology”. In October 2004, the WHO World

Alliance for Patient Safety was launched with six major action areas, which was renamed as the Patient Safety Programme in 2009. The major message regarding patient safety by the WHO is related to raising awareness and providing technical solutions for WHO member states in the form of WHO Patient Safety Global Challenges, which contribute to mobilising countries.

In addition to launching the Patient Safety Global Challenges, the WHO established their patient safety educational programme in 2009 to support the education and training of healthcare professionals and students in regards to patient safety and improving the quality of care. The Multi-professional Patient Safety Curriculum Guide, published in 2011, provides worldwide support to countries and medical schools for introducing and implementing the core elements of safe practice into their curricula.

In the EU's health policy, patient safety is placed under the label of "consumer protection", and was explicitly mentioned for the first time under quality issues in the European Commission's Public Health Working Plan for 2004. In the decade since it has become an increasingly urgent, significant and high-level priority for the Commission in the area of public health. The focus on patient safety began in Luxembourg with two international events: the conference in Luxembourg on patient safety organised as a part of the European Council's presidency programme, and another European Commission-sponsored event held in Luxembourg in April 2005 that produced the Luxembourg Declaration on Patient Safety: "Patient Safety - Making it Happen!" The Declaration consists of a list of recommendations addressed to EU institutions, National Authorities and healthcare providers. It recommends *"to include patient safety in the standard training of health professionals combined with integrated methods and procedures that are embedded in a culture of continuous learning and improvement"*, and welcomes the opportunity to address the issue of education quality and safety at the EU level.

In 2009 the Council Recommendation on patient safety and quality of health services, including the prevention and control of healthcare-associated infections (9 June 2009), was launched. The Recommendation consists of instructions requesting the European Union, Member States and local healthcare institutions to address the issues of patient safety. With regard to patient safety education, the Recommendation envisaged that Member States: "Promote, at the appropriate level, education and training of healthcare workers on patient safety by:

- (a) encouraging multidisciplinary patient safety education and training of all health professionals, other healthcare workers and relevant management and administrative staff in healthcare settings;
- (b) embedding patient safety in undergraduate and postgraduate education, on-the-job training and the continuing professional development of health professionals;
- (c) considering the development of core competencies in patient safety namely, the core knowledge, attitudes and skills required to achieve safer care, for dissemination to all healthcare workers and relevant management and administrative staff;
- (d) providing and disseminating information to all healthcare workers on patient safety standards, risk and safety measures in place to reduce or prevent errors and harm, including best practices, and promoting their involvement;
- (e) collaborating with organisations involved in professional education in healthcare to ensure that patient safety receives proper attention in the higher education curricula and in the ongoing education and training of health professionals, including the development

of the skills needed to manage and deliver the behavioural changes necessary to improve patient safety through system change.”

Other European initiatives on patient safety include addressing the issue within Council presidency programmes, both in the EU and CoE. The Polish presidency programme in 2011 organised the Expert Conference on Education in Quality Care and Patient Safety, which produced the Krakow Statement on Education in Quality Care and Patient Safety. This international consensus statement recommended “*embedding patient safety education and training of all health professionals, other healthcare workers and relevant management and administrative staff in the healthcare setting*”.

Education and Training in Patient Safety Across Europe

The recommendations take into account the reported initiatives for education and training in patient safety, illustrated with examples and experiences from 27 European countries (26 EU Member States and Norway) and nine European professional associations (NGOs), which are based on the previous experiences gained from the work performed by the education workgroup of the European Union Network for Patient Safety (EUNetPaS4) project. Additionally, it takes into account advice from the WHO Multi-professional Patient Safety Curriculum Guide. The recommendations describe the experiences gained from reported education and training activities and lists factors necessary for their implementation.

The significant takeaways are that education and training in patient safety:

- “should be introduced and implemented in the curricula for healthcare workers and managers in every Member State;
- should be on all levels of healthcare professionals and managers learning and development;
- should be based on previous European project and WHO work in building/developing curricula;
- should find constructive, feasible and effective ways to include the perspective of patients when developing the curricula on patient safety;
- should use curricula adaptable to each country - cannot be a static program.”⁸

Recently, however, the focus on patient safety has been redirected and merged into the EU policy of focusing on premature mortality from non-communicable diseases by improving the population’s health and the sustainability of the health systems.

Main Findings from the Literature about the Efficient Teaching of Patient Safety and Handover

Patient Safety Education

In a systematic review, Kirkman et al.⁹ reviewed the latest evidence on patient safety education for physicians and medical students. Twenty-six studies were investigated in which 15 were for trainees or residents and the rest were for students. Most of the courses included didactic and experiential teaching methods, such as small-group discussions or workshops, lectures, multimedia approaches, case-based learning, project or presentation requirements and simulations or role-plays in order of frequency. All of the studies evaluated the effects of

courses, but the thoroughness of the evaluations varied. In terms of Kirkpatrick's level of evaluation, it meant that the majority of the studies examined participation, attitudes/perceptions (1 and 2/a level), fewer looked at knowledge/skills and behavioural change (2b and 3 level), some measured organisational change (4a level) and none of them included patient benefit evaluations (4b level). Although courses were mostly well received by participants and resulted in improvements to safety knowledge and attitudes, barriers could be detected in the case of a sustainable integration of knowledge gained through the courses. These were poor engagement by the learners, a lack of expert faculty, competing educational priorities, and an unsupportive institutional culture.

Kirkman et al. summarised their findings on the factors influencing the implementation of patient safety courses according to the following:

- Learner factors
 - Enhancing learner engagement by ensuring clinical relevance
 - Empowering learners through the application of learning
 - Competing clinical/service delivery commitments
 - Learning interprofessionally improved teamwork and communication
- Faculty factors
 - Investment in faculty development is essential
 - Faculty role-models and importance of clinical credibility
 - Protected faculty time
- Curricular factors
 - Promoting patient safety as a science
 - Competing curricular demands
 - Balance between didactic and experiential learning
 - Balance between reinforcement of learning and repetition of teaching material
 - Central administrative support necessary for sustainability
 - Creating interprofessional learning opportunities is challenging
- Learning environment factors
 - Institutional culture is key to implementation
 - Ensuring a safe learning environment
 - Forging improved links between training programmes and hospital improvement activities
 - Financial support to fund the programme

Handover Education

As is the case with respect to patient safety, we also possess limited information regarding the impact of handover education on patient outcomes and even on handover practice itself. Stoyanov et al.'s study examined this issue, and they determined that there are three different types of training interventions, while also providing suggestions on how to make education more effective. Three training interventions were identified: formal training, workplace training and clinical microsystem-based interventions. As a result, they concluded that the easiest way to provide handover education is formal training, but an automatic impact on handover practice is not achieved by this type of education. Community practice could change organisational culture, but its feasibility is very low, while workplace learning can be situated between the

other two. Further investigations were suggested in order to identify the most effective form and content for handover education.¹⁰

In another study on training needs that was led by various handover stakeholders across Europe, the topics below were noted as being of significant importance:

- Watchfulness for vulnerable patient groups
- Communication skills
- Knowing what to handover
- Awareness of being responsible for the patient's wellbeing

Factors that influenced the successfulness of handover training were identified as follows:

- Promoting participation
- Ensuring the transfer of what is learned during training to the workplace
- Characteristics of the trainer
- Characteristics of the trainee
- Delivery of the training

To maximise their effectiveness, handover trainings should be standardised in terms of their general content, but customised for special topics. What these topics are can be determined through an analysis of training needs conducted prior to the training course.¹¹

Based on the results of the studies and activities mentioned above, further investigations were suggested in order to determine possible effective training methods in the field of patient safety, and especially for healthcare professionals. Furthermore, only a few studies related to the topic of handover exist, and despite the European Commission-funded research project HANDOVER (www.handover.eu), there are still no available tools or practical guides for effective handover education and training courses. For these reasons, our MAP4E project was designed to provide essential input to the European transition of care experience.

Aims of the Project

The main goal of the project is to improve the safety of care by developing and disseminating more effective educational courses for healthcare professionals.

The direct goal is to develop and create:

- educational content and methods based on the opinion of practicing healthcare professionals, which can make a positive impact on everyday work in order to improve patient safety;
- recommendations for best practices regarding patient safety education for healthcare workers based on the results of the project.

Project Outputs

As a result of the project, we have undertaken the formulation of the following three main products:

- IO1: The development of educational materials for practicing healthcare professionals (available in English, Hungarian and Polish)

- IO2: The development of (1) patient safety knowledge and (2) organisational culture survey forms (available in English, Hungarian and Polish)
- IO3: Methodological recommendations and guidelines for organising and executing patient safety education courses:
 - developing educational methods
 - assessments of patient safety knowledge and organisational culture through the developed surveys
 - testing the methods developed through training sessions
 - developing methodological recommendations and guidelines for patient safety education courses based on our results

More information about the project partners and activities is available in Annex 1.

Methods

The MAP4E project was designed as a series of case studies in which the effectiveness of PS training courses - focusing on patient handover - was tested and measured according to three different methods at six different hospitals (three hospitals in Poland and three hospitals in Hungary). Each method was tested in one Hungarian and one Polish hospital.

Selection of Hospitals

In order to make our results comparable and to facilitate interpretation, the hospitals were chosen on the basis of certain involvement criteria. In both countries we aimed to select medium-sized hospitals (300-700 beds). This was the size where we felt that the effects and impact of the training courses would be detectable in a relatively short amount of time.

All of the hospitals involved were multiprofessional and provided acute care. In addition to being multiprofessional hospitals representing the majority of institutions, this characteristic helped us study the differences and characteristics in regards to handover between different professions.

The medium maturity of the hospitals with respect to patient safety and quality was also an important factor for inclusion. Our intent was to implement our educational programme in institutions where patient safety and especially handover were genuine areas in need of further development.

Methods for Developing the Curriculum

For developing the curriculum, our goal was to use three different methods, behind which there were different expectations or pre-requisites, such as the following:

- **Method 1 (MI):** For the case of MI, we planned to study the format and effects of large-scale and frontal training, which is a common educational style in the subject. With the help of this method, we aimed to enrich existing knowledge through the involvement of large members of frontline staff that could assist us in reaching the critical mass needed for a feasible change to the process, in order to launch a wide-ranging dialogue on the problems tackled by the training course.

- **Method 2 (MII):** For the case of MII, we designed a small group training course for participants working on the same ward. This method is based on a transfer of knowledge related to patient handover, an evaluation of the exercises and practices of the involved ward, an evaluation of the intervention points, and opportunities for transferring relevant development plans to the given unit.
- **Method 3 (MIII):** The key figure in this method was an internal trainer with methodological and professional knowledge of the hospital, who ensured the possibility of retaining additional training experience on handover involving several or all wards. The basic idea behind this method was based on the principles of the Train the Trainers programmes.

The programme was designed with a time frame of 30 hours/training for each method. The compiling of the curricula related to each method was based on the materials available in the literature along with previous educational experiences that were in line with the methods' primary defined objectives.

Following the development and assembling of the teaching materials, we organised a pilot training course with the involvement of the frontline staff of a Hungarian paediatric intensive care unit. According to the experiences gained from the pilot training course, we modified the group work, the scheduling, as well as the description of some exercises based on the feedback from the participants and instructors.

Methodology for Evaluating the Training Course

Several methods were used to compare the applied teaching methods that follow the Kirkpatrick model:

Level of evaluation (Level according to the Kirkpatrick Model)	Measurement terms	Data collection tool/method	Participants	Timing
Assessment of the training courses (1)	The views and opinions of the participating healthcare workers about the training courses' content, the trainer and methods employed	A questionnaire to determine the participants' satisfaction (personal development)	Participants in the training course	Immediately following the training course
Knowledge (2a)	Current knowledge on the main topic being taught (handover) and its improvement	A survey consisting of seven questions to determine prior knowledge of handover (personal development)	Every healthcare worker from the participating hospitals (on a voluntary basis)	Before the first training course and six months after the completion of the training programme

Attitude and changes in behaviour (2b, 3)	Measuring the organisational culture/climate and its development due to the training courses	The AHRQ Hospital Survey on Patient Safety Culture modified for this project	Every healthcare worker from the participating hospitals (on a voluntary basis)	Before the first training course and six months after the completion of the training programme
Organisational changes (4a)	Follow up on the changes to handover practices as a result of the training courses	Semi-structured interviews	Five or six healthcare workers from each department involved	Before the first training course and six months after the completion of the training programme
Patient benefit evaluation	not measured	not measured	not measured	not measured

Table 1 - Methodology for evaluating the training course

The timeline for hospital activity in MAP4E

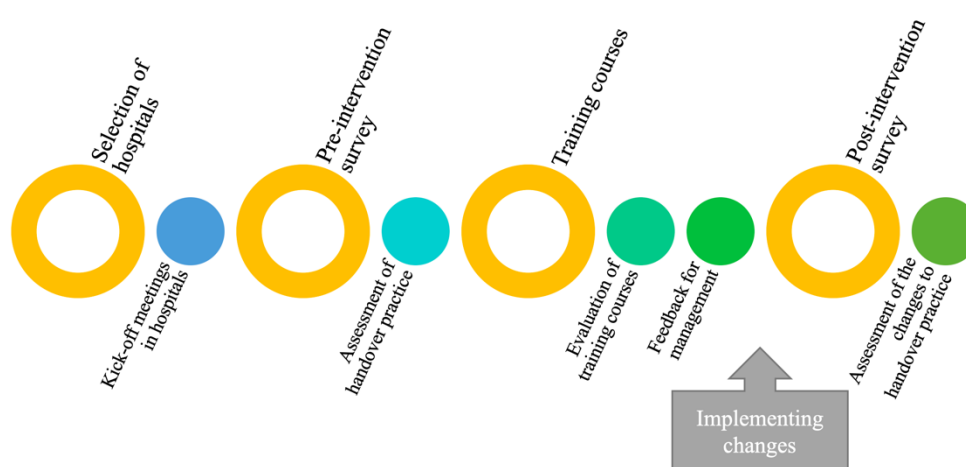


Figure 2 - Timeline for hospital activity in MAP4E

Methodology for Validating the Data of the Patient Safety Knowledge and Organisational Culture Survey

Hospital staff responded anonymously to the paper-based handover knowledge and patient safety culture questionnaires twice (before and after the training), which are known as the baseline and follow-up surveys.

Following the manual entry of the responses into the database, we tested a random sample of the data (10% of questionnaires from each hospital) according to our validation protocol, which provided us with the opportunity to correct any mistakes.

Methodology for the Statistical Analysis of the Patient Safety Knowledge Questionnaire

The responses were categorized according to their degree of correctness and the direction and extent of the changes in each category were analysed. We determined the rate of the responses in the different categories (Figure 3) of correctness for both countries and all hospitals, both in the baseline and the follow-up surveys, and made cross table analyses to explore the differences. The significance of these differences was determined by the Chi squared test, or, if there were too few responses, we applied the Fisher exact test. The cross tables, frequencies and statistical analyses were performed by SPSS 25.

Definitions and abbreviations

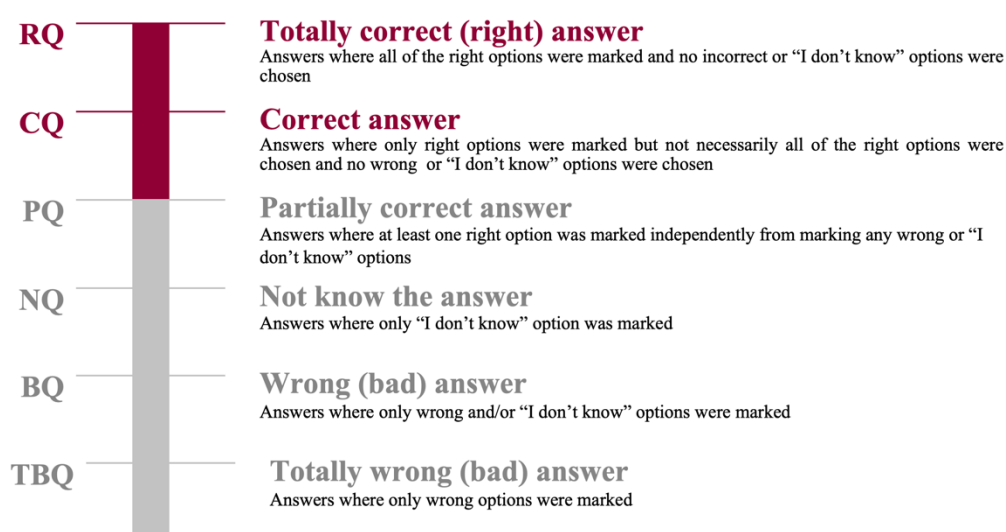


Figure 3 – Definitions and abbreviations used in the analysis of the survey's patient safety knowledge section

Methodology for the Statistical Analysis of the Patient Safety Culture Questionnaire

The analysis of the survey was performed according to AHRQ recommendations.¹²

The frequency of responses to items were assessed as follows: the lowest response categories (a negative response: Strongly disagree/Disagree and Never/Rarely) and the two highest response categories (a positive response: Strongly agree/Agree and Most of the time/Always) were calculated. The midpoints of the scales were reported as a separate category (a neutral response: Neither or Sometimes). Missing data were excluded.

The percentage of positive responses and the percentage of negative responses overall included in each dimension were averaged to calculate the dimension score. The negatively worded items were reversed to calculate all the scores. Disagreeing or responding "Never" to a negatively worded item indicated a positive response.

The dimensions with positive response scores above 75% indicated strengths with regards to patient safety and dimensions with negative response scores above 50% represented weaknesses.

The analysis was performed using Statistical Product and Service Solutions (SPSS) 21.0. with a focus on comparing patient safety grades pre- and post-intervention, determining the improvement of positive and negative percentage responses pre- and post-intervention, and on an evaluation of strengths and weaknesses pre- and post-intervention. ¹²

Methodology for Examining Other Influencing Factors

Factors that can affect the effectiveness of training courses were identified through interviews with hospital coordinators, top management, the staff of wards involved in the training courses, and environmental studies made during the training courses as well as during other related personal appearances in the hospitals. The same qualitative measurements were also used to examine the relationship between change management strategies, education and training courses.

Results

Training Methods and Content

A comparison of the three different methods is shown in the following table:

	MI	MII	MIII
Aim	To provide basic information on handovers to a larger group of hospital workers and to present them with handover techniques that they can utilise to further develop their practice.	To review the handover practice of a given ward and to lead ward workers along a developmental process step by step in order to give them the ability to analyse and improve their activities.	To train an internal hospital trainer who has the ability to implement the handover training programme, and review, analyse and improve handover processes in the hospital by having knowledge both on handover and quality development methods.
Focus	Basic knowledge on handovers to a larger group of hospital workers.	Practice and situation-oriented training for a group of ward workers. The precise project plan for the chosen ward will be prepared during the training course.	Provide knowledge and abilities to the hospital managed by the internal, MAP4E-trained trainer.
Breakdown of methods	<ol style="list-style-type: none"> 1. Kick-off meeting with hospital managers 2. Kick-off training course for professionals (Chief Medical Officers, Head Nurses) 3. Interviews about handover practices with the representatives of selected wards before the training courses 4. Group training courses 5. Interviews about handover practices with the representatives of selected wards six months after the training courses 	<ol style="list-style-type: none"> 1. Kick-off meeting with hospital managers 2. Kick-off training course for professionals (Chief Medical Officers, Head Nurses) 3. Group training courses (including interviews about handover practices) 4. Interviews about handover practices with the representatives of selected wards six months after the training courses 	<ol style="list-style-type: none"> 1. Kick-off meeting with hospital managers 2. The selected trainer from the hospital will take part in the kick-off meeting and the group training of the MII hospital 3. Consultation with the external trainers 4. Kick-off training course led by the hospital's trainer (Chief Medical Officers, Head Nurses) 5. Group training course led by the hospital's trainer 6. Interview about handover practices with the representatives of the selected ward six months after the training courses

Training courses and duration	Kick-off training course + a 4 lesson training course per group	3 + 5 lesson training course per group	The trainer participates in a 3+5 lesson training course as an observer and a 7 lesson consultation
	This is repeated six times during the course of the project	This is repeated three times during the course of the project	During the project the trainer hold a 3+5 lesson training course on one chosen ward in his/her own hospital
Content of kick-off meetings and training courses	<ul style="list-style-type: none"> - brief presentation about the project - brief summary on the basics of patient safety - importance and basics of handover - general aspects of successful implementation at the hospital level - description of the local training programme 	<ul style="list-style-type: none"> - brief presentation about the project - brief summary on the basics of patient safety - importance and basics of handover - general aspects of successful implementation at the hospital level - description of the local training programme 	<ul style="list-style-type: none"> - brief presentation about the project - brief summary on the basics of patient safety - importance and basics of handover - general aspects of successful implementation at the hospital level - description of the local training programme - tasks of the trainer, expectations from the trainer
Training participants	As many hospital workers as can participate	Training courses are for small groups of 8-15 persons with different jobs/professions from a chosen ward (three wards were selected from each two participating hospitals).	One trainer from the hospital is trained, who will then hold the same training course once within the MII framework in his/her hospital under the same conditions.
Delivery methods	Didactic lectures, exercises using the SBAR technique.	Didactic lectures, exercises using the SBAR technique, exercises that make the training practice-oriented.	By participating in some MII training courses, the trainer becomes familiar with the same methods, and the trainer also receives consultations regarding information about the educational/training courses as well.
Content of group training courses	<ul style="list-style-type: none"> - Basics of patient safety - Importance of handover - Basics of handover - Handover types and tools - Key aspects for handover good practice - Conditions for successful implementation - Case studies, role plays 	<ul style="list-style-type: none"> - Basics of patient safety - Requirements for adequate handover practice - Handover techniques - Guided assessment of handover practice - Identifying the areas needing improvement and further development - Conditions for successful implementation, aspects of change management - Working out a project plan for the implementation of changes, scheduling of implementation and maintenance 	<ul style="list-style-type: none"> - Same as in MII - Additional aspects for educational/training courses
Deliverers	External trainer/Experts in patient safety	External trainer/Experts in patient safety	Internal trainer (colleague from the selected hospital)
Assessments	PS knowledge (handover) and a patient safety culture survey before and six months after the training course	PS knowledge (handover) and a patient safety culture survey before and six months after the training course	PS knowledge (handover) and a patient safety culture survey before and six months after the training course; performed by the trainers
	Assessment of training courses	Assessment of training courses	Assessment of training courses

	Assessment of handover practice (independently from the training course) and a follow-up assessment six months after the training.	Assessment of handover practice (structured questions about handover practice incorporated into the training course itself) and a follow-up assessment six months after the training.	Assessment of handover practice (structured questions about handover practice incorporated into the training course itself) and a follow-up assessment six months after the training course that are performed by the hospital's trained trainer.
Expectations	If many people hear the same information and characteristics regarding handover, it makes it easier to introduce a new system or development in their practice. If merely one or two colleagues per ward have the intention of starting something new in this area, then that can be enough to result in changes to handover practice and in the organisational climate as well.	If we provide practical training to colleagues, and by leading them through a given activity teach them how to review and analyse their activities so that they can then make proposals for change and know how to implement said proposals, then they would have the ability to repeat this process in other fields with respect to handover or patient safety. If the training course contains not only knowledge on handover, but also information on implementing changes, colleagues' initiatives would be better presented and their adoption in actual practice would also increase.	If we concentrate our efforts on just one person, and provide him/her with knowledge in regards to handover, project and change management, as well as the ability to deliver this information to others, then one well-prepared person can make a stronger impact on the practice of the whole hospital. The reason for this is partly because this person (and of course the knowledge and ability that he/she has received) stays in the hospital, so the knowledge will be available even a long time after the training course.
Notes	The small group blocks run with the same syllabus and content, so the same training course sample will be held six times. Each of the six occasions are for colleagues from any ward/department, so in this case it is not required to hold a training course for colleagues from the same ward or department.	The small group blocks are made for colleagues of a given ward, so in a given small group block there will be colleagues from the same ward, and the assessment of handover practice is focused on the handover practice of that given ward. With this practice-assessment it can be determined how the given ward fits the handover requirements and also which areas need improvements.	It is the same as in MII, but in this method a trainer delegated by the hospital itself is trained to perform the entire training according to the method presented in MII. What this means is that the hospital's trainer is the person who executes the training courses for a selected ward. While being trained, the hospital trainer is given the entire curriculum and its contents, background materials, and he or she takes part in the training programme of the hospital impacted by Method 2.

Table 2 - Comparison of the three different methods tested in MAP4E

The presentations for each method are available on the Erasmus+ Project Result Platform as well as on the project's website.

Number of Participants in Training Courses

	MI 6 similar training occasions	MII 2 similar training occasions for 3-3 wards in 2 hospitals	MIII 2 similar training occasions for the selected wards
HU	145 participants	8 participants / each ward	13 participants from the selected ward
PL	85 participants	8-15 participants / each ward	13 participants from the selected ward

Table 3 - Number of training participants per method

Evaluation of the Training Course Results

The results below are presented according to the Kirkpatrick levels of training evaluation.

Results from Training Courses' Assessments (Reactions)

The following results are derived only from Hungarian assessments, as this sort of evaluation was not an original part of the study. According to the Hungarian partners' other training courses, this is a general assessment of the training course evaluations.

The amount of training materials were found to be adequate for every training method, as even the lowest score for this statement was above 70%. In the case of MI, 17% of respondents thought that there had been too much material, and that less would have been sufficient. The percentage of similar responses was 5% in MII. Another 8% in MII and 15% in MIII believed that there had been too much material, but that due to the topic's importance, it should have been taught over more hours.

As for the content of the training courses, respondents were satisfied with all of the training methods. The best results were found in MIII, where an internal trainer held the lessons. The results for MI and MII were similar, despite the fact that the two training materials were quite different in terms of their depth. (Figure 4)

The trainers received high scores for all of the training methods (more than 4 on a 1-5 scale), with the best responses also received by MIII.

Training course contents

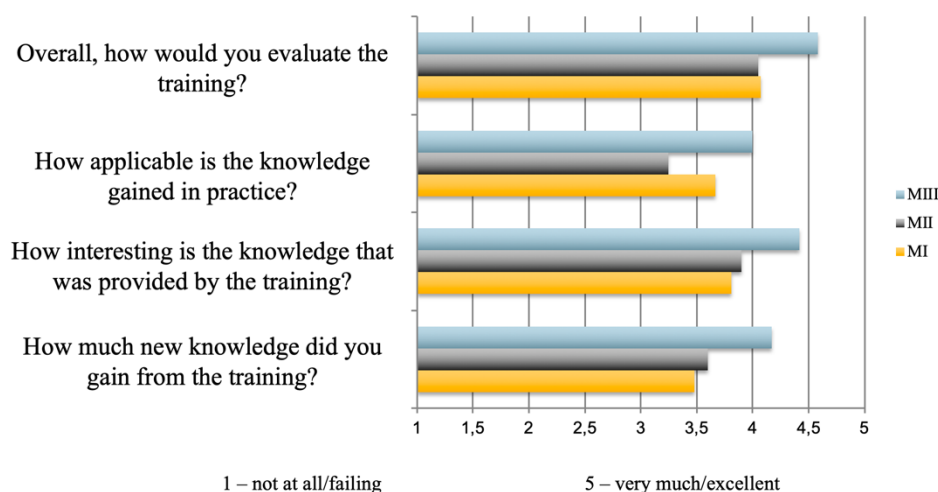


Figure 4 - Assessment of the training course contents

Results from the Patient Safety Knowledge and Organisational Culture Questionnaire

The descriptive statistics of the survey before (pre) and after (post) the training courses are presented on Figures 5 and Table 4.

Response rates for the questionnaire (pre/post) by country and method

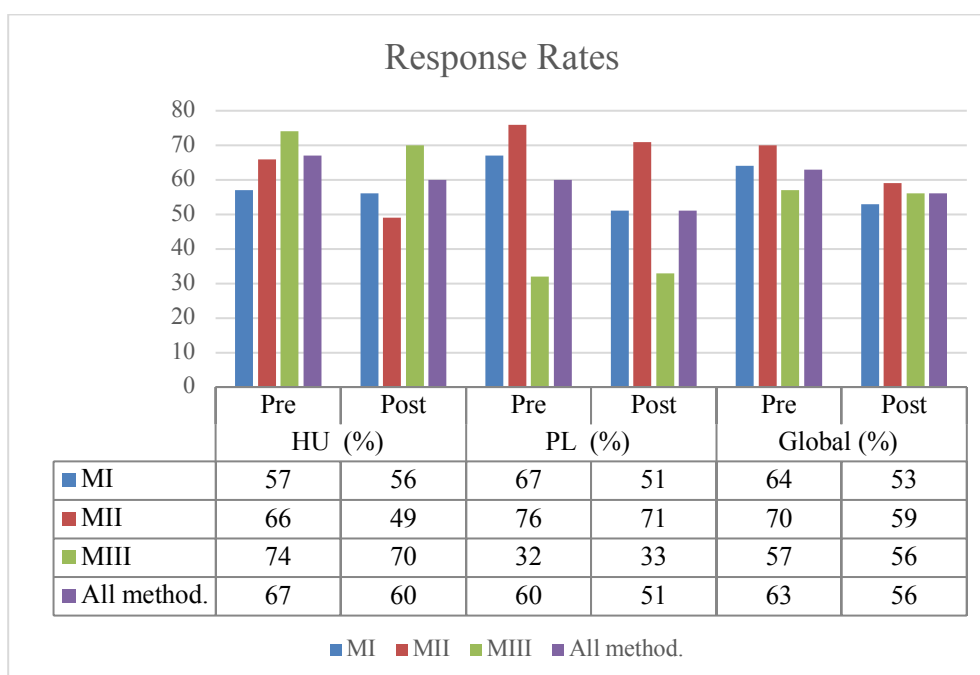


Figure 5 - Response rates for the patient safety knowledge and organisational culture questionnaire (pre/post) by country and method

The average methodologies response rates were 63% in the pre-intervention survey and 56% in the post-intervention survey. In General there was less post-intervention response rates (-7% in average), except in PL – MIII where the response rate increased in 1%.

Background Characteristics of the Respondents

The total of professionals who have complete the pre and post-intervention survey is 3488. The characteristics of the responders presented in Table 4 are based on respondents' answers to survey questions about the background characteristics.

		Pre		Post		Total	
		N	%	N	%	N	%
Time in hospital	0 - 6 years	633	56.3%	492	43.7%	1125	100.0%
	7 - 15 years	393	53.1%	347	46.9%	740	100.0%
	> 16 years	769	51.5%	725	48.5%	1494	100.0%
Time in unit	0 - 6 years	776	56.2%	606	43.8%	1382	100.0%
	7 - 15 years	457	55.2%	371	44.8%	828	100.0%
	> 16 years	558	48.5%	593	51.5%	1151	100.0%
Working hours (per week)	<40	689	56.4%	533	43.6%	1222	100.0%
	40 - 79	1074	51.5%	1010	48.5%	2084	100.0%

	>80	34	59.6%	23	40.4%	57	100.0%
Staff position	Medical doctor	217	57.9%	158	42.1%	375	100.0%
	Nurses/midwives	1207	52.0%	1115	48.0%	2322	100.0%
	Other	336	54.9%	276	45.1%	612	100.0%
Contact with patients	YES	1669	54.2%	1413	45.8%	3082	100.0%
	NO	121	51.7%	113	48.3%	234	100.0%
Length of work as a professional	0 - 6 years	563	57.3%	419	42.7%	982	100.0%
	7 -15 years	395	55.6%	315	44.4%	710	100.0%
	> 16 years	845	50.1%	842	49.9%	1687	100.0%

Table 4 - Background characteristics of the respondents to the patient safety knowledge and organisational culture questionnaire

Results of the Patient Safety Knowledge Questionnaire (Knowledge)

The results of the knowledge questionnaire were analysed and assessed according to the categories presented in the method section.

Based on the results of the knowledge questionnaire, it was established that knowledge concerning handover is an area in need of further development, as the proportion of totally correct responses in both countries was similarly low. Questions regarding handover techniques and tools presented the most difficulties.

Changes Between the Results of the Pre- and Post-training Questionnaire

In almost all of the cases the results were better for each category (RQ, CQ, PQ, NQ, BQ and TBQ), so we may assume that knowledge has improved in all hospitals and in the case of all methods. (Figure 6) Although the knowledge did not become perfect, a shift can be seen from totally wrong answers towards totally correct answers, indicating that a moderate improvement was achieved.

Interestingly, the same methods in Poland did not achieve the same results, and it may be assumed that factors other than the training course itself affected the final results. It is also evident that each training method has the ability to improve knowledge in hospitals.

The rate of improvement was higher in Poland even if the Polish average does not include results from the third hospital. Taking into account that the baseline Hungarian values were in general a little bit higher, this rate helped the final results (follow-up results) to be closer to each other in the two countries studied.

The average difference between baseline and follow-up values in all categories for each hospital

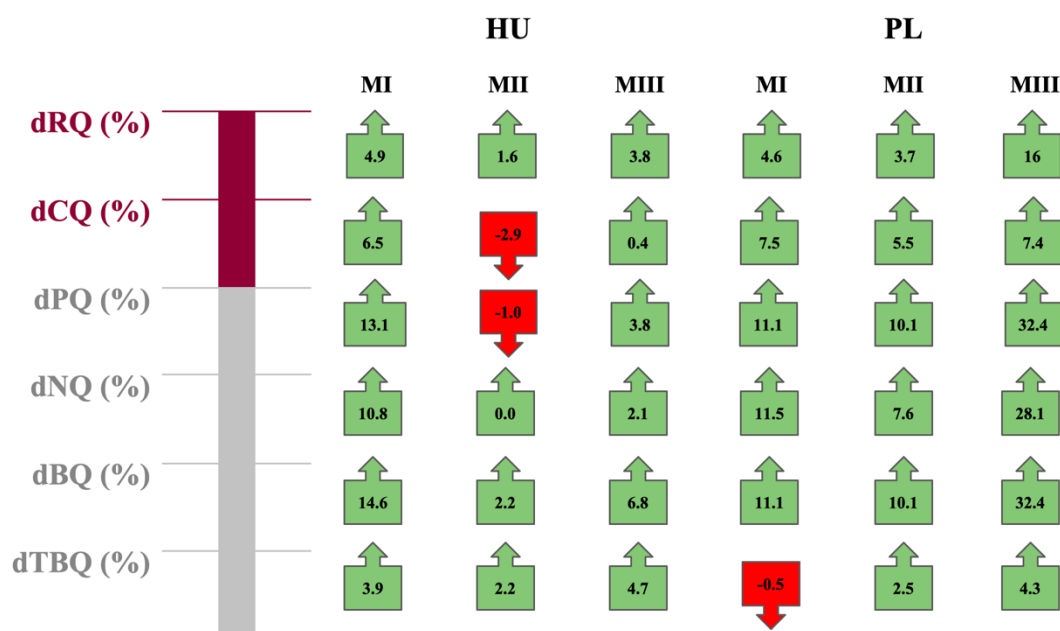


Figure 6 - The average difference between baseline and follow-up values in all categories of the survey's patient safety knowledge section for each hospital

Green boxes with an upward arrow represent an increase in the results, while the number written in the boxes shows the average difference between the results from the baseline and follow-up period for the given category and for the given method in a country. Red boxes with downward arrow shows the decrease in the results in the same way.

Results from the Patient Safety Organisational Culture Questionnaire (Attitude and Changes in Behaviour)

The percentages for the positive and negative (Pos and Neg) answers in each culture dimension during the follow-up period can be seen in Figure 7 according to the different methods for the two countries. Green-coloured numbers in the positive answer percentage columns show that the relevant culture dimension is a strong dimension for a given case. Similarly, the red-coloured numbers in the negative answer percentage columns show that the related culture dimension is a weak one. Teamwork within units can be considered to be a strong dimension in general. The values which were not above 75% but were close to it were marked with a circle in the Figure 7 such as Pos response column for supervisor/manager expectations and actions promoting patient safety, organizational learning - continuous improvement, and management support for patient safety, are additional closely strong related dimensions. As for the weakest dimension, staffing can be declared to be it, but that can only be shown for the Hungarian hospitals.

Improvement (that is an increase in the percentage of positive answers along with a decrease in the percentage of negative answers) could be detected in each patient safety dimension between the baseline and follow-up period (Figure 8), and in most cases these positive changes occurred in more than three dimensions. Mostly negative changes could only be detected in one case (MII in Hungary), where the hospital went through a top management change during the study

period. These are all presented in Figure 8, where green cells show the improvements and red cells show the declines in the different dimensions.

FOLLOW-UP PERIOD (%)	HU						PL					
	MI		MII		MIII		MI		MII		MIII	
	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg
OVERALL PERCEPTIONS OF PATIENT SAFETY	69.73	13.74	60.7	22.88	62.32	22.79	57.12	15.5	67.63	16.46	32.36	3.1
SUPERVISOR/MANAGER EXPECTATIONS & ACTIONS PROMOTING PATIENT SAFETY	74.45	9.62	70.39	14.36	66.18	16.82	61.84	14.5	67.42	14.64	71.26	0.39
ORGANISATIONAL LEARNING – CONTINUOUS IMPROVEMENT	74.08	9.71	64.98	16.83	66.82	15.54	65.14	10.17	60.05	20.4	29.72	1.81
TEAMWORK WITHIN UNITS	76.42	15.02	80.9	11	75.99	14.13	56.13	19.92	70.34	16.13	75.58	3.29
COMMUNICATION OPENNESS	50.64	23.17	52.7	21	42.62	30.05	55.21	19.81	57.02	21.18	28.65	9.24
FEEDBACK & COMMUNICATION ABOUT ERRORS	72.53	7.78	54.98	20.18	60.31	17.53	64.92	13.93	64.98	18	59.17	0.78
NONPUNITIVE RESPONSES TO ERRORS	45.03	31.95	36.63	36.55	35.33	39.45	31.89	36.82	42.48	37.06	87.86	2.07
STAFFING	33.15	51.84	36.28	51	34.11	49.65	40.84	33.22	42.24	40.85	38.57	33.27
MANAGEMENT SUPPORT FOR PATIENT SAFETY	70.17	14.55	43.33	27.17	67.21	17.91	46	20.4	66.06	12.08	76.36	1.68
TEAMWORK ACROSS UNITS	58.84	22.24	48.14	29.79	55.13	27.21	43.12	18.55	51.91	17.7	44.64	28.75
HANDOFFS & TRANSITIONS	69.72	17.92	59.11	24.96	59.09	24.84	55.44	16.87	58.61	20.36	22.48	24.94

Figure 7 - Percentage of positive and negative answers for each patient safety culture dimension in the patient safety organisational culture questionnaire follow-up period according to method and country

(%)	HU						PL					
	MI		MII		MIII		MI		MII		MIII	
	dP	dN	dP	dN	dP	dN	dP	dN	dP	dN	dP	dN
OVERALL PERCEPTIONS OF PATIENT SAFETY	0.69	-5.3	-3.79	2.55	0.14	0.66	-4.27	-0.4	7.16	-3.34	-32.36	-7.25
SUPERVISOR/MANAGER EXPECTATIONS & ACTIONS PROMOTING PATIENT SAFETY	-2.76	-3.56	0.65	-1.02	0.82	-2.8	-8.22	1.77	3.3	-2.34	-4	-5.56
ORGANISATIONAL LEARNING – CONTINUOUS IMPROVEMENT	2.29	-2.49	-3.08	3.02	7.41	-5.44	2.88	-2.4	-4.75	6.34	-29.92	-6.32
TEAMWORK WITHIN UNITS	1.65	-2.95	0.98	0.99	7.6	-5.71	-2.39	1.93	7.64	0.54	0.78	-5.04
COMMUNICATION OPENNESS	-1.16	-3.16	2.98	0.1	-1.96	1.31	0.16	2.45	7.37	-0.65	-31.49	-6.45
FEEDBACK & COMMUNICATION ABOUT ERRORS	5.3	-7.37	-1.57	2.04	0.91	1.53	-1.71	0.64	6.06	3.04	-3.23	-11.75
NONPUNITIVE RESPONSES TO ERRORS	-0.22	-6.23	-3.08	2.49	-0.46	-2.25	5.1	-5.24	16.88	-7.27	51.3	-27.1
STAFFING	0.19	-1.79	-5.02	7.99	-3.51	1.67	-7.69	-0.33	9.33	-2.38	-4.36	12.07
MANAGEMENT SUPPORT FOR PATIENT SAFETY	2.78	-1.84	-5.17	4.51	8.28	-2.9	-2.04	0.71	16.69	-11.6	19.16	-11.12
TEAMWORK ACROSS UNITS	1.23	-3.39	-2.81	3.55	5.86	-2.58	0.01	-0.95	7.32	-4.44	-15.47	20.35
HANDOFFS & TRANSITIONS	4.06	-3.55	-4.22	3.18	1.62	0.72	3.64	-3.92	7.66	-0.8	-32.51	9.71

Figure 8 - Changes in percentage of positive and negative answers for each patient safety culture dimension from the patient safety organisational culture questionnaire according to method in both country

Results of Changes to Handover Practice (Organisational Changes)

Changes detected in each hospital are summarised in the following figures (Figure 9 and 10) .

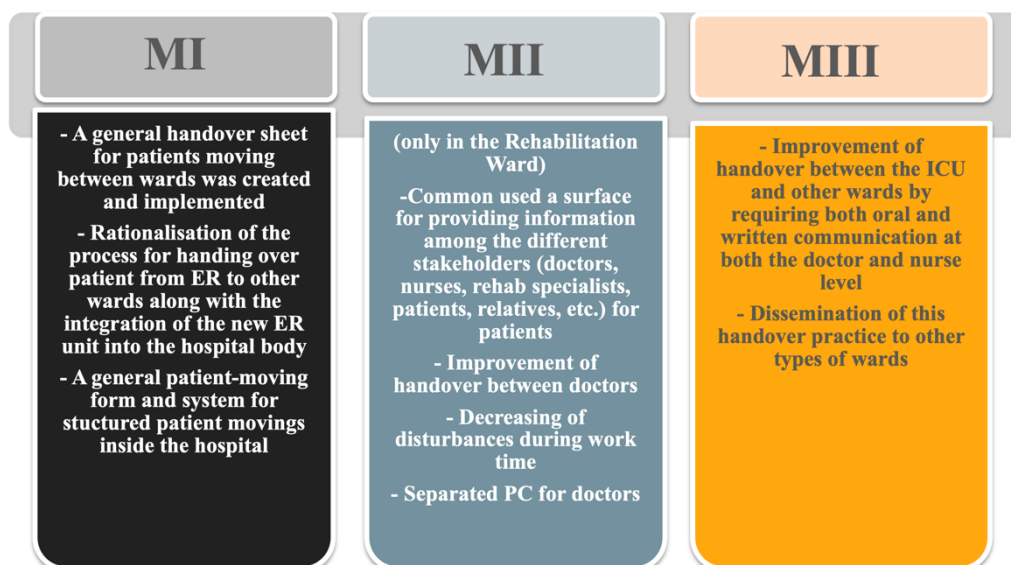


Figure 9 - Changes to handover practice in the participating Hungarian hospitals

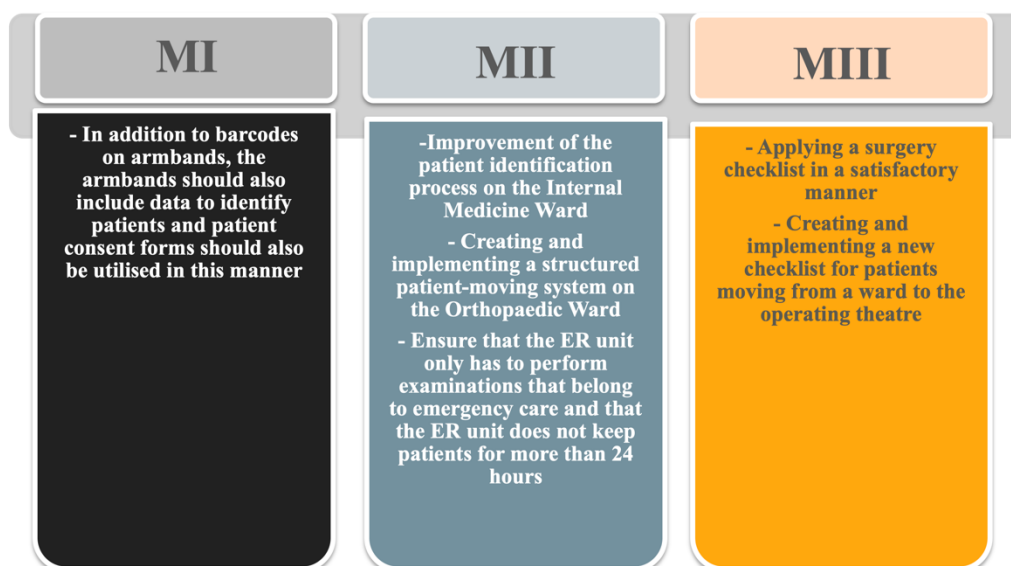


Figure 10 - Changes to handover practice in the participating Polish hospitals

Influencing Factors

The outcome and results of the education and training courses were not only influenced by the content and methods of the training, but they were also affected by the multiple factors presented below:

Participant Characteristics in the Training Courses

For training courses, especially in the case of small groups, it is essential to work with colleagues who have sufficient knowledge and influence on actual practice in their own wards. A lack of knowledge leads to inappropriate solutions, while the lack of influence does not allow for the solutions to be implemented due to a lack of acceptance and support. Furthermore, as patient safety requires adequate cooperation between different groups of professionals, the participants should represent every affected profession.

Characteristics of Wards Chosen to Participate in Handover and Patient Safety Training Courses

For the best results possible it has been suggested to choose wards that are closely connected to the topic of the training course, possess enough significance in the hospital (are large enough, have a significant admission rate and connection to other wards, etc.) and are capable of achieving any result.

Fluctuations of Staff Numbers

Although our study did not find evidence of fluctuations may be one of the reasons for the outstanding degrees of change in the case of the third hospital in Poland.

Interim Leadership Changes

Developments initiated through training courses could have easily failed if the main leaders or stakeholders had changed to then be followed by a lack of further support. Additionally, this could bring uncertainty and even fear into the colleagues responsible for implementing solutions.

Support for Training by Top Management

There are several ways for top management to express its support for the training courses. In general, the greater their support, the better the results were. It is important that this support should be “real”, which means that it is not enough to say that the training or its topic is important, but that it should also be acted upon, e.g. by management participating in the training courses and in patient safety and quality improvement meetings. This can help increase the number of participants and also underscore the significance of the topic.

Involvement of Healthcare Professionals in Improving Patient Safety

The involvement of key healthcare professionals in improving patient safety can also increase the effectiveness of education and training courses. The key individuals could be those who are already in a key position (leaders, managers, department heads) and those who have an informal but significant influence on their colleagues (so-called opinion leaders).

Training Topics Corresponding to Hospital Strategies

If top management has a concrete organisational aim related to the topic in question, training course and top management aims can be of mutual benefit to each other. With an adequately chosen strategy or change management technique, the training courses can be used highly

effectively to achieve organisational goals. Thus, the training courses can support the organisational change management process at different levels.

Summary of the Results from the Six Hospitals

A summary of the results from the six hospitals in both countries is shown in Figure 11. The figure shows the changes to handover knowledge, organisational culture and clinical practice, as well as the level of organisational change that occurred.

	HU MI	HU MII	HU MIII	PL MI	PL MII	PL MIII
KNOWLEDGE	✓	—	✓	✓	✓	✓
CLIMATE	✓	✗	✓	—	✓	—
CLINICAL PRACTICE	✓	✓	✓	✓	✓	✓
LEVEL OF CHANGE IN CLINICAL PRACTICE	Hospital	Ward	Hospital	Hospital	Ward	Hospital

Figure 11 - Summary of the results from the six hospital

Training Programmes and Change Management

As shown above, the different training methods induced top-down or bottom-up changes. Top-down changes can work if top management initiatives and the subject of education closely align. Bottom-up changes can work if top management makes no specific change initiatives, but the education topic fits into wider organisational goals. Education is especially important for the effectiveness of improvement, consequently it is critical that education be received not only within the appropriate professional context, but also through the appropriate method. Education can, however, support top management's intentions, for they have even more tasks following the educating of staff: they have to recognise, encourage, support and acknowledge an individual's improvements as well as that of the wards, and they are also the only ones who can identify the initiatives that affect many wards at the same time or that need a systemic solution at the hospital level. Finally, they have to discover the problems that reach beyond the field of education and which need more complex solutions with support from management.

Our projected results show that training courses designed according to different methods better support different points of change management. The role of the methods was adapted to Kotter's 8-step change management model, and estimates regarding the possible impact of the different teaching methods on each step of the model are illustrated in Figure 12. For the best results, change techniques and training methods should be perfectly synchronised.

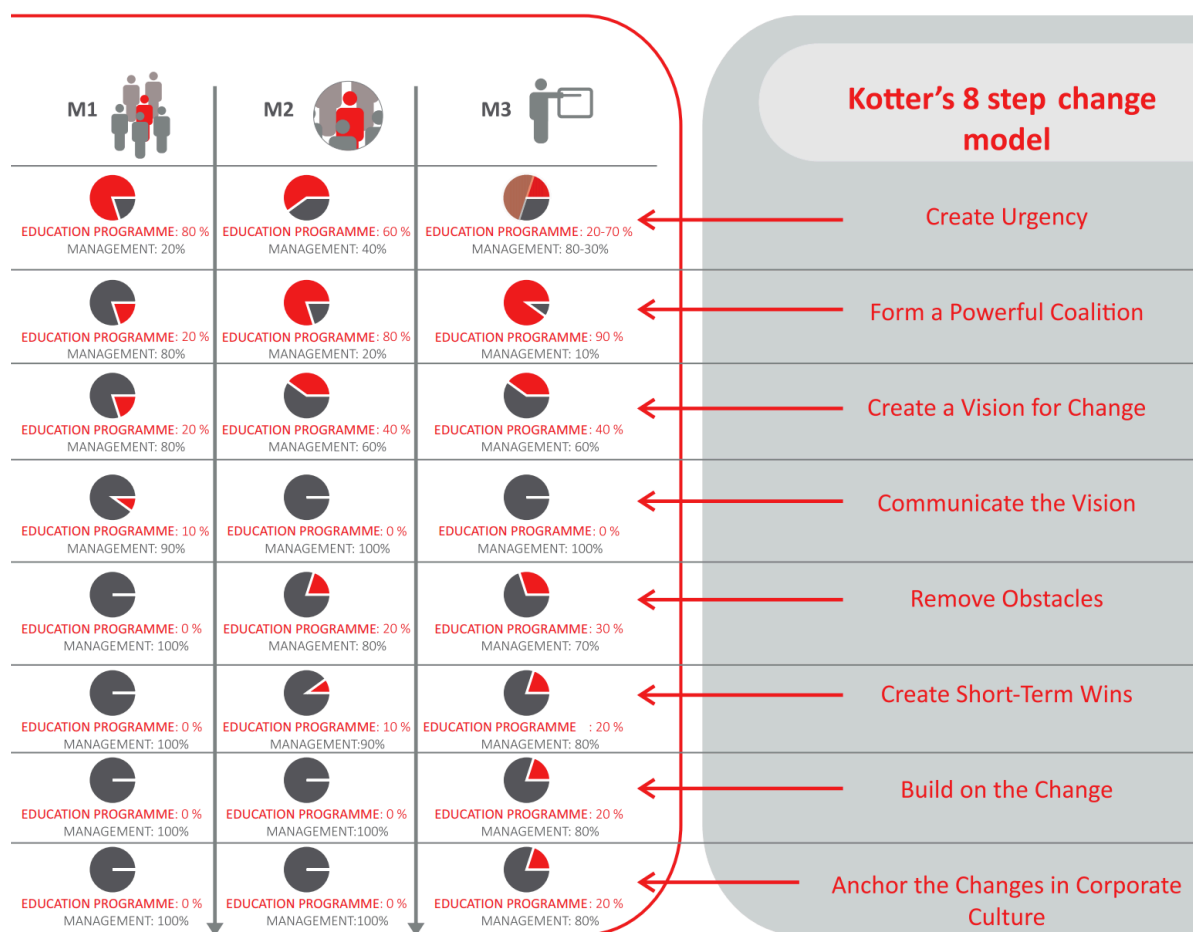


Figure 12 - The role of the methods in following Kotter's 8-step change management model, and the estimate regarding the possible impact of the different teaching methods

Discussion

Since the follow-up assessment was planned to be performed at least six months after the training programme was finalised in the hospitals, the results of the project show the long-term effects of training courses. Our main conclusions derived from the results are the following.

Training Courses

- Creating just culture in patient safety education is crucial in order to identify the real problems in practice, therefore trainers should encourage the participants (and management) to talk about these real problems.
- Training at the workplace that involves and empowers frontline staff should support the discovery and discussing of real problems in practice while also facilitating the finding and implementing of correct solutions.
- Group learning methods that involve all relevant professionals can improve efforts to find existing weaknesses and to develop solutions for handling them.
- In the case of hospital-level problems, the management was informed (and advised) where a hospital-level problem occurred, in order to initiate or support the actions required to resolve the issue. What this means is that the training programme has been

widened into becoming an organisational development programme that provides additional guidance.

- Management feedback must be given in a way that it does not lead to punishment or scapegoating.
- On the basis of the evaluations completed after the training course and the results of the student satisfaction surveys, it can be stated that for all three methods the composition of the training programme is equally sound and suitable.

Knowledge of Patient Safety

- Each method can improve knowledge:

Although the same methods delivered differing results in the hospitals from both countries, all of them resulted in improvements to most of the questions in the handover knowledge questionnaire.

Patient Safety Climate

- Each method can improve PS climate:

Results varied for the methods, but all of them showed improvements for some dimensions of the PS climate. The final results were influenced by other factors, such as the local organisational context and deficiencies in the healthcare system.

Clinical Practice

Patient safety education and training usually results in identifying different clinical and organisational problems at different levels, and it can also result in changes to clinical practice at different levels.

Other Factors

Outputs for each method depend on various factors:

- Characteristics of the participants in the training courses
- Characteristics of the wards participating in the training courses
- Management, staff and trainer turnover
- Top management support
- Involvement of healthcare professionals in patient safety improvement
- Whether or not training course topics correspond with hospital strategy

Six Cases

It is clear that in all of the cases clinical practice has changed. Even hospital-level changes occurred in many cases, although the level of knowledge did not improve by a significant degree. This can reinforce the statement that changes do not necessarily need significant improvements in knowledge for the case of all healthcare workers in a hospital.

Change Management

Based on our results, we found that the MI method is best suited for top-down changes while the MII and MII methods support bottom-up changes. From a managerial perspective, a selection of specific training courses is a potentially effective tool that can support the introduction of relevant ideas to change practice.

According to the project results, no single training method was found to be the best. The best method always depends on the local situation, taking into account all of the related and influencing factors. Therefore, the results of the project do not identify a best method, but instead show the way to choose the appropriate one for a given situation. Further studies can provide more evidence about the impact of education and training as well as influencing factors in relation to changes to patient safety.

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Recommendations for Teaching Patient Safety Based on the Results of the MAP4E Project

Patient safety has become the most emphasised issue in healthcare policymaking as every 10th patient is harmed while receiving hospital care. As a result of recently obtained information, we know that most of this harm can be prevented by reducing risks through appropriate measures and process improvement tools. Yet, despite the rich array of training courses and education provided with respect to patient safety, healthcare workers remain resistant to implementing proven patient safety solutions into everyday practice. What this underscores is the importance of measuring the effectiveness of patient safety training and education, choosing the right content, and using the appropriate training methodology.

The recommendations for patient safety training and education that are the product of MAP4E work indicate the importance of focusing on the relevant local problems; involving formal and informal leaders, building on proven solutions, and contributing to the improvement of patient safety culture at both the individual and organisational level, in cooperation with professionals and healthcare organisations.

Whether or not patient safety training and education will be successful significantly depends upon the overall support provided by healthcare policymakers. This includes clearly emphasising the importance of the patient safety issue in every aspect of healthcare delivery, including further research in the field, considerable financial support, and encouraging patient-provider collaboration to improve patient safety.

The role of upper management should be emphasised as well, for it plays an essential role in determining the effectiveness of education, training and the implementation of changes with respect to providing a commitment to patient safety culture.

Since all three of the methods that were tested in the MAP4E project were able to make a positive impact on safety culture, a key issue is promoting education and continuous training with the proper methodologies for healthcare professionals with respect to patient safety, including continuous professional development to further nurture patient safety culture.

Recommendations for Policymakers

Promoting patient safety culture

- Promotion of patient safety through education and continuous training by providing appropriately chosen methods for healthcare professionals, including continuous professional development is a key issue in increasing patient safety culture as all three methods made a positive impact on safety culture.

Training and education

- Encourage training courses that promote the implementation of acquired knowledge with the goal of changing professionals' behaviour. This is absolutely crucial at every educational and training level.

- Promote training courses at the workplace that are related to real problems that occur in everyday practice with the involvement and empowerment of frontline staff to identify problems, and to find and implement solutions.

Strengthen collaboration and networking

- Promote an exchange of knowledge and experiences at the micro-, meso- and macrolevel for patient safety education and training, along with the results of these initiatives.

Recommendations for Healthcare Organisations

Promoting patient safety culture

- Promotion of patient safety through education and continuous training by providing appropriately chosen methods for healthcare professionals, including continuous professional development is a key issue in increasing patient safety culture as all three methods made a positive impact on safety culture.

Training and education

- Develop and encourage adequate methods that promote the implementation of acquired knowledge into everyday practice along with the required changes to patient safety culture.
- Promote training courses at the workplace that are related to real problems that occur in everyday practice with the involvement and empowerment of frontline staff to identify problems, and to find and implement solutions.
- Encourage group learning methods instead of individual development.
- Promote just culture in patient safety education to identify problems that occur in everyday practice.
- If there is enough capacity, promote the continuous monitoring of the effectiveness of patient safety training courses by looking at indicators such as satisfaction, knowledge, patient safety climate, and clinical performance.
- Encourage the use of training modules that decrease resistance on the part of healthcare workers (e.g. case studies that are based on identified adverse events, as well as patients', relatives' and healthcare workers' stories).
- Engaging managers and leaders is crucial for strengthening learning and just culture and for initiating follow-ups and implementing real changes in everyday practice. A consciously selected training course can potentially be an effective management tool.
- Involve the participants (among them key opinion leaders) who can increase the effectiveness of training courses.

Strengthen collaboration and networking

- Promote an exchange of knowledge and experiences at the micro-, meso- and macrolevel for patient safety education and training, along with the results of these initiatives.

Recommendations for Training Centres and Academies

Training and education

- Develop and encourage adequate methods that promote the implementation of acquired knowledge into everyday practice along with the required changes to patient safety culture.
- Promote training courses at the workplace that are related to real problems that occur in everyday practice with the involvement and empowerment of frontline staff to identify problems, and to find and implement solutions.
- Encourage group learning methods instead of individual development.
- Promote just culture in patient safety education to identify problems that occur in everyday practice.
- Promote the continuous monitoring of the effectiveness of patient safety training courses by looking at indicators such as satisfaction, knowledge, patient safety climate, and clinical performance.
- Encourage the use of training modules that decrease resistance on the part of healthcare workers (e.g. case studies that are based on identified adverse events, as well as patients', relatives' and healthcare workers' stories).

Strengthen collaboration and networking

- Promote an exchange of knowledge and experiences at the micro-, meso- and macrolevel for patient safety education and training, along with the results of these initiatives.

Recommendations for Patients and Their Close Family and Friends

Promoting patient safety culture

- Taken together, patient empowerment and involvement promotes the development of patient safety culture.

Training and education

- Encourage the use of training modules that decrease resistance on the part of healthcare workers (e.g. case studies that are based on identified adverse events, as well as patients', relatives' and healthcare workers' stories).

Strengthen collaboration and networking

- Promote an exchange of knowledge and experiences at the micro-, meso- and macrolevel for patient safety education and training, along with the results of these initiatives.

Annex 1.

Characterisation of project participants

All three of the project partners have been involved in patient safety programmes for many years now, all of them lead national-level activities in their respective countries, and all are also participants in the Patient Safety Joint Action.

Our project aims to develop an educational method, including an impact assessment, in order to confirm the effectiveness of this form of training. This involved on-site testing of the methods, therefore we included two Eastern European countries, with different, yet equal experiences in the field of patient safety.

Hungary (HU), as the coordinating country (represented by Semmelweis University, SU) is highly dedicated to education: over the past three years the Patient Safety Division of Semmelweis University has organised (or participated in) more than 500 net hours of lecturing in patient safety by reaching out to approximately more than 1,400 people working in healthcare (mostly physicians and nurses). As a part of the management institute (Health Services Management Training Centre, Semmelweis University - HSMTC), the division has both the educational and managerial knowledge skills to successfully coordinate the current project.

The partner organisation Towarzystwo Promocji Jakości Opieki Zdrowotnej w Polsce (TPJ) from Poland (PL) added great value to the project in the fields of patient safety and healthcare quality. As a former partner in the DUQuE project, TPJ coordinated field studies, and possessed experience that could be used in designing and executing on-site testing of educational methods. Members of TPJ are also involved in education as experienced lecturers and are active in EU-level processes as members of the EU Patient Safety and Quality of Care Expert Group. This link is a significant resource for the expected EU-level dissemination of the developed patient safety educational methods.

However, in order to increase professionalism and eliminate the distortion caused by inner blindness resulting from both countries being Eastern European, a need for a Western country's involvement arose, thus Spain (ES) was invited to participate in the project. The Spanish Ministry of Health, Consumer Affairs and Social Welfare (earlier: Ministry of Health, Social Services and Equality) has vast experience in patient safety education since it already has operating programmes at both the BSc and MSc higher educational levels. The Spanish partner guided and supported the two Eastern European countries with professional advice on the development of educational methods and also took an important role in evaluating survey and educational feedback results.

Thus, the distribution of tasks was the following: the professional concept, management and coordination was the duty of Semmelweis University HSMTC. The detailed professional concept, the basis of methods and the final recommendations on the methods involved all participating partners as equals, with the same conditions applied. Furthermore, Eastern European (HU, PL) countries were responsible for on-site testing and gathering results and feedback from the test sites involved; Spain, on the other hand, participated as a professional consultant and also as a leading partner for evaluating the results.

Main project activities

- Processing the literature related to the teaching methods on patient safety
- Selecting the precise field of patient safety (handover) to be taught within the training courses in regards to its close connection to the domains of patient safety culture
- Defining selection criteria for the hospitals participating in the training courses
- Developing the three different educational methods to be tested during the training courses
- Preparing a guide for each educational method and adapting the teaching materials to the different methods
- Developing the patient safety knowledge and organisational culture questionnaires, and surveying methods and contents
- Selecting the hospitals and which of their departments would participate in the training courses, and scheduling the training courses in both countries with the help of coordinators from each hospital
- Completing the pre-intervention (baseline - before the trainings) patient safety knowledge and organisational culture questionnaires in Poland and Hungary with the help of coordinators from each hospital
- Entering and analysing the data of the pre-intervention patient safety knowledge and organisational culture questionnaires from Poland and Hungary
- Evaluating the pre-intervention handover practices of the participating departments from the six hospitals
- Testing the three different methods – training courses were held in Hungary and Poland according to the three developed methods with the help of coordinators from each hospital
- Analysing the assessments of the training courses
- Creating protocols for the data entry validation and analysis of the surveys
- Completing the post-intervention (follow-up - after the trainings) patient safety knowledge and organisational culture questionnaires in Poland and Hungary with the help of coordinators from each hospital
- Entering and analysing the data of the post-intervention patient safety knowledge and organisational culture questionnaires from Poland and Hungary
- Comparing the pre- and post-intervention results of the surveys
- Evaluating the post-intervention handover practices of those departments from the six hospitals that participated in the training courses
- Developing the methodological recommendations and guidelines for organising and executing patient safety education courses according to the project's results
- Organising multiplier events in Poland and in Hungary to disseminate the results of the project