



Escola Nacional de Saúde Pública,

Universidade Nova de Lisboa

**The World Health Organization Multi-Professional Patient Safety Curriculum:
Implementation of key modules and its impact on patient safety knowledge, skills,
and attitudes of medical students at the University of Algarve**

by

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Masters dissertation

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Submitted in partial fulfilment of the requirements for the degree

MESTRADO EM SEGURANÇA DO DOENTE

Orientador:

Professor Paulo Sousa

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‘nanos gigantum humeris insidentes’

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Dedication

To my loved ones, my students, and my patients – may you live long and prosper.

Abstract

Objectives: We attempted to show how the implementation of the key elements of the World Health Organization Patient Safety Curriculum Guide Multi-professional Edition in an undergraduate curriculum affected the knowledge, skills, and attitudes towards patient safety in a graduate entry Portuguese Medical School.

Methods: After receiving formal recognition by the WHO as a Complementary Test Site and approval of the organizational ethics committee, the validated pre-course questionnaires measuring the knowledge, skills, and attitudes to patient safety were administered to the 2nd and 3rd year students pursuing a four-year course (N = 46). The key modules of the curriculum were implemented over the academic year by employing a variety of learning strategies including expert lecturers, small group problem-based teaching sessions, and Simulation Laboratory sessions. The identical questionnaires were then administered and the impact was measured. The Curriculum Guide was evaluated as a health education tool in this context.

Results: A significant number of the respondents, 47 % (n = 22), reported having received some form of prior patient safety training. The effect on Patient Safety Knowledge was assessed by using the percentage of correct pre- and post-course answers to construct 2 × 2 contingency tables and by applying Fishers' test (two-tailed). No significant differences were detected (p < 0.05). To assess the effect of the intervention on Patient Safety skills and attitudes, the mean and standard deviation were calculated for the pre and post-course responses, and independent samples were subjected to Mann-Whitney's test. The attitudinal survey indicated a very high baseline incidence of desirable attitudes and skills toward patient safety. Significant changes were detected (p < 0.05) regarding what should happen if an error is made (p = 0.016),

the role of healthcare organizations in error reporting ($p = 0.006$), and the extent of medical error ($p = 0.005$).

Conclusions: The implementation of selected modules of the WHO Patient Safety Curriculum was associated with a number of positive changes regarding patient safety skills and attitudes, with a baseline incidence of highly desirable patient safety attitudes, but no measureable change on the patient safety knowledge, at the University of Algarve Medical School. The significance of these results is discussed along with implications and suggestions for future research.

Resumo

Objetivos: Tentamos demonstrar como a aplicação de elementos-chave da *World Health Organization Patient Safety Curriculum Guide Multi-professional Edition* no currículo afeta conhecimentos, competências e atitudes em relação à segurança do paciente no curso de Medicina pós-graduado da Universidade do Algarve, Portugal.

Métodos: Após reconhecimento formal pela OMS como um *Site Complementar* e aprovação da comissão de ética organizacional, os questionários pré-curso validados foram administrados ao 2º e 3º ano de um curso de quatro anos ($n = 46$). Módulos chave do currículo da OMS foram implementadas ao longo do ano letivo utilizando várias de estratégias pedagógicas, incluindo aulas por peritos, sessões de ensino em pequenos grupos baseada em problemas (PBL), tal como sessões de laboratório de simulação seguido por administração de questionários idênticos. O impacto das atividades de aprendizagem foram avaliadas, tal como a introdução do currículo como ferramenta de aprendizagem neste contexto.

Resultados: Um número significativo de inquiridos 47%, ($n = 22$) relataram algum tipo de formação prévia na área de segurança do paciente. O efeito sobre os Conhecimentos de Segurança do Paciente foram avaliados utilizando a percentagem de respostas certas pré e pós-curso para construir tabelas de contingência 2x2 e aplicando o Teste de Fischers (2 caudas). Não foram detetadas diferenças significativas ($P < 0,05$). Para avaliar o efeito da intervenção em competências e atitudes de Segurança do Paciente, a média e o desvio-padrão foi calculada para as respostas pré e pós-curso, e foi aplicado o teste de Mann-Whitney para amostras independentes. A avaliação de atitudes indicou uma incidência base muito elevada de atitudes desejáveis para a segurança do paciente. Foram detetadas alterações significativas ($P < 0,05$) em relação ao que deveria acontecer no caso de ocorrer um erro ($p = 0,016$), o papel das

organizações de saúde em reportar o erro ($p = 0,006$) e na ocorrência elevada do erro médico ($p = 0,005$).

Conclusões: A implementação de módulos chave do Curriculum Multiprofissional Segurança do Paciente da OMS foi associado a algumas alterações de atitude positivas em relação à segurança do paciente num grupo com incidência e atitudes positivas, de base já elevada. Não foi mensurável qualquer alteração no nível de Conhecimentos no âmbito de segurança do paciente, neste grupo de estudantes do curso de medicina da Universidade do Algarve. O significado destes resultados é discutido tal como as sugestões para futuras investigações.

Key Words: WHO Patient Safety Curriculum Guide, Medical Education, Graduate Entry, Problem-based Learning, Simulation

Palavras-chave: OMS; Currículo; Segurança do Paciente, Formação Médica

Aprendizagem Baseada na Resolução de Problemas, Simulação

Preface

“The patient must be at the centre of all that we do. Within available resources, they must receive effective services from caring, compassionate, and committed staff working within a common culture, and they must be protected from avoidable harm and any deprivation of their basic rights”.

Robert Francis QC

Chair

The Mid Staffordshire NHS Trust Public Inquiry

London, 2013

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1.0 Patient Safety and Public Health: The Challenges

1.1 The Extent of the Problem

The practice of medicine can be harmful to patient health. Hippocrates admonished his students to “help, or at least to do no harm”(1) around 2500 years before the landmark Institute of Medicine report “To Err is Human”(2) gave an indication of the nature and extent of harm resulting from medical care in the 21st century. Globally, between 3.4% and 16% of all acute admissions to hospitals in Spain, Canada, The UK, and Denmark result in patients experiencing harm associated with the delivery of healthcare rather than the disease process itself: it is estimated that almost half of these adverse events are preventable in the hospital(3). On par with global estimates, in Portugal, an adverse incident rate of 11.1% has been reported, with 53% of these events being avoidable and resulting in a 10.8% mortality rate(4). Besides the human cost, the authors also estimated a 10.7-day increase in length of stay and an additional cost of 470,380 Euros to the Portuguese Healthcare Service. The vital role of training and education in delivering safe and effective healthcare that is also patient centred, compassionate and respectful has been acknowledged for some time(2), and remains the defining challenge facing modern practitioners of all professions. It is not surprising that like many other lawmakers and administrators, the Portuguese Ministry of Health has integrated Patient Safety as a cornerstone of its overall 10-year strategy for its health improvement initiatives(5) .

1.2 Educating for Safer Care

Individual technical competence is the bare minimum necessary, but arguably not sufficient in the face of increasingly complex systems of healthcare delivery in most developed countries. A number of authorities including The General Medical Council(6), National Nursing, and Midwifery Council Guidance(7) define a range of patient safety knowledge, skills, and attitudes as being desirable in professionals. The details of how this might be achieved are less clear and are to be expected since the role of patient safety education and the delivery of safe clinical practice is not well understood although it has been claimed that the WHO Patient Safety Curriculum guide is an important contributor to educational reform and the advancement of patient safety education(8). Despite the known extent of harm, of the USD 5.5 trillion spent on healthcare, only 2% is used on professional education(9) Educational interventions, especially at the undergraduate level, are also remote in the time from eventual clinical practice and thus a clear relationship between patient safety education and safer clinical practice can be difficult to demonstrate. There is considerable variation in medical education models, the most traditional based on omniscient experts full of knowledge teaching empty vessels and filling them with knowledge. Educating for patient safety, even on the rare occasions where it has been incorporated into an already very crowded curricula(10), could be considered a particular challenge in this regard since a significant proportion of the knowledge base and techniques in the field is drawn from outside the traditional disease and treatment-based medical model that is already highly hierarchical and competitive(11). The evidence for the lack of efficacy of traditional lecture-based learning is well established(12)and the traditional expert-novice relationship is commonly inverted with the emergence of newer information technologies(13).

The consequence of this curious inversion of power on the traditional teacher and learner roles in a world of ever-increasing information accumulation has yet to be determined.

1.3 The World Health Organization's Patient Curriculum

Guide

In 2011, the WHO published the curriculum guide(Annex A), a comprehensive programme for the implementation of patient safety education in healthcare settings worldwide, to facilitate and support in an inter-disciplinary manner, where possible, the building of students' patient safety knowledge, skills and attitudes in healthcare education institutions(9) .The WHO curriculum has heavily influenced the most recent initiatives: The Australian Patient Safety Education Framework(APSEF)(14) and the Canadian Framework(15). Both of these have applied the same methodology to construct their framework, as outlined extensively in the referenced works. Both utilized an extensive review of the body of patient safety knowledge to identify the major areas of activity (knowledge, skills and behaviour) contributing to patient safety. These activities were then categorized into “learning areas” and further subdivided into 22 major subject area topics and allocated an expected level of competency according to the level of responsibility within the healthcare system(14). The WHO curriculum has incorporated 16 of the APSEF's 22 topics into its 11 topics(9) in addition to the competencies outlined in the Australian and Canadian Frameworks, the curriculum included an additional part A in the form of guidance for teachers. In part B of the curriculum, the concepts to be covered within the topic are outlined; in addition, uniquely, the various different educational approaches to each topic as well as different methods of assessment are supplied.

The lecture outlines and slides, ward-based and small group session activities, case discussions and also role play and simulation exercises(see appendix A) are packaged along with the knowledge base into a single tool that provides a comprehensive, ready-to-teach, a 11 topic-based patient safety programme that can be utilized as a whole or on a per topic basis (9).

These topics include:

Topic 1: What is patient safety?

Topic 2: Why applying human factors is important to patient safety

Topic 3: Understanding systems and the effect of complexity on patient care

Topic 4: Being an effective team player

Topic 5: Learning from errors to prevent harm

Topic 6: Understanding and managing clinical risk

Topic 7: Using quality improvement methods to improve care

Topic 8: Engaging with patients and carers

Topic 9: Infection prevention and control

Topic 10: Patient safety and invasive procedures

Topic 11: Improving medication safety

1.4 Topic Selection

In this study, three core topics were selected out of the 11 – Topic 1: What is patient safety, Topic 2: Why applying human factors is important to patient safety, and Topic 4: Being an effective team player. These topics were designated as key topics by the WHO and accorded priority when it was anticipated that the curriculum would not be delivered in its entirety. With the agreed implementation of these topics as a minimum, it was possible to achieve recognition

as a WHO complementary test site and thus in a reciprocal arrangement, in return for having received authorized approval to use the validated survey questionnaires and guidance on data handling, the data obtained during the study would be made available to the WHO. For ease of identification in the study and subsequent discussion, these three topics have been designated as A, B, and C and correspond to the WHO Curriculum Topics 1, 2, and 4.

This paper aimed to evaluate, in a structured manner, the effect of introducing these key elements of the World Health Organization Patient Safety Curriculum Multi-professional edition on patient safety knowledge, skills and attitudes as a new graduate entry Medical Course at the University of Algarve in Portugal.

1.5 Delivering Change: Patient Safety Curriculum within a Systems Engineering Approach

The Department of Medicine and Biomedical Sciences, University of Algarve, represents a unique confluence of opportunity to undertake this evaluation. As a new medical school geographically isolated in a remote part of Portugal, it is also significantly distinct from the hitherto standard model of medical education in Portugal. It is significantly smaller than established medical schools and uses an exclusively problem-based learning methodology to deliver clinical skills rather than lecture and subject-based teaching. A significant investment was made in simulation-based teaching with the purchase of a high-fidelity human simulator and the appointment a full-time clinician and associate professor (JdF) allowing the simulation to be incorporated into areas as apparently diverse as skills training, pharmacology, and patient safety. The first two years of training take place in primary care, and trainees enter the tertiary hospital-based environment only in their third year of training. Exclusively open to graduates from areas

allied to medicine(nursing, dentistry, pharmacy, dietetics, psychology) with considerable life and work experience, the learning is modelled on the key principles of adult education as outlined previously (16)(e.g. understanding why they are learning, motivating learners by the need to solve problems actively, and encouraging learners to build on previous experience and to work collaboratively in the process of learning and draw on each other's diverse experience).

From this cohort of mature graduates, using the McMaster pioneered multiple mini-interview model(17), those with proven collaborative problem-solving skills and self-appraisal ability as well as the ability to relate to others rather than just focusing on academic performance were selected for this study. Altruism as a motivation to study medicine as well as dedication to life-time learning and collaborative learning and working style styles were also important components of the selection method. Organizational culture has already been identified as an important determinant of safety behaviours (13).In addition to the integration of the patient safety concepts and skills into the required clinical curriculum and competencies, the school also objectively integrates these values and abilities into the formative and summative assessments(see Appendix C),thus aligning the requirements of safety to those of technical competence as advocated in the systems approach to patient safety in medical education(18).

These authors applied a model of system failure (Figure 1.1) to undergraduate medical education and suggested that effective patient safety training is the product of a systematic approach that goes beyond just a curriculum and considers entrance requirements, selection criteria and methods of student assessment.

Figure 1. Educating physicians to improve care and safety (Source: (18))

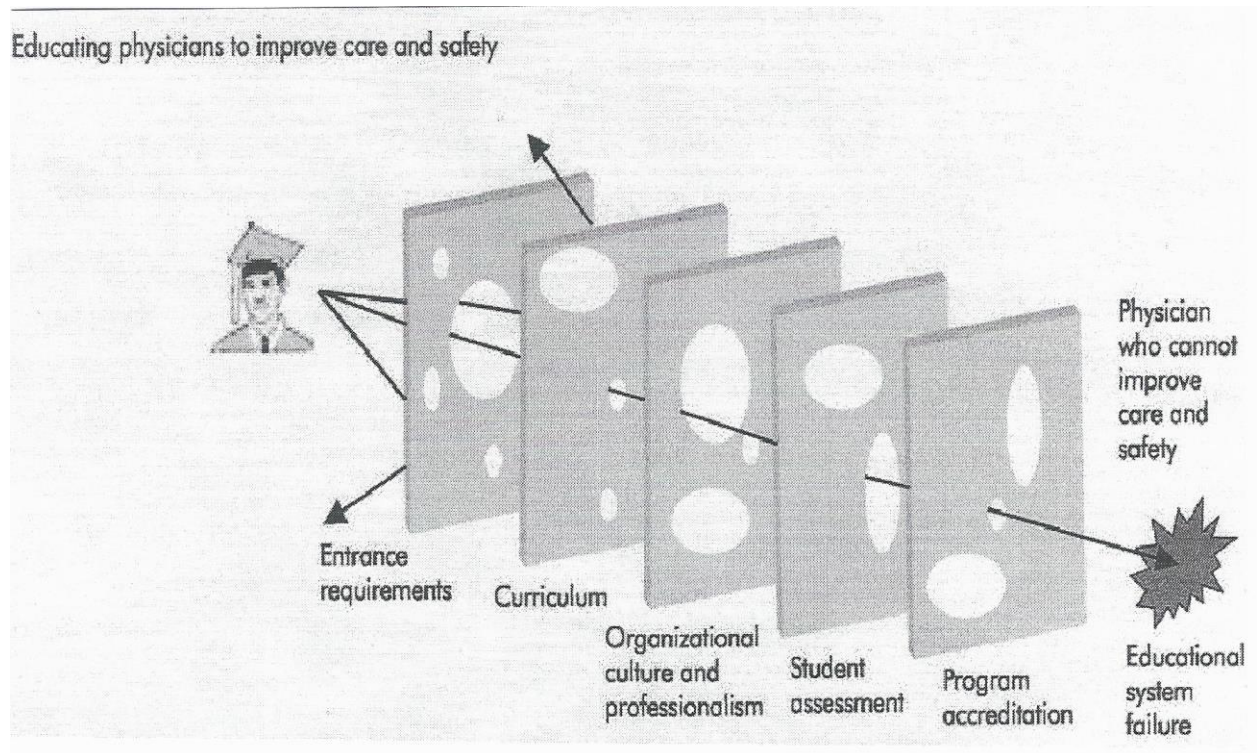


Table 1. Organizational defences, holes, and proposed means to strengthen defences

(Source: (18))

Organizational defences	Holes	Proposed means to strengthen the defences
Entrance requirements	<ul style="list-style-type: none"> • Score based selection criteria may not identify individuals with ability to reflect on practice, work with others and continually improve their performance 	<ul style="list-style-type: none"> • Include an assessment of prior experience and skills in these areas as part of student selection
Curriculum	<ul style="list-style-type: none"> • Lack of attention to the skills needed to improve one's practice, including collaboration, interdisciplinary teamwork and the ability to admit and discuss error 	<ul style="list-style-type: none"> • Modify content to include core content in improvement, including team training • Emphasize value of learning from error
Organizational culture	<ul style="list-style-type: none"> • Overemphasis on physician/physician interaction, chronic fatigue and other threats to professionalism • Insufficient value placed on scholarship of teaching and improvement • Person oriented model of error 	<ul style="list-style-type: none"> • Address threats to professionalism • Align organizational values with desired goals • Seek training opportunities in organizations with cultures that support safety and improvement
Student assessment	<ul style="list-style-type: none"> • Mismatch between what we measure and our real objectives • Lack of assessment related to improvement and patient safety 	<ul style="list-style-type: none"> • Develop approaches to student assessment that address all required competencies
Program evaluation	<ul style="list-style-type: none"> • Accreditation standards do not address sufficiently the skills needed by physicians to improve care and safety 	<ul style="list-style-type: none"> • Develop broader approaches to program evaluation • Increase accountability for outcomes

2.0 Research Design

2.1 Study Design

This uncontrolled, non-randomised field experiment study was designed as a longitudinal survey. Validated questionnaires were administered to a study population consisting of graduate entry medical students at the start of their academic year and against the end of that year after the implementation of the selected topics of the WHO Patient Safety Curriculum Guide Multi-Professional Edition.

2.2 Population and Sample

A sample of 2nd and 3rd-year medical students (N =47) was selected from the population of students in a four-year Graduate-entry Masters Programme medical course at the University of Algarve, Portugal. The second and third year students were selected, as there was no fourth year then; this being a new course, the first-year students were not yet on campus having a staggered start, so for logistical reasons it was not feasible to include them in the study. No biographical data were collected, e.g. data regarding age, gender, and previous area of study within the field of medical sciences was not collected.

2.3 Questionnaire design and delivery

The questionnaire survey is provided in appendix C and both knowledge and attitude questionnaires were administered at the start of the academic year, prior to the implementation of the above Patient Safety Training programme and then administered again at the end of the academic year after its implementation. The questions for all variables had a close-ended design. In our study, three core topics A, B, and C were introduced in compliance with WHO

Complementary test site recommendations and corresponding to Curriculum Topics 1, 2 and 4. The questions measuring knowledge acquisition related to these topics the responses to the closed questions had a nominal polytomous design. The response for each knowledge question was marked and then coded as 1=correct, 0=incorrect, depending on the responses. The number and percentage of correct answers per topic were tabulated and the results pre and post training were prepared for the construction of contingency tables for comparison ahead of statistical analysis. Students attitudes to patient safety were also assessed using a questionnaire with a close-ended design but in this case, the responses were bounded continuous. The Attitude survey evaluated 4 composites: Knowledge of patient safety (7 questions), Safety of the healthcare system (5 questions), Personal Influence over safety (7 questions), and Personal Attitudes to Patient safety (4 questions). Students were asked to rate their agreement with each question in the composite on a Likert-like scale of 1 to 5, with 5 being strongly in agreement, 3 moderately in agreement/neutral, and 1 being strongly disagree. Both surveys are outlined below in Tables 2.1 and 2.2.

Table 2. Outline of questions testing knowledge of topics A, B, and C (Appendix C)

Topic A: What is Patient Safety

- What multiple factors can lead to the delivery of unsafe care?
- A doctor fails to practice hand hygiene between patients because he/she feels is too busy even if there is an alcohol hand-rub dispenser in the ward. What is this an example of?

Topic C: Being and Effective Player

- The TeamSTEPPS programme identifies a number of different, but interrelated team types that support and deliver health care. The teams formed for emergency or specific events belong to which type of team?
- There are four stages in team development. At which stage is open communication between team members established?
- Scenario about wrong knee surgery. What should you, as a student, do next?

Topic B: Why is applying human factors important for patient safety?

Which Human Factors predispose healthcare workers to errors?

How should we apply human factors' thinking to healthcare environments?

Retained swab post-episiotomy scenario: Human factors contributing to the swab being left behind.

Table 3. Outline of Student Attitudes to Patient safety Survey (Appendix C)

<p>Composite 1:</p> <p>Knowledge of Patient Safety</p>
1. Different types of human errors in health care.
2. Factors contributing to human error.
3. Factors influencing patient safety.
4. Ways of speaking up about errors.
5. What should happen if an error is made?
6. How to report an error.
7. The role of health-care organisations in error reporting.

Composite 2:

Safety of the Healthcare System

1. Most healthcare workers make errors
2. In my country, there is a safe system of healthcare for patients.
3. Medical error is very common.
4. It is very unusual for patients to be given the wrong drug.
5. Healthcare staff receive training in patient safety.

Composite 3:

Personal Influence over Safety

1. Telling others about an error I made would be easy.
2. It is easier to find someone to blame rather than focus on the causes of error.
3. I am confident about speaking to someone who shows a lack of concern for patient safety.
4. I know how to talk to people who have made an error.
5. I am always able to ensure that patient

safety is not compromised.
6. I believe that filling in reporting forms will help improve patient safety.
7. I am able to talk about my own errors.
Composite 4: Personal Attitudes to Patient Safety
1. By concentrating on the causes of incidents, I can contribute to patient safety.
2. If I keep learning from my mistakes, I can prevent incidents.
3. Acknowledging and dealing with my errors is an important part of my job.
4. It is important for me to learn how best to acknowledge and deal with my errors by the end of medical school.

The questionnaire was made available by the WHO on registration as a Complementary Test Site and had been used in the evaluation of a previous edition of the WHO Patient Safety Curriculum(19) .Flin, et al. had recognised the need to design and evaluate a questionnaire measuring attitudes to medical error and patient safety and thus facilitate the evaluation of new patient safety learning interventions(20), and the questionnaire subsequently developed and

validated in their cohort of UK medical students was adopted for the evaluation of the WHO curricula. Other questionnaire-based surveys, e.g. The Health Professional Education Patient safety Survey(H-EPSS) were developed for the evaluation of patient safety knowledge, skills, and attitudes, but these have been used in “classic” medical educational models and have been designed to complement the Canadian Patient Safety Institute Safety Competencies Framework (21).Some multiple-choice questionnaire surveys do exist, but these in turn, are designed to test only patient safety knowledge and not attitude and skills, and are specific only to the context of the regional Massachusetts Patient Safety Curriculum of the Risk Management Foundation, Cambridge(22).

2.4 Statistical Analysis

Knowledge data: The number of correct answers and percentages were analysed by the construction of 2×2 contingency tables and the application of Fisher’s Exact Test to test the null hypothesis. This was considered appropriate for the non-parametric distribution of the data and the small sample size. The significance level was set at 0.05.

Attitude data: For each individual student’s response to the composites evaluated, the means and standard deviations were calculated for each question in that composite. The means and standard deviations for all these variables across responses for all the students were then calculated and collected on the data collection template (Appendix B). Mann-Whitney's *U* test for independent samples was applied to the collated non-parametric data and the null hypothesis H_0 was tested, so the probability of the scores from the first questionnaire exceeding those of the second questionnaire was the same as the scores on the second questionnaire exceeding the first. A nominal significance level of 0.05 for that probability was set. All analyses were conducted using the OpenEpi V3.03a software.

2.5 Ethics Approval and Complementary Site Recognition

In accordance with the Declaration of Helsinki, there was no potential of harm to the participants. Ethical approval was confirmed by the WHO and local approval was not required. Participation was voluntary and anonymous; with the students being clearly briefed verbally and in writing that participation or non-participation in the study would in no way affect their assessment and grades.

3.0 Curriculum Implementation

3.1 Topic A: What is Patient Safety?

(WHO Curriculum Topic1)

This module was introduced by one of the authors (PS) a respected national expert and investigator in the area of patient safety in Portugal. In his didactic lecture illustrated using contemporary media reported local cases, the extent of unsafe practice and patient harm was highlighted with reference to international landmark studies(2) as well as local studies(4).The considerable burden of suffering as well as the economic costs of preventable harm was explored in addition to the extent of harm identified. The WHO defined patient safety as the absence of preventable harm to a patient during the process of healthcare provision based on the landmark report “To Err is Human”(2).

3.1.1 The WHO taxonomy of error

This was outlined and key terms are defined and explained below:

Error means doing something wrong when meaning to do something right, more formally defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim(23). The example used to explore this concept was that of a patient with shortness of breath and wheezing being treated for acute severe asthma when in fact he was suffering from oedema. Errors were further subdivided in to lapses, slips, and violations according to Reason’s classification(24).

In this classification of error, a slip was illustrated by the case of a nurse picking up a label with a specific patients name, but inadvertently picks up a different label and the specimen

is incorrectly identified. A lapse was illustrated using the example of a young surgeon charting the post-operative instructions for a patient and forgetting to prescribe medication for preventing deep vein thrombosis. Violations included failure to appropriately wash hands when required. The role of human factors and their contribution to error was alluded to in this first module.

Adverse event is defined as injury to the patient because of care provision rather than the illness itself. This concept was explored using the case of a patient being administered penicillin and suffering an allergic reaction. If the patient was not known to be allergic, then the reaction is an adverse event, a complication of the treatment rather than the disease itself, and can be regarded as not preventable and not the result of an error. Had the patient been known to be penicillin allergic, then the reaction to the penicillin administered would still be regarded as an adverse event—harm caused by the treatment rather than the illness, but in this case, it would be the result of an error, and could be regarded as preventable .

A “Near-Miss” in this WHO taxonomy is considered an error that did not produce an adverse event.

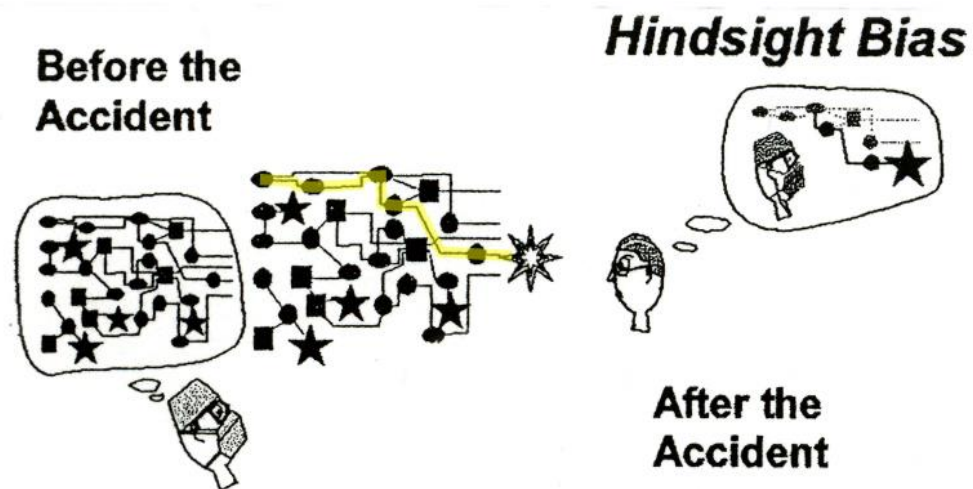
3.1.2 Name shame and blame vs. a Systems Approach:

A short history of the individual’s responsibility approach to medical error (culture of blame) was presented, including some key contributory concepts:

Hindsight bias: “Once the outcome of a series of events is known, it is tempting but unhelpful to use that hindsight to comment on what should have been done— ‘what were they thinking-they clearly should have done x or not done y’”(25).

Figure 2. Illustration of hindsight bias

(Source: (26))



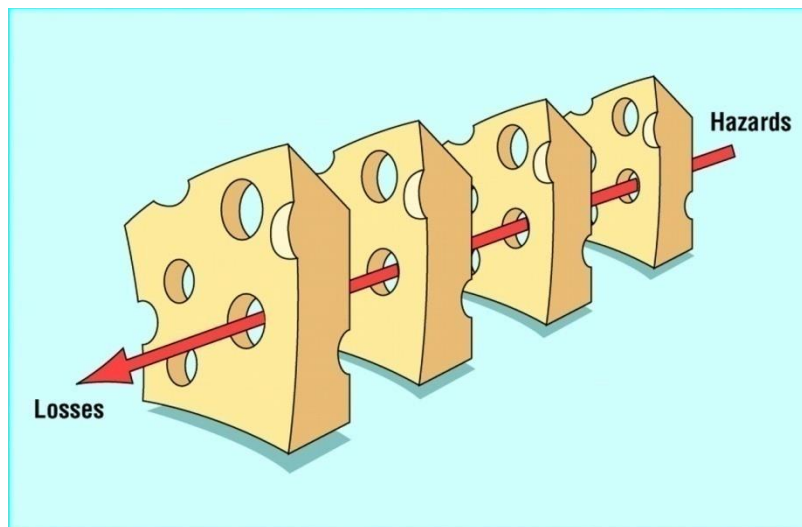
Dekker identifies these hindsight bias-based reactions as counterfactual, judgemental, and focused on the individual assuming individuals have complete freedom of choice over their actions and that “bad things” happened because they are somehow deficient or bad (also called as fundamental attribution bias). This traditional approach nurtures the assumption that people make mistakes because they are not trying hard enough and thus if they are sufficiently punished they will try harder to make fewer mistakes.

In this regard, the more modern systems-based Swiss cheese concept expounded by Reason (27) was presented as an alternative. The concept of latent and active failures was introduced and explored: active failure occurs as an immediate consequence of an error at the interface between the patient and the healthcare whilst latent errors are the delayed consequences of decisions and actions taken at some a rather remote point, not usually by clinicians, but by designers, builders, procedure writers, and higher-level leaders and managers and thus “latent” in

the sense that they may have delayed consequences, remote from decision both in time and place in the organization before manifesting as an adverse incident(28).

Figure 3. Reason's Swiss Cheese Model

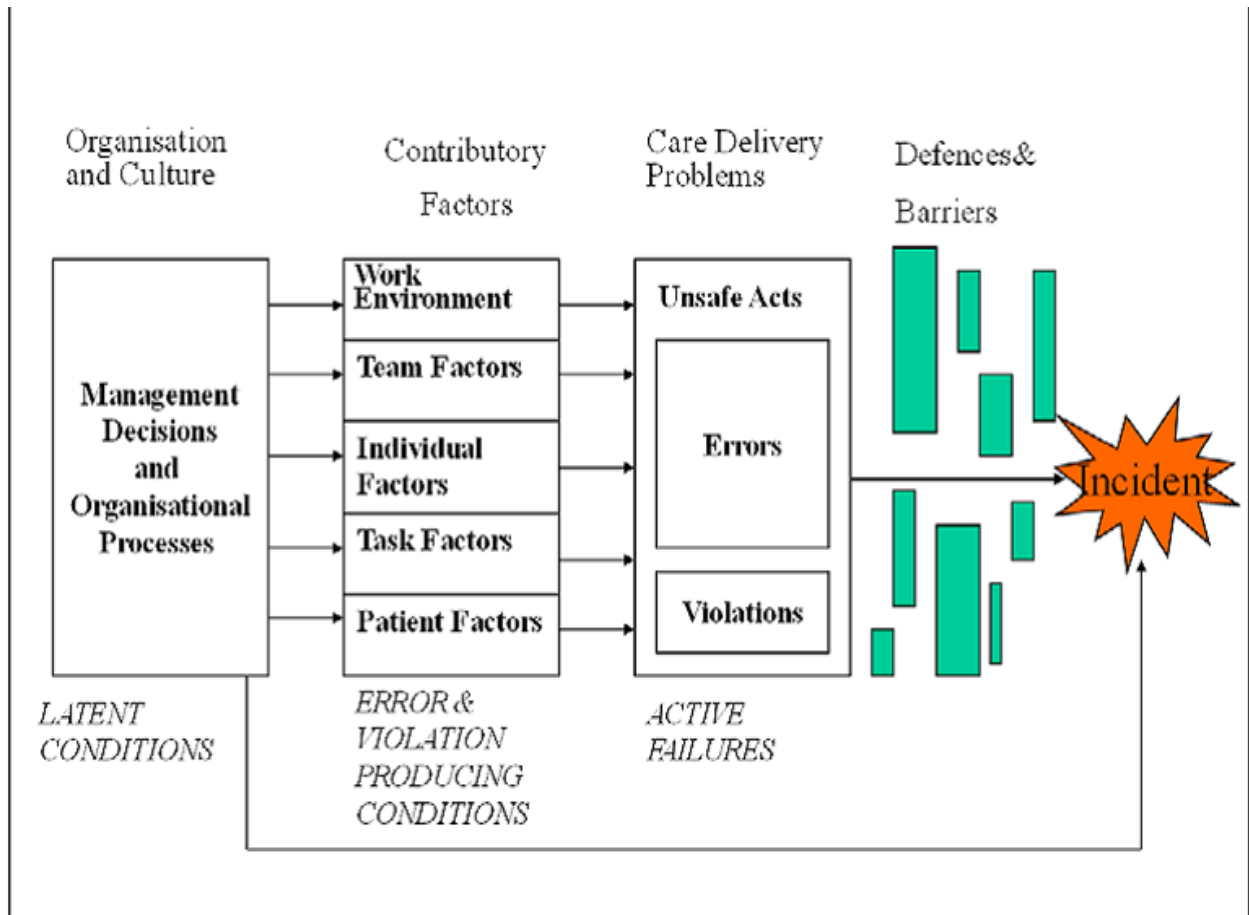
(Source: (24))



The topic was further explored in facilitated small group sessions where a training video produced by the Department of Health(29)illustrated the events surrounding an inadvertent intrathecal injection of methotrexate. The participants were asked to identify active and latent failures, slips, lapses, and violations, and extrapolate those identified in the film to their personal experience. A full account of those events was provided in the supplied official report(30).

Figure 4. Latent and active errors as illustrated by Vincent’s Framework for analysing risk in clinical medicine

(Source: (31))



Two WHO initiatives and their effect on modulating patient harm were also presented in the following lectures: the Safe Surgery Checklist and the Hand Hygiene Campaign to Reduce Healthcare Associated Infections (WHO).

3.2 Topic B: “Why applying Human Factors is Important for Patient Safety” (WHO Curriculum Topic 2)

The delivery of this module started with the delivery of a lecture/seminar by aviation experts from the Portuguese Air Force (Capitao Psicologa Cristina Fachada) as well as commercial aviation (TAP Air Portugal, Piloto Comandant Rui Seabra Santos, and Joaquin Oneto, Director of OMNI Aviation Training Centre respectively) outlining the Human Factors Theory and how these are applied in aviation and medicine.

3.2.1 Human Factors a: a definition

Often perceived by the public mind as those human conditions that predispose one to mistakes, for example, anxiety or fatigue, the WHO Curriculum defines Human Factors as the discipline of engineering that deals with the interface between people (human-human interactions), equipment (human-machine interactions), and the environment in which these interactions take place. It can thus be considered the study of all the factors that make it easier to do the work right(9). Human beings are creative, self-aware, imaginative, and flexible with regard to their performance(32). Making errors is inevitable and thus an understanding of Human Factors, the science of doing the job right, and fundamentals of delivering safe clinical care is paramount.

3.2.2 Lessons from Aviation

The importance of the organization as a focus for controlling risk in civil aviation was pointed out with reference to the SMS Manual(33), where airline safety is defined as that condition in which the risk of harm to personnel and property is maintained at an acceptable level through a process of continual identification of hazards and the management of risks.

Particular attention was given to the important contribution of workplace design and equipment in mitigating human error in aviation as well as the effects of fatigue, stress, poor communication, inadequate training, or lack of familiarity with a task that can affect the performance of flight crew. The WHO Curriculum advocates a number of strategies drawn from Human Factors to mitigate the potential for harm in healthcare(9). In medicine, these include avoiding reliance on memory (e.g. use of protocols, standard operating procedures), making things visible (e.g. using signage to remind staff of hand washing), simplifying and standardising common processes, routine use of checklists (e.g. Safe Surgery Checklist), and reduced reliance on vigilance. Comparisons and contrasts were made using examples from the field of aviation.

3.2.3 A Case Study from Healthcare

The lecture was followed by further facilitated small group sessions where the video/case study “Just a Routine Operation”(29) was shown, illustrating the events surrounding an unexpected intra-operative death. The students were asked to identify aspects of Human Factors relevant to the case and extrapolate them to their own experience. The simulation session dealing with teamwork and Crew Resource Management was undertaken in a complimentary session.

Case Study used to explore application of Human Factors Principles to Healthcare settings(34)

Case Study 1

Elaine Bromiley was a fit and healthy young woman who was admitted to hospital for routine sinus surgery. During the anaesthetic, she experienced breathing problems and the anaesthetist was unable to insert a device to secure her airway. After 10 minutes, it was a situation of “can’t intubate, can’t ventilate” – a recognised anaesthetic emergency for which guidelines exist. For a

further 15 minutes, three highly experienced consultants made numerous unsuccessful attempts to secure Elaine's airway and she suffered prolonged periods with dangerously low levels of oxygen in her bloodstream. Early on, the nurses informed the team that they had brought emergency equipment to the room and booked a bed in intensive care but neither were utilised; 35 minutes after the start of the anaesthetic it was decided that Elaine should be allowed to wake up naturally and was transferred to the recovery unit. When she failed to wake up she was then transferred to the intensive care unit. Elaine never regained consciousness and after 13 days the decision was made to withdraw support.

The film of this case study can be viewed at:

http://www.institute.nhs.uk/safer_care/general/human_factors.html

3.3 Topic C: “Being an Effective Team Player” (WHO Curriculum Topic 4)

This module was taught exclusively in a simulator environment: Two different scenarios were constructed as appropriate for the level of training, although the principles applied were identical for both. Examples of learning materials utilized can be found in Appendix C. “The immediate assessment and management of an acutely ill patient” for the clinical year 2 students and the “Immediate Management of a Severely Poly-traumatized patient” for year 3 students were utilized to design a clinical scenario, where the learning objective was how to be an effective team player as per the curriculum. The simulator was programmed with the baseline clinical parameters of each scenario. A clinical collaborator adjusted the physiological output of the simulator according to the observed interventions of the students(e.g. decreased heart rate and increased mean arterial blood pressure following fluid administration, desaturation, and snoring, if airway manoeuvres were not used).After a period of familiarisation with the simulator

mannequin and environment, the participants were divided into three groups: group 1 was given a clinical vade mecum and briefing of the scenario they were to undertake and entered the simulation environment. Group 2 was given the clinical management guidelines and was expected to assess successful achievement of the clinical tasks (e.g. opening airway, monitoring, IV access as appropriate). Group 3 was asked to identify and provide feedback on skills defined by the Agency for Healthcare Research and Quality(35) and to identify a series of distributed cards (Call Out, Check-back, SBAR communication of safety critical information¹, IPASSBATON handover) along with a series of key Crew Resource Management skills (call for help, leadership, repeated evaluation and anticipation and planning, avoiding fixation error, establish task priority, know the environment, appropriate task distribution). The participants were rotated through each of the three groups followed by a structured debrief using a “good judgement model”(36) to evaluate the performance of the group against the specified objectives of the session. After the debrief, the scenarios were repeated so that some of the issues discussed could be implemented and explored.

4.0 Results and Statistical Analysis

The results obtained from the knowledge questionnaire are presented in Table 4 below.

The results for each of the attitudes composites are presented in Tables 5 to 8

¹ SBAR :Situation Background Assessment Recommendation

I PASS BATON : Introduction Patient Assessment Situation Safety Concerns Background Actions Timing Ownership Next

Table 4. Survey results for student knowledge of patient safety

	% Correct Answers		Fischer's Test (2-Tailed)	
	Pre	Post	P-Value	Significance
Topic 1				
What is patient safety?				
Factors leading to unsafe care.	30.6	34.3	P=1.0	NS
Hand hygiene failure.	22.2	31.4	P=0.43	NS
Topic 2				
Applying human factors.				
What human factors predispose one to making an error?	0	0	P=1.0	NS
Application of human factors to healthcare environment.	0	0	P=1.0	NS
Retained swab – clinical case scenario.	2.8	2.9	P=1.0	NS
Topic 3				
Being a team player.				
Description of teams.	27.8	34.3	P=0.79	NS
Stages of team development.	11.1	11.4	P=1.0	NS
Wrong site surgery – clinical case scenario.	58.3	39.0	P=0.15	NS

We were unable to measure the effect of implementing the safety curriculum using the WHO-validated questionnaire surveys on students' knowledge of patient safety (Table 4). However, a non-significant trend of increase in the value for most of the knowledge topics tested was observed, except for the wrong site surgery – clinical case scenario question.

The student Attitude survey showed a significant improvement in some attitude composites after the introduction of the Patient Safety Curriculum, with the students agreeing strongly that most healthcare workers make errors and reported a moderate level of knowledge regarding the role of the healthcare organization in error reporting, having only reported a low level of knowledge at baseline (Table 5).

An overwhelmingly positive attitude to patient safety across the range of attitude composites surveyed was detected at baseline and subsequently (Table 6) with no significant changes detected in most attitude composites before and after the introduction of the Patient Safety Curriculum. We observed a strong agreement that medical error is common, that drug errors occur commonly, and that staff training in patient safety is insufficient. They agreed that finding someone to blame for an incident was easier than focusing on the cause, and they felt able to talk about their own errors, recognizing the importance of reporting systems in improving safety (Table 7). They strongly agreed that by focusing on the causes of incidents they can contribute to patient safety and that by learning from mistakes future incidents can be prevented. They strongly agreed and acknowledged that error management was an important part of their job and an important learning goal during professional training (Table 8).

Table 5. Results of the Student Attitude Survey: Composite 1 – Knowledge of Patient

Safety

Composite 1 Knowledge of Patient Safety	Pre-Training		Post-Training		Independent Samples Mann-Whitney <i>U</i> Test	
	Mean	SD	Mean	SD	Significance (0.05)	Null Hypothesis
Different types of human errors.	3	1	3	0.9	0.398	Retain
Factors contributing to human error.	3	1	3	0.7	0.322	Retain
Factors influencing patient safety.	3	0.9	3	0.8	0.122	Retain
Ways of speaking up about error.	3	1.0	3	0.9	0.315	Retain
What should happen if an error is made?	3	1.1	3	0.8	0.016	Reject
How to report an error.	2	1	3	1.0	0.091	Retain
The role of the healthcare organization in error reporting.	2	1	3	1.1	0.006	Reject

Five-point scale used where:

1 = low level of knowledge, 3 = moderate level of knowledge, and 5 = high level of knowledge.

The key findings of this composite highlight the significantly improved perception of knowledge regarding what should happen when a mistake is made ($p = 0.016$) and the role of the organization in healthcare reporting ($p=0.006$).

Table 6. Results for Student Attitude Survey: Composite 2 – Safety of the Healthcare System

Composite 2 Safety of the healthcare system	Pre-Training		Post Training		Independent Samples Mann-Whitney U	
	Mean	SD	Mean	SD	Significance (0.05)	Null Hypothesis
Most healthcare workers make errors.	4	0.7	5	0.5	0.005	Reject
In my country, there is a safe system of healthcare for patients.	2	1	2	1.1	0.280	Retain
Medical error is very common.	4	1	4	0.8	0.208	Retain
It is very unusual for patients to be given the wrong drug.	2	1.1	2	0.8	0.548	Retain
Healthcare staffs receive training in patient safety.	2	1	2	1.1	0.838	Retain

Five point scale used where:

1 = strongly disagree, 2 = disagree, 3 = neutral (neither agree nor disagree), 4 = agree and 5 = strongly agrees

The students agreed that most healthcare workers make mistakes (4/5) and that the likelihood of medical error is ubiquitous(4/5)and strongly disagreed that patients receive safe healthcare(2/5)and healthcare staff receive adequate patient safety training(2/5).There was no significant difference in these desirable attitudes before and after the learning intervention.

Table 7. Results for Student Attitude Survey: Composite 3 – Personal Influence over Safety

Composite 3 Personal influence over safety	Pre- Training		Post Training		Independent Samples Mann-Whitney <i>U</i> Test	
	Mean	SD	Mean	SD	Significance (0.05)	Null Hypothesis
Telling another about an error I made would be easy.	3	1.1	4	1.1	0.279	Retain
It is easier to find someone to blame rather than focus on the causes of the error.	2	1.4	2	1.5	0.796	Retain
I am confident about speaking to someone who is showing a lack of concern for a patient's safety.	4	1	3	1	0.387	Retain
I know how to talk to people who have made an error.	3	0.9	3	0.8	0.086	Retain
I am always able to ensure that patient's safety is not compromised.	3	0.9	3	1.0	0.199	Retain
I believe that filling in reporting forms will help to improve patient safety.	4	0.7	4	0.8	0.111	Retain
I am able to talk about my own errors.	4	0.8	4	0.7	0.739	Retain

Five-point scale used where:

1 = strongly disagree, 2 = disagree, 3 = neutral (neither agree nor disagree), 4 = agree and 5 = strongly agrees

In the survey of personal influence over patient safety, the students felt strongly (4/5 agreement) that they could confidently speak about their own errors as well as when someone showing a lack of concern for patient safety but interestingly not confident about approaching someone who has committed an error. They also agreed(4/5) that filling in incident report forms would improve patient safety. They acknowledged (2/5) that it is easier to blame others than find the cause of the error. They felt ambiguous about being able to ensure patient safety is not compromised. Again, there was no statistical significance before and after the introduction of the patient safety curriculum.

Table 8. Results for Student Attitude Survey: Composite 4 – Personal attitudes to Patient

Safety

Composite 4 Personal attitudes to patient safety	Pre-Training		Post-Training		Independent Samples Mann-Whitney <i>U</i> Test	
	Mean	SD	Mean	SD	Significance (0.05)	Null Hypothesis
By concentrating on the causes of incidents, I can contribute to patient safety.	5	0.6	5	0.6	0.279	Retain
If I keep learning from my mistakes, I can prevent incidents.	5	0.5	5	0.6	0.796	Retain
Acknowledging and dealing with my error will be an important part of my job.	5	0.6	5	0.5	0.387	Retain
It is important for me to learn how best to acknowledge and deal with my error by the end of medical school.	5	0.9	5	0.9	0.224	Retain

Five point scale used where:

1 = strongly disagree, 2 = disagree, 3 = neutral (neither agree nor disagree), 4 = agree and 5 = strongly agree

With regard to the personal attitudes to patient safety, the students agreed strongly (5/5) across the board that they could contribute to safety by focusing on the cause of accidents, learning from mistakes, acknowledging that dealing with errors is an important part of a physician's job, and that learning how to deal with errors was an important educational goal at medical school.

5.0 Discussion

Our inability to measure the effect of our implementation of the safety curriculum on students' knowledge of patient safety using the WHO-validated questionnaire has similarly been reported in other studies(20); (37) , with some authorities advocating shifting the focus of efforts to inculcate the desired knowledge, skills, and attitudes from the early specialist phase to the undergraduate curriculum(38).The acquisition of skills and attitudes can be considered a process and a model describing the progress from novice to advanced beginner, competent, expert and finally master has been proposed(39).

In this study, the failure of the intervention to deliver a measurable improvement despite a high level of satisfaction with the content and delivery, as indicated by the University's routine evaluation forms, could in part be attributed to the language and structure of the survey assessing the knowledge component. In particular, the multiple-choice structure used (a root question with a number of answer statements, a combination of which was correct) may have resulted in erroneously low scores. The question was scored as correct only if the exact combination of correct and incorrect answers to the root question was provided, resulting in some learners scoring 0when many of the responses to the question were correct. This effect would have been exacerbated by the limited sample size. The survey questions were developed from an earlier questionnaire entitled “The Medical Students Patient safety Questionnaire” utilized in an earlier similar study, although the authors assert that measuring and describing the changes that result from an educational intervention is complex and that ultimately the outcome in the workplace is of paramount importance(20). These limitations notwithstanding, the questionnaire, were then specifically adjusted to be used in the evaluation of the WHO curriculum(20). This contention

that outcomes may be improved despite the failure of questionnaires to detect knowledge improvement is supported in another study(37) that was also unable to show a significant improvement in patient safety knowledge, and attitudes using a questionnaire after the introduction of “Booster Patient Safety Conferences” in the final year of medical training. The students were however able to reliably propose robust safety interventions when analysing and responding to safety events drawn from their clinical setting, implying that this might be a more effective method of assessing the efficacy of a patient safety educational intervention, as previously suggested. In a recent approach using a combination of questionnaires, simulations, and in service performance assessments, not only did all patient safety parameters show significant improvement but also the measured incidence of adverse events decreased significantly after implementation of the patient safety educational intervention(40). The role of patient safety teaching in the acquisition of competencies needed for safer healthcare with specific regard to the WHO curriculum has been described previously (8). In addition, our students spent two years of their four-year training in primary care, so both the nature(what are the most common and serious safety issues) and incidence(how many patients are harmed) of unsafe clinical practice are unknown(41).Although different despite some areas of congruence(e.g., infection control, communication, teamwork, etc.),the learning interventions would need to be better understood to be able to improve the methodology for assessment of both knowledge and skills improvements, resulting from patient safety educational interventions, particularly in the subset of error reporting as suggested by these results. In general terms, not only is the assessment of learning interventions considered complex but also the efficacy of lecture-based learning has been widely questioned(12), with concentration reportedly being held for a maximum of 18 minutes or so, no matter how interesting the material or compelling the

delivery, and then returning only sporadically for the last 5 minutes. The delivery of the topic content, at least in part, in the form of lectures can also be questioned as an effective use of limited time and resource constraints.

Given the difficulties in questionnaire-based assessment of attitudes, it is necessary to be reminded of the primacy of attitude as a determining factor in behaviour, including patient safety behaviour (the prime outcome measure of a patient safety educational intervention, as proposed by Flin (42) , and this relationship has been long established(43). Unlike the other studies cited, this study involved graduate-entry mature students who already had previous work and life experience, in addition to significant prior clinical experience and exposure to patient safety issues. In this group of students, the highly positive attitudes can be attributed to the nature and structure of the course, as the study sample included graduates from different fields related to medicine (nursing, dentistry, pharmacy, dietetics, psychology). From this cohort of mature graduates, using the McMaster pioneered multiple mini interview model(17), those with proven collaborative problem-solving skills and self-appraisal ability, as well as the ability to relate to others rather than just academic performance were selected for this study. Altruism as a motivation to study medicine as well as dedication to life-time learning and a collaborative learning and working style are also important components of the selection method. In addition to the integration of these skills into the required clinical curriculum and competencies, the school also objectively integrates these values and abilities to the formative and summative assessments, thus maintaining the requirements of safety and technical competence, as advocated in the systems approach to patient safety in medical education(44). Certainly, this early acquisition of desirable attitudes may be even more complex than initially thought and acquired prior to the start of medical training(45), particularly with regard to attitudes regarding empathy and

teamwork already firmly established in first year students from five different health professions, thereby defining the attitude which will guide safety behaviour at an early stage of training. In apparent contrast, the study conducted by Hoff, Pohl & Bartfield(46) suggested that an important component of the acquisition of desirable attitudes to patient safety arises from the dynamic process of interaction between trainer and trainee encountered particularly during every day clinical practice and that it is these interactions are the legitimate target of attitudinal and behavioural change (46).This study supports both the above tenets. Of particular note, the development of a “Safety Zone” during the year of the curriculum implementation supports their study. The Safety Zone arose spontaneously by student initiative. Once a week on campus, prior to the weekly academic debrief, students met to present and informally discuss any medical errors that they had either observed or been involved in, in the absence of a structure in the clinical setting to explore these experiences. Many issues around the different types of error, the disclosure process and secondary victims, a systems-based approach, and the importance of reporting in learning from errors were approached with reference to the day-to-day reality of student life in a clinical setting and referred back to components of the patient safety curriculum and would explain the significant changes detected in the attitude questionnaire. The experience at Columbia University Medical School(37) reported a similar unexpected phenomenon, commenting on the safe environment produced by the patient safety teaching sessions and the important role, in this context, of strong faculty role models and departmental behaviours that enable more active student participation in the established hospital reporting system that is already described as well resourced, mature, robust and places an emphasis on learning. The possible role of a “safe” environment to optimise student reporting has been put forward by others (47) including in the context of the Patient Safety Training curriculum(8).The in-house

compiled OSCE Manual(edited by a University of Algarve Medical School graduates Dr Luis Castelo Branco and Tania Gago and submitted for publication),another student initiative emerging during the introduction of our Patient Safety Training Curriculum, aimed to include important patient safety components(for example communication and handover, hand washing and prevention of healthcare associated infections, handover and communication, adverse incident reporting, and dealing with disruptive colleagues[Appendix C]) to provide model examination answers. The incorporation of these patient safety considerations, some explored in the simulator-delivered sessions of the curriculum, reflect the recognition of their importance in clinical practice, complementing the technical competencies. These two initiatives emerging during the introduction of the Patient Safety Curriculum suggest the less explicit role of an undergraduate Patient Safety Curriculum, i.e. of a catalytic matrix, “a nutrient soup”, of patient safety practice. Within this matrix of information and concepts, students dynamically interpret their unique clinical experiences and develop specific individual knowledge, skills, and attitudes according to their own inherent strengths and abilities, and the interaction of these with the perceived holes in the “Swiss cheese” that act as barriers to optimal, safe patient care. This dynamic role of The Patient Safety Curriculum in giving a structure to the process of medical education as proposed earlier, (39) is in line with Bucher’s work that identified the importance of the structure in which professional socialization took place and the interaction with peers and trainers was the strongest single determinant of the outcome of that process, even describing the language changes a particular medical group adopts when sharing an underlying belief system that it does not want to overtly disclose(48).

This study highlights the potentially innovative role of the Patient Safety Curriculum, i.e. of not only a source of content from which empty undergraduate vessels are filled but also a

framework helping students make sense and contextualise dynamic clinical experience, thus acting as a mechanism for developing strategies for safer patient care.

Berwick, in his thoughtful appraisal of the challenges faced in preparing medical students for improving healthcare, postulates that curricular integration is not sufficient(49), citing the segregation of clinical medical teaching from the complex context in which it is delivered, further exacerbated by the natural clinical environment where medical students are regarded as tenants rather than as landlords. This study suggests that this gap may be narrowed by both the introduction of the curriculum as well as the use of learning in a simulated environment. In particular, the role of simulation applied specifically to the learning and evaluation of critical safety attitudes as well as clinical and safety skills may well provide a more effective alternative to lecture-based activities and questionnaires. In a recent study involving medical, nursing, and pharmacy undergraduate students, simulator-based training and debriefing was able to significantly improve the knowledge, skills(especially communication and teamwork) as well as attitudes regarding patient safety(50).Innovative techniques utilizing simulated environments for assessment of patient safety performance are also emerging and found to be promising(51).One of the key limitations of the study is the very limited sample size; nonetheless this approach to medical education in general and to patient safety specifically was previously unknown in Portugal and as such a pioneering approach in Portuguese Medical Schools. This study despite its limitations highlights some important lessons and areas for future investigation. Firstly, the importance and benefit of a systems approach to education doctors. In this study, the particular strengths of the selection methods and the associated strength of baseline positive attitudes highlight this as an important strategy for other institutions selecting future doctors. The integration of the selection methods with the philosophy of the course in terms of assessment and

teaching methods, specifically the inclusion of patient safety parameters in both summative and formative assessments and the adoption of PBL methodology is in keeping with what is already known regarding 'hidden curricula and the lack of efficacy of lecture based learning. Despite the limitations of the study, an argument can be made for the adoption of these principles in Portuguese medical schools. This study has highlighted some of the methodological problems of questionnaire based assessments, particularly in non-native English speakers. The use of simulation based assessments, or specific task based competencies may provide more robust alternatives both for learning and assessment. This in our study appears to be especially true for the areas of error reporting where the base in primary care may have a greater influence than in other courses where this is not the case. This study suggests that further research in to the type and incidence of medical error in primary care and is important in understanding of patient safety in that context. It is known that academic , clinical as well as organisational context contribute to professional knowledge (52) This improved understanding of primary care may provide hitherto unexplored opportunities to enhance learning and assessment of patient safety. Finally the 'matrix' role identified in recent studies where an improved patient safety culture was measured following an unrelated patient safety intervention (53)

6.0 Conclusions

A number of healthcare professional bodies have defined a series of important Patient Safety Competencies but have not specified how they can be achieved. The Association of American colleges has declared an intent to ensure the preparedness of American medical Schools to deliver patient safety and quality Improvement by 2022.(54) In their extensive report, they outline the importance of integrating patient safety in the educational activity of the school including the assessment process. They recognise that this can only be delivered by a critical mass of motivated and engaged and trained educators. They stress the importance of the alignment of clinical and academic enterprises at both a local as well as a national level. In this study, the introduction of key components of the WHO Multi-Professional Curriculum Guide did not result in improved Patient Safety Knowledge as measured by the survey questionnaires, which is hardly surprising given the fact that the highly desirable attitudes to patient safety at baseline were objectively measured. Traditional lecture-based learning as well as questionnaire-based assessment of complex outputs in this study appears to be poorly suited to the task and the role of simulation is sub-optimally utilized in this regard. The high degree of desirable patient safety attitudes at baseline in this study suggests the important contribution of the selection process and systems-approach to patient safety learning in medical education by identifying suitable individuals with the desirable safety critical attributes and identifying the key areas in the learning process where these attributes can be modified and strengthened. The student initiatives of “The Safety Zone” and the “Safety Incorporated” Clinical OSCE’s Manual suggest that the introduction of the WHO Patient Safety Curriculum may have an important complementary role as a matrix providing skills, knowledge as well as positive role models and a safe environment where the required competencies can be explored, acquired and developed


appropriate to the level of training as well as learners needs, as defined by Dreyfus(39). Similarly, the model of medical error suggests that error is not the result of the failure of an individual at the patient-healthcare worker interface but is the result of a number of systemic inadequacies, both human and organisational, more distal to the point of care. Similarly, failure to successfully educate a healthcare professional in safe clinical practice is not the result of a single point intervention, but requires the systemic approach starting from candidate selection, strong faculty role models and safety culture, and the alignment of educational goals and practices in clinical competency to safe patient care. This study suggests that in addition to providing important content, the Patient Safety Curriculum provides a matrix which aligns these various components. Further research and a sounder understanding of the dynamic interactions between the required components of patient safety competencies, learner characteristics and how they can be identified and selected, and the clinical and learning environments can facilitate targeted development of the curriculum to support this novel “hidden” function. This improved tool would be more effective in guiding learner clinicians from their first tentative patient safety steps to a deeper understanding of the broader principles of safe practice and their application to complex and evolving clinical challenges. In the hope of delivering globally the laudable aspirations proposed by the AAMC, research priorities include how some of the key principles outlined in this study can be applied to classic medical education including developing a cadre of trained educators. Further research in to mechanisms and legislation to integrate academic and clinical efforts also needs to be undertaken.

7.0 Appendices


Appendix A: The Patient Safety Curriculum Guide: Multi-professional Edition

Appendix B: Student Survey Questionnaires and Data Collection Templates

Appendix C: Structured student evaluation sheet for evaluation of history taking clinical skills, illustrating both technical as well as patient safety competencies



Avaliação do Estudante - UC Clínicas





403-42367

Local de Avaliação: _____

Estudante: _____

Tutor: _____ Data: __ / __ / __

Preencha assim: 
 Valor das notas - 1: muito mau; 2: mau; 3: satisfaz; 4: bom; 5: muito bom; 6: excelente; NO: Não Observado.



Tipo de Acção do Estudante	Insatisfatório		Satisfatório		Bom		NO
	1	2	3	4	5	6	
Reconhece as funções da equipa de cuidados primários	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reconhece a abordagem generalista e tolera a incerteza	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entende o paciente como uma pessoa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstra capacidade de comunicação com o Paciente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstra capacidade para obter a história clínica	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstra capacidade para conceber um plano de gestão inicial dos problemas do paciente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstra conhecimento do Registo Médico Centrado nos Problemas (RMOP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reconhece o que é profissionalismo: cuida do equilíbrio pessoal e dos valores próprios (apresentação, pontualidade, assiduidade, organização, eficiência)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comunicação efectiva com o Paciente:
 - Assertividade: saber interpretar, vocabulário adequado, escuta activa, capacidade de dizer "sim", "continue" "hum, hum", "muito bem"
 - A proximidade adequada física em relação ao doente
 - Postura (body language)
 - Olhar, sinais com a cabeça, gestos, expressão
 - Tom de voz, ritmo, rapidez, clareza
 - Saber ouvir, saber explicar

Entender o Paciente como uma pessoa:
 - Ter em conta as ideias, preocupações e expectativas do Paciente, bem como os efeitos dos problemas na sua capacidade funcional
 - Demonstrar capacidade para entender o Paciente como um todo biopsicossocial
 - Tolerar e compreender as diversas experiências, crenças, valores e expectativas dos pacientes que possam afectar a oferta de cuidados de saúde

8.0 References

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