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SAFE PATIENT HANDLING EDUCATION: ANALYSIS FROM EUROPEAN HIGHER EDUCATION INSTITUTIONS

MARION KARPPI[1], JAVIER JEREZ-ROIG[2], KATI NAAMANKA[3], TERESA MIMOSO[4], ERJA SORMUNEN[5], VILMA DUDONIENE[6], EIJA MÄMMELÄ[7], ALDINA LUCENA[4], and LEENA TAMMINEN-PETER[8]

[1] Turku University of Applied Sciences, Turku, Finland
Faculty of Health and Well-Being, New Ways of Promoting Performance Research Group
[2] University of Vic-Central University of Catalonia, Vic, Spain
Faculty of Health Sciences and Welfare, Research Group on Methodology, Methods, Models and Outcomes of Health and Social Sciences (M_3O)
[3] Turku University of Applied Sciences, Turku, Finland
Faculty of Health and Well-Being
[4] Polytechnic Institute of Setúbal, Setubal, Portugal
Department of Physiotherapy
[5] Finnish Institute of Occupational Health, Helsinki, Finland
[6] Lithuanian Sports University, Kaunas, Lithuania
Department of Health Promotion and Rehabilitation
[7] Oulu University of Applied Sciences, Oulu, Finland
School of Health and Social Care
[8] Ergosolutions BC Oy Ab, Turku, Finland

Abstract

Objectives: According to current research, patient handling is not universally taught in academic nursing programs in Europe. Miscellaneous patient handling education may expose students and novice health care workers to occupational hazards, especially if the evidence-based contents of safe patient handling are not recognized. Health care workers deal with high physical workloads daily, which points out the importance of evidence-based curricula contents from the early phases of education. The aim of this study was to describe the patient handling education and to analyse the differences in curricula among higher education institutions (HEIs) in Europe. **Material and Methods:** The study used a cross-sectional design and was conducted in HEIs educating health care professionals in Europe. The data was collected through a Webropol questionnaire consisting of structured and open-ended questions. **Results:** Only 68.4% of the respondents stated that they have a framework that guides the patient handling education. Additionally, some answers referred to guidelines that are not adequate to be referred to as evidence-based guidelines on patient handling. There is variation in emphasizing workplace safety and risk assessment issues in the curricula, and variation in teaching of assistive aids. **Conclusions:** Currently the patient handling education in the studied HEIs does not meet the requirements of evidence-based practice.

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Corresponding author: Marion Karppi, Turku University of Applied Sciences, Faculty of Health and Well-Being, New Ways of Promoting Performance Research Group, Joukahaisenkatu 3, 20580 Turku, Finland (e-mail: marion.karppi@turkuamk.fi).

The establishment of a European-wide framework, including both theoretical and practical training for safe patient handling is needed. The inclusion of risk assessment and workplace safety issues is essential to improve the risk management knowledge and skills and further avoid work-related musculoskeletal disorders. Int J Occup Med Environ Health. 2022;35(5):615–23

Key words:
ergonomics, occupational safety, risk prevention, framework, assistive aids, patient handling

INTRODUCTION

Safe patient handling and mobility is not universally taught in academic nursing programs neither in Europe nor in the USA [1,2]; instead, the curricula on patient handling in health care workers' educational institutions are variable. There is variation in the instruction time, physically strenuous and unsafe patient handling methods are still commonly taught [3,4], professional quality standards and teaching materials are lacking, and teachers lack sufficient prerequisites for the proper teaching of safe patient handling [5]. Assisting the patients to move is considered as one horizontal core competence in health care professions; nevertheless, it has not received the recognition this multi-dimensional competence requires. As the research of patient handling has extended to the risk management approach [6], the requirement to explore the contents and methods of patient handling in health care students' curricula is evident.

Studies have found a high prevalence of musculoskeletal problems already among nursing students and a greater risk of injuries among health care students [7,8]. The cumulative effect of repeated manual patient handling activities and static awkward postures in care work is considered the main cause of work-related musculoskeletal disorders, which remains as the leading and most costly occupational health problem in care work in Europe and the USA [9]. Compared with other occupations, evidence shows that health care workers are subject to the highest risks of developing musculoskeletal disorders (MSDs), particularly for the spine and shoulder [6]. Once the health care professionals in the early stage of their career show a greater risk of work-related musculoskeletal diseases, the prevention of the risks should begin in the basic professional education. Miscellaneous patient handling curricula may expose students and novice health care workers to occupational hazards if safe patient handling perspectives are ignored.

In 1990, the European Union (EU) introduced a directive to protect workers against the risks involved in handling heavy loads [10]. It instructed on the minimum health and safety requirements for the manual handling of loads and was implemented in most European countries [11]. However, patient handling is more complicated than lifting loads and requires specific guidelines and risk assessment protocols for the care work. Few countries have established national guidelines, instructions by a professional body or university standards for patient handling. The International Consensus on Manual Handling of People in the Healthcare Sector as a state of science in reducing musculoskeletal injuries related to patient handling activities was published in the Technical Report ISO/TR 12296 in 2012 [12]. This sets out a model of risk management to include risk assessment of organizational aspects, the usage of adequate assistive aids and equipment, the evaluation of built environment and its design, and environment design, training, education, and an evaluation of the effectiveness of prevention [13]. Since 2009, Finland has had the national multicomponent "Ergonomic patient handling card"® program which includes the aforementioned elements. The benefits of the card program are widely accepted in Finland and the results are promising: the decrease in sick leave days due to MSDs, increase patients' safety, and the quality of care [2].

In this study, the concept of safe patient handling refers to the application of human factors [14] into patient assisting situations, in which the working methods are performed safely and by utilizing the patient's own rehabili-

tation potential. This includes a holistic and multidimensional approach across all patient handling situations, including a systematic risk evaluation, the patient's functional assessment, an optimized and safe environment, the usage of appropriate assistive aids, safe assisting methods and optimal working positions and body control of the worker. Safe patient handling requires knowledge and skills to apply evidence-based practices into different patients in a variety of environments, and a perception of legal and professional responsibilities of the topic concerned. Evidence-based safe patient handling is based on the researched information of the physical load in patient handling techniques and effectiveness of injury prevention in patient handling; therefore, it should be included in the curricula of the health care education [15].

The diversity in patient handling curricula described above raises questions on the grounds the education lies on and how diverse the patient handling education really is. The aim of this study was to describe the contents and grounds in safe patient handling and to analyze the differences in curricula between higher education institutions (HEIs) in Europe. The large-scale goal of this study was to highlight the differences in frameworks guiding the patient handling education and to suggest improvements to achieve the implementation of safe patient handling curricula into health care education.

The research questions were:

– What frameworks guide the teaching of patient handling education?
– How are the risk assessment and workplace safety issues emphasized in the curricula of the participating HEIs?
– What assistive aids are included in the teaching of patient handling contents?

MATERIAL AND METHODS

The data for this cross-sectional survey was collected via Webropol during January–March 2020 from HEIs in Finland, Estonia, Lithuania, Slovenia, Portugal, and Spain. The questions were derived from the analyzed core competencies of safe patient handling research [6,15–17] and the questionnaire consisted of both structured and open questions. The survey was conducted as a part of the EU project "RENE – Renewing ergonomic education for health care students in European HEIs," which develops an international course on safe patient handling based on current evidence.

The survey was sent to 116 HEIs: 2 in Estonia, 11 in Lithuania, 5 in Finland, 13 in Slovenia, 67 in Spain and 18 in Portugal. The survey was distributed inside each HEIs by the head of education, which prohibits the researchers to get information on the precise number of survey recipients. A reminder was sent 2 weeks before the survey's closure.

Statistical analysis

The data analysis combined the statistical quantitative approaches. Absolute and relative frequencies were calculated for categorical variables; median and range (minimum and maximum) were considered for quantitative variables. For bivariate analysis, the χ^2 test was used to analyze potential differences between proportions between countries and undergraduate programs. If differences were statistically significant ($p < 0.05$), the non-parametric Fisher's test was applied to test specific differences between all the categories of countries and programs. For quantitative variables, overall differences were tested with the Kruskal-Wallis test; if differences were statistically significant, the Mann Whitney test was used to analyze potential differences between every category regarding the reference. Finland was chosen as a reference country since it has had the national evidence-based guidelines for safe patient handling for <10 years [18]. Physiotherapy was chosen as a reference study program since ergonomics is included in physiotherapists' professional competences [19].

Ethical considerations

Permission to gather the data was given at the participating institutions according to each country's and university's national standards. The respondents were given written information about the aim of this study. The respondents were informed that participation in this study is voluntary and that answering the questionnaire was considered as informed consent to participate. The anonymity of the respondents and confidentiality were considered and protected by treating the data confidentially, and by asking the respondents to answer the questions anonymously.

RESULTS

Respondent characteristics

A total of 57 subjects responded to the survey. Thirty-six of them (63.2%) were from physiotherapy education, 11 (19.3%) from nursing, 3 (5.3%) from occupational therapy and 7 (12.3%) from other disciplines (e.g., radiography, midwifery, social gerontology) in social and health care. Most respondents were lecturers (N = 28, 49.1%) and heads of departments or program coordinators (N = 8, 49.1%); one of the respondents (1.7%) did not specify their position.

Frameworks guiding the safe patient handling education

In this study, 39 (68.4%) out of the total of 57 individuals responded to the question "If you can address, in which framework is the current course based on?" Among the respondents, 16 (41.0%) reported to have only 1 framework and the rest mentioned several; 8 respondents used the Finnish "Ergonomic patient handling card"® education scheme by the Finnish Institute of Occupational Health; 2 the Occupational Safety and Health Administration framework and another 2 the International Ergonomics Association. The World Confederation for Physical Therapy guidelines, the Portuguese National Occupational Health Plan, the Slovenian association for work safety for health care and other patient handling techniques like Kinaesthetics, Bobath or Paul Dotte's biomechanical method were mentioned once.

Risk assessment and safety issues in curricula

The results indicate that the respondents from Spain emphasize workplace safety significantly less than those from Finland. Professionals from Lithuania highlight workplace safety and risk assessment significantly less (Table 1). Biomechanics was significantly more emphasized among the respondents from Portugal. Besides, the nursing programs present significantly less emphasis on biomechanics and environmental design compared to physiotherapy. Movement analysis and biomechanics are topics less highlighted in other study programs than physiotherapy.

Teaching of assistive aids

Table 2 shows the taught assistive aids for patient handling. Overall, the most used were medical beds, sliding sheets (tube or separate sheets) and stand aids, whereas the compression stocking applicators were less commonly taught, followed by shower trolleys and ceiling lifts or wall-mounted lifts. According to the responses (N = 56), most assistive aids and devices were more frequently taught by professionals from Finland. Stand aids and compression stocking applicators are more taught by lecturers from Portugal. Responses from Slovenia and Estonia presented the lowest proportions for the six items. However, according to the χ^2 test, the differences between respondents by countries were not statistically significant.

DISCUSSION

The primary aim of this study was to find out the current situation of safe patient handling education in respondents from HEIs in 6 European countries and to analyze the differences. Also, the goal was to discuss the differences in frameworks guiding the patient handling edu-

Table 1. Analysis of safe patient handling topics emphasized in curricula according to respondents from European higher education institutions, by countries and study programs

Safe patient handling topic	Participants (N = 57) [%]											
	country							study program				
	Finland (ref.) (N = 17)	Spain (N = 12)	Portugal (N = 10)	Lithuania (N = 10)	Estonia (N = 4)	Slovenia (N = 4)	p*	physiotherapy (ref.) (N = 36)	nursing (N = 11)	others (N = 10)	total	p*
Movement analysis	82.4	100.0	100.0	90.0	75.0	75.0	0.382	97.2	90.9	60.0**	89.5	0.003
Biomechanics	58.8	75.0	100.0*	70.0	75.0	50.0	0.270	94.4	27.3**	40.0**	71.9	<0.001
Environmental features	82.4	50.0	70.0	50.0	50.0	50.0	0.401	66.7	54.5	60.0	63.2	0.025
Environmental design	94.1	58.3	80.0	90.0	100.0	75.0	0.164	88.9	54.5**	90.0	82.5	0.025
Workplace safety	100.0	66.7*	80.0	70.0*	100.0	75.0	0.167	83.3	72.7	90.0	82.5	0.568
Risk assessment	94.1	75.0	90.0	60.0*	75.0	75.0	0.338	80.6	81.8	80.0	80.7	0.994

* Chi-square test.
** Fisher's test

cation, and to suggest improvements into safe patient handling curricula. The response rate to the survey was low as we received answers from 57 respondents. Still, the results represent the HEIs in geographically different parts of Europe, which allows preliminary interpretation of the results as indicative.

Evidence-based framework and guidelines are fundamental in teaching safe patient handling. However, the open-ended questions revealed that the criteria for evidence-based practice is not fully comprehended among the respondents. The respondents mentioned they follow frameworks that do not consist of procedures avoiding heavy lifting, using assistive aids or assessing the physical risks, as guided in the technical report [2]. Hence, the technical report gives general guidelines for risk management in the health care sector. In our study, one out of three respondents followed a specific framework in safe patient handling.

Nevertheless, our study revealed that the environmental features, environmental design, workplace safety and risk assessment were mentioned as included in the content of patient handling of all institutions participating in the study. This may indicate that the respondents recognize the importance of environmental features and risk assessment and utilize them without perceiving them as a part of an evidence-based framework. The guidelines of The World Confederation for Physical Therapy and International Ergonomics Association were mentioned as utilized frameworks; however, those guidelines' contents are too generic for safe patient handling. Surprisingly, the British guidebook *The handling of people* [17] or the technical report about manual handling of people in the healthcare sector [2] were not mentioned, which reveals lecturers' lack of knowledge.

The status of health care educators' knowledge and skills on evidence-based safe patient handling content remains unclear. Our results support the previous studies of Frost and Barkley [20], in which it was found that outdated

Table 2. Analysis of assistive aids and devices included in safe patient handling curricula, according to respondents from European higher education institutions

Assistive aid/device	Participants (N = 56) [%]							
	total	Finland (ref.) (N = 17)	Spain (N = 12)	Portugal (N = 10)	Lithuania (N = 9)	Estonia (N = 4)	Slovenia (N = 4)	p*
Medical bed	91.1	94.1	100.0	70.0	100.0	75.0	100.0	0.095
Sliding sheets	82.1	94.1	83.3	70.0	88.9	75.0	50.0	0.315
Sliding board	80.4	94.1	66.7	90.0	66.7	100.0	50.0	0.134
Coach/stretcher	48.2	58.8	66.7	40.0	33.3	25.0	25.0	0.392
Stand aid	67.9	76.5	41.7	80.0	66.7	75.0	75.0	0.389
Lift								
mobile								
active	48.2	70.6	58.3	50.0	22.2	0	25.0	0.053
passive	55.4	82.4	58.3	40.0	44.4	25.0	25.0	0.093
ceiling/wall mounted	37.5	41.2	58.3	40.0	11.1	25.0	0	0.169
Slings	37.5	52.9	41.7	50.0	22.2	0	0	0.147
Shower chair	46.4	52.9	41.7	50.0	66.7	0	25.0	0.293
Shower trolley	32.1	47.1	25.0	30.0	33.3	0	25.0	0.545
Compression stocking applicator	19.6	17.6	16.7	40.0	22.2	0	0	0.450

* Chi-square test.

methods are still used in patient handling education and the educators are unaware of that certain procedures may even cause injuries. The educators have inadequate access to proper assistive technology or the educators' perception of patient handling is not based on the current evidence. Our findings, indicating the lack of specific framework guiding the patient handling education, go in line with the results of the previous studies [5,21].

Our study showed that movement analysis, biomechanics, environmental features, environmental design, workplace safety and risk assessment contents, which form the basis of evidence-based curricula, were highly covered in the six studied countries, but still there were significant differences between the study programs. Biomechanics is inherently included in the physiotherapy program, since they are movement specialists having an extensive background in biomechanics and kinesiology [4]. It is notable that workplace safety and risk assessment issues are significantly less emphasized in Lithuania and Spain.

The nursing programs' curricula contain significantly less hours in all the 6 evidence-based topics compared to physiotherapy programs. Nurses transfer patients and assist them to move in everyday activities and they are frequently exposed to high physical workloads [7,22,23], which leads to increased risk of work-related musculoskeletal disorders. Our findings show that the environmental design topics are significantly less covered in nursing programs than in physiotherapy. The environmental design is a prominent issue in the safety and risk reduction procedure; hence it should be included more distinctively in safe patient handling education in nursing programs.

Our survey showed that the HEIs teach how to use several assistive aids, such as sliding materials, sliding boards, rollators, crutches, wheelchair, and walking frame. However, in responses from Finland, 70–80% teaches the use of mobile or ceiling lifts, and in other countries only half or less report to have lifts included in curricula contents. This raises questions how the education can ensure the prevention of extensive overload and back injury among health care workers during their daily duties? Previous research shows that some educators have false beliefs regarding the usage of assistive aids, such as considerations of assistive aids as deteriorating the therapeutic value or leading to functional decline, loss of patient independence, or decrease of functional status scores [24]. The knowledge promotion of the advantages of assistive aids is obviously needed, not only from the perspective of health care workers' safety at work, but also from the perspective of patients' safety.

The most significant difference between the countries is the lack of a specific framework in patient handling education. Only Finland has established an evidence-based framework whereas the other educational institutions rely on national or professional guidelines, which are not specific enough to guide safe patient handling. Despite of the Finnish guideline, the study of Tamminen-Peter et al. [2] reveals that only some of the institutions in Finland have safe patient handling as a compulsory part of the curriculum. The dissemination of safe patient handling to the workplaces has been faster than to the HEIs, partly due to Finnish legislation requirements of workplace risk assessments and partly due to aspirations to reduce musculoskeletal disorders [2]. The systematic safe patient handling education has decreased the musculoskeletal related sick leave rates by 26–30%. In addition to the fact that the safe patient handling education promotes the well-being of the health care workers, it has an impact on the financial savings. In addition, the evidence-based patient handling education evolves qualitative improvements in patient care, such as the fluency and organization of the work tasks as the work is planned better, the nurses activate the patients' own rehabilitation potential more and patients are less aggressive [2]. For further studies, we suggest investigating the efficient solutions for improving the dissemination of safe patient handling protocols into different stakeholders' practices.

Limitations of the study

The limitations recognized are related to data gathering and the questions formed in the survey. First, the response rate was relatively low considering the number of HEIs the survey was sent to. Due to national regulations in some countries, the survey distribution inside the organizations was allocated only to leaders, which is one of the reasons for the small number of respondents. Even though the questionnaire was piloted, the sampling for piloting should have been done more heterogeneously.

CONCLUSIONS

The current situation in patient handling education in the studied HEIs was not based on evidence-based practices, which indicates the need to standardization and establishment of a framework for safe patient handling. A risk assessment and workplace safety issues should be included in the education of safe patient handling in all health care institutions. In addition, the scope of education should be standardized to include both theoretical and practical training. This would create wider knowledge for health care students to manage risks and ensure the use of safe patient handling methods in patient handling situations, and further avoid the work-related musculoskeletal disorders. There should be unified requirements for safe patient handling education, and European-wide standards to guide educational institutions as they play a key role in the education of the future professionals.

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