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A peer-education based disaster medicine course to turn medical students into a useful resource

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ABSTRACT

Introduction: The Italian medical curriculum lacks a multidisciplinary disaster medicine course. The purposes of the present research were to verify whether a peer-education based disaster medicine training programme addressed to medical students could be effective in improving their knowledge of this topic.
Methods: The contents of the "In-hospital disaster response and rescue" training programme refer to three thematic areas concerning medical, technical and psychological/social issues. The topics were chosen with the aim of providing students with both technical and non-technical skills about disaster medicine through a peer-education based course. A "Knowledge Test" and an "Attitude Test" were submitted to the participants, who formed the experimental group, and to a control group composed of medical students who had not attended the course. Pre- and post-test course scores were analysed and compared.
Results: One hundred and twenty-five students took part in the course. Forty-four of them were included in the present research and compared to an equivalent control group of students. There was no significant difference either in the Attitude or in the Knowledge pre-test scores obtained by the control group and the experimental group (Attitude: 44.48 vs. 44.07 $p > 0.05$ and Knowledge: 8.34 vs. 8.02 $p > 0.05$). Post-test scores were lower in the control group than in the experimental group (Attitude: 45.07 vs. 50.16 and Knowledge: 9.40 vs. 20.10) and the comparison between pre- and post-test scores showed a significant difference between the control group and the experimental group (Attitude: $0.59 < 6.09$ $p:0.000$ and Knowledge: $1.05 < 12.08$ $p:0.000$).
Discussion: The training programme proved its efficacy in improving medical students' knowledge of disaster medicine. Peer-education resulted to be an effective teaching technique in transmitting the contents of the course to the students.

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1. Introduction

Both natural and man-made disasters have always been part of human history, but in recent years their scale and consequences seem to be magnified. Soon after the 2001 anthrax attacks, the Columbia University Centre for Public Health carried out a series of educational programmes about bioterrorism addressed to physicians which showed that most participants seemed to be concerned about the topic but ill-equipped to deal with such concerns [1].

After events such as September 11/2001 and the threat of weapons of mass destruction (WMD), many medical schools in different countries included disaster medicine

programmes in their curricula. In 2003, the Association of American Medical Colleges (AAMC) recommended to include bioterrorism education and response training in all United States medical school programmes [2]. Medical students' training in disaster medicine is often not sufficient, and only recently have several medical schools around the world developed disaster medicine courses [3,4]. In 2010, Scott et al. demonstrated that medical students can rapidly learn core elements of disaster medicine thanks to a course added to the traditional university curriculum [5]. In Germany, federal laws have been issued with the aim of letting medical students become familiar with disaster medicine [6] and in 2010 Pfnigger et al. developed a disaster medicine curriculum to improve medical school students' knowledge of this topic [4].

Even if disaster medicine is an issue currently dealt with on an international level, there are uncertainties about the best didactic methodology to teach it. The University of Birmingham in the United Kingdom developed a peer-led tuition programme about basic life support. In this programme senior healthcare students trained their younger colleagues [7] and seemed to make reliable assessments of their peers in the final tests [8]. Peer education is a teaching technique where people from a similar age group, background, culture and/or social status educate and inform each other about a variety of issues.

The purpose of the present research was to verify whether a peer-education based disaster medicine training programme addressed to medical students could be effective in improving their knowledge of this topic.

2. Methods

Since 2008 a course called "In-hospital disaster response and rescue" has been held at the Medical School of the University of Florence. The course has been proposed to medical students as an elective didactic activity and is made of 4 sessions of 4 h each, for a total of 16 h. It has been held for six years, from the academic year 2008–2009 to the academic year 2013–2014. Statistical data presented in our research refer to the courses which took place from the academic year 2008–2009 to the academic year 2010–2011. The training programme aims at providing medical students with basic knowledge and skills to support hospital staff in case of in-hospital mass casualties events. The course is composed of three main sections.

2.1. Medical area

This module was developed to enable students to intervene with efficacy and in safety conditions in case of mass-casualty emergency. START triage protocol, both Paediatric and Adult Basic Life Support and Trauma First Aid are among the main issues dealt with in this module.

2.2. Psychological/social area

People's possible behaviours in case of emergency, communication skills and language problems are presented in this module.

2.3. Technical area

This module is composed of an engineering section (emergency and evacuation plans and CBNR safety devices), a chemical section (potential dangerous chemical in hospital areas) and a fire-fighting section (evacuation, simulation and basic fire-fighting techniques).

In the very first course (October 2008) trainers were part of a multidisciplinary team composed of young doctors, engineers, linguists, psychologists, chemists and fire-fighting technicians, but at the end of the first cycle of lessons some of the participants chose to become trainers themselves through a specific 2-steps programme (becoming co-trainers first and trainers later). This way the course went on, applying peer-education as teaching technique.

All participants were asked to fill in a pre-test composed of a "Knowledge Test" and an "Attitude Test". The same tests were submitted again at the end of the course (post-tests) to the students who had attended the course who formed the experimental group. The same tests were also submitted to a control group of medical students who did not attend the course. Pre- and post-tests were submitted with a four week interval in order to match the course timing.

The "Knowledge Test" was a twenty-question questionnaire about elements of disaster medicine with five possible answers per question (only one answer was correct; one point was given if the answer was correct and 0 points were given if the answer was wrong or incomplete). The "Attitude Test" was a test which described an in-hospital emergency situation and three situational scenarios in which the students had to identify with the characters and choose the best option. Each scenario was followed by some questions, for a total of thirteen items. The students had to choose what they considered the right solution on the basis of their experience and to express their choice using a 1 (excellent) to 5 (wrong) Likert scale.

We took into consideration the following variables in order to compare the two groups of students: Pre-course Attitude score, Post-course Attitude score, Pre-course Knowledge score, Post-course Knowledge score. For each variable the difference between pre- and post-test scores was calculated.

Normal distribution data were analysed through "Paired sample t-test" and Non-normal distribution data were analysed through non-parametrical tests ("Wilcoxon–Mann–Whitney Test" and "Wilcoxon Signed Ranks Test").

3. Results

One hundred and twenty five medical students from the 3rd to the 6th year took part in the course, as shown in Table 1.

As explained above, samples were made homogeneous for what concerned the following variables: "Sex", "Course year" (63.6% of the students were attending the 3rd year and 36.4% students were attending the 4th year) and "Previous First Aid Courses Attendance" (77.3% of the