

Undergraduate Training in Occupational Health at Kocaeli University Medical School: A Turkish Experience

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Received September 22, 2004 and accepted July 29, 2005

Abstract: Processes and conditions of production may produce unhealthy effects. Both must therefore be included in the education of health care personnel. Vocational training in occupational health at Kocaeli University Medical School, Turkey aims to demonstrate students that occupational health is a specific and important area of work within the context of primary health care. This research is a cross-sectional study. It was planned as a three stage study: 1- reviewing literature and grouping of countries according to their occupational health curricula; 2- reviewing the occupational health programs of medical schools in Turkey, and 3- recommendations for an occupational health curriculum to include an occupational health vocational training period of one week in the two month public health education program for medical interns. During this experience, senior students would be assigned to workplace health units. Of 283 medical schools found on the web, with occupational health teaching, only 20 have a curriculum that includes training in workplace health care units. In Turkey, there is no structured practical education on occupational health. In the third part of this study, we initiated at Kocaeli University School of Medicine's curriculum, a new occupational health education model applied in the workplace health units of factories. Practical experience of occupational health in the workplace is useful in introducing the community-based approach to occupational health in undergraduate medical education and understanding the determinants of health in industry.

Key words: Medical education, Occupational health, Workplace-based training, Practical education, Curriculum, Internship, Apprenticeship, Turkey

Introduction

In every society, educational institutes have formed the necessary backbone via which knowledge is passed through generations, through both theoretical and practical channels. Education with this characteristic is more effective in determining infrastructure than other elements of superstructure¹. Medical education is a dynamic process responding to changes in the mode of production of physicians. This process which is very complex can be analyzed at two different levels. The first is directly related to the question of “what kind of physician do we want to

produce?”. These will determine the processes of undergraduate education including occupational health education. The second level is related to the question of “what kind of physician do we need to educate in occupational health?”². The answer to this question is directly related to the kind of health care system in which physicians are being employed. The aim and content of health services in a country determines the medical education programs basically.

Discussions on the aims of medical education have intensified in recent years. For example the Edinburgh Declaration (August, 1988) of the World Federation for Medical Education (WFME) stressed that medical education should reflect the priorities of the population served, and that education should take place not only in hospitals.

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The Edinburgh Declaration contains the following suggestions:

1. Enlarge the range of settings in which educational programs are conducted, to include all the health resources of the community, as well as hospitals.
2. Ensure that the curriculum content reflects national health priorities and the availability of affordable resources.
3. Ensure continuity of learning throughout life, shifting emphasis from passive methods so widespread now to more active learning ones, including self-directed independent study, and tutorials...³⁾.

In the same year, another meeting coordinated by the World Health Organization (WHO) Regional Office for Europe emphasized the same topics of the Edinburgh Declaration⁴⁾. The main point that came out was to prioritize the health problems of specific countries when preparing medical education programs⁵⁾.

Since the process and conditions of production in which an important part of human life is passed include and produce unhealthy conditions, the places and the processes of production must be considered in the education of health care personnel. If neglected, it is very clear that undesirable developments in health care systems could appear. For this reason, in preparing medical education curricula, attention should be paid to the relation between health and the processes of production that generate or have the potential to generate unhealthy conditions. Moreover, medical education should also consider health units in production process. In other words, medical education should be able to edify the effects of work on health and workplaces.

The Joint International Labour Organization (ILO)/WHO Committee on Occupational Health defines occupational health as, "...the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job"⁶⁾. Within the framework of this definition, the physician has a significant role in providing health services in workplaces. Occupational health practices, historically based on monitoring the effects of work on health in workplaces are becoming widespread by the developments especially in mining and in manufacturing industries.

Occupational health physicians are key players in a team dealing with disease and accident prevention. The physician's

expertise and the administrative capability of his/her team are determinant factors in the smooth performance of an occupational health unit in the workplace. A physician needs both theoretical background and the capacity to blend this knowledge and abilities with experience⁷⁾.

Current Situation in Turkey

Occupational health is defined as a specialized area of work by WHO and is part of undergraduate and postgraduate medical education programs in a number of countries. Unfortunately, it is often a theory only based on lectures and practical education is limited to factory visits especially in the undergraduate medical curriculum. These didactic lectures are frequently given as part of the epidemiology and public health curriculum⁸⁻¹²⁾.

In the Kocaeli University Medical School's Curriculum, occupational health lectures are mainly a part of the public health lectures in the third year. It includes visits to one or two industrial operations followed by discussions with reference to these visits. Additionally, a lecture of two hours is given in the last year in the primary health care unit.

With respect to administrative arrangements in Turkey, health care delivery is organized on a population-basis, with priority to rural areas, and provided as a team in primary health care units. Medical interns in our country get vocational/practical training in primary health care units for one or two months.

In the years that administrative arrangements were initiated (early years of the 60s') nearly 31.9% of the population lived in cities. Today, according to the 1997 estimates 65% of the population is living in urban areas¹³⁾. Labour market in urban areas has shifted from agriculture to industry and service sectors. In the first half of 2002, 19.8% of the total employment was in industry, 45.6% is in the service sector and 30.5% is in the agriculture sector¹⁴⁾. But, 48.5% of people working in agriculture are unpaid family labour. Considering the fact that people having any social insurance are working in sectors outside of agriculture, both health care organization and medical education of health manpower should be revised urgently. Workers, insured and uninsured, and their families are under greater risk than the rest of the population.

Kocaeli is one of the most industry-intensive cities in Turkey. According to latest statistics, this city is home to 1.8% of Turkey's industries. In particular, 12.3% of Turkey's manufacturing plants are located in this city. Of this, 31.7% are in the chemical industry; 18.8% are in the basic metal industry; 12.4% are in the machinery industry, and 8.4% are in electrical tools industry. Because of this concentration of economic activity in this city, the gross national product

per capita in Kocaeli is US\$ 6,236—that is almost three times the gross national product per capita of US\$ 2,847 for the whole of Turkey.

Medical education should consist of occupational health in order to educate the students about production process health relations, tasks and responsibilities of the occupational physician. Otherwise, necessities for medical education pointed out in international documents could not be met.

Objectives

The objectives of this study are to review the occupational health programs of medical schools in Turkey and the world, and present our model for vocational training in occupational health.

The objective of this vocational training in occupational health at Kocaeli University Medical School is to change medical education from being clinic-based to community-based. In order to implement a community-based approach to medical education, a model located in workplace health units, has been designed consisting of an apprenticeship in occupational health aimed to make clear to students that occupational health is a specific area of work within the context of primary health care.

Materials and Methods

The study was planned in four stages: The first stage was a literature review conducted from December 2001 to May 2002. Before detailed curricula were reviewed, countries were categorized by both their health care systems and occupational health practices. Health care system categorization was done according to the criteria of Elling who proposed a new approach for comparing nations' health care system. He categorized nation states into six groups according to their government policies, workers' movements, welfare spending, and health and welfare services¹⁷. Totally 16 countries, which could be categorized into one of the six groups without any interference with other groups, have been chosen, and their public health and occupational health education programs have been tried to reach. The countries chosen were the United Kingdom(UK), Italy, Germany, France, Norway, Sweden, Denmark, Finland, Poland, Romania, Bulgaria and Russia from Europe; the United States (USA), Canada and Cuba from America; and Japan from the Far East. The research has been carried out via internet^{18–23}.

During our web search, we first located medical schools with published online curricula. We, then, narrowed down the numbers, by looking at only those that had occupational health programs listed. Once we had identified medical

schools with occupational health programs, we then proceeded to examine these programs in further detail.

Surveys were mailed to medical schools that did not have webpages, or had offered little information on their occupational health programs. In particular, they were asked if they had vocational training programs that were held at the workplace and, if so, to give us some information about them.

In the second stage of this research, we examined occupational health practices of medical schools in Turkey. Webpages of all universities (n=48) were examined, using the same criteria we had used for foreign universities.

Subsequently, we examined the content of these training programs. For this purpose, the 'Occupational Health Vocational Training Portfolio' was prepared with the aim of serving as a detailed framework for a step-by-step training program. Every medical intern was obliged to apply their own 'Portfolio,' which was handed out to them at the beginning of the program. The content of the 'Portfolio' is based on the laws and regulations in Turkey, especially *Statuses on Working Conditions, Tasks and Responsibilities of Occupational Physicians*, as well as the production processes of three factories to which we sent our medical interns for practical training.

Finally, the medical interns were sent to the three factories, which produce automobiles, metal tools and tires, for a one-week practical training program during which they were to apply their own 'Occupational Health Vocational Training Portfolio'.

In Turkey, the occupational health education that includes a practical training program at workplaces has been in place since February 2002. Primary health care internship at Turkish medical schools is held over a period of eight weeks. This means that every two months, a new team of eight or nine students would be assigned to the Public Health Department of our Faculty. During their first week of internship, they would learn about primary health care issues, including occupational health. This is followed by a six-week practicum with affiliated governmental health care units. Upon completing their internship, these interns are expected to write a pre-test about the practical issues of occupational health. Armed with their Portfolio, these students are then grouped into teams of two or three, and sent to the workplace health units at the three factories.

These three factories were selected because they have somewhat standardized workplace health units that are suitable for students to do their practical training. It may have been preferable to use small- and middle-sized workplaces for the practical training program, especially

Table 1. Occupational medicine practical training in medical schools' curricula

Region/ country	Number of schools found via the internet	%	Number of schools with websites	%	The number of schools sent e-mail	Number of responses to e-mail	%	Total number of schools with training in healthcare unit in workplace
USA	125	44.2	116	47.5	115	23	20.0	15
Canada	16	5.7	15	6.1	15	2	13.3	3
Japan	8	2.8	7	2.9	7	0	0	no information*
Europe	134	47.3	106	43.4	106	8	7.5	2
TOTAL	283	100	244	100	243	33	13.6	20

*Websites were in Japanese.

since these often have the highest occupational fatality rates, and the highest incidence of occupational accidents and diseases in Turkey^{15, 24}). However, doing so would mean that the medical interns would be exposed only to occupational health and safety problems that are peculiar to Turkey. Moreover, it would not be possible to standardize the program across the different workplaces. Additionally, the interns lack supervision, since most of the smaller factories do not have a full-time physician working there.

Results

Occupational health practice education in some countries of the world

Our Internet search identified 283 medical schools in 16 different countries. Two hundred forty-four (or 86.23%) had websites, and e-mails were sent to 243 (85.9%) of them (Table 1). Out of the 243 schools, 33 schools (or 13.6 % of our total population sample) responded to our email inquiries, with only some of them having occupational health program in their curriculum.

Upon evaluating their online curricula and the answers sent in response to our e-mails, it became apparent that there were occupational health programs in nine universities in the European region: three were located in the UK; one in Italy; one in Norway; one in Sweden; one in Poland; and two in Finland. Out of these, only two schools in the European region had practical occupational health education on their websites: (1) Padua University, Italy (*no details*), and (2) Turku University, Finland (*4 h practical education in factories*).

Ten e-mails sent to medical schools in the European region were returned because of address change or errors in their e-mail addresses. We obtained a total number of five responses: two from Finland; two from the UK; and one from France. One of the responses from Turku University, Finland, contained the information given above. The other

Finnish respondent, University of Kuipio, explained that their occupational health education program included a one-day workplace examination. Aberdeen and Liverpool Universities in the UK, and the University of Paris in France, stated that they do not have practical education programs.

Of the American and Canadian medical schools we found that offered information on their websites, 92 had no practical occupational health education programs, and only 14 had theoretical occupational health education programs.

There are 18 schools in the USA and Canada that provide practical occupational health education in workplace health units. The content of occupational health education in these countries reveals four characteristics in these countries. First, in these programs, training is largely theoretically oriented. Secondly, it is clinic-based. Thirdly, it is an elective for senior students. And, finally, even if there are factory visits, the students are only there to observe and do not gain any practical, hands-on experience while attached to these workplace health units.

We have no information on occupational health education in Japan, whether through the medical schools' websites, or through e-mail inquiries. We also could not find any on occupational health education programs in Cuba.

Occupational health practical education in Turkey's medical schools

The most recent research on occupational health education at the undergraduate level in Turkey was conducted at the end of 1998. The research was based on data collected through a questionnaire survey that was distributed to 27 of 29 public health departments in 42 medical schools. In addition to occupational health lectures given to third year students in 70% of the schools surveyed, but only six offered opportunities for practical education. Even then, these opportunities were limited to visits to industrial facilities²⁵).

In June 2002, an attempt was made to ascertain public health curricula of medical schools in Turkey via the Internet,

Table 2. The content and framework of the occupational health internship program at Kocaeli medical school

<i>General Principles of Occupational Health</i>	
comprehend these;	
<ul style="list-style-type: none"> • the association between occupation and health • definition of occupational accident • definition and classification of occupational diseases and work-related diseases • measuring the indicators of occupational health • prevention (protection at source, personal protecting, etc.) 	
<i>Legal Arrangements in Turkey</i>	
learning these;	
<ul style="list-style-type: none"> • educational requirements and method of appointment of physicians at workplace health units • organization of workplace health units • registries • responsibilities of the physician and the employer • the activities to the commission of workers' health and workplace safety 	
<i>Practices of occupational health and workplace safety</i>	
fulfill these;	
<ul style="list-style-type: none"> • to evaluate the workplace hazards and risk by the flowchart • to conduct physical examinations and to learn the procedure for periodic examination • to evaluate the noise, light, vibration, etc. at the work environment • to complete a occupational accident form 	

but only 13 schools had websites. Out of the 13 schools, Akdeniz University Medical School stated that there was 'occupational health practice' for four hours as part of the public health program for medical interns. According to responses given to e-mails, this exposure included a 20-min video presentation in the electrometallurgy factory, followed by a factory tour by technicians. The students that attended the session were then divided into four study groups to discuss their observations and findings. The topics of these workshops included the general evaluation of the workplace, based on the sketch of the enterprise and the numbers of workers and their tasks; a discussion with an occupational health physician on the occupational health practices; an examination of workplace's records; and a discussion with an occupational health and safety specialist on procedures and records of occupational diseases.

Vocational training on occupational health in Kocaeli university medical school: an experience of a model

Permission by the faculty board of management was obtained before we set up the implementation of vocational training in occupational health at Kocaeli University Medical School. Interviews were, then, conducted with authorized persons at the factories that were selected for the occupational health training programs.

After required permissions were obtained, Kocaeli

University launched its vocational training in occupational health in February 2002 as a one-week internship in primary health care. In the workplace health units of factories, students work full-time with occupational health physicians. During this one-week practicum, and according to the guidelines laid forth in the 'Occupational Health Vocational Training Portfolio', students are expected to learn about the organization of occupational health and safety services in the workplace, measurements used in occupational health and their interpretation, risk factors in the workplace, the preventive measures against occupational diseases and injuries, and the responsibilities and authority of occupational health and safety personnel.

To evaluate the success of the program being implemented, each medical intern are surveyed both prior to, as well as after completing the practical training program. The issues that were evaluated included the laws and practices of occupational health and safety in Turkey, the work conditions at factories, and workplace risks and hazards. The questions in the pre-test and in the post-test were standardized. There are 20 questions that examine the students' knowledge of the general principles of occupational health, the laws in our county, and, finally, practices of occupational health and safety (Table 2).

To summarize, students participate in the practices and meetings that occupational physicians are involved in and

attend. During the apprenticeship period, each of the two instructors, are responsible for the occupational health vocational training program, visit the place of vocation twice and evaluate the students progress with the participation of the occupational health physician. At the end of the vocational training period, the students tell each other of the activities they were involved in at the factories for a week, and discuss their experiences with the participation of the academicians.

Discussion

Recent discussions on undergraduate medical education emphasize the importance of community-based instruction and some faculties have changed their curricula to encompass community-based education fully or partially. In Turkey, these also occur. "Occupation" is an important determinant of human health. For this reason, understanding the relationship between health and work is a necessary component to be a part of medical education, but often the subject is limited to a few lectures on occupational health or occupational medicine. Yet, occupational health education should be adequately represented in the changing context of medical education. Living in the workplace environment would be instructive for a medical student in order to comprehend occupational health and safety. Community-based education on occupational health would give the student a practical understanding of the topic. Unfortunately, this study suggested that usually occupational health education is still being taught in a traditional way. The study's origin arose out of the need for much more thinking on different and more effective methods for occupational health and safety teaching.

Undergraduate occupational health education is didactic in most of the 120 medical schools of the USA and usually a part of public health or epidemiology courses. These courses (Public Health or Occupational Health, say which) usually are 2–4 h a week and occur in the second or the fourth year. Clinical and research rotations are rare and usually are electives. Nowadays, there are three special programs supported by National Institute of Environmental Health Sciences, Program of Academic Awards in Occupational and Environmental Medicine and National Institute for Occupational Safety and Health^{9,26)} to increase the number of studies on occupational and environmental issues.

Israel seems to have the most comprehensive occupational health education programs. Occupational health is taken into account at all levels of education; i.e. undergraduate and graduate. In Tel-Aviv University Medical School, it is

stated that in the second year of their education, students have courses on health education, health promotion and occupational and environmental health for 30 h. In the fifth year, students are involved in factory programs for a full day within the framework of a course in preventive medicine. In addition, they have "hands on" experience in occupational health clinics. In the sixth year, students have the chance to choose an elective rotation in occupational health for one month and can spend half of this period in clinics and the other half in the field. At the three other faculties in Israel (Jerusalem, Haifa and Beer Sheba Medical Schools) occupational health programs run for shorter periods⁸⁾.

In Denmark, there is an occupational and environmental health program in the undergraduate period running for 100 h. The courses include visits to industrial enterprises and discussions on occupational health in addition to "hands on" experience with patients. There is an examination at the conclusion of the course. Students are required to write reports on occupational and environmental health, under the guidance and evaluation from specialists. Occupational health departments in the university hospitals deal with both education and treatment of patients²⁷⁾.

In Japan, Switzerland and Argentina, undergraduate occupational health education focused on occupational diseases and toxicology is usually included in public health programs and its duration varies from a few hours to 30 h^{10–12)}.

Wynn *et al.* provide evidence that the number of hours allocated to undergraduate teaching on occupational medicine in the UK is declining, with fewer schools providing lectures, project work or ward-based tuition and also no workplace clinics attended by medical undergraduates²⁸⁾. However, Newson-Smith and Nicol showed that they had recently introduced workplace visits into their occupational medicine curriculum and found them to be extremely useful. Still 15 h of didactic teaching and 3 h of workplace visits in their medical undergraduate curriculum is far less than the time allotted in our program²⁹⁾.

Reports from Turkey also demonstrate that occupational health education at the undergraduate medical level occurs in the public health lectures in the third or the fourth years of medical school. With the exception of Akdeniz University, the other faculties do not have vocational training/practice in occupational health. In Turkey, exposure to public health has been traditionally in primary health care units (PHCU) for two months in the last year of medical school. For most faculties in Turkey, an internship in a PHCU is a unique opportunity for community-based medical education. It is limited to visits to some industrial operations and to observe workplace hazards for a couple of hours. In Turkey,

occupational health laws stipulate that there be a registry system for workplace health units. These visits and lectures are also aimed to introduce the medical students to the registry system. No study was found measuring the impact of such occupational health practice, but it is thought to be of limited value for comprehension of either occupational health and safety and the registry system.

The occupational health model at Kocaeli University Medical School was introduced as a result of the need for a broad and community-based training in occupational health. For medical students, being in industrial plants, is the best way to understand occupational health and safety, and working in workplace health units actively is also the best way to comprehend both the registry system in our country and preventive practices.

For this purpose, a new model had been devised based on Turkish labour and occupational health and safety laws. According to the new model, an apprenticeship in occupational health and safety was implemented in the public health internship and practice topics were outlined in a "portfolio". The portfolio was prepared taking into consideration the principles of occupational health and occupational health and safety laws in Turkey. The scope of occupational laws in Turkey is concordant to universal occupational health practices.

The portfolio was aimed to standardize the practice for every student. The duration of the workplace apprenticeship was limited to one week (considered the minimum amount of time to complete the portfolio). But perhaps the duration of the apprenticeship should be extended. The interns are working under the supervision of physicians who have received postgraduate training in occupational health and safety.

The occupational health practice model will be revised based on experience with workplace health units. Nevertheless, this community-based practice is thought to be a contribution to occupational health and safety education.

Conclusion

This model of vocational training on occupational health for medical interns at Kocaeli Medical School provides a comprehensive knowledge of workplace practices that cause unhealthy conditions as well as an understanding of occupational health services. Furthermore, the program is periodically evaluated using measurable evaluation criteria, including occupational health legislations. Should it prove successful at Kocaeli it can equally be at other Turkish medical schools.

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