

CHALLENGES FACING TEACHING OCCUPATIONAL AND ENVIRONMENTAL HEALTH IN MENOUIFYA FACULTY OF MEDICINE AS A COMMUNITY ORIENTED SCHOOL

By

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Abstract:

Introduction: The department of Public Health and Community Medicine (PHCM) in Menoufiya Faculty of Medicine, Egypt serves over 400 undergraduate students and around 5 post graduate students yearly. The department also provides teaching courses to Ministry of Health and Population, Faculty of Nursing, Institute of Nursing, School of Nursing, Faculty of Education as well as Environmental Research Institute. **Aim of the work:** Studying the challenges facing teaching Occupational and Environmental Health in Menoufiya Faculty of Medicine, Egypt as a community oriented school. **Material and Methods:** Teaching Occupational and Environmental health is divided into: teaching under graduate students and teaching post graduate students. The researchers tried to touch some challenges facing teaching Occupational and Environmental health in a practical way in depth. **Results:** Challenges facing teaching Occupational and Environmental Health are divided into: Logistic challenges; like inadequate infrastructure efficiency from the stands, internet access and library services, absence of an outpatient clinic or inpatient ward for occupational and environmental health for student training and shortage of financial support to purchased modern occupational health teaching resources and aids. Organizational challenges; like shortage in the number of qualified staff, assistant staff members and lab technicians in relation to

the steady increase in the number of students, limited curriculum time for teaching Occupational and Environmental Health, lacking of student interest, unavailable weekly transportation for the occupational field study and inability of the student to evaluate staff member performance in teaching. **Conclusion and Recommendations:** It was obvious that Occupational and Environmental Health teaching in Menoufiya Faculty of Medicine, Egypt faces a lot of challenges. Although there are challenges but a solution of every challenge can help in achievement of this branch more and more. Future survey research on the students of Menoufiya Faculty of Medicine, Egypt about Occupational and Environmental Health teaching may help in overcoming these challenges.

Key words: Challenges, Teaching, Occupational and Environmental Health, Faculty of Medicine, Menoufiya University.

Introduction

Occupational health is generally defined as the recognition, treatment, and prevention of work-related illnesses and injuries, and occupational medicine is typically defined as occupational health in a clinical context. There are several definitions of environmental health and environmental medicine. Environmental health is often defined as the recognition, treatment, and prevention of illnesses and injuries related to the environment, and environmental medicine is usually defined as environmental health in a clinical context. Some physicians consider occupational health as a subset of environmental health, and others consider these fields as distinct entities (Buwstein and Levy, 1994).

Public attention is increasingly focusing on the potential health effects of exposure to toxic chemicals and physical agents in the

environment. Concomitantly, the pressure has mounted on the medical community to supply information regarding Occupational and Environmental health concerns and provide diagnostic and treatment services for environmental disease (Rosentock, 1981).

Menoufiya Faculty of Medicine has been established in 1984, and since then the University has become interested in the development of sections, units and clinics. The Faculty has about 28 divisions in various medical disciplines, with laboratories for scientific research and a University Hospital with various medical departments for the delivery of health services and medical examinations and treatment of citizens paid symbolic and hospital equipped with cabins for operations and a number of specialized units, such as the intensive care unit, the Centre for forensic and clinical toxicology

and blood bank and others, many research labs. And extension nursing school, Technical Institute of nursing and the medical complex hospital emergency and critical situations and Oncology hospital, and Susan Mubarak hospital for maternal and child health branch in Manshet Sultan.

Menoufiya governorate contains two industry- intensive cities, Quesna and Al-Sadat. Both contains iron and steal industry (Ezz Al-Dekhela), machinery industry (Toshiba Al-Araby), pharmaceutical industry (Sigma), fine electrical industry (Bitchino) and other small industries.

The department of Public Health and Community Medicine (PHCM) is one of the clinical departments in the College. The department mission is to prepare the physicians who have appropriate knowledge and skills to work as effective leader of the health team. The department provides them with capabilities to act proactively in applying efficient and effective health promotion, prevention and control measures in any health care setting.

The department serves over 400 undergraduate students and around 5 post graduate students yearly. The department

also provides teaching courses to ministry of Health and Population, Faculty of nursing, school of nursing, faculty of Education as well as Environmental Research Institute.

Notes on Course Specifications:

A) Basic information:

- Allocated marks: 300.
- Teaching hours:
 - Theoretical: 14 hours from the total 128 Hours.
 - Practical: 6 hours from the total 64 Hours.
 - Field training: 2 visits from the total 12 Visits.

Field Visits conducted outside the Faculty (community based):

1. Occupational activity visit (2).

B) Professional Information:

It includes Overall Aim of the Course, Intended Learning Outcomes (ILOs, Professional Skills, Communication and Intellectual skills.

C) Course contents:

1- Lectures and Training Activities Outlines (Table 1):

#	Topic	Hours	Practical Topics	Practical Hours	Field Visits
19	Environmental Health	8	Industrial health program	3	2 Visits to the factory
20	Occupational Health	6	Geriatric Health and preparatory o visit	3	
	TOTAL HOURS of the whole Community Medicine course	128		64	12 visits

2- Curricular Design Outline (Table 2):

Topics		Lectures		practical	Site visits
		Hrs	%		
31	Environmental Health	8	6%		
32	Occupational Health	6	4%		
	Total hours of the whole Community Medicine course	128	100%		

3- Teaching Plan:

A. The educational year is divided into 4 groups each lasting 8 weeks. The department receives one fourth of students' number. The whole course is covered during those 8 weeks (practical and field training). All students attend lectures.

D) – Students Assessment methods of the whole Community Medicine course:

1- Attendance Criteria: Faculty by laws

2- Assessment Tools (Table 3):

Tool	Purpose (ILOs)
Written examination	To assess intellectual ,knowledge and analytical skills , problem solving
Oral examination	To assess: Presentation skills, information synthesis, understanding, applied knowledge
Practical examination	To assess: Analytical skills, problem solving, presentation skills, leadership/team work, communication skills, creativeness, advocacy, reporting skills.

3- Time Schedule (Table 4): Faculty by laws.

Exam	Week
1- Written following each round	Following each round
2- Practical exam	Following each round
3- Final exam	End of year

4- Grading System of the whole Community Medicine course (Table 5):

Examination	Marks allocated	% of Total Marks
1- Shock exams	End Round	
2- Written end of round	Practical = 30	10%
3- Practical end of round	Written = 30	10%
4- End of year:		
a- Written	150	50%
b- Oral	60	20%
c- Project discussion	30	10%
1- Assignments & other activities	(Included in the Practical)	
Total		300

Table (6): Comparison between teaching Occupational and Environmental Health for undergraduate students in Menoufiya faculty of medicine and other local faculties of medicine.

Faculty of Medicine	Subject	No of hours	Lectures	% from total	Practical	Field training
Menoufiya	EH	12	8	6%	3	1
	OH	10	6	4%	2	2
Kasr Al-Ainy	EH	12	8	6%	3	1
	OH	10	6	4%	2	2
Assuit	EH	12	8	6%	0	4
	OH	18	12	9%	4	4

It is clear that Assuit Faculty of Medicine is more interested in Occupational Medicine than Menoufiya and Kasr Al-Ainy faculties. To our knowledge Community Medicine department is considered one of the clinical departments in all faculties of medicine in Egypt except Ain-Shams faculty of medicine.

Table (7): Hours of teaching Occupational and Environmental Health for undergraduate students in schools of medicine in different countries.

School of Medicine	No of hours
Denmark	100
Tel-Aviv	30
Japan	30
Switzerland	30
Argentina	30

Aim of the work

A. Studying the challenges facing teaching Occupational and Environmental health in Menoufiya Faculty of Medicine, Egypt as a community oriented school.

Methodology:

Teaching Occupational and Environmental Health can be divided into:

- Teaching undergraduate students.
- Teaching post graduate students.

Challenges facing Occupational and Environmental Health are divided into:

- B. Logistic challenges.
- C. Organizational challenges.

A- Logistic challenges for undergraduate students include:

1- Inadequate infrastructure efficiency from the stands, internet access and library services.

To overcome this challenge, stands must be increased to face the increased number of students and an internet access of each student by a user name and a password for the library services are must.

2- Absence of an outpatient clinic or inpatient ward for occupational and environmental health for student training like that in Kasr Al-Aini University.

To overcome this challenge, more efforts are needed by Public Health and Community Medicine department in collaboration with the faculty Dean trying to establish one of the Occupational and Environmental health staff members in the hospital Directors Board to establish an outpatient clinic. This outpatient clinic through contracting with private factories or the Health Insurance authority can increase the income of the hospital and will facilitate clinical training for the students and can improve the clinical sense for them

3- Shortage of financial support to purchased modern occupational health teaching resources and aids like videos, models and skill labs as well as in occupational health library services that help students at a depth of understanding of the article in the theoretical and practical parts.

To overcome this challenge, supporting lectures as well as sections with modern aids and resources like videos, models and skill labs can help in increasing the student performance in understanding occupational and environmental health. Many of these educational tools are easily obtainable and will be helpful for medical schools.

B- Organizational challenges for undergraduate students include:

1- Shortage in the number of qualified staff, assistant staff members and lab technicians in relation to the steady increase in the number of students. The number of students in the 1st year of establishment of Menoufiya faculty of medicine was 54 however this year the number of students is 514 students.

To overcome this challenge, number of staff and assistant staff members must be increased especially from the graduated students from the faculty. Also, increasing the number of lab technicians even through private contracts, not government appointments.

2- Limited curriculum time for teaching Occupational and Environmental Health. Occupational and Environmental Health teaching has a minor presence in the basic science curriculum making the student much more compressed and loss his interest in learning more issues. 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 curriculum.

To overcome this challenge, occupational and environmental health curriculum time must be increased and trying to revise and select the important topics to the undergraduate students.

3- Lacking of student interest. Students at the 4th grade are interested more in ophthalmology, Ear, Nose and Throat specialty and Forensic and Toxicology specialty more than Community medicine (especially Occupational Medicine) specialty. Unfortunately, most of the students' vision towards Community Medicine as a whole and especially occupational and environmental health is as being "National Education". This, beside that the time for teaching occupational and environmental health is so limited throughout the year making the student much more compressed and loss his interest in learning more issues. Physicians can make a considerable impact on the recognition, treatment, and prevention of work-related illness and injury if they are properly trained as students.

To overcome this challenge, we must know that the way of teaching Occupational and Environmental health by lectures must be more attractive to the students where more pictures, graphs, statistics etc....

should be included. We should believe in the students' abilities and to know that they are creative and innovators and invest this to let them share by searching in the internet, where they have more skills than the staff members, about the new issues or making a power point presentation or poster or health care message regarding any related issue which may be the project of the year. A required written reports of factory visits by students after speaking to health care professionals, employers/managers, workers, and safety or industrial hygiene professionals are must.

4- Wrong concept of the staff members in Menoufiya Faculty of Medicine that teaching Occupational and Environmental Health in the practical part is the same like the theoretical one it is just repetition, this appears as a big challenge. This let most of the students concentrate and attend the practical part and neglect attending the lectures.

To overcome this challenge, we suggest that the staff members must focus in the practical part of teaching on presenting as a problem based learning (PBL) or case studies and let the students make a group discussion and solve the problem under supervision of the staff member.

5- Unavailable weekly transportation for the occupational field study. Because all

of our occupational field studies are to Queisna industrial zone, outside Shebin Al-Kom city. For any reason if the bus doesn't arrive, the students go to the field study by their own way or we may cancel the field study.

To overcome this challenge, the university must provide a bus for the department every week for the field study or at least it can provide liquidity and cash to the department to hire a bus for this reason every week.

6- The responsibility of getting the approval to enter any private factory is the department's, and absence of the feedback between the department and managers of the private factories about the hazards of their raw materials on their workers, almost all of the managers of the private factories reject categorically our entrance to their factories with our students.

To overcome this challenge, the university must invite the factories managers to explain and discover how can Occupational and Environmental health serves them to improve the health of their workers which will increase the worker productivity. Also, the excuse of entrance to any factory must be signed by the university manager.

7- Lack of continuous clinical training for faculty staff members to provide them with practical skills not only the theoretical ones. Training of the trainee will enhance the interest of both staff members and students.

To overcome this challenge, a financial support by the University must be provided to participate in training courses and workshops as well as national and international conferences that will positively achieve the performance of faculty staff member and develop the needed skills.

8- Inability of the student to evaluate staff member performance in teaching. Some staff members feel embarrassed in just thinking that the student can evaluate their performance. This evaluation never done in Community Medicine department except in a personal way by the researchers.

To overcome this challenge, student can feel free to evaluate the staff member performance in a polite and respectful manner. Staff members should not feel embarrassed and sensitivity of student assessment and feel that this would help him/her to communicate effectively with students and improve his/her performance and avoid some mistakes that impede the learning process. It is possible to enhance

students' perception of the value of teaching Occupational and Environmental session by modifying the session in the light of student-based evaluation.

9- No integration between Occupational and Environmental health and other branches of Medicine, as Occupational and Environmental health is taught to students only in one year (at the 4th grade) is not a good idea.

To overcome this challenge, incorporating more occupational health information into the standard preclinical and clinical curricula may help. For example, information on occupational lung disorders can be taught during pathology or pulmonary medicine courses; occupational musculoskeletal disorders can be taught as a component of rheumatology and orthopedic surgery; toxicology concerning work-related exposures can be incorporated into pharmacology and/or toxicology courses; occupational history taking can be included as a component of physical diagnosis or a patient interviewing course; occupational health injuries can be taught with surgery and occupational reproductive disorders can be taught in endocrinology or obstetrics and gynecology.

10- If not all, most of the undergraduates don't believe in Occupational and Environmental health as a subspecialty

of Community medicine based on lecture based learning in a theoretical manner lacking to the clinical base. They deal with this branch with no importance except just to pass.

To overcome this challenge, the new way of teaching like problem based learning or team based learning may be better than this traditional lecture based learning. Also, shifting to E-learning may be helpful to the students to use their skills in the computer to download the lectures, quiz, make comments beside communication with the staff members may be a new dream. The concept reaches the student must be: I deal with and treat groups and the whole community not a single person.

For postgraduate students: Most of the problems acquired in the undergraduate period will be inherited and pass to the postgraduate.

A- Logistic challenges for postgraduate students include:

1- Unavailable adequate financial support to attract experts in this discipline from other universities and specific institutes. The department has undergone realistic experience of recruiting specialized professors from other universities and from the National Research Centre, Dokki, and despite the strenuous efforts

by those distinguished professors, lack of financial support has led to the suspension of those experts persons from participation in raising the performance of the department members. It will be difficult to substantially recruit future faculty qualified to teach occupational health without necessary funding.

To overcome this challenge, provide financial support by the University would raise the level of services presented by the department members. A sincere commitment to Occupational Health teaching through empowering experts in this field and providing more opportunities for practical training of Occupational and Environmental health.

2- Lack of specific laboratory in Occupational and Environmental measurements, devices and specialists who work on those devices, as well as the lack of maintenance for devices that already exist, would cause a serious challenge to the scientific research section.

To overcome this challenge, the department must be provided with recent occupational and environmental devices for environmental measurements, trained specialist for these devices and continuous maintenance for these devices.

3- Attribution of research projects for post graduate students without providing the appropriate financial support, lead to incomplete research cycle and causes damage to the educational process.

To overcome this challenge, the university must provide each post graduate student by a pocket money according to his/her research steps and methodology to make him/her focuses on the scientific research without having to worry about the future of the research project's financial support. In addition, funding for research activities in occupational health should be increased. Through increasing research activity, more academic occupational health physicians may be recruited, which may, in turn, provide greater opportunity for occupational health faculty to increase teaching.

B- Organizational challenges for postgraduate students include:

1- Limited number of students enrolled in master and doctorate degree and post graduate studies from outside the university as well as the physician needs both theoretical background and the capacity to blend this knowledge and abilities with experience. Since occupational medicine is not able to generate the same level of income as hospital-based specialties, such as

surgery and internal medicine, it is vital that the government contribute to recruitment and faculty development in this field.

To overcome this challenge, much efforts can be done to increase the awareness of the students and house officers about Occupational and Environmental Health specialty through posters, advertisings, work shops, symposiums ect.....

Discussion

Since 1980s, lacking of school interest in teaching Occupational and Environmental Health was the same finding through a questionnaire on teaching Occupational Health sent to United Kingdom (UK) and United states (US) Medical Schools (Rosenstock and Cullen 1986, Cullen et al., 1990 and Wynn et al., 2003). In University of British Columbia Faculty of Medicine, Vancouver, Canada (Broudo and Walsh, 2002), the same result was, also, observed. Occupational and Environmental Medicine learning ranked the last interesting issue between students in the school of Medicine, Montréal, Montréal, Canada (Baillargeon et al., 2011). As with law and ethics, however, unless something is taught as a formal subject and then comes up in examinations, there is a risk that students will not take it seriously. Even worse could be a clumsy introduction by clinicians who

have themselves no real understanding of the subject beyond their clinical knowledge. There remains no substitute for a properly constituted Occupational Health teaching program for undergraduates (which does not need to be sophisticated, specialized or time-consuming) and there is fair consensus on what should be in that program (Wynn et al., 2003).

Limited curriculum time for teaching Occupational and Environmental Health and lack of continuous training of faculty staff members were the results obtained by old and recent studies (Buwstein and Levy, 1994 and Baillargeon et al., 2011). Wynn et al., 2002 in UK undergraduate school of medicine concluded that despite the prominence given to issues related to Occupational Health in recent UK government policy, their study suggests a declining commitment to occupational medicine on the part of UK medical schools. Moreover, Tomorrow's Doctors—Recommendations on Undergraduate Medical Education, 2002 reported that a decrease in the hours committed to formal occupational medicine teaching was found in centers that do not have academic Occupational Health departments, themselves dwindling in numbers.

Also Wynn et al., 2003 found that general practitioners (GPs) remain, for

the most part, the first point of health care contact for employees who develop health problems as a result of work. Such patients have to rely on their doctor to recognize that their condition may be work-related, advice on appropriate benefits, the need for a RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations) report and whether they should withdraw from work as a result of the condition and if so, for how long.

In one study done over 127 US Medical Schools, it was reported that library services for occupational health were, on average, rated between "fair and good" however, Occupational Health teaching resources and teaching aids were, on average, rated "fair" by the respondents. They also found that funding for research activities in Occupational Health should be increased¹.

In UK, it was concluded that it is possible to enhance students' perception of the value of a teaching session by modifying the session in the light of student-based evaluation (Grime et al., 2006).

In University of British Columbia Faculty of Medicine, Vancouver, Canada, the result of a study revealed that usage of statistics indicate that over 90% of students regularly use the E-learning sites and have found them helpful. E-learning sites will likely play an increased role in

distance learning by continuing to deliver the resources already described, as well as facilitating synchronous communications (e.g., PBL chat rooms) and teaching (e.g., video-streamed lectures) to students located across the province (Broudo and Walsh, 2002). In India, distance learning, especially when used in blended courses, is an adequate delivery method for teaching knowledge, skills and attitude in Occupational medicine. Develop a modern curriculum, organize teachers' learning, standardized the course contents and the evaluations could all be topics to be taken up in an organize way (Wanger et al., 2005).

To determine future training needs for physicians in Occupational and Environmental Medicine in USA, it was reported that there is a sharp physician shortage in Occupational and Environmental Medicine and graduate specialty training would need to be increased to about 3-5 times the current maximum capacity (Castorina and Rosenstock, 1990).

Given that Tomorrow's Doctors—Recommendations on Undergraduate Medical Education, 2002 states: 'Graduates must understand areas of psychology and sociology relevant to medicine, including: ...occupation', how has the decline in undergraduate Occupational Health teaching come about? Contributory

factors may be the decline in the number of academic departments of occupational health in UK universities, the continuing emphasis by medical specialists on traditional occupational diseases such as pneumoconiosis and lead poisoning and a reduced teaching of undergraduate medical students to Occupational Health issues. Even the traditional factory visit is becoming a rarity. All these may be having an insidious effect on promoting a low profile for Occupational Health professionals and resultant difficulties in filling existing Occupational Health vacancies. This decline in Occupational Health teaching in medical schools is paralleled in the findings of a similar survey of UK nurse training at undergraduate level (Whitaker et al., 2002).

In Mexico, Sánchez-Román et al., 2009 said that disparity in teaching basic aspects of OM in medical schools explains the little development, social and professional recognition of the specialty; it also highlights serious problems for Public Health, derived from the lack of prevention of risks in work environments.

Israel seems to have a 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 (Ribak et al., 1997). In Denmark, there is an occupational and environmental health program in the undergraduate period running for 100 h (Netterstrom and Grandjean, 1998). 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 (Okubo, 1997, Netterstrom and Grandjean, 1998; and Werner, 2000).

In Turkey in 2005, there is no structured practical education on Occupational Health although it is covered in theoretical courses to some extent (Hamzaoglu et al., 2005). According to a recent survey in 25 Medical Schools in Turkey, Yildiz and Caman, 2011 reported that all public health departments of participating medical schools have

an undergraduate occupational health education. The study showed that the mean value for the total education time was 8.1 hours, in which most of the courses were carried out as class lectures or small group work. Practical sessions were carried out in nearly half (44%) and workplace visits were paid in one third (32%) of the schools. In Hacettepe University Faculty of Medicine in Ankara, starting in November 2007, the content and duration of occupational health teaching sessions were revised as to respond to the students’ needs and faculty’s suggestions as well as to conform to internationally recognized practices. This led to a greater increase in students’ knowledge on technical precautions than their knowledge on issues related to medical practice in the workplace (Yildiz et al., 2012).

Summary and Recommendations

It was obvious that Occupational and Environmental Health teaching in Menoufiya Faculty of Medicine faces a lot of challenges. Although there are challenges but a solution of every challenge can help in achievement of this branch more and more. Future survey research on the students of Menoufiya Faculty of Medicine about Occupational and Environmental Health teaching may help in touching these challenges in depth.

References

1. Baillargeon M, Maheux B and Gilbert A J (2011): The challenge of teaching occupational medicine to medical students: the Université de Montréal experience. *Occup Environ Med*; 53(11):1258-1261.
2. Boillat MA, Guillemin MP, Savolainen H (1997): The present state and practice of occupational health in Switzerland. *Int Arch Occup Environ Health*; 70: 361–364.
3. Broudo M and Walsh C (2002): MEDICOL: online learning in medicine and dentistry. *Acad Med*; 77 (9): 926-927.
4. Buwstein JM and Levy BS (1994): The Teaching of Occupational Health in US Medical Schools: Little Improvement in 9 Years. *Public Health Briefs*;84 (4).
5. Castorina JS and Rosenstock L (1990): Physician Shortage in Occupational and Environmental Medicine. *Ann Intern Med*; 113(12):983-986.
6. Cullen MR, Cherniack MG, Rosenstock L (1990): *Occup Med. N Engl J Med*; 322: 594-601, 675-683.
7. Grime P, Williams S and Nicholson S (2006): Medical students' evaluation of a teaching session in occupational medicine: the value of a workplace visit. *Occup Med*; 56 (2): 110-114.
8. Hamzaoglu O, Yavuz CI, Caglayan C, Erdogan MS and Etiler N (2005): Undergraduate Training in Occupational Health at Kocaeli University Medical School: A Turkish Experience. *Ind Health*; 43: 677–684.
9. Netterstrom B, Grandjean P (1998): Occupational and environmental medicine in Denmark. *Int Arch Occup Environ Health*; 71: 3–6.
10. Okubo T (1997): The present state of occupational health in Japan. *Int Arch Occup Environ Health*; 70: 148–152.
11. Ribak J, Lerman Y, Froom P (1997): Occupational health in Israel. *Int Arch Occup Environ Health*; 70: 73–76.
12. Rosenstock L, Cullen MR (1986): *Clin Occup Med*. Philadelphia, Pa: WB Saunders Co.
13. Rosenstock L (1981): Occupational medicine: too long neglected. *Ann Intern Med*; 96: 774-776.
14. Sánchez –Román FR, Medina-Figueroa AM, Rangel-Zertuche RA, Sánchez-Ramos A (2009): The teaching of occupational medicine in Mexican medical schools. *Salud Publica Mex*; 51: 97-103.
15. Tomorrow's Doctors—Recommendations on Undergraduate Medical Education. Education Committee (2002): General Medical Council. http://www.gmc-uk.org/med_ed/tomdoc.htm
16. Wagner NL, Wagner PJ, Jayachandran P (2005): Distance learning courses in occupational medicine—Methods and good practice. *IJOEM*; 9 (2): 57-61.
17. Werner AF (2000): Occupational health in Argentina. *Int Arch Occup Environ Health*; 73: 285–289.
18. Whitaker S, Wynn P, Williams N (2002): Occupational health teaching for pre-registration nursing students. *Nurse Educ Today*; 22: 152–158.
19. Wynn PA, Aw TC, Williams NR and Harrington M (2003): Teaching of occupational medicine to undergraduates in UK schools of medicine. *Occup Med*; 53: 349–353.
20. Wynn PA, Williams N, Snashall D, Aw TC (2003): Undergraduate occupational health teaching in medical schools—not enough of a good thing? *Occup Med*; 53: 347–348.
21. Yildiz AN, Bilir N, Camur D and Caman OK (2012): Evaluation of Occupational Health Teaching Sessions for Final Year Medical Students. *Safe Health Work*; 3:123-129.
22. Yildiz AN, Caman OK (2011): Occupational health education in public health departments of medical faculties. *Proceedings of XIX World Congress on Safety and Health at Work*; Istanbul, Turkey. Istanbul: International Organizing Committee; p. 416.