

OCCUPATIONAL HEALTH AND SAFETY TRAINING: KNOWLEDGE, ATTITUDE AND PRACTICE AMONG TECHNICAL EDUCATION STUDENTS

By

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Abstract

Introduction: Workers represent half of the world's population. Maintaining a safe working environment is reflected on a healthy worker. Some reasons for not implementing the safety policy by most developing countries are lack of effective enforcement system, lack of information and accurate records of occupational diseases and accidents, and lack of basic professional training in occupational health and safety. **Aim of Work:** To assess a technical school students' knowledge, attitude, and practice toward the occupational health hazards. Changes in their knowledge were also measured before & after the health education session. **Materials and Methods:** A health education training session was done on fifty students in a technical education school in Abbasia district, Cairo. Their level of knowledge regarding occupational health was measured by means of a questionnaire distributed among them before and after the session. **Results:** Only 12.2 % of studied students have reported a previous training on occupational hazards. Thirty five students (71.4%) reported that their work require personal protective equipments (PPEs), 63.3% of students reported that they are protective to their health in workplace and 61.2% prefer to wear them; however only 26.5 % were always wearing them. Only about half of students (51%) knew the correct definition of periodic medical examination. After the health education program, there was a statistically significant improvement in the knowledge of occupational law, proper management of chemical spill and knowledge of hazard of machinery noise. **Conclusion:** Technical school students require further training sessions to provide them with the knowledge needed to protect themselves and their working environment. **Keywords:** Occupational hazards, Health education, Knowledge, Occupational safety, Training.

Introduction

Workers represent 50% of the world's population and contribute significantly to socio-economic development. Their health is largely determined by the standard of occupational health services available to them at their place of work (WHO, 2007).

Occupational health means provision of comprehensive health care (personal and impersonal) to workers through a mix of promotive, preventive, curative and rehabilitative interventions so as to raise their quality of life (Park, 2005). It is also defined as the effect of working environment and work on the health of the workers and in turn the effect of workers health status on the productivity (Shah, 2006).

Most of us spend our lifetime at the workplace; therefore, maintaining a safe working environment and a sound mind and body becomes very important issues (Tung and Yen, 2000, Xu, 2001). "Healthy" means a condition without diseases and that the body is at a comfortable physiological, psychological, social, and spiritual state of health (Xu, 2001, Chen, 2003).

Recent globalization and industrialization has exposed

occupational workers to increasing occupational hazards. The health status of global workforce and their exposure to occupational risks represents large gaps between and within countries (Ahmed and Newson-Smith, 2010). Only a small minority (5-10%) of the global workers has access to occupational health services (Aderaw et al, 2011). Overall, young workers aged 16 to 19 years have twice the injury rate of workers of all ages (Bureau of Labor Statistics, 2000, NIOSH, 2004). In the United States, direct and indirect costs of occupational injuries to teenaged workers have been estimated to be approximately \$5 billion annually (Miller and Waehrer, 1998).

There is a need to confront the common challenges to occupational health & safety (OHS) including illiteracy, lack of the basic infrastructure, deficient qualified human resource in occupational health and safety, poor sanitation, inadequate nutrition, lack of research and decreased interdisciplinary cooperation between the social sciences and medicine (Prabhakara, 2002, Pool and Geissler, 2007).

As the health and safety of the workers has been recognized as a

fundamental human right, hence all possible measures including medical, engineering as well as legislative and occupational surveillance need to be strengthened, especially in developing countries (Gupta and Mahajan, 2003). The triad of Knowledge, Attitude and Practice (KAP) together make up the dynamic system of life itself (Lakhan and Sharma, 2010).

KAP study serves as an educational diagnosis of the community (Kaliyaperumal, 2004). KAP surveys today are widely used to investigate health behavior and health-seeking practices for effective health promotion (Hausmann-Muela et al, 2003). Required safety training was considered in the past a burden bared by companies. However, recent trends show that injury reduction is not the only benefit of safety training. Better management and employee relations, improved worker morale, increased production, and lower workers' compensation insurance costs can be achieved as well (Sinclair et al, 2003, O'Toole, 2001 and Seo et al, 2004).

Some reasons for not implementing the safety policy by most developing countries are lack of effective

enforcement system, lack of information and accurate records of occupational diseases and accidents, and lack of basic professional training in occupational health and safety (World Bank, 2007).

The nature of technical institutes and universities is focused on the workplace in the training of human resources, not on academic research; therefore, theoretically speaking, since every graduate from the technical institutes and universities will enter the work force, maintaining good health or paying attention to safety at work should be a basic skill for each student (Su-Chang, 2010). Wu defined general technological and vocational education as "the 'professional development' combining specialized and generalized skills. He considered them as a base to promote the overall sustainable development of cognitions, skills, and attitudes according to the individual's conditions, and thus to practice such skills in reality" (Wu, 1999).

Aim of study

This study aimed to assess a technical school students' knowledge, attitude, and practice toward the occupational health hazards. Changes in their knowledge were also measured

before and after the health education session.

Materials and Methods

A visit to a school of technical education in Abbasia, Cairo was carried out after obtaining administrative approvals from the school. It was held on a regular school day in March 2014. Ten percent sample of the students (N=50) was included in the study. A pretest questionnaire was distributed on the participants. An initial set of questions collects data on student's age, job title (if found) and previous training background. Another set of questions covers their knowledge about occupational health hazards and safety measures to prevent such hazards. Their attitude and practice of different lines of prevention were also assessed in the questionnaire.

Then a health education session – about two hours long in the form of interactive lecture was carried out by the researchers. A handout of the

training session was distributed all over the students, the attending teachers and supervisors. The questionnaire was then distributed as a post-test to those who participated in the study.

Data Management and Analysis:

The collected data was revised, coded, tabulated and introduced to a PC using Statistical Package for Social Science (2001). Data was presented and suitable analysis was done according to the type of data obtained for each parameter. Descriptive statistics included frequency and percentage for non-numerical data. Analytical statistics included McNemar Test that tests for changes in responses using the chi-square distribution. The test is useful for detecting changes in responses due to experimental intervention in “before-and-after” designs. For larger square tables, the McNemar-Bowker test of symmetry is reported.

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Results

Table (1): Basic characteristics of studied group

Basic characteristics of studied students		N°	Percent (%)
Academic year	1st year	31	63.3
	2nd year	14	28.6
	3rd year	1	2
Occupation	Non working student	41	83.7
	Working student	8	16.2
Previous training on occupational hazards		6	12.2

This study included a ten percent of the technical school students (n=50) most of them from the 1st and 2nd academic years (63.3 % and 28.6 % respectively). Only 12.2 % of studied students have reported a previous training on occupational hazards; however 16.2 % of them are currently working (Table 1).

Table (2): Basic knowledge and attitude toward occupational health PPEs before health education

General knowledge toward occupational health		N°	Percent (%)
knowledge of occupational law		11	22.4
Source of knowledge	Teachers	23	46.9
	Curriculum	18	36.7
	Training courses	10	20.4
	Colleagues	8	16.3
	Media	3	6.1
	Employer	3	6.1
Your work require PPEs		35	71.4
	Mask	6	12.2
	Boot	5	10.2
	Google	8	16.3
	Gloves	9	18.4
	Coat	3	6.1
PPEs are protective in workplace	Correct	31	63.3
Do you prefer to wear PPEs	Yes	30	61.2
Do you wear PPEs	Always	13	26.5
	Sometimes	18	36.7
	Never	3	6.1

Regarding the baseline knowledge toward occupational health; only 22.4 % of students reported knowledge of occupational law, majority of them received the knowledge from teachers, curriculum and training courses (46.9 %, 36.7 % and 20.4 % respectively). Thirty five students (71.4%) reported that their work require PPEs, 63.3% of students see that they are protective in workplace and 61.2% prefer to wear it; however only 26.5 % were always wearing it (Table 2)

Table (3): General knowledge and attitude regarding chemical hazards in workplace

		N°	Percent (%)
Are you afraid of machines or chemicals	Yes	16	32.7
Cause of fear	Machinery	5	10.2
	Welding	3	6.1
	Chemicals	1	2.0
Proper management of chemical spill	Correct	2	4.1
Hazards of eating food in the work site	Correct	16	32.7

Sixteen students (32.7 %) were afraid of machines or chemicals; however only 4.1 % of students knew the proper management of chemical spill and 32.7 % of them knew the hazards of eating food in the work site (Table 3)

Table (4): General knowledge regarding occupation in workplace

General knowledge toward occupational health	N°	Percent (%)
Proper definition of PME	25	51.0
Bad lighting is an occupational hazard	41	83.7
Goggles are a must during welding	45	91.8
Hazard of machinery noise	39	79.6
Change clothes before returning home	46	93.9

Only about half of students (51%) knew the correct definition of periodic medical examination, 79.6 % knew the hazard of machinery noise, 83.7 % knew that bad lighting is an occupational hazard , 91.8 % knew that goggles are a must during welding and 93.3 % of students knew that changing clothes is mandatory before returning home (Table 4).

Table (5): Change in knowledge before and after intervention

				Post Intervention		McNemar Test	P
				Incorrect	Correct		
Pre	knowledge of occupational law	Incorrect	N°	10	18	0.22	0.004*
			Row %	35.7%	64.3%		
		Correct	N°	4	5		
			Row %	44.4%	55.6%		
	Hazard of machinery noise	Incorrect	N°	0	7	0.205	0.035*
			Row %	0	100%		
		Correct	N°	1	34		
			Row %	2.90%	97.1%		
	Proper management of chemical spill	incorrect	N°	0	8	0.33	0.05*
			Row %	0	100.00%		
		don't know	N°	1	24		
			Row %	4.00%	96		

*Statistically significant

After the health education program, there was a statistically significant improvement in the knowledge of occupational law, proper management of chemical spill and knowledge of hazard of machinery noise (64.3%, 96% and 100% respectively) ($P < 0.05$) (Tables 5).

Discussion

Technical school students face hazards at their work stations in schools and furthermore at their work such as physical, chemical and psychosocial hazards. Since the nature of the technological and vocational education system is career oriented, the mentality of the students usually emphasizes specialized subjects and neglects general curricula (Su-Chang, 2010)

If students have to participate in activities to promote their health, they must be aware of the risks at work. Young workers (15–24 yrs old) have a disproportionately high rate of injuries in the workplace and many are employed on a casual, temporary or intermittent basis, in jobs that require low technical skill (Thamrin et al., 2010). In the current study, 16.2% of students were currently employed at the time of the survey or had been employed while enrolled in school with only 12.2% of them have received a previous training on occupational hazards that will make those students at a greater risk for occupational hazards.

Similar surveys among college students and teen in United States

revealed employment of their participants at time of school or college (Zierold et al 2012 and Balanary et al 2014). In a study among cement workers in United Arab Emirates, only 36.6% of workers attended a training course about occupational health and safety (Ahmed and Newson-Smith, 2010). Higher frequency of attending such workers was reported by Paramasivam et al (2010).

One approach to reduce the burden of young worker injury is through improvements in the provision and effectiveness of safety training, initially at school and then in the workplace. The value of school-based introductory safety training can be inferred from a study in Canada which found that only one in five employees had received safety training in their first year with a new employer (Smith and Mustard, 2007).

In an Australian survey of 270 workplaces in the hospitality industry, the need for improvement in induction training for young workers was highlighted (Hicks, 2009). Indeed, the importance of providing occupational safety education in the secondary school setting has been widely recognized

(Davis and Pollack, 1995, National Institute for Occupational Safety and Health (NIOSH), 1999 and Schulte et al., 2005).

This study revealed a significant improvement of student's knowledge regarding general occupational law, chemical and noise hazards.

A review of literature by NIOSH showed that majority (87%) of those who used knowledge test to assess the effect of training revealed improvement (Cohen and Colligan, 1998). A training on paper mill workers in the United States in 2007, demonstrated that workers' knowledge of hand injury prevention techniques can be significantly improved with safety training. This finding is similar to studies which evaluated the effectiveness of safety training among teleworkers (Harrington and Walker, 2004) and food service workers (Sinclair et al. 2003). A health education session towards blood borne pathogens on health care workers in Cairo resulted in significant improvement in their knowledge (Saleh et al, 2009)

In the current study, 63% knew that wearing PPEs during work is protective to their health and almost the same

(61%) preferred to wear it. While only 26% always wear it. About 37% of study participants sometimes use PPEs and 6% never use them. Those results are comparable to a study carried by Ahmed and Newson-Smith, (2010), where 29% of their study subjects were using PPEs all the time, only 2.6 % used them frequently, the majority (62.1%) of subjects used them sometimes, and 6.5 % never used the masks. Similar results were reported by others. Yassin et al. (2002) in Gaza reported that 21.7% of farmers wore masks during application of pesticides. Kripa et al, (2005) in India found only 29.5% of the salt workers were using ordinary shoes as a sort of protection. A much lower percentage (7% only) were using hearing protective devices was reported by Ahmed et al. (2001) on exposure to noise in Saudi Arabia. This might be due to the low awareness among the workers about the adverse health effects of noise. Other researchers found that half of the workers had positive attitude towards using PPEs and only 34% of them were using theirs during work (Paramasivam et al, 2010).

Several researchers reported that the majority of workers have good

knowledge about protective measures in Cement industry in United Arab of Emirates (Ahmed and Newson-Smith, 2010), and among farm workers in Gaza (Yassin et al, 2002), whereas Kripa et al. (2005) in India reported that all the salt workers had some knowledge of protective measures to protect them while working in brine.

In the current study, only 2% of the study subjects knew properly how to deal with chemical spills. In a study in India (Paramasivam et al, 2010), 73% of the workers had been instructed on safe methods of handling dyes. This discrepancy might be due to the fact that those workers were specifically dealing with chemicals, while our study subjects as students deal with multiple exposures and are not yet specified.

Limitations and Recommendations

Limitations of this study include inability to recruit larger number of students in the health education session. This can be explained by administrative and educational problems due to shortness of the current semester as a result of political issues in the country. It is recommended to carry out a regular health education session in their curricula to raise their knowledge in the occupational health and safety aspects.

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