

## SUMMARY

Technical education represents an integral and important part of Egypt's educational system, technical education, which is provided in three-year and five-year programs and includes schools in three different fields: industrial, commercial and agricultural (*Wikipedia, 2010*). Students enrolled in industrial schools spend about one half of their education time in training in industrial workshops and laboratories facing different types of hazards and having the highest injury rate in schools. These hazards may include physical, chemical, mechanical and biological hazards (*El-Demerdash, 2007*). A safe school environment consists of not only the physical plant (buildings and grounds), but also involves those instructional areas that present specific hazards to students such as physical education, industrial arts, chemistry and biology (*Spengler, 2004*).

*The aim of the present study* was to assess the environmental health hazards and safety measures among secondary technical school students, the following *research questions* were formulated:

- Do the students have any information about environmental health hazards which facing them in the workshops?
- Do the students have any information about the safety measures?
- Is there a relationship between using the safety measures and the students' characteristics?
- Is there a relationship between using the safety measures and the students' information about them?
- Is there a relationship between unhealthy school workshop environment and occurrence of health hazards among secondary technical school students?

The study was conducted at three governmental secondary technical schools in Benha City, Benha Secondary Mechanical School for Boys, Benha Secondary Decorative School for Boys and Benha Technical Secondary School for Girls. The study subjects included 333 students aged from 15 to 19 years, and from each of three scholastic years.

*Two tools were used for collecting data*, an interview questionnaire and observational checklist.

**A- An interview questionnaire:** consisted of the following four parts.

**Part I:** It is designed to collect data about personal and educational characteristics of students as; age, gender, school grade, type of department and training courses.

**Part II:** It is concerned the knowledge of students about environmental health hazards that facing students in school workshops. It covered areas as hazards that students exposed to during working in the workshop as mechanical, physical, chemical and electrical hazards.

**Part III:** It is devoted to assess the knowledge of students about safety measures needed to control these hazards as fire, electrical and mechanical safety measures. It covered areas as the objectives of industrial safety in the school, presence of committee of industrial safety in the school, prevention of electrical hazards, fire prevention, mechanical hazards prevention, personal protection and first aid

**Part VI:** It is designed to assess the knowledge of students about the role of school nurse regarding promotion of healthy school environment.

**B- Observation checklist:** Checklist to assess environmental safety and sanitation of schools workshops. It included cleanliness and housekeeping, communication facility, lighting, fire protection, electrical

protection, machine safeguarding, personal protective equipment and medical services and first aid.

Data collection phase lasted from beginning of November 2009 to beginning of February 2010, in secondary technical school in Benha City, these were: Benha Secondary Mechanical School for Boys, Benha Secondary Decorative School for Boys and Benha Technical Secondary School for Girls.

**The main findings of this study were:**

- As regards the sociodemographic data, one third (33.33%) of studied group are enrolled in each scholastic year. Slightly less than one third (30.03%) of studied group were within age group of 15-<16 years with mean age of  $16.55 \pm 1.28$  years a range 15-19 years. Approximately two thirds (65.77%) of the studied group were male. In relation to departments, slightly more than one fifth (21.92%) of the studied group were in electrical department.
- Concerning **hazards that students were exposed to before inside workshop**, approximately one third (33.33%) of students were exposed to electrical hazards, while the minorities of them representing (2.7% and 1.2%) were exposed to mechanical and chemical hazards respectively.
- Regarding to **hazards that may face them inside the workshop**, flying light objects in the form of reich in the eye and skin is the most commonly type of mechanical hazards that affected them (56.76%). Approximately two thirds (67.27%) were reported that electrical hazards may be due to short circuit More than two fifths (44.14%) revealed that chemical hazards caused by

gases. Less than half (48.05%) had correct knowledge about loss in the ability to concentrate.

- Concerning **mechanical hazards prevention** the majority of the sample (97.60%) reported that the machines are lubricated on regular basis. slightly more than half (57.36%) agreed on presence of special activation key for each machine to protect them from hazards. More than three quarters (76.58%) of students stated that safety barrier should prevent the worker from exposure to hazards during working on the machine
- About **personal protective equipment** approximately two thirds (66.97%) stated that wearing coats that must be closed when working on the machine was important mean for personal protection. More than half (56.16%) reported that unavailability of personal protection equipment is a barrier to use them.
- There were highly statistically significant differences ( $P < 0.001$ ) between hazards that students were exposed to inside the workshop with personal and educational characteristics as department, school grade and sex.

**The following are the main recommendations:**

- There is a need to plan and conduct an in-service safety training program for students and teachers such as first aid program and using fire extinguishers.
- School administration should work on supplying the workshops with necessary personal protective equipments. It should be more adequate, more effective, properly worn, and maintenance should be done in regular basis.
- Adequate safety signs and symbols about machines danger should be available and using precautions is required near each machine.
- School system should teach first aid program as a part of educational curriculum.