

## Assess Students' Knowledge and Practice Regarding Disastrous Risk Reduction at Preparatory Schools at Helwan District

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### Abstract

**Background:** More than 400 national disasters take place every year, affecting more than 230 million people and causing an average of almost 75,000 deaths annually

**The aim:** The present study aimed to Assess Students' Knowledge and Practice Regarding Disastrous Risk Reduction at Preparatory Schools at Helwan District.

**Design:** A descriptive design will be used

**Setting:** The study will be conducted at two governmental preparatory schools in El Maasara, Helwan district.

**Sample:** A stratified multi-stage cluster random sample of 121 preparatory school students will be used for selection of school students.

**Tools:** Data was collected through two tools, 1- structured interview questionnaire to assess demographic characteristics and student knowledge regarding the disaster management plan 2- Observational checklist to assess school environment and the system of dealing with injured personnel in school.

**Results:** the study shows that there were decreased students level of knowledge regarding disaster concept and disaster management at time of study The revealed that all two preparatory school had unhealthy environmental related to classrooms, laboratories , clinics and playground schools. It's also revealed that there were statistical significant positive correlation between students age, father educational levels, place of residence and total knowledge scores  $p \leq 0.001$ .

**Conclusion:** The study concluded that preparatory school students had poor levels knowledge and practices regarding disastrous risk reduction and the schools had unhealthy environmental related to classrooms, laboratories , clinics and playground schools.

**Recommendation:** Applying disaster plan in schools on larger scale are needed to obtain more generalization of the results on all Egyptian schools.

**Keywords:** Disaster risk reduction plan and preparatory schools.

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### I. Introduction

Disaster risk is a product of the interaction of hazard and the vulnerability conditions of the society or elements exposed. Disaster risk reduction (DRR) is the concept and practice of reducing disaster risks through systematic efforts. The role of education in reducing disasters effects and confirmed the positive impact of education on reducing the risk of disasters. Based on framework for Action, education and training (Alex & Akani, 2015).

Education is a process that must be integrated at different levels of management and practice and has a positive effect on community knowledge and attitudes for risk reduction. These proper education and training could raise community knowledge and understanding to change behavior. The first and foremost desire of every person is to ensure the safety and well being of their students. In schools we find students from primary to advance level and it is essential to provide adequate infrastructure and educational facilities for them, in order to create a positive learning environment. (Asiabaka & Mbukwem, 2014).

Hence being alert about possible hazards is an important aspect in a school and is strongly felt in the context of Sri Lanka, which has a multi hazard vulnerability profile. The damages caused by recurrent floods, landslides, terrorism and last not least the tsunami in December 2004 have convinced us that the society should be better prepared to cope with such disasters in the future. Therefore, the Disaster Management Act of 2005 was enacted providing strong legislative and institutional arrangements for disaster risk reduction. Education is considered to be the best way for making a safe and disaster resilient society (Oyedjeji et al., 2014).

School is an important agency to reduce disasters risk through knowledge, innovation and education. Teachers and students play crucial roles in the development of a culture prevention and preparedness, because they can transfer knowledge and skills to the family and community. Therefore, the active participation of teachers and students in school disaster safety programmers is desired for moving the world towards a safer living place (**Ekpo and Essien-Ibok, 2015**).

From clinical observation and experience in Egyptian schools, there is no proper disaster management plan in preparatory governmental schools. The disaster plan includes assigned personnel (administrators' personnel & teachers), types of disasters (fires, earthquakes & volcanoes), and detailed information about each disaster. This may lead to be doubled or tripled cases of victims and injuries among these group as well as untrained disaster team. Disaster plan is just a documented paper to accomplish the disaster file in the school (**Abd El-kareem et al., 2014**).

Community nurses have an essential role to keep the community surrounding school safe and healthy even in case of dissenter through her communications. They should play a positive role for orientation of school staff, student for community resources and facilities that improve their knowledge and practice regarding disaster (**Stanhope &, Lancaster, 2015**).

Community health nursing practice must remain a constant across the national planning framework: prevention, protection, mitigation, response, and recovery. The recognition of public health nurses' specific, population-based skills in times of disaster is an extremely important part of our national capabilities. They are not just acute care replacements or back-up first responders for triage assignments in a mass casualty environment. This is not to say that they cannot do these functions if trained, and, indeed, all health professionals may be called on to stretch into non-routine practice areas in a catastrophic response. In disaster and emergency response, though, it is time for public health nursing to take a stand on its scope of practice and standards (**Clemenstone et al., 2016**).

#### **Significance of the study:**

The unintentional injuries annual incidence sustained by preparatory school age (13-15 years) was 190000 out of total 714212 students in school. As well as approximately 15,000 injuries occurring in school playgrounds during school hours yearly in Egyptian schools (**Health Insurance Agency, 2013**). So, if there is no management plan, the high incidence of injuries or deaths will increase in preparatory schools. In Egypt (1992) earthquake caused more than 530 deaths in Cairo, and more than 6500 injuries. More than 5500 residential, school and other buildings collapsed or were heavily damaged. Many of the casualties were not from falling buildings but from people being trampled in the panic to get out. In one district, 37 school students were killed and 65 were injured in the panic to get out from the school (**Abd El-kareem et al., 2014**).

Nursing role begins when the theme of "Disaster Reduction, Education and Students" was introduced during the United Nations World Disaster Reduction Campaign in 2000 (**UN 2000**). This priority has become integral to the 2005-2015 Hyogo Framework for Action as part of Priority, focusing on the "use of knowledge, innovation and education to build a culture of safety and resilience at all levels" (**United Nations, 2015**). Disaster risk reduction begins at school aimed to promote the integration of disaster risk reduction into government plans for school curricula and to ensure that school buildings are safe from the impacts of natural hazards (**Action Aid International, 2019**).

#### **Aim of the study**

This study aims to Assess Students' Knowledge and Practice Regarding Disastrous Risk Reduction at Preparatory Schools at Helwan District

#### **Research questions:**

- What are the students' knowledge and practice regarding disastrous risk reduction at preparatory schools at Helwan district ?
- Is there a relationship between the students' knowledge and practices about disasters and disaster plan and disaster risk reduction?
- What are the student knowledge and practice regarding disaster evacuation plan at preparatory schools at Helwan district ?

#### **Subject and methods:**

The methodology followed in conducting the study was presented under the following four designs: technical, operational, administrative and statistical designs.

### **I) Technical design:**

The technical design of this study includes a description of the research design, setting, subjects and tool of data collection.

#### **1- Research design:**

A descriptive design was used to carry out this study.

#### **2- Setting:**

The study was conducted at two governmental preparatory schools in El Maasara, Helwan district namely: El Sayeda Khadega preparatory school (850 students) 3 floors building with one small playground and El Maasara Preparatory School (900 students) 2 building (3 floors & 2 floors) with one small playground.

### **Sample:**

A stratified multi-stage cluster random sample was used for selection of school students in Al Maasara.

**First stage:** The total number of governmental preparatory schools in Al Maasara are (3), two were chosen randomly for conducting of the study.

**Second stage:** One class from third grade (59 students) were selected randomly from El Sayeda Khadega preparatory school. One class third grade (62 students) were selected randomly from El Maasara preparatory school.

**Third stage:** All school students in the selected classrooms were taken, the total number of students in two schools is 121 according to certain criteria:

1- Their age ranged from 13 to 15 years.

2- They got acceptance letter from their parents to participate in the study.

### **Tools:**

Two tools were utilized in this study

**Tool I:** A structural interviewing questionnaire was used in the study developed by the researcher after reviewing the national and international related literature. It contained 2 parts:

**First part:** Concerned with student demographic characteristics such as Age, sex, educational level of parent, occupation and place of residence.

**Second part:** Concerned with student knowledge regarding the disaster management plan in schools: This sheet includes 4 parts; 1. Knowledge about disaster and disaster management (7 questions), 2. Knowledge about disaster team in school (2 questions), 3. Knowledge about dealing with injured personnel during and after disaster (22 questions) and 4. Knowledge about psychological stress during and after disaster (4 questions)

### **Scoring system:**

The total number of questions was 35 coded as the following: Correct complete answer was given 2, Correct and incomplete was given 1 and Incorrect / no answer was given 0, so the total score for knowledge questionnaire tool was equal 70

Good knowledge = 43 -70 points (>60%), Average knowledge= 35 - 42 points (50-60%), and Poor knowledge= 0 – 34.5 points (<50%).

**Tool II: Observational checklist will be** consisted of two parts:

**First part:** Included observational checklist regarding schools (2 sections) 1. to assess school environment; classrooms, laboratories, school clinic, playgrounds, and corridors 2. to assess school evacuation (Abd El-kareem et al., 2014).

### **Scoring system:**

The total number of items are 35 coded as the following: Correct observed practice =1, Wrong observed practice = 0, therefor Total score for first part = 35.

Good observed practice = 22-35 points (>60%), Average observed practice = 17.5-21 points (50-60%) and Poor observed practice = 0-17 points (<50%).

**Second part:** Included eight subscales: 1. observed practices about wound care, 2. Practices about bleeding care, 3. Practices about dealing with unconscious personnel, 4. Practices about dealing with asphyxia personnel 5. Practice about burn, 6. Practice about fracture care, 7. Practice about dealing with besieged person, 8. Practices about the technique of lifting injured personnel (Abd El-kareem et al., 2014).

### **Scoring system:**

The total number of questions are 21 coded as the following:

Done = 2, Not Done = 0 So, Total score for second part = 42.

Good observed practice = 26-42 points (>60%), Average observed practice = 22-25 points (50-60%) and, Poor observed practice = 0-21 points (<50%).

### **II- Operational design:**

The operational design of this study included the preparatory phase, content validity, pilot study, reliability, field work and ethical consideration and educational program phases.

**A) Preparatory phase:**

For full understanding of the research problem and the technique used, the researcher took enough time to review the related literature and theoretical knowledge of various aspects of the study using books, articles, internet and magazines to develop tools for data collection.

**B) Content validity:**

The tools were revised by 4 juries experts from community Nursing staff (in Helwan & Ain Shams university) who reviewed the tools content for clarity, relevance, applicability comprehensiveness and understandable. All recommended modifications were applied.

**C) Tool reliability:**

The reliability of the tools was tested by measuring its internal consistency. It demonstrated a good level of reliability with Cronbach's alpha, it was 0.80.

**A-Pilot study:**

A pilot study was conducted on 10 % (21 students) of the total study sample to test and evaluate the clarity, feasibility and applicability of the study tools and time required for completion of each study tools also, pilot study sample was included from the main study sample.

**B-Field work:**

- A written approval letter was obtained from the Dean of Faculty of Nursing, Helwan University for performing the study in two preparatory schools at Helwan. Written letter should be sent to the school directors including the aim of the study.
- Data were collected within two semesters of (2017-2018) academic year, two days per week(Saturday & Thursday) from 10 Am - 2 Pm and interview the preparatory school students. A written approval was obtained from students parents after the researcher introduces herself for them, and after explaining the purpose of the study. The study was conducted by the researcher for students by distribution of the tool for them. The sample consists of 121 preparatory school students. They were divided 5 groups, and each group consists of 20 students.

Weeks	Days	Saturday	Thursday
First week	10AM: 2 PM	G1 - G2 each group equal 20	G1 -G2
Second week	10AM: 2 PM	G3 - G4 each group equal 20	G3 -G4
Third week	10AM: 2 PM	G5 each group equal 20	G5

**c- Ethical considerations:**

Prior to the pilot study, an ethical approval was obtained from the scientific research ethical committee of Faculty of Nursing, Helwan University. A written informed consent was obtained from each participant. They were assured that anonymity and confidentiality would be guaranteed and the right to withdraw from the study at any time.

**3- Administration Design:**

Approval to carry out this study was obtained from Dean of Faculty of Nursing, Helwan University and from Cairo Educational Directorate.

**IV- Statistical design**

The collected data were computerized and statistically analyzed using SPSS program (Statistical Package for Social Science) version 22.0. Qualitative data were represented as frequencies and relative percentages. Chi square test was used to calculate difference between qualitative variables. Quantitative data were expressed as mean  $\pm$  SD (Standard deviation). Pearson correlation coefficient used to calculate correlation between quantitative variables. The significance level for all above mentioned statistical tests done. The threshold of significance is fixed at 5% level (P-value). A t-test is used as a hypothesis testing tool, which allows testing of an assumption applicable to a population. The main result of a correlation is called the correlation coefficient (or "r"). It ranges from -1.0 to +1.0. The closer r is to +1 or -1, the more closely the two variables are related.

## II. Results

**Table (1):** showed that 71.9 % aged of student" less than 14  $\geq$ 15 years with the mean age 15.4 $\pm$ 0.5, the majority of the study sample were females. Regarding father educational level 30.6% were read and write, Regarding the father occupation 38.6 % were official workers. Regarding the mother education 26.5% were read and write, 80.2% of the mothers were housewives.

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**Table (2)** shows that there were decreased students' level of knowledge regarding disaster concept and disaster management at time of study.

**Table(3)** shows that there was decreased students levels of knowledge regarding disaster team in schools all knowledge items at  $p \leq 0.001$ .

**Table (4)** shows that there were decreased students levels of knowledge regarding dealing with injured personal during disaster in all knowledge items at  $p \leq 0.001$ .

**Figure (1)** reveals that, Distribution of total score of observational checklist about practices was non satisfactory in all practice items at  $p \leq 0.001$ .

**Table (5)** illustrated that there were a highly statistical significant difference between the mean scores of post practice, knowledge score levels and evacuation process  $p \leq 0.001$

**Table (1): Distribution of the studied sample demographic Characteristics (n=121).**

Characteristics	No.	%
<b>Age</b>		
- 13 $\geq$ 14	20	11.6
- 14 $\geq$ 15	87	71.9
- 15 $\leq$	14	16.5
<b>Mean <math>\pm</math> SD = 14.4<math>\pm</math>0.5</b>		
<b>Sex</b>		
- Female	121	100.0
<b>Father education</b>		
- Illiterate	8	5.0
- Read and write	39	30.6
- Secondary	15	9.9
- Diploma	6	29.7
- University and more	32	24.8
<b>Father job</b>		
- Freelancing	26	21.5
- Craftsman	45	37.2
- Official workers	50	41.3
<b>Mother education</b>		
- Illiterate	18	14.9
- Read and write	32	26.5
- Secondary	20	16.5
- Diploma	31	25.6
- University and more	20	16.5
<b>Mother job</b>		
- Work	24	19.8
- House wife	97	80.2

**Table (2): Distribution of the students' knowledge regarding disaster concept and disaster management (n=121).**

Knowledge	Incorrect	Incomplete	Complete	P value
	%	%	%	
• Meaning of disaster	45.5	44.6	9.9	0.000*
• Disaster management in the school	42.1	57.9	0.0	0.000*
• causes of disaster	33.9	59.5	6.6	0.000*
• Disaster effects on human	24.8	62.0	13.2	0.000*
• Important plan of disaster	10.7	77.7	11.6	0.000*
• Health task	25.6	73.6	0.8	0.000*
• Potential injuries	9.0	86.0	5.0	0.000*

(\*) statistically significant at  $P \leq 0.001$

**Table (3): Distribution of the students' knowledge regarding disaster team in schools. (n =121).**

Knowledge	Incorrect	Incomplete	Complete	P value
	%	%	%	
Team of disaster	37.2	62.8	0.0	0.000*
Training program about disaster	100.0	0.0	0.0	0.000*

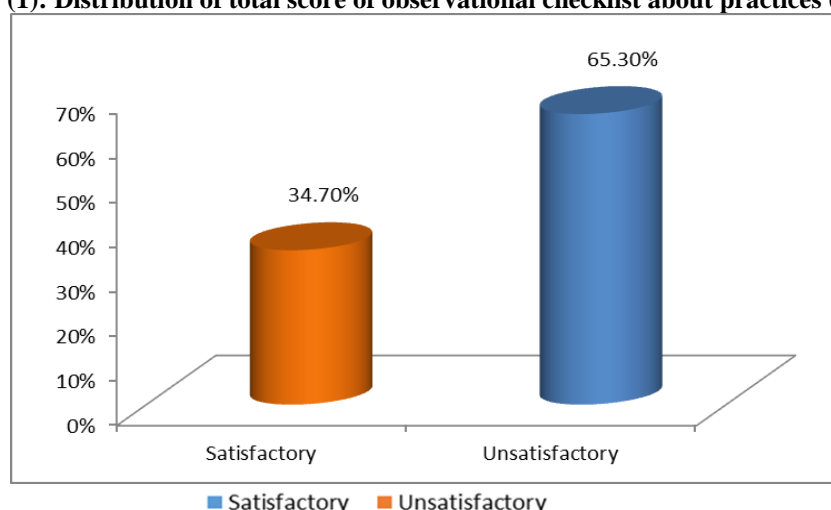
(\*) statistically significant at P<0.001

**Table (4): Distribution of the students' knowledge regarding dealing with injured personal during disaster (n =121).**

Knowledge	Incorrect	Incomplete	Complete	P value
	%	%	%	
• Emergency service	61.2	33.1	5.7	0.000*
• Evaluation information	69.4	26.4	4.2	0.000*
• Classification	71.9	24.0	4.1	0.000*
• Transport	62.8	35.5	1.7	0.000*
• Classification priorities	62.8	33.9	3.3	0.000*

(\*) statistically significant at P<0.001

**Figure (1): Distribution of total score of observational checklist about practices (n =121).**



**Figure (1): Distribution of total score of observational checklist about practices**

**Table (5): Correlation between total knowledge, total practice and students' evacuation process (n =121).**

Item	students' evacuation process	
	R	P value
Knowledge	- 0.197	0.03
Practice	- 0.028	0.763

(\*) statistically significant & (\*\*) high statistically significant P<0.001

### III. Discussion

The present study aimed to evaluate the effect of educational program of disastrous risk reduction at preparatory schools of Helwan district.

According to the demographic characteristics of students, the present study findings indicated that the mean age of students was 14.4±0.5 years (Table 1). This result is similar to a study conducted by Al-jundi, Al-Waeili,(2015) who “assess the level of knowledge of school student regarding immediate emergency management on 220 Jordanian school staff and students ”found that, age of students was 15.18 ±4.95 for the study group, compared to 13.94±4.50 for control group. As well it is nearly consistent with Ahmed,(2016) who study the implementation of disaster prevention educational programmer on 12 primary school in Kafr-Elzayat in Egypt, represented that mean age of students was 15.17 ±10.8 years. Also, in accordance with **Srinivas, (2016)** study which conducted in India about disaster management program, illustrated that the mean age of students was 15.1 ± 9.64 years

Regarding the sex, the study finding revealed that the majority of them were females (Table 1). This study finding is in agreement with a study conducted in Egypt at Ain Shams University by **Arafa and Amin, (2015)** also, a study conducted in Nigeria, by **Bernice et al, (2016)** where both studies found that the majority of primary school students female than the male. This may be due to greater number of females than males in the most populations.

Concerning the level of education of parents, the current study result revealed that the more than half of the father and mothers had low level of education read and write only (**Table 2**). This goes in line with the high percentage of participants from rural areas, where the education was low. This low level of education would certainly influence student's knowledge and practices regarding disaster prevention. In the same line the study conducted in Palestine by **Abu Obaid and Eljedi, (2016)** who studied the preparedness of school in responding to emergencies among schools, found that parents with high level of education have better knowledge and practice regarding disaster prevention, more aware of suspected complications and have more flexibility to improve their health for student. This study is similar to the study conducted in Egypt at Mansoura city by **Salah (2015)** who study about "application in disaster management plan in primary school in Mansoura city", found that three quarter of the parents had low level of education. This finding may be due to that in rural areas there is increase in illiteracy rate among parents and low income among families living in the villages.

Regarding the father and mother occupation, the current study revealed that one thirds of fathers workers in official workers and the majority of mothers are housewives (**Table 1**). This finding was in accordance with (**Sissolak et al, 2015**), who studied the evaluated the impact of disaster education course on 2500 student in Jordania and found that, the majority of fathers workers in official workers and on third of mother had housewife.

Current study results revealed that student had poor and incomplete knowledge about the disaster concept and disaster management such as meaning of disaster, causes, important plane of disaster and health task. This in accordance with **Abd El Aziz and Abd -El Aal, (2012)** in research about Occupational Program for Improving the student knowledge about disaster management and that the educational program improved students' knowledge regarding disaster management and its dangerous effect on health.

Current study results revealed that there were students had poor and incomplete knowledge about the role of team during disaster the majority of team and all off students had no experience in disaster management . This in accordance with **Hu et al. (2013)** More than half of team of disaster reported that there was trained team in emergency situation in all team it's very important. These results supported by **Tuswadi & Hayashi, (2014)** who studied the implementation of disaster prevention education program on 24 preparatory schools in Indonesia and found that, 101 students still have lack of experience related to disaster prevention due to limited training programs and the stay revealed that need for continuous training programs on disaster management at schools to improve the students and teachers skills in case of any disasters. In addition, the study of **Ostad, Taghizadah, Mowafi & Ardlan. (2016)** that explored the gap between the policy and practice of disaster management in Iranian schools revealed that, improper practices during disasters lead to tragedy during evacuation, which alert the Iranian Ministry of Education to organize regular training programs for school staff and students in safety measures especially fires in schools.

Regarding practices, the current study indicated a poor levels of practice among students, The current finding was supported by **Ingrassia, et al (2014)** who assessed the effect of a disaster management educational program and training initiatives on 3410 school students in European and found improving in the emergency response after disaster management educational program and a highly statistical significant differences between total scores practice related disaster among students before and after the educational program. Also, the present finding agreed with the study done by **Wolmer et al (2012)** who described the effects of a universal students – based preventive intervention program on 46 students in six Israeli schools and found a significant differences between practice scores among students before and immediately after the preventive intervention program related to disaster.

The current study revealed a statistical significant positive correlation between student age, father educational levels and total knowledge scores. The finding contradicted the study done by **Zurlo et al (2014)** who analyzed the impact of disaster management on 863 students in Italy and found a statistical significant correlation between student age, father educational levels and total knowledge scores. While no statistical significant correlation between father educational levels and total practices

Theses contradictions may be related to the culture diversity between Egypt and Italy, also it could be related to the sample size and selection,

The current study indicated a statistical significant positive correlation between student age, father educational levels and total practice scores. The finding contradicted the study done by **Liao. (2014)** who examined the effect of a disaster education course on students in Taiwan and found a significant positive correlation between students age, father levels of education and disaster knowledge, practice, and their behavior

intention toward disaster, the contradicted could be related to the sample selection where most of the students were females, also no correlation with their age because all of them had the same age.

#### IV. Conclusion

The study concluded that preparatory school students had poor knowledge and practices regarding disastrous risk reduction and the schools had unhealthy environmental related to classrooms, laboratories , clinics and playground schools

#### V. Recommendations

Based on the findings of this study, the following recommendations are suggested:

- 1- The availability of booklet well oriented disaster team with disaster plan in schools.
- 2- Apply disaster plan periodically to keep students, school staff and school environment safe.
- 3- Periodic training programs for all the disaster team in different types of schools on disaster management.
- 4- Empowering the role of nurses working in schools as a member in disaster team.
- 5- Further researchers about applying disaster plan in schools on large scale are needed to obtain more generalization of results on all Egyptian schools.

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