



## Awareness of Undergraduate Nursing Students regarding Disaster Management at the British University in Egypt

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### Abstract

**Background:** Disasters occur more frequently with greater force than in the past and have a detrimental effect on society on many levels. Nursing students as future nurses should be prepared for disaster management. **Aim:** Assess awareness of undergraduate nursing students regarding disaster management at the British university in Egypt. **Design:** A descriptive research design was utilized in this study. **Setting:** The study was conducted at the Faculty of Nursing, the British University in Egypt. **Sample:** A systematic random sample for undergraduate nursing students from the four academic degrees was used, included 251 students. **Tool:** A Structured interviewing questionnaire consisted of four parts: Part I: Demographic characteristics of undergraduate nursing students. Part II: Undergraduate nursing students' knowledge regarding disaster and disaster management. Part III: Undergraduate nursing students' attitude toward disaster management. Part IV: Undergraduate nursing students' reported practices regarding disaster management. **Results:** 75% of the studied students had an unsatisfactory total level of knowledge regarding disaster management, 83 % of them had a total positive attitude, and 60% had an inadequate total level of reported practices. **Conclusion:** There were highly statistically significant positive correlations between total knowledge, attitude and reported practices regarding disaster management among the studied students. **Recommendation:** Implementing educational programs for nursing students about disaster management.

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**Keywords:** Awareness, Disaster Management, and Undergraduate Nursing Students

### Introduction

Disasters had a profound effect on society and contributed to the downfall of many civilizations throughout history. Disaster can be defined as "The major disruption of the functioning of a community involving widespread human, material, economic, or environmental losses that exceed the affected community resources and capabilities". Disasters can be broadly divided into several categories based on their cause or origin. For example, disasters can be classified into man-made disasters such as terrorist attacks and natural disasters that are caused by natural phenomena such as climatological and biological disasters (*United Nation Office for Disaster Risk Reduction, 2024*).

Disasters are also categorized as either internal or external disasters in healthcare settings. Internal disasters result in disruption of regular hospital operations due to damage and injuries or deaths of hospital personnel. On the other side, disasters that occur outside of a hospital but strain their resources because of patient volume or any kind of injury are known as external disasters. Disasters not only can cause fatalities and injuries but also have the potential of straining the health care systems and reducing accessibility and availability of medical care (*Badina et al., 2022*).

Disaster management is the process of effectively anticipating and responding to disasters. There are various stages involved in disaster management; these stages are frequently referred to as the disaster management cycle. The mitigation phase comes first, and it focuses on reducing or eliminating the risk of disasters. The second phase is the preparedness phase, which emphasizes developing plans and procedures, and managing resources to effectively respond to a disaster. Then the response phase, and its primary goal is to save lives, protect property, and meet immediate needs of the victims. Ending with the recovery phase that involves restoring affected communities to a pre-disaster state or a new improved state (*Alruwaili et al., 2021*).



Nurses are typically the first medical personnel to arrive at a scene of emergency during disasters. Thus, nursing students as future nurses should be knowledgeable, have a positive attitude, and competent in disaster management. Recently, disasters occur more frequently with greater force than in the past. Therefore, there is an increasing possibility of nursing students to be involved in disaster management efforts (*Oktari et al., 2020*).

Awareness of nursing students about disaster management can be evaluated through three major domains, which are their knowledge about the core concepts of disaster and disaster management, attitude regarding disaster management, and practices during disaster events. The level of awareness of disaster management among nursing students can differ based on multiple factors, including age, cultural background, previous exposure to disaster, and previous experience in disaster management even through training and drills. Thus, integrating disaster management in nursing curriculum and disaster management education in general is very critical for nursing students (*Aftab Ghouri et al., 2023*).

Community Health Nurses (CHN) play a crucial role in disaster management whether before, during, and after disasters. Their main role is providing education and health promotion activities to safeguard public health. Also, CHN provide psychological first aid, assess and triage victims, allocate scarce resources, and monitor ongoing physical and mental health needs. Furthermore, community health nurses assist with organizational coordination by developing operational response protocols and performing statistical analysis of individual and community level data (*Avasthi, 2021*).

### Significance of the study

Disasters have a significant financial impact. In Egypt, the medical related disasters such as Covid-19 have a noteworthy financial burden on the Egyptian health system. According to the International Monetary Fund (IMF), Covid-19 is estimated to cost Egypt 15.2% of its Gross Domestic Product (GDP), this is equivalent to approximately \$ 40 billion (*International Monetary Fund, 2021*). Due to high temperatures and extreme weather, Egypt is highly vulnerable to water scarcity, droughts, rising sea levels, and other adverse impacts that can cause horrible disasters. For instance, studies revealed that by 2050, an estimated 5.7 million people will live in flood zones. This is an undeniable warning sign for strengthening disaster management efforts in Egypt (*World Bank, 2021*).

Disaster management awareness among undergraduate nursing students is widely acknowledged, because this will help in recognizing students' scientific literacy to be prepared for professional practice. However, in Egypt there are no studies done in this area. There is still a gap in understanding the awareness and preparedness levels among nursing students in Egypt, who represent a critical segment of the population (*Kaye, 2020*).

Assessing the nursing students' level of awareness regarding disaster management will shed light on potential gaps and misconceptions in disaster management. These insights can inform the development of educational programs and policies tailored specifically to nursing college students (*Aftab Ghouri et al., 2023*). Therefore, there is a high need to conduct this study to assess awareness of undergraduate nursing students regarding disaster management.

### Aim of the Study:

This study aimed to assess awareness of undergraduate nursing students regarding disaster management at the British university in Egypt through the following objectives:

1. Determining the undergraduate nursing students' level of knowledge regarding disaster management.
2. Assessing undergraduate nursing students' attitude regarding disaster management.
3. Identifying undergraduate nursing students' reported practices regarding disaster management.

### Research questions:

Q1. What is the undergraduate nursing students' level of knowledge regarding disaster management?

Q2. What is undergraduate nursing students' attitude toward disaster management?

Q3. What are undergraduate nursing students' reported practices regarding disaster management?

Q4. What is the relation between undergraduate nursing students' level of knowledge, attitude and reported practices regarding disaster management?

Q5. What is the correlation between students' level of knowledge, attitude and reported practices and their demographic characteristics?

## Subjects and Method

**Research design:** A descriptive research design was used to conduct this study.

**Research setting:** This study was conducted at the Faculty of Nursing, the British University in Egypt (BUE).

**Subject:** The subjects of the current study were nursing students from the Faculty of Nursing, the British University in Egypt

**Sampling technique:** A systematic random sample for undergraduate nursing students from the four academic degrees (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> degree).

**Sample Size:** The total students are 718 undergraduate nursing students from all academic degrees divided as follows: 293 students from the first academic degree, 220 students from the second academic degree, 100 students from the third academic degree, and 105 students from the fourth academic degree. The study used the following standardized sample equation:

$$n = \frac{N \times p(1-p)}{\left[ \frac{N-1}{d^2} \div Z^2 \right] + p(1-p)}$$

**Where:**

N = Population size

Z = Class standard corresponding to the level of significance, and it equals 0.95.

d = The error rate which equals 0.05

P = Ratio that provides a neutral property = 0.50 (Suresh & Chandrashekara, 2012).

N x p (1-p)	= 718 x 0.5 x (1-0.5)
N-1	= (718-1)
$d^2/z^2$	= 0.0025 / 3.8416
p(1-p)	= 0.5 x (1-0.5)
N	= 250.7 = <b>251</b>

Based on the above equation, the actual sample size was 251 undergraduate nursing students, divided into the following:

Academic degree	No. of the students
1 <sup>st</sup> degree	106
2 <sup>nd</sup> degree	76
3 <sup>rd</sup> degree	34
4 <sup>th</sup> degree	35
<b>Total</b>	<b>251</b>



### Tool for data collection

The data was collected by using the following tool:

**A structured interviewing questionnaire:** Was developed by the investigator after reviewing relevant recent national and international literature. It consisted of 4 main parts as follows:

**Part (1): The undergraduate nursing students' demographic characteristics** categorized into 9 questions included age, gender, place of residence, academic degree, father and mother education, and father and mother occupation, and family's monthly income.

**Part (2): Assessment of nursing students' knowledge level** divided into:

**A. Knowledge related to disaster** with 8 questions involved meaning of disasters, types of disaster, the meaning of natural disasters, examples of natural disasters, meaning of man-made disasters, examples of man-made disasters, and direct and indirect effect of disasters.

**B. Knowledge related to disaster management** consisted of 13 questions included phases of disaster management, mitigation measures, meaning of Hazard Vulnerability Analysis (HVA), meaning of disaster preparedness, community-level disaster preparedness procedures activities, purpose of disaster drill, priorities during disaster response, golden hour in disaster management, meaning of the evacuation plan, the use of the Incident Command System (ICS), triaging, the purpose of a disaster recovery plan, and examples of a long-term recovery activities.

### Scoring system for knowledge items

The total knowledge items consisted of 21 questions, the total score of the knowledge items were 42 grades, "Complete Correct" answer was scored two grades, "Incomplete Correct" answer was scored one grade, and "Do not know" or "Incorrect" answers were scored zero. Those scores were summed and converted into a percent score. They ranged from 0-42 grades and categorized into 2 categories:

- Satisfactory level of knowledge if the score  $\geq 60\%$  ( $\geq 25$  grades)
- Unsatisfactory level of knowledge if the score  $< 60\%$  ( $< 25$  grades)

**Part (3): Assessment of nursing students' attitude toward disaster management** consisted from 15 questions included likelihood of different types of disasters in Egypt, the necessity of disaster management plan and committee, maintaining a personal and family disaster preparedness plan, participation in disaster drill, communication during disasters, prioritizing care and triaging, the efficient use of resources, providing psychological first aid, following the institutional or national ethical framework, nursing students' responsibility in disaster management efforts, incorporating disaster management education in nursing curriculum, importance of disaster management for educated people only, willing to volunteer in disaster response efforts, and helping others during a disaster.

### Scoring system for attitude items

The attitude part consisted of 15 items and the total score were 45 grades, in which each item was evaluated as "Agree" taking three grades, "Neutral" taking two grades, and "Disagree" taking one grade. Those scores were summed and converted into a percent score. They ranged from 1 - 45 grades and categorized into 2 categories:

- Positive attitude if the score  $\geq 60\%$  ( $\geq 27$  grades)
- Negative attitude if the score  $< 60\%$  ( $< 27$  grades)

**Part (4): Assessment of nursing students' reported practices regarding disaster management** adapted from the core competency of nursing disaster guidelines *International Council of Nurses, (2019)* and modified by the investigator. It included 21 questions divided into six subcategories as the following:

Preparation and planning which included 4 items and involved developing a personal and family preparedness plan, participating in disaster drills, identifying the available resources, policies and procedures, and having a disaster preparedness kit.

Communication in disasters that divided into 3 items which were communicating disaster-related priorities during disasters, discussing disaster management plan with others, receiving training on communication during disaster.

Safety and security which had 3 items like maintaining safety for self and others during disasters, using Personal Protective Equipment (PPE), and reporting the possible risks in the community.

Intervention and response that consisted of 6 items, including implementing basic first aid, prioritizing needs and resources during disasters, participating in surge capacity activities, involving the self in real life disaster response efforts, practicing turning off utilities during disasters, and receiving training on disaster response.

Recovery that divided into 2 items, which were applying regular assessment for self and others after disasters and assisting others and community to resume functioning in post disaster phase.

Law and ethics that included 3 items like practicing within the applicable emergency laws, policies and procedures during disasters, demonstrating understanding of ethical practices during disaster response, and following the chain of command during disasters.

### Scoring system for reported practices items:

They had 21 items, and the total score was 21 grades. "Done" answer given one grade, and "Not done" answer given zero grade. Those scores were summed and converted into a percent score. They ranged from 0- 21 grades and were classified into 2 categories:

- Adequate reported practices level if the score  $\geq 60\%$  ( $\geq 13$  grades).
- Inadequate reported practices level if the score  $< 60\%$  ( $< 13$  grades).

### Validity

The developed tool was formulated and submitted to three experts from Community Health Nursing, Helwan University to assess the content validity. No modification was required based on the experts' feedback.

### Reliability

Cronbach's Alpha was used to determine the internal reliability of the tool as follows:

Tools	Cronbach's Alpha
The undergraduate nursing students' knowledge	0.876
The undergraduate nursing students' attitude	0.764
The undergraduate nursing students' reported practices	0.923

### Ethical consideration

An official permission to conduct the study was obtained from the Scientific Research Ethical Committee, Faculty of Nursing, Helwan University. Participation in the study was voluntary and subjects received complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study and stating the possibility to withdraw at any time. Confidentiality of the information was ensured where the subject information cannot be accessed by any other party without taking permission from the participants. Ethics, values, culture, and beliefs were respected.

### Pilot Study

The pilot study was done on 10% (25) undergraduate nursing students of the sample to examine the clarity of questions and time needed to complete the study tools. Based on the results, minor modifications had been done like changing the

way of asking the questions and the answering options in the knowledge items. Subjects included in the pilot study had been included in the study because there were no major modifications required.

### Field work

- Approval to carry out this study was obtained from the dean of the Faculty of Nursing at Helwan University directed to the Faculty of Nursing at the British University in Egypt.
- After establishing a trustful relationship, the investigator began data collection by introducing herself to the participants and explaining the study and its significance.
- Informed consent was obtained from each participant prior to data collection.
- The data had been collected during the academic year of 2023-2024 over a period of 3 months (beginning of February 2024 till the end April 2024). Data was collected 3 days per week (Sunday, Tuesday, and Thursday) from 11:00 am to 2:00 pm to fit with all the academic degrees timetables. This means that almost 3 students had been interviewed using the Google form questionnaire each week during the study period.
- The interviewing questionnaire had been filled online through Google form, taking almost 20-30 minutes to be fully filled in.

### Statistical Item

Upon completion of data collection, data was computed and analyzed using Statistical Package for Social Science (SPSS), version 24 for analysis. Data was presented using descriptive statistics in the form of frequencies, percentage for categorical data, mean  $\pm$ , and standard deviation ( $\pm$  SD) to describe the results. In addition, appropriate inferential statistics such as chi-square were used to compare between the variables. Also, the r-test was used to identify the correlation between the study variables. Degrees of significance of the results were considered as follows:

- P-value  $>0.05$  not statistically significant (NS)
- P-value  $\leq 0.05$  statistically significant (S)
- P-value  $\leq 0.001$  highly statistically significant (HS)

### Results

**Table (1):** Shows that 47.8% of the studied students were at the ages of  $20 \leq 23$ , with mean age  $20.19 \pm 2.13$ . 57.4% of them were male, and 59% came from rural areas. Additionally, 42.2% of the students were in their first degree of study. Furthermore, 38.6% and 32.7 % of the studied students' fathers and mothers had a secondary education and basic education respectively. Moreover, 76.5% of the studied students' fathers were employed while 68.5% of their mothers were housewives.

**Figure (1):** Illustrates that 48.2% of the studied students' families' monthly income was not enough, compared to 39.4% of the students' families that had enough monthly income.

**Figure (2):** Presents that 75% of the studied students had unsatisfactory total knowledge level regarding disaster management, while 25% of them had satisfactory total knowledge level.

**Figure (3):** Presents that 83% of the studied students had positive total attitude toward disaster management, while 17% of them had negative total attitude toward disaster management.

**Figure (4):** Shows that 40% of the studied students had adequate total reported practices regarding disaster management, while 60% had inadequate total reported practices.

**Table (2):** Demonstrates that there was a highly statistically significant relation between the studied students' total knowledge level and their demographic characteristics such as age, academic degree, father's and mother's educational level, father's occupation, and family's monthly income with  $P \leq 0.001$ . However, there was no statistically significant relation between gender, place of residence, and mother occupation of studied students with the total knowledge level regarding disaster management.

**Table (3):** Illustrates that there was a highly statistically significant relation between total attitude of the studied students and their demographic characteristics such as age, academic degree, fathers educational level, fathers' occupation, and family's monthly income. Also, there was statistically significant relation between the gender and mothers' educational



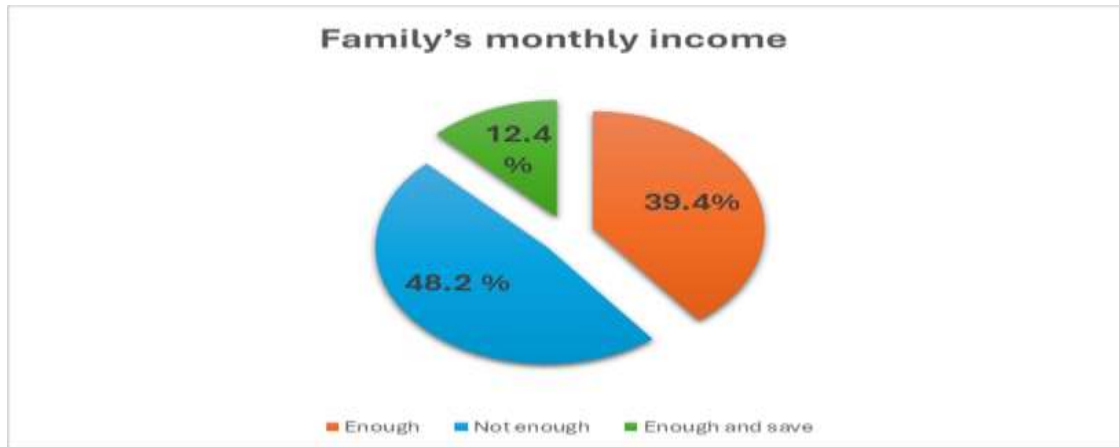
level of the studied students and their total attitude. However, there was no statistically significant relation between the place of residence of the studied students and the mother's occupation with the total attitude of the studied students.

**Table (4):** Shows that there was a highly statistically significant relation between total reported practices level of the studied students and their demographic characteristics such as age, gender, academic degree, and father's occupation. Moreover, there was a statistically significant relation between the place of residence and the family's monthly income. However, there was no statistically significant relation between the fathers' and mothers' educational level and mother's occupation with total reported practices level regarding disaster management.

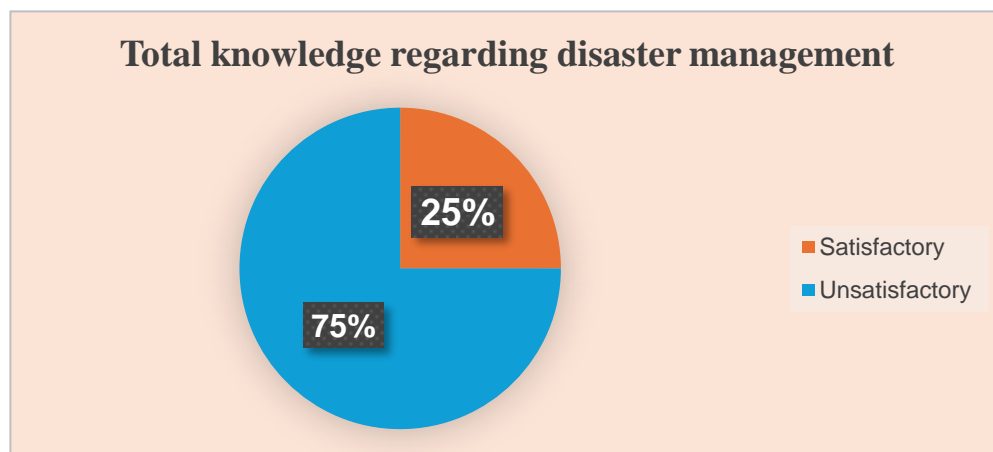
**Table (5):** Presented that there was a highly statistically significant positive correlation between total knowledge, attitude and reported practices regarding disaster management among the studied students at ( $P \leq 0.001$ ).

**Table (1):** Frequency Distribution of the Studied Undergraduate Nursing Students according to their Demographic Characteristics (n=251).

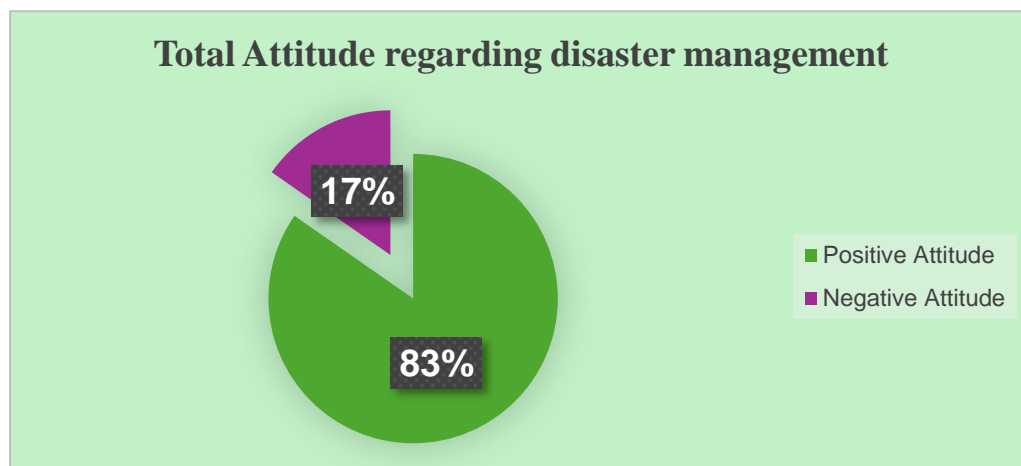
Demographic characteristics	No.	%
<b>Age (years)</b>		
17 < 20	113	45
20 ≤ 23	120	<b>47.8</b>
>23	18	7.2
<b>Mean(<math>\bar{x}</math>) ± SD      20.19 ± 2.13</b>		
<b>Sex</b>		
Male	144	<b>57.4</b>
Female	107	42.6
<b>Place of residence</b>		
Rural	148	<b>59</b>
Urban	103	41
<b>Academic degree</b>		
1st	106	<b>42.2</b>
2nd	76	30.3
3rd	34	13.5
4th	35	14
<b>Fathers' educational level</b>		
Can't read and write	15	6
Basic education	47	18.7
Secondary education	97	<b>38.6</b>
University education	92	36.7
<b>Mothers' educational level</b>		
Can't read and write	39	15.5
Basic education	62	24.7
Secondary education	82	<b>32.7</b>
University education	68	27.1
<b>Fathers' occupation</b>		
Employed	192	<b>76.5</b>
Unemployed	59	23.5
<b>Mothers' occupation</b>		
Employed	79	31.5
Housewife	172	<b>68.5</b>



**Figure (1):** Distribution of the Studied Nursing Students according to Family's Monthly Income (n=251).

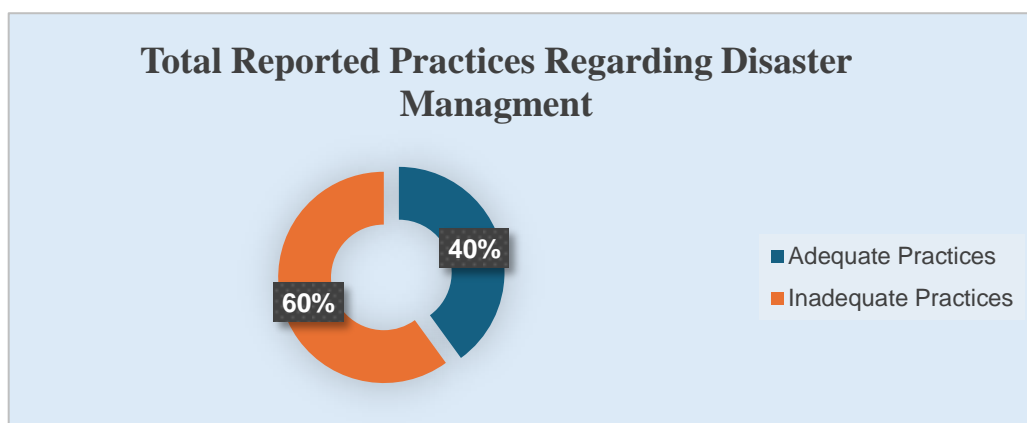


**Figure (2):** Percentage Distribution of the Studied Undergraduate Nursing Students' Total Knowledge regarding Disaster Management.



**Figure (3):** Percentage Distribution of the Studied Undergraduate Nursing Students' Total Attitude toward Disaster Management.





**Figure (4):** Percentage Distribution of the Studied Undergraduate Nursing Students' Total Reported Practices Regarding Disaster Management.

**Table (2):** Relation between the Demographic Characteristics of the Studied Undergraduate Nursing Students and Their Total Knowledge of Disaster Management (n=251).

Demographic Characteristics	Total knowledge level					
	Satisfactory (n= 63)		Unsatisfactory (n= 188)		Chi-square	P-value
	No.	%	No.	%		
Age (years)						
17 < 20	11	17.5	63	33.5	40.11	0.001**
20 ≤ 23	2	3.2	109	58		
>23	50	79.3	16	8.5		
Gender						
Male	41	65.1	103	54.8	2.044	0.153
Female	22	34.9	85	45.2		
Place of residence						
Rural	34	54	114	60.6	0.868	0.352
Urban	29	46	74	39.4		
Academic degree						
1st	50	79.3	56	29.8	48.83	0.003**
2 <sup>nd</sup>	7	11.1	69	36.7		
3rd	5	8	29	15.4		
4th	1	1.6	34	18.1		
Father's educational level						
Can't read and write	1	1.6	14	7.4	23.62	0.001**
Basic education	10	15.9	37	19.7		
Secondary education	40	63.5	57	30.3		
University education	12	19	80	42.6		
Mother's educational level						
Can't read and write	8	12.7	31	16.5	12.37	0.006**
Basic education	23	36.5	39	20.7		
Secondary education	24	38.1	58	30.8		
University education	8	12.7	60	32		
Father's occupation						
Employed	59	93.7	133	70.7	13.77	0.000**
Unemployed	4	6.3	55	29.3		
Mother's occupation						
Employed	20	31.7	59	31.4	0.003	0.957
Housewife	43	68.3	129	68.6		

Family's monthly income						
Enough	47	74.6	52	27.6	43.88	0.000**
Not enough	14	22.2	107	57		
Enough and save	2	3.2	29	15.4		

\*\* Highly statistically significant at  $P \leq 0.001$

**Table (3):** Relation between the Demographic Characteristics of the Studied Undergraduate Nursing Students and Their Total Attitude toward Disaster Management (n=251).

Demographic Characteristics	Total Attitude					Chi-square	P-value
	Positive (n=208)		Negative (n=43)				
	No.	%	No.	%			
Age (years)							
17 < 20	83	40	30	69.7	12.88	0.002**	
20 ≤ 23	109	52.4	11	25.6			
>23	16	7.6	2	4.7			
Gender							
Male	113	54.3	31	72.1	4.599	0.03*	
Female	95	45.7	12	27.9			
Place of residence							
Rural	123	59.1	25	58.1	0.015	0.904	
Urban	85	40.9	18	41.9			
Academic degree							
1st	76	36.5	30	69.8	17.84	0.001**	
2nd	69	33.2	7	16.3			
3rd	29	14	5	11.6			
4th	34	16.3	1	2.3			
Father's educational level							
Can't read and write	15	7.2	0	0	32.29	0.000**	
Basic education	44	21.1	3	7			
Secondary education	64	30.8	33	76.7			
University education	85	40.9	7	16.3			
Mother's educational level							
Can't read and write	36	17.3	3	7	10.95	0.01*	
Basic education	44	21.2	18	41.9			
Secondary education	67	32.2	15	34.8			
University education	61	29.3	7	16.3			
Father's occupation							
Employed	150	72.1	42	97.7	12.946	0.000**	
Unemployed	58	27.9	1	2.3			
Mother's occupation							
Employed	65	31.2	14	32.6	0.028	0.866	
Housewife	143	68.8	29	67.4			
Family's monthly income							
Enough	63	30.3	36	83.7	42.686	0.000**	
Not enough	116	55.7	5	11.6			
Enough and save	29	14	2	4.7			

Statistically significant at  $P \leq 0.05$  \*\* Highly statistically significant at  $P \leq 0.001$

**Table (4):** Relation between the Demographic Characteristics of the Studied Undergraduate Nursing Students and Their Total Reported Practices regarding Disaster Management (n=251)

Demographic Characteristics	Reported Practices					Chi-square	P-value
	Adequate (n=100)		Inadequate (n=151)				
	No.	%	No.	%			
Age (years)							
17 < 20	15	15	45	29.8	60.83	0.000**	
20 ≤ 23	75	75	8	5.3			
>23	10	10	98	64.9			
Gender							
Male	54	54	53	35.1	8.787	0.003**	
Female	46	46	98	64.9			
Place of residence							
Rural	67	67	81	53.6	4.436	0.03*	
Urban	33	33	70	46.3			
Academic degree							
1st	8	8	98	64.9	102.1	0.002**	
2nd	54	54	22	14.6			
3rd	10	10	24	15.9			
4th	28	28	7	4.6			
Father’s educational level							
Can't read and write	8	8	7	4.6	3.189	0.363	
Basic education	17	17	30	19.8			
Secondary education	34	34	63	41.8			
University education	41	41	51	33.8			
Mother’s educational level							
Can't read and write	22	22	17	11.3	6.733	0.81	
Basic education	19	19	43	28.5			
Secondary education	33	33	49	32.4			
University education	26	26	42	27.8			
Father’s occupation							
Employed	66	66	126	83.4	10.181	0.001**	
Unemployed	34	34	25	16.6			
Mother’s occupation							
Employed	25	25	54	35.8	3.23	0.072	
Housewife	75	75	97	64.2			
Family’s monthly income							
Enough	55	55	66	43.7	6.29	0.04*	
Not enough	30	30	69	45.7			
Enough and save	15	15	16	10.6			

\* Statistically Significant at  $P \leq 0.05$  \*\* Highly Statistically Significant at  $P \leq 0.001$

**Table (5):** Correlation between Total Knowledge, Attitude, and Reported Practices regarding Disaster Management among the Studied Students (n=251).

Variables	Total Knowledge	Total Attitude
Total Knowledge		$r = 0.263$ $P = 0.000**$
Total reported practices	$r = 0.711$ $P = 0.000**$	$r = 0.370$ $P = 0.000**$

r= correlation coefficient test. P= p-value \*\* highly statistically significant at  $P \leq 0.001$



## Discussion

Disaster management is the process of effectively anticipating and responding to disasters. It includes the strategic allocation of resources to minimize damage caused by disasters, ensures that victims receive appropriate assistance, and accomplishes an efficient recovery (*Sun et al., 2020*). With disasters occurring more frequently and posing a threat to people worldwide, it is critical to prepare nursing students for disasters. Namely, nursing students should be prepared with knowledge, positive attitude, and good practices for efficient disaster management (*Zhou et al., 2022*).

### Part I: Studied nursing students' demographic characteristics:

The current study's findings showed that nearly half of the studied students were in ages of  $20 \leq 23$  (**Table 1**). Similarly, a study conducted by *Mohamed et al., (2023)* in Saudi Arabia about "Nursing students' knowledge, attitude, and practice regarding disaster preparedness: a cross-sectional study" ( $n = 206$ ) revealed that 53.9% of the studied nursing students' ages ranged between 20 and 23 years old.

Regarding the sex of the participants, the present study found that more than half of the study participants were male. However, several other studies revealed the opposite. For example, a study conducted by *Sahar et al. (2018)* about "The effect of an educational intervention about disaster preparedness on knowledge and attitudes of technical nursing institute intern-nurse students" ( $n=119$ ) clarified that 85.5 % of the study subjects were female.

From the investigator's point of view, this may be because studying nursing in Egyptian universities was exclusive for females only till few years ago. However, nowadays the ratio of male and female enrollment in nursing colleges has changed with equal chances for both genders.

Concerning the academic degree, the current study showed that more than two fifths of the studied students were in their first degree of their study. On the contrary, *Mohamed et al., (2023)* found that 36.4% of the study participants were studying in the fourth degree.

From the investigator's point of view, this can be interpreted by the huge number of first academic degree students compared to the other academic degrees at the British University in Egypt, where the study was conducted.

Regarding the place of residence, the present study clarified that nearly three fifths of the participants came from rural areas. The study agreed with *Aurelio et al., (2022)* in their study about "Knowledge, attitude, and practices of nursing students on disaster preparedness" ( $n=507$ ). Authors presented that 58.6% of the respondents came from rural areas.

This can be explained by the nature of the greater Cairo as the capital city to attract students from Upper Egypt and other small cities to have their university degrees because of the unavailability of similar programs in their cities.

In terms of parents' education, the current study displayed that more than one third, and more than one quarter of the studied students' fathers and mothers had a secondary education respectively. This finding was inconsistent with a study done by *Alkalash et al., (2023)* about "knowledge and attitude toward disaster preparedness among secondary school students in the western region of Saudi Arabia" ( $n=726$ ), which stated that 45.7% and 41.5 % of the students' fathers and mothers were at university level education respectively.

This can be due to the low rate of higher education among the older generation in Egypt, especially in rural areas.

Regarding the family's monthly income, the present study illustrated that nearly half of the students did not have enough monthly income (**Figure 1**). This finding contrasts with the observations of *Alkalash et al. (2023)*, who reported that 38.8% of participants had enough family's monthly income ranging from 10,000 to 20,000 SAR.

## Part II: Studied nursing students' knowledge regarding disaster management:

The current study presented that three quarters of the students had an unsatisfactory total knowledge level regarding disaster management (**Figure 2**). On the same line, *Dargahi et al., (2017)* who investigated the "Knowledge and attitudes of students in Khalkhal Medical Sciences Faculty on health actions in emergencies" (n=200), found that 8% of studied students had a good disaster management knowledge, while 65.5% had moderate knowledge level, and 26% had poor knowledge level.

From the investigator's opinion, the reason is that nursing curriculum did not fully incorporate disaster management and preparedness topics. There is a significant association between incorporating disaster management education in nursing curriculum and enhanced knowledge, improved skills, and increased readiness for unforeseen disaster events.

On the other hand, *Hussein & Awad (2022)* who investigated "Assessment of knowledge preparedness nurses for disaster management in primary health-care centers in Al-Hilla, Iraq" (n=200) stated that 84.5% of the studied nurses possessed a high level of disaster management knowledge.

From the investigator's point of view, nursing students are less exposed to the working environment and professional life than registered nurses. Hence their knowledge about handling disasters can be affected negatively.

## Part III: Studied nursing students' attitude toward disaster management:

The present study indicated that majority of the studied students had a total positive attitude toward disaster management (**Figure 3**). These results were in accordance with *Mariappan, (2021)* who investigated "knowledge and attitude regarding disaster preparedness and management among nurses and nursing students" (n=100) and found that 98% of the studied nursing students had a favorable attitude toward disaster preparedness and management.

From the investigator's point of view, the studied student demographic characteristics and personal experiences may have contributed to shaping this positive attitude. Also, previous exposure to disaster situations could have instilled a sense of empathy, responsibility, and commitment to being prepared for such events, leading to the development of a positive attitude toward disaster management. Namely, nursing students who experienced any disaster events whether on a personal level or a large scale have a positive attitude toward disaster management.

## Part IV: Studied nursing students' reported Practices regarding disaster management:

This current study also revealed that almost three fifths of the studied students had inadequate total level of reported practices regarding disaster management (**Figure 4**). On the same line, *Mohamed et al. (2023)* found that 84% of the student nurses had inadequate practices regarding disaster preparedness. The present study finding was also consistent with *Bhandari & Takahashi, (2022)* who study "Knowledge, attitude, practice, and perceived barriers of natural disaster preparedness among Nepalese immigrants residing in Japan", and they reported that 96.04 % of participants lacked adequate practices of disaster preparedness.

From the investigator points of view, inadequate reported practices level of nursing students regarding disaster management can be related to the profound gap in disaster management education, training, and workshop. Disaster management training is recommended to ensure nursing students' preparedness to respond appropriately in such circumstances.

## Part V: Relations and correlation between studied variables.

The current study demonstrated that there was a highly statistically significant relation between the studied students' total knowledge level and their age, academic degree, father's and mother's educational level, father's occupation, and family's monthly income with  $P \leq 0.001$  (**Table 2**). *Alkalash et al., (2023)* agreed with the previous findings that there was significant relation between knowledge about disaster management preparedness and fathers' education, mothers' education, and average monthly income ( $p < 0.001$ ) and fathers' occupation ( $p = 0.005$ ).

The present study also revealed that there was no statistically significant relation between gender, place of residence, and mother occupation of the studied students with total knowledge level regarding disaster management. This was inconsistent with *Aftab Ghouri et al., (2023)* in their study about “Knowledge, attitude, and practice regarding disaster preparedness among undergraduate nursing students” (n= 175 students), who showed that a significant difference was found in the knowledge of males and females, with males having more knowledge compared to females (p=0.38).

It may be due to the lack of variation in gender representation, place of residence, and mother occupations (e.g., majority of mothers were housewives), which can restrict the ability to detect differences in knowledge levels based on gender, place of residence, and mother occupation.

The present study illustrated that there was a highly statistically significant relation between total attitude of the studied students and their age, academic degree, father’s educational level, father’s occupation, and family’s monthly income (**Table 3**). This was consistent with *Alkalash et al., (2023)*, who illustrated that the average monthly income of parents was significantly correlated with attitude scores toward disaster management (p = 0.040).

It can be due to participants who had enough parental average monthly income had a more positive attitude toward disaster management.

The current study showed a highly statistically significant relation between the total reported practices level of the studied students and their age, gender, academic degree, and father’s occupation (**Table 4**). This agreed with *Aftab Ghouri et al., (2023)* who stated there was a significant difference in the participant’s practice with respect to age.

It may be the case that as students grow older, they become more competent in handling disasters.

The current study indicated that there was a highly statistically significant positive correlation between total knowledge, total attitude, and total reported practices regarding disaster management among the studied students at ( $P \leq 0.001$ ) (**Table 5**). Similarly, *Alshakka et al., (2022)* in their study about “Knowledge, attitude, and readiness to practice disaster preparedness among university health students: insights from resource-poor setting” (n=250) said that there was a highly significant positive correlation between knowledge, attitude and readiness to practice.

From the investigator point of view this can be explained by students with a higher level of knowledge about disaster management are more likely to have a positive attitude towards disaster preparedness and exhibit better disaster preparedness practices.

## Conclusion

In light of the current study results and answering the research questions, it can be concluded that three quarters of the studied nursing students had unsatisfactory total knowledge level, majority of them had total positive attitude, and three fifths had inadequate total level of reported practices regarding disaster management. In addition, there was a highly statistically significant positive correlation between total knowledge, attitude, reported practices, regarding disaster management among the studied undergraduate nursing students.

## Recommendations

**In the light of the current study’s findings, the following recommendations were suggested:**

- Implementing educational programs about disaster management to increase nursing students’ awareness.
- Designing an easy-to-read instructional guide such as pamphlets about disaster management.
- Conducting training programs about disaster management including periodical evacuation plan drills to improve the practices of the nursing students in case of disasters.
- Further studies are needed not only about disaster management but also about disaster preparedness in different settings and large sample.



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