

Consolidate Knowledge and Practices' of Head and Charge Nurses in Emergency Situations: an Intervention Study

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Abstract

Background: Emergency situation is a sudden onset event that disrupts the functioning of the facility and endangering patients, staff, and visitors. Nurses are well positioned to serve in leadership roles within health care agencies during times of emergency. Planning for a successful emergency response is essential to ensuring the best possible outcome for all parties involved. **The aim:** This study aimed to consolidate knowledge and practice of head and charge nurses regarding emergency situations in hospital. **Setting:** The study was conducted in Beni-Suef university Hospital. **Research designs:** Quazi – experimental design. **Subjects:** A convenience 70 head and charge nurses. **Tools:** three tools were used (I) A questionnaire for participants' demographic characteristics format, (II) knowledge assessment questionnaire and (III) observation checklist for practice. **Results:** The study finding showed that statistically significant differences were detected regarding all items of emergency situations management ($P < 0.001$). The majority of subjects' knowledge had satisfied by high score average 90% - 95.7% after implemented program There is a highly statistically difference among the three practice procedures, pre and post the educated program as ($p < 0.001$) and there was improvement in their practice after implemented program by percent of 90%. **Conclusion:** It is concluded that the overall participants' knowledge and practice regarding emergency situations management were satisfactory after implemented program **Recommendations:** Hospital administration should develop training programs for all categories of nursing staff regarding emergency situations management and conduct drills to ensure competence of staff in emergency situation at least once yearly.

Keywords: Emergency Situation, Head Nurses, Charge Nurses.

Introduction

An emergency situation is a condition that arises as a result of the occurrence of an actual or imminent incident that demands quick response. An emergency differs from a disaster in that it involves an unplanned set of events that necessitates quick action to provide for victims ranging from one to many. Emergency situations are usually handled through the emergency management system. Complex catastrophes that overwhelm available hospitals, emergency medical services, buildings, and resources are known as disasters. (White, et al., 2021).

Emergency situation is defined as the sudden onset event that disrupts the functioning of the facility and endangering patients, staff,

and visitors, and undermining the integrity of the facility as a steward of public safety (Milsten, 2020). An emergency situation is a crisis that has gone out of control, leading to multiple causalities; sever distractions or both (Stenberg, 2021).

An emergency situations that related to "internal disaster" occurs when the hospital's day-to-day operations are disturbed by an incident. Various internal disasters have been reported, including fires, water supply interruptions, and power outages. During all types of disasters, hospitals play a key role in providing communities with critical medical care. Disasters can result in a rapid increase in service demand, which might overwhelm the functional capacity and safety of hospitals and the healthcare system as a whole, depending on

their extent and character. As a result, each hospital must have a plan in place to deal with mass casualty occurrences. Hospitals that are prepared can deal with the unpredictability of disasters and emergency situations (**Sonopant, 2012**).

Emergency management system is a discipline that involves the avoidance of risks, while simultaneously putting plans in place to deal with emergency situations if and when they do occur with a view to rebuild and restore society to a functional level in as short a time as possible after an emergency event. (**Notaras, 2019**). Emergency management systems are technological aids that facilitate the effective management of disasters. EMS technology can assist in several areas that are critical to effective disaster management, such as: Drafting and testing of evacuation and general disaster plans (Evacuation Plans), Training personnel in effective shelter management, basic first aid and other “response” skills (Manpower). Establish a national warehouse and ensure that it is stocked with items for national survival in the immediate aftermath of the disaster, before the arrival of overseas help (Materials). Setting-up reliable communication systems, such as, the traditional two-way CB-type radios (Communication) (**Rupert, 2021**).

All nursing staff should participate in the development and evaluation of emergency response strategies for their health-care organizations and communities. An emergency can occur at any time, and planning for a successful emergency response is essential to ensuring the best possible outcome for all parties involved. Because of their outstanding communication and teamwork skills, nurses are well positioned to serve in leadership roles within health care agencies during times of emergency (**Cherry & Jacob, 2021**). As nurses are the largest group of healthcare providers (HCP), they play significant roles in preparing for internal disasters management, including identifying risks, analyzing identified risks, creating plans, conducting drills, participating in education and training activities, and identifying areas for development and improvement (**Goniewicz and Goniewicz 2020**).

Hospital managers and decision-makers must prepare nursing staff to be ready to respond rapidly and effectively to emergency situations. For holistic preparedness, nurses must be involved in preparing and activating the plan and educated in emergency management, including intensive training on all issues expected to arise before, during, and after the response and drill simulations of different types of emergency or disaster scenarios such as natural, internal, external, biological, chemical, and radiological disasters (**Verheul & Dückers, 2020**). Managers and decision-makers across countries, cultures, and healthcare systems must work hard to create a scope of practice, policies, and procedures with clear responsibilities and accountability for all healthcare providers (HCP) of the disaster and emergency management team (**Al Harthi et al 2020**).

Significant of the study

There was a gap in HCP education and training at personal and systemic levels as reported by (**Barrett, 2017 and Santibaez, 2017**). Every member of the nursing community should be responsible for emergency situations and the crisis. Studies conducted worldwide have shown that a nurse’s presence in emergency situations and crisis can reduce the death percentage from 50 to 70 percent (**Usher, et al., 2015**). Nurses’ clinical skills in crisis include technical efficiency, ability to use nursing techniques with specialized equipment, ability to perform physical examinations, clinical decision-making skills, triage and trauma skills, flexibility skills, and the ability to perform tasks in non-conventional roles (**Al Thobaity, et al., 2015 and Firouzkouhi, et al., 2018**).

The WHO (2019) addressed the need for emergency situation preparation in their report on health emergency situations preparedness, mitigation and response in the Eastern Mediterranean Region. All health care providers must have the appropriate knowledge and skills for emergency management before it strikes. They must recognize when they cannot provide effective care for multiple victims, and

when they must call for outside help to prevent additional mortality and morbidity. This requires appropriate emergency management plans and preparation. So, nursing researchers and educators all strongly recommend emergency and disaster preparedness education. Before embarking on educational programs, nursing leaders need to assess nurses' current preparation levels.

In Saudi Arabia, **Al Harthi et al., (2021)** study about "Improving Disaster Readiness and the Response of Nurses in Saudi Arabia" revealed that Saudi Arabia nurses, as they are First-line responders in disasters, emergencies and pandemics facing several challenges in all phases of disasters nursing, such the infancy of the specialty and lack of education, preparedness, research and expertise in both the clinical field and academics.

In Egypt, **Ali et al., (2019)** reported in their study "Assessment of Emergency Nurses Response Toward Caring of Victims During Disasters" that emergency nurses had poor level of knowledge regarding the disaster, response, education and training" among at Assuit University hospital and the Minister of Health hospitals. Therefore this study conducted to consolidate knowledge and practice of head nurses and charge nurse regarding emergency situations in hospital that related to internal disaster.

The aim of the study:

This study aimed to consolidate knowledge and practices of nursing staff regarding emergency situation management in hospital related to internal disaster through:

Assessing head and charge nurses' knowledge about emergency situations.

- Determining head and charge nurses' practices regarding fire, explosion and gas leakages emergency situations.

- Developing of training program emergency situations management for head and charge nurses based on the assessment data.

Hypothesis:

- Head and charge nurses' knowledge in emergency situation management in hospital

will be improved after their attendance the training program.

- Head and charge nurses' practice in dealing with fire, explosion and gas leakages emergency situation in hospital will be improved after their attendance the training program.

Methodology

Research design:

A quazi- experimental (one-group pre/post test) design was utilized to achieve the study's aim.

Setting of the study:

The study was conducted at the Beni Suf University Hospital; it is composed of two buildings. The first building consisted of six floors as the following; the first floor (Dialysis unit, Surgical ICU, Emergency ICU & Emergency unit). The second floor includes units of (General ICU, General Operative department & Cardio Thoracic ICU). The third floor includes units of (Orthopedic department, ophthalmology unit & the surgical departments (male & female)). The fourth floor includes units (Cardiac Care Unit, Medical male department, Neural ICU, Medical ICU & Pediatric ICU). The fifth floor includes units of (Tropical ICU, Medical female department, Obstetric department & Neonatal ICU). And finally the sixth floor units of (Chest ICU). Its bed capacity was about (420) beds during the data collection period. The second building consisted of 3 floors contain outpatient clinics which provide medical services for university workers and faculty staff member.

Study subjects:

A convenience 70 of available head and charge nurses were included in the study according the following criteria.

Tools of data collection:

The data for this study were collected using three different types of tools, namely a demographic characteristics, knowledge assessment questionnaire form and an observation checklist.

Tool (I): A questionnaire for participants demographic characteristics format. It was used to assess demographic characteristics of head and charge nurses' which aimed at collecting data related to age, sex, job

title, marital status, and attendance of related training courses.

Tool (II): Knowledge assessment questionnaire: This questionnaire aimed at measure head and charge nurses' knowledge about emergency situations management. The tool was developed by the researchers based on a review of pertinent literature (**Mostafa, 2003 and Abd Elazeem, 2009**). It aimed at collecting data about participants' knowledge of emergency situations management. It consisted of 65 questions, 45 of which were multiple choice questions and twenty of which were true or false questions. Concepts of emergency situation (18) questions, mitigation phase (7) questions, preparedness phase (15) questions, response phase (13) questions, and recovery phase (7) questions

Scoring system

Head and charge nurse` responses were graded with a (1) for correct answers and a (0) for incorrect answers. When total score < 60%; participants had unsatisfactory knowledge about emergency situation management, $\geq 60\%$ participants had satisfactory level of knowledge about emergency situation management.

Tool (III): observation checklist of emergency practices: This checklist aimed at identifying the participants' practice in emergency situations management. It was developed and constructed by the researchers, guided by literature review, (**Pan American Health Organization (PAHO) and WHO, 2014**). It contains three practice procedures of how to deal with fire inside the hospital (20 items), Explosion inside the hospital (10 items) and gas leakages (10 items).

Scoring system:

The scoring system for observation checklist, the items "not done" and "done" were scored "0" and "1", respectively. The item scores were summed up and converted to a percent score. The total score practice was as the following:

- If score < 60% is considered unsatisfactory participants' practice.

- If score $\geq 60\%$ is considered satisfactory level of participants' practice.

Tool validity:

Five experts from the Faculty of Nursing Beni-Suef University's Nursing Administration

Department and Medical Surgical Department reviewed and tested the content validity of the data collection instruments, and improvements were made based on their comments.

Tool reliability:

The Cranach's Alpha test was used to assess the reliability of study tools. For the head and charge nurses' **Knowledge assessment questionnaire and observation checklist of emergency practices** were tested and reliability was computed and found (0.94) (0.72) respectively.

Pilot study

A pilot study was undertaken to test the instruments' face and content validity, as well as to estimate the time required to complete the study tools. It was carried out on 10% of the total number of study subjects (7 participants). These included in the study sample.

Fieldwork

The study was extended over six-month period from March 2019 to August 2019 as the following **I. Preparatory phase which lasted around two months.** It involved reviewing recent related literature in order to design data collection tools and prepare emergency situations management handouts. Prior to data collection, the study's aim was explained to the participants, and their agreement to participate in the study was also acquired. Head and charge nurses were given the data collecting tools to complete on their own in order to assess their understanding of emergency situations management and determine their learning needs. The questionnaire took each participant about 25 minutes to complete. On the basis of the identified needs, teaching materials were developed and a training plan was devised. In addition, a timetable, instructional sessions, media, and a handout were developed. **II. Implementation phase:** Head and charge nurses at Beni-Suef University Hospital were given the courses. First, according to their empty times, researchers divided them into (5) groups (14 of them in each group). The program sessions took place in the morning shift, starting in March 2019 and ending in April 2019. The program lasted for 12 hours distributed into four sessions and was held twice a week for each group, from 9 a.m. to 1 p.m. for morning shift

and from 3 p.m. to 6 p.m. for afternoon shift. Each session lasted three hours, , case studies and scenarios. Lectures, group discussions, and brainstorming were all used as instructional approaches. The **first session** included introduction about emergency situation concept and definitions, types, hazard which hospital is vulnerable, and explain the emergency situations management and its phases. The **second session** included researchers explain hospital strategic plan and the role of nurse in emergency situation management then conduct post test on knowledge part. The **third session;** researchers make a pre observation checklist, then explain the three procedures for dealing with fire, explosion and gas leakage in hospital. **The fourth session;** Demonstration and redemonstration were applied for the three procedure with cooperation of Hospital Civil Defense Team. **III. Evaluation phase:** to assess the consolidation of the training program on improving knowledge, practice of participants, a post-test (immediately after the application of the training program), was done using the same tools.

Administration Design

To carry out the study, the necessary approvals were obtained from the general manager and nursing directors of the hospital. The subjects' permission and ethical consideration was also taken from nursing office.

Ethical Considerations:

At the interview with participants to collect data they informed about the purpose and benefits of the study and that it would be used only for scientific research, and they were informed that their participation is voluntary and they have the right to refuse or withdraw from the study without rational. In addition, confidentiality and anonymity of the participates were assured through coding of all data. Individual oral consent was also obtained from each participant in the study.

Statistical Design

Data entry and analysis were done using SPSS 13.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. As normal distribution of the data could not be assumed, respectively, for quantitative variables. Qualitative categorical variables were compared using a chi - square test. Statistical significance was considered at p-value <0.05 and highly significant at p-value <0.001.

Results

Table 1 presented the demographic characteristics of the study nurses where it is evident that less than half of the sample (47.1 %) aged < 25 year. And majority of them was married (86.6%) and 90.1% of them were females. More than half of them 57.15 % were head nurses.

Figure 1 showed that total score of studied nurses knowledge's regarding emergency situation management, pre and post program implementation. It indicated that majority of them had satisfactory knowledge by high score about 95.7% after implementation of program.

Figure 2 indicated that there is a highly statistically difference among the three practice procedures pre and post the educated program as there was improvement in studied nurses' practice after educated program

Figure 3 revealed that there is a highly statistically significant in studied nurses level of satisfaction in their knowledge and practice in emergency situation management, pre and after the educating program

Table 2 The correlation between studied participants' knowledge and practices in emergency situation management, it cleared that there is a highly statistically significant between nurses' knowledge and practice as ($P < 0.001$, $r 0.90$).

Table 1: Frequency distribution of study sample related to demographic characteristics (n = 70)

Socio demographic characteristics	No	%
Sex		
Male	6	8.9
Female	64	90.1
Age		
< 25	33	47.1
25< 35	25	35.7
35- 45	12	17.1
Job Position		
Head nurses	40	57.15
Charge nurses	30	42.85
Marital Status		
Married	48	86.6
Single	22	31.4
Attain related training program		
Yes	0	0.0
No	70	100.0

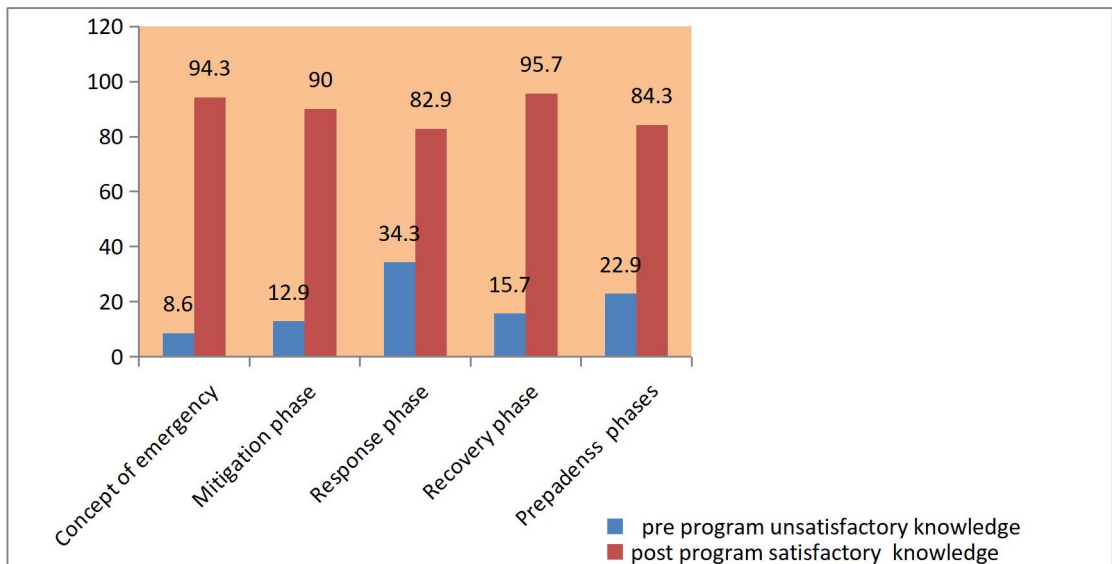


Figure 1: Nurses knowledge regarding emergency situation management, pre and post program (n=70)

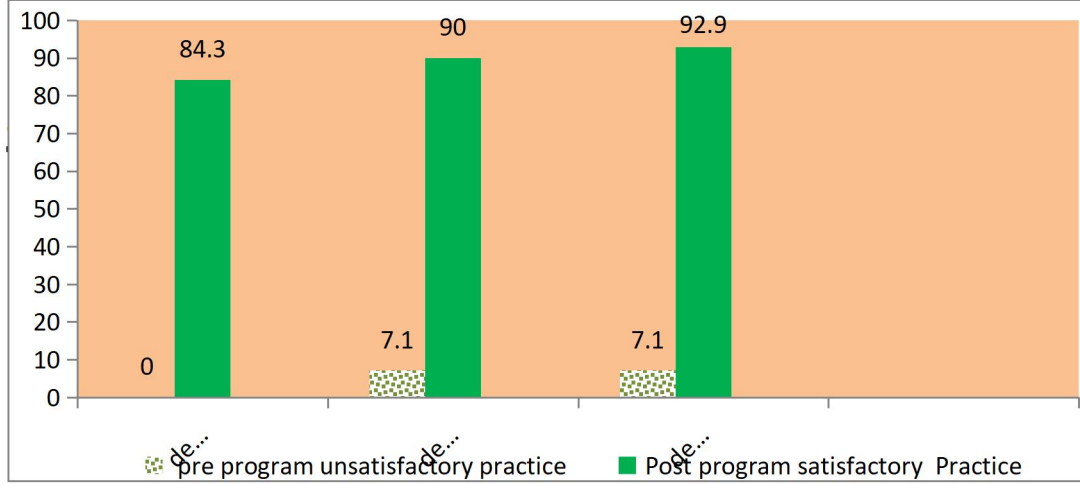


Figure 2: Frequency distribution of total scores of study sample practice in procedures of dealing with fire, explosion and gas leakage emergency situation management pre and post program (n=70)

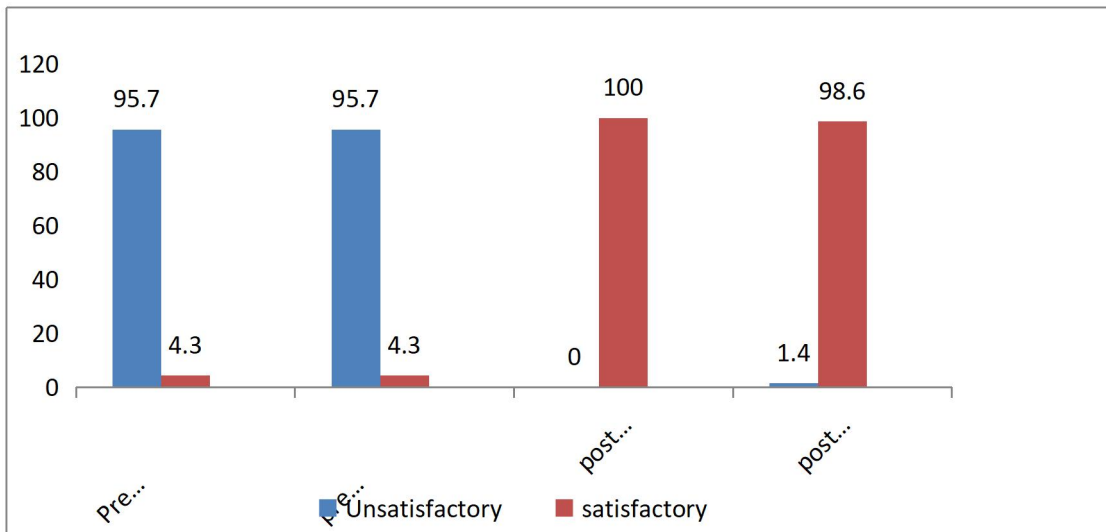


Figure 3 Level of Satisfaction and dissatisfaction of study sample' knowledge and practices in emergency situation management pre and post the program (n=70)

Table 2: Correlation between study sample's knowledge and practices in emergency situation management (n=70)

Total practices	Total knowledge	
	r	P- value
	0.90	0.000**

*Significant P<0.05

**Highly significant P< 0.001

Discussion

In this study, it was found that education of emergency situation management was effective in studied head nurses and charge nurses knowledge. So before educational program, most of the participants had low knowledge about the concept of managing emergency situations related to internal disaster in hospital and after educational program the majority of them had good knowledge. The findings are in the same line with **Saucier and Gerst, (2015)** finding as they showed that the education is helpful and important for increasing the amount of preparation, knowledge, and practice of head nurses and other health staff about the concept of emergency situation, mitigation phase, preparedness phase, response phase and recovery phase.

According to finding of the present study the majority of head nurses and charge nurses knowledge about types of emergency situation is low especially landslide and flooding are not emergency situation. This is with agreement with **(Abd Elazeem, 2009)** study respondent' opinions, gas explosion had the highest probability of occurrence followed by fire. Conversely, low percentage of respondents viewed the probability of sand storms, infectious epidemics, and terrorist occurrence in hospital.

Similar to the present study results regarding the low knowledge of head nurses, chagre nurses about emergency situation management, **Ahayalimudin, et al., (2020)** indicated that studied sample had inadequate knowledge about emergency situation management Also, **O'Sullivan et al., (2018)** indicated that studied nurses felt unprepared to respond to large scale disasters and emergency situations. Approximately 40% of them were

unaware that their hospital has an emergency plan. Moreover, they reported inadequate access to resources to support disaster and emergency situation response capacity, and expressed a low degree of confidence in the preparedness of Canadian health care institutions for future outbreaks. Therefore, the authors recommended that more training and information were needed to enhance preparedness for Frontline health care workers especially nurse managers and their assistants and other important members of the response community.

The result of current study revealed that head nurse and charge nurse knowledge about mitigation phase of emergency situation management is low pre the education program implementation but these results improved after program especially item of implementation and drilling of evacuation plan is considered from non-structure mitigation. In this regard (**Bullock, 2015**) found that Mitigation planning involves an assessment of the threats facing a hospital

The finding of the present study regarding head nurse and charge nurse's knowledge about preparation of hospital to prevent fire indicated that majority of them had low level of knowledge before education program. This is disagreement with **Abu Hussein, (2012)** who found that more than half of studied nurses aware that fires could be classified from great emergency situations. But this result contradicted with (**Jose and Dufrene, 2014**) as they reported in their results from an analysis which links fire awareness, risk perceptions and policy performances indicate that urban residents have a low initial awareness to fire severity, assign low probabilities to occurrences, and prefer policy strategies that shift the hazard management responsibility to public resource managers. Also, **Mostafa, (2003)** result indicated that majority of studied nurses expected that fires are most of emergency situations related to internal disaster can be occurred in surround environment.

As regards hospital prevention measures for internal fire, **Abd Elazeem, (2009)** study findings showed that the presence of preventive measures for internal fire concerning no

smoking rules and signs, fire extinguishers in working condition, but no training of staff in their use. This area of emergency situations has been shown to be the most expected. Therefore, preventive measures are of utmost importance. This might explain the good awareness of respondents about it. This finding are in agreement with **Mostafa, (2003)** who pointed to high awareness about the presence of safety precautions as no smoking.

The current study results revealed unsatisfactory practices of head and charge nurses in response to emergency situations related to how dealing with fire, explosion and gas leakage inside the hospital before training which got satisfied after training program. In support of the cited finding, **Silber, (2015)** indicated that basic competency training and systems are essential need to be in place to provide just-in-time training in particular, less common scenarios or problems, given the specifics of the event. Along this line, **Piercey, (2021)** averred the significance of training and continuing education in the nurses' further acquisition of professional competencies.

Further, **Grant, (2021)** cited that both head nurses and charge nurses should be knowledgeable about their role during emergency situations. Including, triage, coordination of the first aid response team, and direct hands-on care to victims of the emergency. As licensed health care professionals, they should respond to all serious adverse events that threaten the health, safety, or well-being of a population. As advocates for safety, they must address new challenges. They have an important role before, during, and after an emergency.

Also, (**Hodge et al., 2017**) finding indicates the significance of continuing education on the nurses' preparedness during emergency situations, which implies the need for nurses' participation in trainings and seminars for professional growth and development.

Veenema (2018) on the other hand stressed the significance of continuous

integration, coordination, and training in reducing injury and death in any emergency situation. Further, **Cox and Briggs (2014)** alleged that skills in applying the nursing process enable the preparedness of nurses in times of emergency. In addition, **(Hodge, et al., 2017)** averred that knowledge of scientific and nursing practice principles in emergency management is necessary to prioritize correctly.

The finding of the present study revealed that the majority of head and charge nurses at Beni-Suef university hospital, had a low level of knowledge and unsatisfied practices in emergency situation management in hospital before education program. The researchers believes this may be due to Beni- suef university hospital had no available emergency situation management plan and there is no training program about emergency situations in hospital also all of study subject answer they not attain any training about emergency management. Meanwhile, this is agree with finding of, **Mosca, et al., (2015)** who shows that most nurses have low confidence in preparedness capabilities to emergency situation and in the same respect with, **The United States Institute of Medicine, (2016)** reported that the training for healthcare workers in the area of emergency situation preparedness was deficient.

Regarding the highly statistically significance correlation between studied participants' knowledge and practices in emergency situation management. This is In the same line with **Wynd, (2016)** who emphasized that nursing staff must learn the knowledge and skills needed to respond to emergency situations and **Rokkas et al (2014)** stressed that an effective health and medical care response is ensuring adequate supplies of broad array of qualified health care providers who are available and willing to serve in emergency situation and mass causality incident.

The foregoing present study findings are in discordance with, **La face, et al., (2012)** who stressed that providing healthcare managers and their staff for knowledge and practice about emergency management is essential to increase emergency management awareness, preparation,

response, and rehabilitation. Also this result is in difference with, **Ranse, et al., (2014)** who reported that nearly half of studied nursing staff have awareness related to their role in emergency situations management response phase.

Conclusion

Regarding the findings, it can be concluded that the overall knowledge and practice of participants' emergency situation management was unsatisfactory and after implementation of the program they become satisfactory with Statistically significant differences were detected regarding all items of emergency situation management ($P < 0.001$).

Recommendation

- Hospital administration should conduct training programs for all categories of nursing staff regarding emergency situations management.
- Conducting drills periodically to ensure competence of staff in emergency situation.
- Orientation program should include emergency situations management as a basic content.
- Nursing faculty should realize that disaster preparedness is mandatory content for all professional nurses.
- Further educational programs can be developed based on results.

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