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Effect of Educational program on competence of Emergency Nurses Performance Regarding Sudden Death of patients

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Abstract:
Background: Emergency department (ED) nurses are responsible for administering life support and rescuing care for individuals who are immobilized. **Aim:** To evaluate the effect of educational program on competence of emergency nurses' performance regarding sudden death of patients. **Design:** A quasi-experimental research design with a single group pre- and post-test was used. **Setting:** Assiut University Hospital which included four emergency units (general emergency unit, cardiothoracic emergency unit, medical emergency unit and trauma emergency unit). **Subjects:** Convenient sample of 60 available nurses. **Tool one: Nurses' knowledge assessment questionnaire:** To evaluate emergency department nurses' level of understanding regarding unexpected death. **Tool two: Nurses practice observational checklist:** Consisted of 24 elements in 50 phases, covered various aspects of cardio version and defibrillation operations. **Results:** The nurses' total knowledge score pre-intervention was 19.03 ± 15.701 which significantly increased to 54.53 ± 12.197 points after program implementation, and to 65.15 ± 8.851 points after 3 months of the program implementation ($p<0.001$). The total score of nurses' performance before the program was 44.9 ± 37.39 points, which increased to 132.33 ± 29.88 after the program implementation. After 3 months of intervention, the total practice score was 158 ± 21.95 points with a highly statistically significant difference ($p<0.001$). There was a statistically significant variance ($p<0.001$) and a strong positive correlation ($r=0.99$) between the overall practice and knowledge scores. **Conclusion:** The effect of educational program on competence of emergency nurses' performance improved emergency nurses' judgments of appropriate behavioral responses when encountering sudden death, according to the study's results, which raises the caliber of their job. **Recommendations:** Further studies are required to determine whether enrolling emergency nurses in death education programs can considerably enhance their sense of appropriate behavioral reactions while handling unexpected death.

Keywords: Competence, Educational program, Emergency Nurses & Sudden Death.

Introduction
The goal of death education is to help individuals deal with death in a reasoned manner. People's attitudes and behaviors towards death can be changed by education by helping them to understand that dying is a necessary and significant part of life. The intention is for individuals to have a more optimistic outlook on both their own and other people's deaths **(Elbaih et al., 2019).** In the 1920s, death education first appeared in the US. It was well-received throughout the world. Children's storyboards were employed in the UK as a death education tool to raise children's knowledge of mortality. Numerous other nations, including France, Japan, and others, conducted studies on death and provided death educational programs **(Hassankhani et al., 2018; Rubbi et al., 2021; Mani et al., 2023).**

Emergency department nurses offer first treatment to patients in a range of emergency scenarios, including those involving trauma and those in critical condition. In addition to providing moribund patients with emergency care and life support, they also have to offer emotional assistance to the family of the patients **(Bissenbayeva, 2019).** Nurses frequently deal with individuals who are critically sick or who pass away unexpectedly in the course of their employment. Emergency nurses are particularly susceptible to unexpected patient deaths and may have challenges in communicating with patients and their families during this period. They also have a first-line role in supporting bereaved families **(Sjölin et al., 2020).** Critical care nurses feel unprepared and incapable of offering family members end-of-life care **(Salem, 2020).** This can eventually result in emotional, bodily, and psychological disorders as well as frustration, discontent, and a low quality of life **(Elsayed et al., 2019).** When caring for patients who pass away unexpectedly, nurses may face conflicts between their personal and professional responsibilities if they have a negative attitude towards death. This may affect the standard of nursing care. Having an understanding of death can help nurses create healthy coping mechanisms for bereaved families **(Batal et al., 2022).**

Significance of the study

Death education aims to help individuals develop a rational and accepting attitude towards death, recognizing it as a natural part of human life. In Egypt, however, death is considered taboo and cultural beliefs have hindered the development of death education courses, particularly for healthcare professionals. Emergency nurses in particular are vulnerable to the emotional impact of sudden patient death, which can lead to frustration, dissatisfaction, and poor quality of life. A positive attitude towards death is crucial for nurses to effectively care for grieving families. Despite the availability of educational models and strategies developed in Western countries, they may not be directly applicable to Egyptian nurses due to cultural differences. Therefore, it is essential to develop context-specific death education programs that cater to the unique needs of Egyptian emergency nurses. The purpose of educational models on sudden death is to enable nurses to handle families and patients effectively when a family member passes away unexpectedly **(Elsayed et al., 2021).** This study aimed to evaluate the effectiveness of a death education course on emergency nurses' perception of effective behavioral responses in dealing with sudden death, with the ultimate goal of improving their competence in caring for patients who have suffered sudden cardiac arrest.

Aim of the study

Therefore, the aim of the study was to evaluate the effect of educational program on competence of emergency nurses' performance regarding sudden death of patients.

Materials and Methods

Research design

For this investigation, a sort of quasi-experimental approach that aim to evaluate interventions but that do not use randomization (Harris et al., 2006), with a single group pre- and post-test was used.

Research hypothesis

The sudden death educational program has an effect on emergency nurses' performance of effective behavioral responses in dealing with sudden death patients.

Research variables

The nurse's knowledge and procedures regarding unexpected death were dependent factors, and the educational program was the independent variable.

Setting

The four emergency units at Assiut University Hospital the general emergency unit, the cardiothoracic emergency unit, the medical emergency unit, and the trauma emergency unit—were used for this investigation.

Sampling

Study subjects

Convenient sample of available nurses (60) worked in the emergency units in the earlier indicated settings with one year of experience were enlisted.

Study tools:

Following a study of the relevant literature, two tools were used to gather data: to evaluate the nurses' proficiency in identifying the signs of sudden death. Using identical pre-test research tools (knowledge questionnaire and observational checklist), each nurse was assessed twice (pre and post-test) and three months following the program's deployment. The results were contrasted to the pre-test standard. **They included:**

Tool one: Nurses' knowledge assessment questionnaire: After evaluating the literature, the investigator created this measure to gauge emergency unit nurses' level of understanding of unexpected death. There were two sections to this tool:

Section I: personal data of study sample this comprised previous experience, years of education, sex, age, marital status, and participation at prior training sessions.

Section 2: Nurses' knowledge about sudden death (Powers et al., 2015): included understanding of the heart's architecture and physiology, including how to read an ECG **(Mancini et al., 2015),** defibrillation and cardioversion. It has forty items total, with three categories of topics (multiple choice, true/false, and figure) encompassing the three primary sections:

- Basic understanding of the heart's physiology and anatomy.
- Basic knowledge about ECG interpretation.
- Basic knowledge about cardio version and defibrillation (uses, indication, precaution, complications).

Scoring system for nurses 'practice

Each stage was scored as follows: a correct response received a score of (2), an incomplete response received a score of (1), and no response received a score of (0). To determine the average practice of each nurse, every inquiry was counted and divided by the total number of inquiries. A competence score of less than 90% was deemed inadequate, whilst a score of 90% or higher was deemed satisfactory. Using the following scoring scheme, the frequency and percent of individuals with performance scores were determined: 60% failed, 60%–69% terrible, 70%–79% good, 80%–89% very good, and 90% or higher exceptional.

Scoring system for nurses' knowledge:

A score of one was assigned to each correct answer. A score of zero was given for incorrect responses. The survey yielded an overall score of 70 marks. To determine every nurse's mean knowledge, all

questions were counted and divided by the total number of questions. A competence score of less than 90% was deemed unsatisfactory, whilst a score of 90% or higher was deemed satisfactory **(Fuzzed, 2016)**.

Methods

Three stages of deployment were used to perform this study, and they were:

Preparatory phase

After outlining the purpose of the research, the hospital's relevant authorities granted formal approval to carry out the investigation. The investigator created the data gathering instrument by reading pertinent literature.

Seven specialists in the fields of emergency medicine and critical care nursing from Assiut University evaluated the generated tools for content related validity, and extensive revisions had been made.

Pilot study

A pilot study was carried out with five (10%) of the total staff members who participated in the research in order to evaluate the tool's viability, validity, and application. Five critical care unit nurses participated in the questionnaire's pilot trial; they were not part of the study population. The research tool's pilot study sought to ascertain the survey's complexity and simplicity indices as well as if it was successful in gathering the necessary data that is pertinent to the ongoing investigation. To find out if the questions were comprehended correctly, the nurses' answers were evaluated. The validation panel's advice led to the translation of the questionnaire into Arabic.

Test–retest reliability using Cohen's kappa statistics.

For the knowledge and practice domains, the kappa values were, respectively, 0.818 and 0.810. Significant agreement was demonstrated by the questionnaire's average kappa score of 0.796 (Sim & Wright, 2005). This research yielded a valid and trustworthy survey.

Ethical considerations

Once the purpose and nature of the study were explained, official approval to perform the research was acquired from the hospital authorities involved in EMD. The faculty of nursing's ethics committee authorized the research idea. There was no risk to the research subjects while the investigation was being applied. The investigation adhered to the standard ethical guidelines for clinical research. Employees received assurances that the research's data would be kept extremely private, utilized exclusively to further the goals of the study, and not repeated without additional authorization. Anonymity and confidentiality were guaranteed. The staff was free to decline involvement or to leave the research project at any moment, for any reason.

Implementation phase

The team of nurses' awareness of cardiac arrest was evaluated using a pretest questionnaire before to the start of the educational program, in order to serve as the initial information for the study.

The nursing staff was split up into smaller groups, and each group was further divided into six training sessions in addition to the initial one, during which the participant met with the investigator and discussed the goals of the study, the sessions' contents, and the methods of assessment.

The investigator created a nursing educational program that included interactive classes, instructional videos, and publications. The following is how the researcher carried out the study nurses' educational program:

For theoretical part: For two days in a row, two sessions were employed, lasting thirty minutes each.

Session I included: Spent the entire time concentrating on basic knowledge on the anatomy and physiology of the heart (definitions, kinds, danger signs, aetiology and clinical manifestations for sudden death). This was a thirty-minute session.

Session II included: Spent thirty minutes concentrating on typical ECG identification and heart rate calculation techniques.

Session III included: For one hour, learn about life-threatening arrhythmias, their description, causes, and the role of nurses. Definition, kinds, indications, precautions, and complications of defibrillation and cardio version.

Session IV included: Talk about the definition of sudden death, danger factors, and early risk factors and symptoms to identify sudden death.

For the practical part: For two days in a row, two sessions were employed, lasting thirty minutes each.

First session: Prioritized were the following: administering medications safely, reducing temperature, reducing dyspnea, and offering life-saving emergency nursing assistance.

Second session: Nursing care following cardio version, nursing management of defibrillation shock, patient assessment and basic life support (BLS) process initiation, response to therapy assessment, and assessment of patients' and family members' satisfaction following death were the main areas of focus.

Evaluation phase

The beneficial effect of the educational program on the nurses' understanding of sudden cardiac death was assessed by testing the nurses' level of knowledge using the same pretest research technique. Prior to, throughout, and three months following the program's deployment, nurses' practices were also assessed.

Data management and analysis plan:

To begin the statistical evaluation, data was gathered, categorized, analyzed, and submitted via the software (SPSS version 26). For the demographic data, simple descriptive statistics were employed. Standard deviation (SD), averages, percentages, and frequencies were all included in a descriptive statistic. Each and every statistical test has two sides. The median was used to characterize the main trend of quantitative data, the minimum, maximum, and inter-quartile range were used to characterize the dispersion, and frequency and percentage were used to summarize qualitative variables. The total amount of the participant's precise responses to questions was used to get the overall knowledge score for each area of nursing practice and knowledge. The following formula was used for converting the score to a percentage: Percentage is (total score minus highest possible score) * 100. Next, using the following scoring scheme, the frequency and percent of individuals with performance scores were determined: 60% failed, 60%–69% terrible, 70%–79% good, 80%–89% very good, and 90% or higher exceptional. A modified rating scheme was used to determine the frequency and proportion of those surveyed who received practice scores: a score of less than 75% was deemed unsatisfactory, while a score of 75% or higher was deemed satisfactory. To ascertain whether there was a significant correlation between two category variables, a Chi square test was employed. A Monte-Carlo significance threshold was applied if the total anticipated cell counts exceeded 20%.

Results

Table (1): Frequency and presented distribution of personal among the participated nurses

Variable	Parameter	N (%)
Age	▪ Mean ± SD	38.9 ± 8.44
	▪ Median (min-max)	38 (22-58)
	▪ ≤35 years	22 (36.7%)
	▪ >35	38 (63.3%)
Sex	▪ Male	3 (5%)
	▪ Female	57 (95%)
Marital status	▪ Single	17 (28.3%)
	▪ Married	43 (71.7%)
Level of education	▪ Diploma nurse	10 (16.7%)
	▪ Technical nurse	15 (25%)
	▪ Bachelor degree	29 (48.3%)
	▪ Post graduate diploma	5 (8.3%)
	▪ Master's degree	1 (1.7%)
	▪ PhD	0 (0%)
Years of experience	▪ Less than 5 years	20 (33.3%)
	▪ 5-10 years	19 (31.7%)
	▪ 10-15 years	16 (26.7%)
	▪ More than 15 years	5 (8.3%)
Attendance of previous training course	▪ BLS certificate	9 (15%)
	▪ ACLS certificate	7 (11.7%)
	▪ In-service training	2 (3.3%)
	▪ No training	42 (70%)

*Data presented as Mean ± SD and percentage, SD: standard deviation, p-value: the difference among the studied participants, p non-significant if >0.05, *P significant if <0.05, ** p highly significant if <0.001, χ2: Chi-square test.*

Table (2): Total knowledge score before, after program, and 3 months after program implementation among the studied nurses (n=60)

	Before program implementation	After program implementation	After 3 months of program implementation	χ2	p-value
Total score	19.03 ± 15.701	54.53 ± 12.197	65.15 ± 8.851	t-test 221.687	<0.001**

*Data presented as Mean ± SD and percentage, SD: standard deviation, p-value: the difference among pre, post and 3 months after intervention, p non-significant if >0.05, *P significant if <0.05, ** p highly significant if <0.001, χ2: Chi-square test.*

Table (3): Total practice score before, after program, and 3 months after program implementation among the studied nurses (n=60)

	Before program implementation	After program implementation	After (3months) program implementation	$\chi 2$	p-value
Total score	44.9 ± 37.39	132.33 ± 29.88	158 ± 21.95	t-test: 228.19	<0.001**

*Data presented as Mean ± SD and percentage, SD: standard deviation, p-value: the difference among pre, post and 3 months after intervention, p non-significant if >0.05, *P significant if <0.05, ** p highly significant if <0.001, χ2: Chi-square test.*

Table (4): Correlation between nurses' knowledge and practice after 3 months of intervention (n=60)

		Total Knowledge score	Total practice score
Total Knowledge score	r-value		0.990**
	p-value		<0.0001*

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

*r-value: Pearson correlation, p-value: the difference among the studied variables, p non-significant if >0.05, *P significant if <0.05, ** p highly significant if <0.001.*

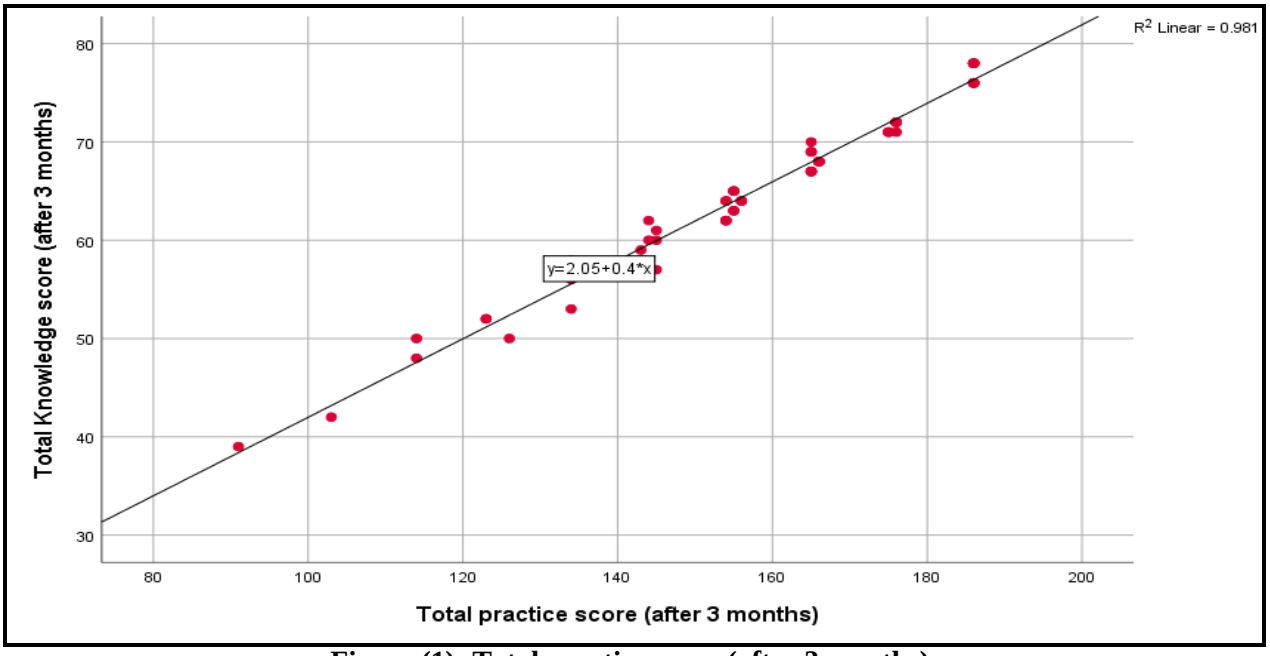

Figure (1): Total practice score (after 3 months)

Table (1): Show that the study included 60 ICU nurses with a mean age of 38.9 ± 8.44 years and most of them (63.3%) aged more than 35 years. Most of the participated nurses were females (95%). 71.7% of them were married and nearly half of them had a bachelor's degree (48.3%). Only 8.3% of the studied nurses had ICU work experience for more than 15 years. Most of the participated nurses (70%) had no previous course training.

Table (2): Showed the improvement of nurses' knowledge about sudden death pre, post and 3 months after intervention. The chi-square test showed a high statistically significant improvement in nurses' knowledge items after the program implementation (p<0.001). The nurses' total knowledge score pre-intervention was 19.03 ± 15.701 which increased to 54.53 ± 12.197 points after program implementation, and it also increased to 65.15 ± 8.851 points after 3 months of the program implementation with a high statistically increase in nurses' knowledge score (p<0.001).

Table (3): Showed the participated nurses' score pre, post and after 3 months of the program implementation. Data showed that there was a highly

statistically significant increase in nurses' practice after program implementation ($p<0.001$). The total score of nurses' practice before the program was 44.9 ± 37.39 points, which increased to 132.33 ± 29.88 after the program implementation. After 3 months of intervention, the total practice score was 158 ± 21.95 points with a highly statistically significant difference ($p<0.001$).

Table 4 and figure 1 show that there was a strong significant positive correlation between total knowledge and total practice score among the studied nurses ($r=0.99$, $p<0.001$).

Table (4): Reported that there was a strong positive correlation between the total score of knowledge and practice score among the studied participants ($r=0.99$) with a statistically significant difference ($p<0.001$) (Table 4, figure 1).

Figure (1): Linear regression model of the correlation between total knowledge and total practice nurses' score 3 months after intervention.

Discussion

In the study emergency units, unexpected deaths happen suddenly at least twice a week. Both the emergency personnel and the survivors are under a great deal of stress at this time due to emotional trauma. When informed that a loved one has passed away, people react in different ways **(Zhang et al., 2020).** When a cardiac arrest occurs in a hospital, nurses are typically the first to notice it and are also the ones who usually notify the support team. Therefore, in order for these specialists to add to cardiopulmonary arrest maneuvers more effectively, they must be required to possess up-to-date technical knowledge and evolved practical abilities. Therefore, the study sought to assess how an educational program affected nurses' performance and understanding of cardiopulmonary resuscitation.

The study included 60 ICU nurses with a mean age of 38.9 ± 8.44 years and nearly two thirds aged more than 35 years. Most of participated nurses were females. Nearly two thirds of them were married and nearly half of them had a bachelor's degree. Small proportion of the studied nurses had ICU work experience more than 15 years. Most of the participated nurses (70%) had no previous course training.

Unlike the current study's findings, **Mohamed (2016)** found that all of the investigated nurses had completed secondary nursing education, the majority of them were between the ages of 30 and 40, and they had more than 20 years of experience **(Mohamed, 2016).**

The findings of **Mohamed (2016)** showed that every nurse in the study delivered CPR in their school and took a single, lengthy CPR training **(Mohamed, 2016).** This conclusion contradicted the findings of **Nagashema et al. (2012)**, who discovered that the majority of nurses are very interested in CPR and that the majority of them have received CPR instruction and training during their time as students or after graduating **(Nagashima et al., 2012).**

In contrast to the present research, **Salem (2020)** found that 41% of the sample was under 25 years old, and around two thirds possessed less than five years of experience. These findings suggest that the majority of nurses start their careers earlier in life.

Ideally, as nurses age, experience, and years of service increase, so does their level of specialized competence. The study's conclusions allow healthcare organizations to proactively improve nurses' competency by offering guidance and support.

Salem (2020) discovered that, in contrary to the present survey, approximately seventy three percent of nurses possess a diploma, while 25% hold a bachelor's degree and two percent hold a master's degree**.**

The lack of competence among nurses may be explained by the existing findings. For example, **Wheelen et al. (2018)** discovered that amongst a thousand discharged patients, a ten percent increase in the number of bachelorette nurses dramatically reduced the death rate by nine cases**.** Moreover, highly qualified and engaged healthcare professionals contribute to a more patient-centered approach that enhances care quality and patient safety **(Nurses & Bell, 2015)**. This fact draws the attention of health organizations to the necessity of improving the competency of nurses through the creation of formal training programs for their assigned staff. Inadequate in-service training was another factor contributing to low competency among nurses; seventy percent of them missed lectures, workshops, or training sessions on sudden death.

The results of this study indicate statistically significant enhancements in nurses' CPR performance and understanding with regard to the intervention program efficacy. This was observed right away following the program's completion as opposed to the pretest. The increase in performance could be attributed to the in-service educational program, which placed equal emphasis on learning CPR and practical training to modify work performances through appropriate courses or sessions. It could also be attributed to improved inspiration, which is necessary to achieve the desired goals, the availability of information sources such as booklets and pamphlets, as well as the provision of enough materials and supplies to complete the task at hand. Nursing staff who took part in the training program received leaflets, booklets, and pamphlets outlining the goals and content of the program. In addition,

enough supplies and materials were provided for the training rather than being offered in the real work environment.

These findings are consistent with **Salem's (2020)** observation that, prior to the program's implementation, nurses' levels of practice were very low. This information improved following the program's installation. This finding suggests that critically sick patients who receive treatment to critical care units and who are experiencing or may develop life-threatening dysrhythmias have a significant risk of dying if nurses are not prepared to handle such cases **(Salem, 2020).**

As the nurses emphasized, there may be other reasons for the inadequate level of nursing practice. More than seventy five of the sample attributed their low level of skill to the high patient volume and workload. The majority of the sample also stated that they had received educational preparation during the study period. The nurses felt that the least significant impediments were those related to lack of motivation (money, certifications, etc.) for nurses who want to improve their standing of education, practice, or expertise. Lastly, some nurses discovered that doctors are in charge of managing abrupt deaths and making early predictions about them. These challenges could negatively impact the nurses' practice or commitment to the field, which could result in job discontent, annoyance, absenteeism, and even abandoning the field **(Salem, 2020).**

Insufficient nursing competency is consistent with research by **Fekry et al. (2020).** Researchers goal was to evaluate the competence of nurses in treating critically sick patients with life-threatening ventricular dysrhythmia. Researchers came to the conclusion that the investigated nurses' proficiency with deadly dysrhythmias was inadequate and that they needed to be improved **(Fekry et al., 2020).** Likewise, **Ruhwanya et al. (2018)** found that the nurses under study lacked sufficient knowledge and expertise on potentially fatal arrhythmias **(Ruhwanya et al., 2018)**. Furthermore, **El Naeem et al. (2016)** found that most of the healthcare professionals in the study had low levels of competency, which may have something to do with the majority of participants having nursing credentials (Elnaeem et al., 2016). Furthermore, the current study's findings concur with those of **Mousa et al. (2016),** who discovered that a majority of nurses possessed inadequate skill or understanding pertaining to ventricular dysrhythmias **(Mousa et al., 2016).**

Opposite to the findings of the present investigation, **Rajput (2016)** noted that over half of staff nurses were highly knowledgeable about the diagnosis and treatment of cardiac dysrhythmias **(Rajput 2016)**. In a similar vein, **Ruhwanya et al. (2018)** evaluated nurses' knowledge and proficiency in recognizing potentially fatal dysrhythmias and providing the necessary patient care. They came to the conclusion that the majority of participants scored highly on a test measuring their understanding of potentially fatal arrhythmias **(Ruhwanya et al., 2018).**

Conclusion

The current study's findings demonstrated substantial statistical gains in nurses' performance and knowledge of cardiopulmonary resuscitation right away following the program's completion. Our results demonstrate that emergency nurses' judgments of appropriate behavioral reactions in this complex scenario can be enhanced by death education training on the procedure of dealing with sudden death. The instruction may significantly enhance emergency nurses' perspectives on mortality and raise the caliber of their work.

Recommendations:

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

- Undertaking further research is necessary to determine the effectiveness of enrolling emergency nurses in death education programs in significantly improving their response to unexpected patient deaths.
- Providing ongoing education and training to emergency nurses empowers them to manage the psychological impact of a patient's death with emotional resilience.
- Enhancing emergency nurse training continues to refine their understanding of appropriate behavioral reactions to unexpected patient deaths, ultimately laying the foundation for optimal clinical care delivery.

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