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Developing disaster management plan of emergency unit at Minia University Hospital

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Abstract

Background: Recently, the world has been exposed to many disasters that threatened the country's security and economy; as well directed the world to consider how to confront those disasters by making proposed plans to confront future disasters; in which this will increase the world's awareness of how to deal with disasters and avoid the complications of their occurrence.

Aim: to develop a disaster management plan for the Emergency Unit at Minia University Hospital.

Setting: The study was carried out in the Emergency Unit at Minia University Hospital.

Subject: Purposive sample of jury group who are expert in the disaster management (31).

Tools: One tool was used in this study as the Disaster Management Plan Opinionnaire Sheet.

Results: shows that; the majority of the jury group had "moderate response" for all items in the initial phase of the proposed disaster management plan and became "very high response" for all items in the final phase. Also, the sample size and the responses of the jury group were adequate by using (KMO = 0.801). The total Cronbach's Alpha value for the proposed disaster management plan was good (0.875); where the specific reliability coefficients of the proposed plan dimension ranged from (0.844 to 0.990).

Conclusion: Overall, the current study concluded that the validity and the reliability of the developed proposed disaster management plan were satisfactory.

Recommendations: All hospitals should develop an essential rapid updating plan to confronting any disaster according to their special structure.

Keywords: Disaster management, plan, emergency unit, Minia University

Introduction

A disaster is an unplanned event in which the needs of the affected community outweigh the available resources. A disaster occurs somewhere in the world almost daily, but these events vary considerably in scope, size, and context. Large-scale disasters with numerous casualties are relatively unusual events. Results of certain widely publicized disasters from all agencies have focused people's attention on disaster planning and preparedness. Also, disasters are becoming more frequent, and the number of persons who are affected is increasing. Thus, this greater morbidity is attributable not only to the greater number of events, but also to population dynamics, location, and susceptibilities (Ramalingam & Muthunayagam, 2020) [14].

Rapidly mobilize to help the injured and the broader community in general preservation of life and health are of paramount importance to those individuals who are injured in disasters. For this reason, health care professionals must be included in all phases of disaster planning as well as an immediate response to these events. Health care professionals have unique expertise and knowledge of local and regional healthcare systems, which can assist in disaster mitigation and planning. Persons who are affected by a disaster also rely on their skills and treatment in the immediate response to an event. Thus, the adequate preparation and planning, as well as provider and agency education and training; have become more relevant following the visibly problematic responses to many events (Sledge & Thomas, 2019) [17].

Moreover, all hospitals should be define and classify disasters to have better knowledge and understanding of their problems. This will enable concerned specialists and leaders to discuss the conditions and responses needed in more detail. The response may include shifting resources

and manpower or preparing alternative places to transfer victims. And the preparedness of the emergency unit for responding to any emergency or disaster is crucial (Kazmi, *et al.*, 2020).

Disaster is characterized by a sudden overload of the health system caused by natural or man-made disasters. The emergency unit is dependent on close interaction between teamwork in case of confronting a mass casualty incident or sudden onset disaster so the emergency unit and healthcare system should make plans to provide care for all people seeking care. Thus, all patients and casualties should be given care according to need in line with resources available and to allow the reception and treatment of casualties in the event of a mass casualty incident or sudden onset disaster and providing measures to increase capacity in the emergency unit for patients (Perlini, *et al.*, 2020) [13].

Furthermore, the emergency units are central to provide emergency care, and hence when a disaster strikes the society falls back upon the hospitals to provide immediate help in the form of emergency care. Also, emergency units play a critical role in health care infrastructure which has a primary responsibility of saving lives. Therefore, the emergency care system is on the front lines of surveillance and treatment; and the more secure and stable of emergency care system is, the better prepared will be found to handle any possible outbreak (Rezaei, *et al.*, 2018).

Really huge disasters can create environmental imbalances, increasing the risk of communicable diseases and environmental hazards. Disasters may affect the psychological, emotional, and social well-being of the population in the affected community. Therefore, successful recoveries depend upon prepared populations and resilient institutions. Thus, all institutions especially emergency units in hospitals should be developing a disaster management plan and understanding recovery challenges that can help individuals after a disaster (Miles, *et al.*, 2019).

Significance of the Study

A disaster is an unexpected catastrophic event that results in material, moral and human losses that exceed the community's ability to face it. Recently, a series of negligence and insecurity has emerged in several hospitals, and it is still showing its almost endless episodes, where disasters and fires have become a ghost that haunts many patients in many public and private hospitals alike. Last year, the Director of Minia University Hospital decided to evacuate the hospital building because of the appearance of cracks in one of its walls; and health care professionals had no idea about the safe evacuation plan for patients. Hence there is a need for developing a disaster management plan for the Emergency Unit at Minia University Hospital.

Aim of the study

The aim of this study is to develop a disaster management plan of the Emergency Unit at Minia University Hospital.

Research question

What is the valid disaster management plan that will be applicable in the Emergency Unit at Minia University Hospital?

Subjects and Methods

Research design

The Methodological design was utilized in this study.

Setting

The study was carried out in the Emergency Unit at Minia University Hospital.

Subjects

The study subjects were selected by using a purposive sample which consisted from (31) who are expert in the disaster management.

Tools of data collection

One tool was used in this study:

Disaster Management Plan Opinionnaire Sheet

This tool was developed by Mekky, (2009) to assess the validity of the designed proposed disaster management plan by the jury group, and it was modified by the researcher. The tool consisted of (132) items with face validity part (9 items) and content validity part (123 items); and added to tool the socio demographic part; and the tool classified as follows:

1st part socio demographic data for study subjects: it was including (age, gender, marital status, years of experience, and Job title).

2nd part the face validity of the proposed disaster management plan: this part consisted of (9 items) categorized in (6 subscales) namely, The proposed plan completes the structural pillars of the plan (1 item), the final form of the proposed disaster management plan (1 item), the final form of the proposed disaster management plan includes all elements of the entire plan (1 item), the proposed disaster management plan has a logical sequence(1 item), formulating the proposed disaster management plan is characterized (4 items), and finally elements of the proposed disaster management plan are procedural and can be applied (1 item).

3rd part the content validity of the proposed disaster management plan: this part consisted of (123 items) categorized in (11subscales) namely, an introduction of the Emergency unit at Minia University Hospital (6 items), the emergency cases in the disaster management plan (10 items), disasters generally (13 items), the proposed disaster management plan (7 items), the stages of disaster management in the proposed plan (15 items), the stages of implementing the proposed disaster management plan (14 items), the content of the proposed evacuation plan (32 items), different types of disasters with the proposed plan (19 items), a scenario facing a fire inside in Emergency unit at Minia University Hospital at intensive care department (4 items), the job cards for the tasks and responsibilities of all employees(2 items), and an engineering diagram of Emergency unit at Minia University Hospital is clear and comprehensive (1 item).

The scoring system; each item was assessed by four points Likert scale as (Very high= 4, High=3, Moderate =2, Low =1), and the score was divided as follows:

1. Low validity level of the proposed disaster management plan by the jury group if the score ranged from (1) to (132).
2. Moderate validity level of the proposed disaster management plan by the jury group if the score ranged from (133) to (264).
3. High validity level of the proposed disaster management plan by the jury group if the score ranged from (265) to (396).
4. Very high validity level of the proposed disaster management plan by the jury group if the score ranged from (397) to (528).

Validity and reliability

The tool was tested for the validity by a five jury in Nursing Administration field. The jury consisted of one professor and one Assistant Professor at the Department of Nursing Administration - Faculty of Nursing - Minia University, and three Assistant Professor, Department of Nursing Administration - Faculty of Nursing - Tanta University. The tool was examined for content coverage, the sequence of elements, clarity, fit, applicability, wording, length, form, and overall appearance. The reliability of the study tool (opinionnaire sheet) was done through the use of Cronbach's alpha coefficient to measure the internal consistency reliability; it was (0.977).

Pilot Study

The pilot study was conducted on (10%) from the total number of study subjects; three of jury group who are expert in the disaster management; to check and ensure the efficiency, clarity, and applicability of the tool. It also helped in the estimation of the time needed to fill the form. Subjects who participated in the pilot study were excluded from the actual study.

Procedure

Before data collection, official permissions were obtained from the Dean of Faculty of Nursing at Minia University and from the Director of Minia University Hospital to carry out the study. Then the interviews were conducted with the study sample and explain to them the purpose of the study for seeking their cooperation. The study was conducted in three phases; Assessment phase, designing phase, and validity phase.

Phase I. Assessment

- Reviewing the literature as well as assessing the Emergency Unit at Minia University Hospital was done as an initial step to obtain information regarding disaster preparedness and management and modify the study tool.
- Then the validity of the tool was done by a five jury who are expert in disaster management from the field of Nursing Administration. As well as the pilot study for the tool by three study subjects was done.
- Reviewing the scientific literature using textbooks, e-books, journals, periodic, websites, and thesis was done to initiate a draft for the proposed disaster management plan.
- Assessment and reviewing of the engineering diagram of Emergency unit at Minia University Hospital was done to be a guide in preparing the disaster proposed plan.
- An interview with health care team by the researcher was done to collect data and assess their information regarding disaster management.
- Then the researcher assessed the various resources needed for internal disaster management plan in the Emergency Unit at Minia University Hospital.

Phase II. Designing the plan

- Reviewing the scientific literature of national and international resources concerning the topic of the study using textbooks, articles, journals, research, and internet search was done the researcher to develop the proposed plan for disaster management in the Emergency Unit at Minia University Hospital.
- Accordingly, the proposed content of the disaster management plan that designed by the researcher as the initial plan was presented to the supervisors for examining the content coverage, the sequence of elements, clarity, fit, applicability, wording, length, form, and overall appearance, and then making the modification which recommended by the supervisors.
- The researcher established a rapport with all available jury groups who have experience in the disaster management plan and obtain informed consent to participate in the study after explaining the importance and purpose of the study.
- Then, the proposed disaster management plan was presented to the jury group to obtaining their opinion on the content of the plan.

Phase III. Validity of disaster management plan:

- This phase contained the face validity and content validity of the proposed disaster management plan which was done by expert jury as a result of the "thinking aloud" exercise, where minor wording was made in the proposed plan.
- The jury group was asked to read the proposed plan and evaluated the face and content of plan in terms of the plan applicability to reflect disaster management plans.
- Then the researcher collected the proposed plans and opinionnaire sheets from experts' jury to assess their responses and entered the data into SPSS to analysis their responses.
- Consequently, reviewing and analyzing of the proposed plan has been performed through two phases (the initial phase and the final phase)
- In the initial phase; the content of the proposed plan consisted of (109 items) categorized into (9 subscales). And the jury group evaluated the validity and reliability of the proposed disaster management plan by using the opinionnaire sheet.
- After reviewing the jury modification of the proposed plan as well as statistical analysis there were (14 items) invalid have been omitted, and two domains as well as (28 items) were added.
- Thus, in the final phase the content validity of the proposed disaster management plan by jury group

consisted of (123) items categorized in (11 subscales).

Ethical consideration

- This study was granted approval by the Ethical Committee of the Faculty of Nursing, Minia University.
- The aim of the study was explained to all participants in the study.
- Informed consents were obtained from all the participants before the data collection.
- The study participants were reassured that their participation was voluntary, and they had the right to withdraw from the study at any time if they want that.
- The study participants were reassured that their anonymity was maintained, although the study and collected information wouldn't be used except for the purpose of this study and written consent was obtained.

Statistical Analysis

Data entry and statistical analysis were performed by using computer software, the statistical package for social sciences (SPSS), version 22. Suitable descriptive statistics were used such as; frequency, percentage, the Kaiser-Meyer- Olkin (KMO) test, Cronbach's alpha, and the Goodness of Fit Index (GFI) were utilized in analyzing data pretended. The percentage frequency distribution involves first identifying the total number of observations to be represented, and accounting the total number of observations within each data point.

According to Willims, *et al.*, (2012) [20] who revealed that the Kaiser- Meyer- Olkin (KMO) test measured the sampling adequacy. (i.e determining if the responses given by the sample were adequate or not). It should be closed to 0.5 for satisfactory factor analysis in order to proceed. Also, Kaiser (1974) [9] who recommended that (0.5) (i.e. value for KMO test) as a minimal accepted value (i.e. barely accepted). The value between (0.7- 0.8) was considered acceptable, and the value above (0.9) was highly acceptable (i.e. superb).

Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability so the internal consistency of the Opinionnaire Sheet was assessed with Cronbach's alpha coefficient. Cronbach's alpha coefficient of (0.00) indicates no reliability and a coefficient of (1.00) indicates perfect reliability. However, a reliability coefficient of (> 0.70) is acceptable (Bujang *et al.*, 2018).

In addition, the Goodness of Fit Index (GFI) is a measure of fit between the hypothesized model and the observed covariance matrix. The adjusted goodness of fit index (AGFI) corrects the GFI, which is affected by the number of indicators of each latent variable (Donthu *et al.*, 2021).

The GFI and AGFI range between 0 and 1, with a value of over (0.9) generally indicating an acceptable model fit. Relative fit indices (also called "Incremental Fit Indices" (IFI) and "Comparative Fit Indices" (CFI) compare the chi-square for the hypothesized model to one from a "null", or "baseline" model. This null model almost always contains a model in which all of the variables are uncorrelated, and as a result, has a very large chi-square (indicating poor fit) (Grotzinger, *et al.* 2019).

Relative fit indices include the normed fit index and comparative fit index. CFI values range from (0) to (1), with larger values indicating better fit. Previously, a CFI value of (0.90) or larger was considered to indicate an acceptable model fit (Mihalca, 2021).

Root Mean Square Error (RMSE) is the standard deviation of the residuals (prediction errors). Residuals are a measure of how far from the regression line data points are. Root mean square error is commonly used in forecasting, and regression analysis to verify experimental results (Ulloa *et al.* 2018).

Results

Table 1: Socio demographic data of jury group (n = 31)

Socio demographic data	No.	%
Age/ Years		
▪ 20- < 30	7	23.0
▪ 30-< 40	24	77.0
Mean ± SD	32.7 ± 4.3	
Gender		
▪ Male	19	61.0
▪ Female	12	39.0
Current Marital Status		
▪ Single	5	16.0
▪ Married	26	84.0
Years of Experience		
▪ 1- < 10	21	32.0
▪ 10-19	10	68.0
Mean ± SD	8.7 ± 4.8 years	
Job title		
▪ University professors	5	16.0
▪ Workforce safety and occupational health inspectors	15	49.0
▪ Occupational safety and health specialist in hospitals	5	16.0
▪ Occupational safety and health specialist in the factory	6	19.0

Table (1) shows that (77.0%) of the jury group aged between 30 < 40 years, with mean age 32.7 ± 4.3 years, (61.0%) of them are male, the majority (84.0%) of them married, (68.0%) of them have years of experience ranged between 10 - 19 years, and (49.0%) of them work in workforce safety and occupational health inspectors.

Table 2: Percentage distribution of jury group regarding the face validity of the proposed disaster management plan items in the initial phase

Items Face Validity plan	The extent elements achieved the proposed plan The initial phase							
	Achieved degree							
	Very high		High		Moderate		Low	
	No	%	No	%	No	%	No	%
The Face Validity plan								
1. The proposed plan completes the structural pillars of the plan	1	3.2%	13	41.9%	17	54.8%	0	0.0%
2. The final form of the proposed plan includes the internal disasters in emergency unit	1	3.2%	12	38.7%	18	58.1%	0	0.0%
3. The final form of the proposed plan includes all elements of the entire plan	4	12.9%)	11	35.5%	16	51.6%	0	0.0%
4. The proposed plan has a logical sequence	0	0.0%	12	38.7%	19	61.3%	0	0.0%
Formulating the proposed plan is characterized by								
5. Clear	1	3.2%	7	22.6%	23	74.2%	0	0.0%
6. Comprehensive to plan elements	2	6.5%	10	32.3%	19	61.3%	0	0.0%
7. No repetition in proposed plan elements	1	3.2%	12	38.7%	18	58.1%	0	0.0%
8. Following a scientific manner	0	0.0%	11	35.5%	20	64.5%	0	0.0%
9. Elements of the proposed plan are procedural and can be applied	2	6.5%	12	38.7%	17	54.8%	0	0.0%

Table (2): reveals regarding the face validity plan in the initial phase that the jury group has "moderate response" for all items as "plan completes the structural pillars "(54.8%); "plan includes the internal disasters in the reception and emergency unit" (58.1%);" plan includes all elements of the entire plan" (51.6%); and "plan has a logical sequence" (61.3%).

Also, for the formulating the proposed plan; the jury group has "moderate response" for all items as "plan is clear" (74.2%); is comprehensive (61.3%), has no repetition elements (58.1%); following a scientific manner (64.5%); and can be applied (54.8%).

Table 3: Percentage distribution of jury group regarding the face validity of the proposed disaster management plan items in the final phase

Items Face Validity plan	The extent elements achieved the proposed plan The initial phase							
	Achieved degree							
	Very high		High		Moderate		Low	
	No	%	No	%	No	%	No	%
The Face Validity plan								
1. The proposed plan completes the structural pillars of the plan	17	54.8%	14	45.2%	0	0.0%	0	0.0%
2. The final form of the proposed plan includes the internal disasters in emergency unit	18	58.1%	13	41.9%	0	0.0%	0	0.0%
3. The final form of the proposed plan includes all elements of the entire plan	16	51.6%	15	48.4%	0	0.0%	0	0.0%
4. The proposed plan has a logical sequence	19	61.3%	12	38.7%	0	0.0%	0	0.0%
Formulating the proposed plan is characterized by								
5. Clear	23	74.2%	8	25.8%	0	0.0%	0	0.0%
6. Comprehensive to plan elements	19	61.3%	12	38.7%	0	0.0%	0	0.0%
7. No repetition in proposed plan elements	18	58.1%	13	41.9%	0	0.0%	0	0.0%
8. Following a scientific manner	20	64.5%	11	35.5%	0	0.0%	0	0.0%
9. Elements of the proposed plan are procedural and can be applied	17	54.8%	12	38.7%	0	0.0%	0	0.0%

Table (3) shows regarding the face validity plan in the final phase that the jury group has "very high response" for all items as "plan completes the structural pillars "(54.8%); "plan includes the internal disasters in the reception and emergency unit" (58.1%);" plan includes all elements of the entire plan" (51.6%); and "plan has a logical sequence" (61.3%).

Also, for the formulating the proposed plan; the jury group has "very high response" for all items as "plan is clear" (74.2%); is comprehensive (61.3%), has no repetition elements (58.1%); following a scientific manner (64.5%); and can be applied (54.8%).

Table 4: Labelling the extracted dimension regarding the content validity of the proposed disaster management plan

Dimension	Number of items	Eigen value	Variance Explained (%)	Cumulative Variance Explained (%)	*KMO index
1. An introduction of the Emergency unit at Minia University Hospital	6	7.86	71.19	71.19	0.801
2. The emergency cases in the disaster management plan	10	1.06	9.66	80.85	
3. Disasters generally	13	1.06	8.38	82.25	
4. The proposed disaster management plan	7	0.91	4.29	84.15	
5. The stages of disaster management in the proposed plan	15	0.46	2.43	89.52	
6. The stages of implementing the proposed disaster management plan	14	0.27	1.80	93.52	
7. The content of the proposed evacuation plan	32	0.11	1.04	95.95	
8. Different types of disasters with the proposed plan	19	0.06	0.60	97.75	

9. Scenario facing a fire inside the Emergency unit at Minia University Hospital at ICU	4	0.04	0.35	98.79	
10. Job cards for the tasks and responsibilities of all employees	2	0.02	0.18	99.39	
11. An engineering diagram of Emergency unit at Minia University Hospital is clear and comprehensive	1	.008	0.7	99.74	
Total	123	0.009	0.5	99.93	

Note: * KMO denote to the Kaiser- Meyer- Olkin test: Value of 0.5 is considered as minimum (i.e. barely accepted), value between 0.7-0.8 is considered as acceptable, and value above 0.9 are considered as highly acceptable.

Table (4) shows that the sample size and the responses of the jury group are adequate (KMO = 0.801). The highest explained variance values are for (the introduction of the Emergency unit at the Minia University hospital (71.19%), the emergency cases in the disaster management plan (9.66%), and disasters generally (8.38%)).

Table 5: Cronbach's Alpha values, mean and standard deviations for the proposed disaster management plan

The proposed disaster management plan	Cronbach Alpha α	Mean	±SD	Total Cronbach's α
1. An introduction of the Emergency unit at Minia University Hospital	0.883	21.8	2.3	0.875
2. The emergency cases in the disaster management plan	0.945	35.8	4.2	
3. Disasters generally	0.949	46.9	5.2	
4. The proposed disaster management plan	0.844	24.9	2.9	
5. The stages of disaster management in the proposed plan	0.977	54.4	6.7	
6. The stages of implementing the proposed disaster management plan	0.963	53.0	6.9	
7. The content of the proposed evacuation plan	0.990	130.0	18.6	
8. Different types of disasters with the proposed plan	0.985	94.9	13.6	
9. Scenario facing a fire inside of Emergency unit at Minia University Hospital at intensive Care Department	0.978	3.4	0.5	
10. Job cards for the tasks and responsibilities of all employees	0.947	7.2	1.1	
11. An engineering diagram of Emergency unit at Minia University Hospital is clear and comprehensive	0.990	3.6	0.55	

Note: * an excellent reliability; cronbach's @ of ≥0.9 is excellent; Cronbach's @ of ≥0.8 is good; Cronbach's @ of ≥0.7 is acceptable Cronbach's @ of ≥0.6 is questionable, Cronbach's @ of ≥0.5 is poor and Cronbach's @ of ≥0.4 is unacceptable.

Table (5) shows that the total Cronbach's Alpha value for the proposed disaster management plan is (0.875) with good reliability; where the specific reliability coefficients of the proposed guideline dimension rang from (0.844 to 0.990).

Table 6: Goodness of fit indicator (GFI) of proposed disaster management plan

Tool	X^2	Df	X^2/df	IFI	CFI	RMSEA
Initial	1715	325	5.3	0.67	0.62	0.125
Final	1125	515	2.2	0.93	0.91	0.02

Note: denote to significances (i.e. $p< 0.05$). GFI: Goodness Fit Index range CFI: Comparative Fit Index, IFI Incremental Fit Index. RMSEA: Root Means Squared Error of Approximation.

Table (6): shows that the value of the RMSEA index is (0.125), the CFI is (0.62) and IFI is (0.67) at the initial disaster management plan are reasonable compared with the acceptable value of the two fit indices of the CFI and IFI which are ≥ 0.90. The final disaster management plan is satisfactory (X2 (515) = 1125, P-Value < 0.02) in which the CFI and IFI increase slightly, but RMSEA decrease to 0.02.

Discussion

The important variable in the equation of disasters are people and their suffering impact and it can even be said that what defines a disaster is not its cause, but its result. Thus, during a disaster, health care infrastructures have a challenging task to accomplish, since it is the way they manage the disaster that will determine if the outcome will be negative or positive, that is, the extent to which the impact of the disaster will manifest in society. Hospitals and their staff should, therefore, present effective disaster preparedness to minimize the impact of disasters (Strandh & Eklund 2018) [19]. The aim of this study was to develop a disaster management plan for the Emergency Unit at Minia University Hospital.

In the current study, regarding socio demographic data of the jury group, there were more than three quarter of jury group aged between (30 ≤ 40) years old, two third of them had(10-19) years of experience; the highest percent were male. Also, the majority were married; and nearly of half working as inspectors in workforce safety and occupational health.

In the current study, regarding percentage distribution of jury group to the face validity of the proposed disaster management plan; it was noted that the majority of the jury group had “moderate response” for all items in the initial phase; and increased to be “very high response” for all items in the final phase as “plan completes the structural pillars, the plan includes the internal disasters at the emergency unit”, the plan includes all elements of the entire plan, the plan has a logical sequence and finally for formulating the proposed plan.

These results might be attributed to the fact that the jury group evaluated the face validity items of the proposed disaster management plan in the initial phase with “moderate response” for all items due to incomplete elements of the proposed plan but in the final phase; it was noted that the majority of the jury group had "the very high response" for all items which means that the proposed plan is valid, more comprehensive, and complete from the jury group opinions. Also all items of the proposed disaster management plan had a clear, scientific and logical consequence of items which can be applied in Emergency

Unit according to the evaluation of the jury group.

This result is in the same line with Bolarinwa (2015) [3], who mentioned that face validity means that experts are evaluating whether each of the measuring items matches any given conceptual domain of the concept. Also, the jury group assessed the overall proposed disaster management plan in terms of relevancy, clarity, and simplicity criteria and to add their suggestion and recommendations.

Also, this result is in accordance with, Sangoseni, *et al.*, (2013) [16] who revealed that face validity involves the expert looking at the items in the questionnaire and agreeing that the test is a valid measure of the concept which is being measured just on the face of it. Also Bölenius, *et al.*, (2012) [4] added that face validity is established when an individual (and or researcher) who is an expert on the research subject reviewing the questionnaire (instrument) concludes that it measures the characteristic or trait of interest.

In the current study, regarding the validity of jury sample size and labeling the extracted dimension of the proposed disaster management plan of the jury group; it was noted that the sample size and the responses of the jury group were adequate by using (KMO = 0.801). Also, the highest explained variance value were for the domains an introduction of Emergency unit at Minia University Hospital, the emergency cases in the disaster management plan, and disasters generally.

These results are in the line with Willims, *et al.*, (2012) [20], who mentioned that the construct validity was analyzed by labeling of extracted dimensions and expletory factor analysis. Adequacy of the sample size for factor analysis was tested by Kaiser- Meyer-Olkin (KMO) test.

The KMO test measured the sampling Adequacy. (i.e determining if the responses given by the sample were adequate or not). It should be closed to 0.5 for satisfactory factor analysis in order to proceed. Also, Kaiser (1974) [9] recommended that (0.5) (i.e. value for KMO test) as a minimal accepted value (i.e. barely accepted). The value between (0.7- 0.8) was considered acceptable, and the value above (0.9) was highly acceptable (i.e. superb).

In the current study, regarding Cronbach's Alpha values, mean and standard deviations for the proposed disaster management plan; it was noted that the total Cronbach's Alpha value for the proposed disaster management plan was (0.875); where the specific reliability coefficients of the proposed disaster management plan dimensions ranged from (0.844 to 0.990).

This result might be attributed to proof that all items of the tool were relevant to the proposed plan, in a logical sequence, and following a scientific manner. The reliability estimated used in the current study was the internal consistency reliability guided by Cronbach's Alpha coefficient and item-total correlation which assessed the consistency of the results across items within a test. In internal consistency reliability estimation, the proposed disaster management plan at the emergency unit was administered to the jury group to analyze its reliability.

Cronbach's alpha coefficient is the most frequently used statistic to show internal consistency reliability (Brink & Wood, 1998) [2]. Cronbach's alpha is generally increases as the inter-correlations among test items increase and is known as an internal consistency that estimate of the reliability of test scores. Because inter correlations among test items are maximized when all items measure the same construct, Cronbach's alpha is widely believed to indirectly the degree to which a set of items measures a single unity (Polit & Beck, 2004).

This is in the line with, Cronback's, (1951) [5] who mentioned that the alpha is the most appropriately used test when items measure different dimensions within a single construct. Cronbach's alphas reliability coefficient normally ranges between (0 and 1); however, there is actually no lower limit to the coefficient. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. Based upon the given formula, the size of alpha is calculated by rk/ [1 + (k-1)r] and determined by both the number of items considered and (r) is the mean of the inter-items correlations.

Furthermore, in the current study, regarding to Goodness of Fit Indicator (GFI) of the proposed disaster management plan; it was noted that the value of the RMSEA index was 0.125, the CFI was 0.62 and IFI was 0.67 at the initial disaster management plan were reasonable compared with the acceptable value of two fit indices of the CFI and IFI which were ≥ 0.90. The final disaster management plan was satisfactory (X^2 (515) = 1125, P–Value < 0.02) in which the CFI and IFI increased slightly, but RMSEA decreased to (0.02).

The CFI and IFI increased slightly, but RMSEA decreased to 0.02. This result might be attributed to the fact that the absolute correspondence of the guidelines, the indicators applied in a competent strategic analysis was: Goodness of Fit Indicator (GFI) and the Index of Corresponding Values and Approximate Error Expressed as in the Root Mean Square Error of Approximation (RMSEA). In GFI, the higher the value is the higher one with correspondence where the (GFI) value is between (0 to 1) and closeness to indicate a very good fit (Bartholomew & Tzamourani, 1999) [1].

Accordingly from the current findings, the obtained value of the modified proposed disaster management plan was satisfactory [X2 (515) = 1125, P < 0.02]. The (CFI) and (IFI) increased slightly, but (RMSEA) decreased to 0.02. RMSEA is an indicator based on an appreciative error that occurs due to the expected degree of freedom within the population (Sivo, *et al.*, 2006) [18]. The lower the indicator is, the higher the correspondence is. Acceptable correspondence is under the value of 0.08, but some authors agree with the value as even under 0.10. In the current study; the modified plan had value of (0.04) which was according to (Sivo, *et al.*, 2006) [18] was considered as an indicator of good correspondence.

After application of all needed statistical tests and further modifications, the finalized proposed disaster management plan was sent again to the experts to read it, evaluate the content in terms of whether it appears to reflect the proposed disaster management plan at the emergency unit and, assess the overall plan in terms of relevance, clarity, and simplicity criteria using four Likert point scale of very high, high, medium and few.

The finding of finalized tool percentage of (agreement / disagreement) was supported by most of the experts' agreement as majority of them agreed that "The proposed disaster management plan is important to health team at emergency unit, the proposed plan can be used as a guide to

health care team at emergency unit, the number of the proposed items under every dimension of the plan were suitable and the statements of the proposed plan were clear". While, a very little number of experts disagreed that "The proposed plan is applicable and the items were considered specific and understandable words".

Conclusion

Overall, the current study concluded that the validity and the reliability of the developed proposed disaster management plan were satisfactory. The proposed disaster management plan was developed in response to the need for the Emergency Unit in case of disaster.

Recommendations

Based on the findings of the current study it was recommended that:

- All hospitals should develop an essential rapid updating plan to confront any disaster according to their special structure and system.
- Continuous training program should be performed to health care team of the emergency unit regarding disaster management.
- The Ministry of Higher Education should add a curriculum for crises and disasters at all educational levels.

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