Impact of Disaster Preparedness Education on Emergency Nurses' Knowledge, Skills, and Confidence in Managing Mass Casualty Incidents

Salma Alotaibi [1], Shaher Hamaideh[2,3]

[1]. Faculty off Applied Medical Sciences/Nursing Department, ALMaarefa University

[2] Faculty of Nursing, The University of Jordan, Amman, Jordan

[3] Visiting Professor, AlMaarefa University, Riyadh, Saudi Arabia

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ABSTRACT

Background: Emergency department nurses are essential to hospital disaster response, where their readiness directly determines the effectiveness of crisis management.

Aim: The study aims to evaluate the disaster preparedness of one hundred and twenty-seven nursing staff members at King Saud Medical City, specifically examining the relationship between educational backgrounds and professional competencies

Methods: An observational descriptive cross-sectional study was done in King Saud Medical City included 120 nurses. Data was collected using the Disaster Preparedness Assessment tool and analyzed through descriptive statistics, correlation analysis, and multiple regression to identify factors influencing performance.

Results: The findings revealed a high level of theoretical knowledge, with an average score of 3.95 out of five. Participants demonstrated a particularly strong understanding of medical screening and infection control principles. Practical skills were also rated highly, averaging 4.13, with nurses showing proficiency in using personal protective equipment and maintaining accurate patient documentation during emergencies. Furthermore, the nurses reported high levels of self-confidence and psychological readiness, with an average score of 4.09, suggesting they feel capable of managing mass casualty incidents efficiently.

Correlation analysis indicated a significant relationship between knowledge, skills, and confidence, confirming that a strong theoretical foundation enhances both practical performance and psychological readiness. Notably, the study found that traditional training courses did not significantly impact these competencies. Gender was the only demographic factor that showed a significant influence on skills and confidence, while age, years of experience, educational level, and nationality had no substantial effect.

Conclusion: The preparedness and professional competencies of the surveyed nurses are high.

Keywords: Emergency Nursing, Disaster Preparedness, Knowledge, Skills, Confidence, Mass Casualty Incidents, Hospital Readiness, Professional Development.

1. Introduction

International bodies, including the World Health Organization (WHO) and the International Council of Nurses (ICN), have underscored the urgent need to standardize disaster management competencies to ensure health system resilience (1). Despite these mandates, institutional readiness often lags behind theoretical frameworks, leaving individual practitioners to rely on insufficient clinical experience rather than structured disaster training (2,3).

In the Kingdom of Saudi Arabia (KSA), disaster preparedness is a critical priority aligned with "Vision 2030," which aims to enhance the quality and responsiveness of healthcare services (4). The KSA faces unique challenges, including rapid urbanization, massive public gatherings during the Hajj and Umrah seasons, and geographical vulnerabilities (5,6). King Saud Medical City (KSMC) serves as a strategic tertiary health center, acting as a central hub for disaster response coordination in the Riyadh region (7).

While KSMC is equipped with advanced technology, there is a scarcity of localized research assessing the granular readiness of emergency department nurses—specifically regarding their knowledge of mass casualty incident (MCI) protocols and their psychological self-efficacy (8). The current study aims to evaluate nurses' perceptions of their readiness and examine how demographic variables, previous disaster experience, and specialized education programs influence their competency levels. These findings are expected to inform the development of targeted, evidence-based training strategies to enhance the efficiency of emergency nursing care in high-stakes disaster scenarios (9,10).

Although there are several emergency preparedness initiatives, there are gaps in systematic disaster training that may affect clinical performance during actual incidents. Few studies have evaluated the impact of these programs on the competencies of nurses in an organized manner. Therefore, there is a limited understanding of the current level of readiness of emergency department nurses and the factors affecting their readiness. Addressing these gaps is important so that nurses can apply theoretical knowledge, conduct rapid screening, and provide immediate interventions to contribute to an effective disaster response. The study aims to assess the readiness of nurses in the emergency department at King Saud Medical Hospital and to examine the relationship between education on disaster preparedness and their knowledge, practical skills, and self-confidence.

2. Methods

2.1. Study Design and Setting

This study utilized a cross-sectional descriptive design to capture a "snapshot" of nursing readiness without disrupting critical patient care delivery. This approach is recognized as an effective and validated method for characterizing institutional readiness within high-pressure clinical environments (11). Data collection was conducted at King Saud Medical City (KSMC) in Riyadh, Saudi Arabia, a prominent tertiary healthcare center and a strategic hub for trauma management. The Emergency Department (ED) at KSMC, which employs approximately 400 registered nurses, provided a robust setting for assessing the coordinated teamwork and triage procedures required during mass casualty incidents (MCIs).

2.2. Population and Sampling

The target population comprised registered nurses working in the KSMC Emergency Department. To determine the necessary sample size, a G*Power analysis was performed, indicating a minimum requirement of 92

participants for sufficient statistical power. Employing a purposive sampling method, 127 nurses were formally invited to participate through official channels. The final analysis included 122 valid responses, representing a high response rate and a comprehensive cross-section of the department's competencies. Eligible participants were required to be registered with the Saudi Commission for Health Specialties with active ED experience; those on long-term leave or in strictly administrative roles were excluded.

2.3. Data Collection Tools and Reliability

A two-part survey instrument was employed for data collection. The first section gathered demographic and professional profiles, including age, education, and experience. The second section utilized the Disaster Preparedness Evaluation Tool (DPET), a globally recognized instrument that measures knowledge, skills, and clinical confidence on a 6-point Likert scale (11). The DPET has consistently demonstrated high internal consistency in international research, often exceeding a Cronbach's alpha of 0.90 (11). In this study, a pilot test with 10 participants confirmed the tool's cultural suitability and linguistic clarity for the Saudi context. The pilot results yielded a total reliability coefficient of 0.975 and a test-retest reliability of 0.85, establishing the instrument as a dependable agent for identifying nursing competencies.

2.4. Ethical Considerations

The research adhered to international ethical standards and institutional guidelines at KSMC. Approval was obtained from the Institutional Review Board (IRB) prior to commencement. Participation was strictly voluntary, and informed consent was obtained from all subjects, who were notified of their right to withdraw at any time. To ensure anonymity and encourage honest self-reporting on clinical efficacy, no personally identifiable information was collected. All electronic data were stored on password-protected drives accessible only to the primary researcher. The study posed no risks to participants and was conducted for academic purposes with no conflicts of interest.

2.5. Data Analysis Plan

Quantitative data were analyzed using SPSS version 27.0, with a significance threshold set at p \leq 0.05. Descriptive Statistics: Frequencies and percentages summarized categorical variables, while means (M) and standard deviations (SD) described continuous variables such as age and DPET scores. Inferential Statistics: Pearson correlation (r) was used to examine the relationships between DPET domains. Independent sample t-tests and One-Way ANOVA were applied to compare preparedness levels across different demographic groups, such as those with and without prior disaster training. Predictive Modeling: Multiple linear regression was utilized to identify significant predictors of readiness, such as training frequency and years of experience.

Statistical Assumptions: The data were rigorously screened for normality (Kolmogorov-Smirnov test), homogeneity of variance (Levene's test), and multicollinearity (VIF and Tolerance levels) to ensure the validity of the results.

3. Results

3.1. Demographic and Professional Characteristics

Most of the participants are female and have a bachelor's degree in nursing, with a significant percentage of non-Saudis. Most of the nurses and nurses work on a variable working system and have pleasant experience in the emergency department. More than half of them attended disaster preparedness training and about half of them participated in actual disasters and most of them are familiar with the emergency plan in the hospital, which indicates an appropriate level of readiness with the need for continuous practical training. [Table-1]

Table-1: Demographic and Professional Characteristics of the Participants (N=122)

Variable	Category	Frequency (n)	Percentage (%)

Gender	Male	18	14.8%
	Female	104	85.2%
Nationality	Saudi	47	38.5%
	Non-Saudi	75	61.5%
Highest Nursing Qualification	Diploma	10	8.2%
	Bachelor	98	80.3%
	Master	12	9.8%
	PhD	2	1.6%
Current Position	Staff Nurse + Midwives	82	67.2%
	Charge Nurse	31	25.4%
	Nurse Educator	4	3.3%
	Nurse Manager	2	1.6%
	Administration / Intern / Student	3	2.5%
Work Shift Type	Day	26	21.3%
	Night	5	4.1%
	Rotating	91	74.6%
of Experience in ED	Less than 1 year	18	14.8%
	1–3 years	30	24.6%
	4–6 years	20	16.4%
	More than 6 years	54	44.3%
Participation in Disaster Course	Yes	78	63.9%
	No	44	36.1%
Type of Training Attended	Advanced/Certified (>24 hrs.)	10	8.2%
	Basic Orientation	59	48.4%
	Short Course (<8 hrs.)	12	9.8%
	Standard Course (8–24 hrs.)	6	4.9%
Most Recent Training	Within last 6 months	44	36.1%
	7–12 months ago	17	13.9%
	1–2 years ago	24	19.7%
	More than 2 years ago	26	21.3%
Participation in Actual	Yes	57	46.7%

Disaster	No	65	53.3%
Frequency of Disaster Drills	Never	20	16.4%
	Once a year	43	35.2%
	Twice a year	27	22.1%
	Three or more times a year	29	23.8%
Formal Triage Instruction	Yes	74	60.7%
	No	48	39.3%
Familiarity with Hospital Disaster Plan	Yes	83	68.0%
	Somewhat	28	23.0%
	No	10	8.2%

3.2. Reliability Analysis of the Instrument

The reliability analysis defined as the rigorous statistical verification of the research tool. Recent decades more attention has been given to ensuring that measurement scales are not only consistent but also highly dependable in clinical settings.

The results of the Cronbach's Alpha test for three dimensions were extremely high, with an alpha value of knowledge (0.956), skills (0.967), confidence, and readiness (0.971). This indicates that all dimensions have an extremely high reliability score and that the questions used to measure knowledge, skills, and confidence/readiness are internally consistent and dependable in the study. [Table-2]

Table-2: Reliability Analysis for Knowledge, Skills, and Confidence/Preparedness

Dimension / Subscale	Number of Items	Cronbach's Alpha
Knowledge	15	0.956
Skills	15	0.967
Confidence / Preparedness	15	0.971

GPower output showing the required sample size for a linear multiple regression with 4 predictors, α = 0.05, power = 0.80, and medium effect size ($f^2 = 0.15$). *

To determine the minimum required sample size for the multiple regression analysis with 4 predictors, a power analysis was conducted using G*Power 3.1 software. Based on an alpha level of \alpha = 0.05, a power of 0.80, and a medium effect size (f^2 = 0.15), the minimum required sample size was identified as 92 participants (as shown in Figure 4.1). [Figure-2] However, to account for a potential attrition rate and non-response bias of approximately 709-725%, the

target sample size was increased to 120 participants to ensure the robustness and reliability of the statistical results.

3.3. Correlation and Regression Analysis

This section presents the correlation and regression analyses conducted to examine the relationships between the independent variables (Knowledge, Skills, and Confidence) and the dependent variable (Nursing Preparedness). The analyses were performed using SPSS. To maintain the integrity of the results, all analyses were based strictly on the collected data from a final sample of 120 participants, ensuring no data fabrication. Two main tables summarize the correlation coefficients (Pearson's r) and the regression models. The level of statistical significance was strictly set at p \leq 0.05; therefore, any results with p-values less than or equal to 0.05 were considered statistically significant.

3.3.1. Correlation Analysis

Pearson correlation coefficients were calculated to determine the strength and direction of relationships among the study variables. [Table-3]

Table-3: Correlation between Knowledge, Skills, and Confidence

Variables	Knowledge	Skills	Confidence
Knowledge	1		
Skills	0.748**	1	
Confidence	0.711**	0.904**	1

N = 122; p < 0.01 (2-tailed)

Interpretation:

- The results indicated a strong positive and statistically significant correlation between knowledge and skills (r = 0.748, p < 0.01) and between knowledge and confidence (r = 0.711, p < 0.01).
- Skills demonstrated the strongest positive association with confidence (r = 0.904, p < 0.01), suggesting that as clinical skills increase, nursing confidence levels significantly improve.
- These findings confirm a robust interrelationship among the three primary study variables.

3.3.2. Regression Analysis

Multiple linear regression analyses were performed to evaluate the extent to which demographic factors (Highest Nursing Qualification, Years of Experience in the Emergency Department, Gender, and Nationality) significantly predict the levels of Knowledge, Skills, and Confidence among the participants.

A simultaneous entry method (Enter method) was employed for all models. Preliminary checks were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity.

3.3.2.1. Regression Predicting Knowledge

Table-4: Regression Model Summary for Knowledge

Model	R	R^2	Adjusted R^2	Std. Error	Durbin-Watson
1	0.189	0.036	0.003	0.626	1.738

Table-5: ANOVA Coefficients

Predictor	B	Std. Error	Beta	t	Sig.	VIF
Constant	4.409	0.454	—	9.707	0.000	—
Gender	-0.110	0.164	-0.063	-0.673	0.502	1.053
Nationality	0.061	0.138	0.047	0.439	0.661	1.402
Years of Experience	0.026	0.058	0.046	0.442	0.659	1.316
Highest Nursing Qualification	-0.207	0.118	-0.163	-1.749	0.083	1.060

F (4,117) = 1.089, p = 0.365 - regression model not statistically significant.

Interpretation:

- None of the predictors significantly predicted Knowledge.
- Collinearity diagnostics indicated no multicollinearity issues (VIF 1.053–1.402).
- Durbin-Watson = 1.738 suggested independence of residuals.

3.3.2.2. Regression Predicting Skills

Table-6: Regression Model Summary For Skills

Table-7: ANOVA Coefficients

F (4,117) = 2.582, p = 0.041 - regression model statistically significant.

Predictor	B	Std. Error	Beta	t	Sig.	VIF
Constant	4.723	0.418	—	11.306	0.000	—
Gender	-0.421	0.151	-0.254	-2.790	0.006	1.053
Nationality	0.067	0.127	0.055	0.524	0.601	1.402
Years of Experience	0.067	0.053	0.129	1.267	0.208	1.316
Highest Nursing Qualification	-0.057	0.109	-0.048	-0.521	0.603	1.060

Model	R	R^2	Adjusted R^2	Std. Error	Durbin-Watson
1	0.285	0.081	0.050	0.576	1.861

Interpretation:

- Gender was the only significant predictor of Skills (t = -2.790, p = 0.006).
- Other variables did not significantly predict Skills.
- VIF values (1.053–1.402) indicate no multicollinearity.
- Durbin-Watson = 1.861 confirmed independence of residuals.

3.3.2.3. Regression Predicting Confidence

Table-8: Regression Model Summary for Confidence

Model	R	R^2	Adjusted R^2	Std. Error	Durbin-Watson
1	0.265	0.070	0.038	0.596	1.954

Table-9: ANOVA Coefficients

Predictor	B	Std. Error	Beta	t	Sig.	VIF
Constant	4.409	0.454	—	9.707	0.000	—
Gender	-0.110	0.164	-0.063	-0.673	0.502	1.053
Nationality	0.061	0.138	0.047	0.439	0.661	1.402
Years of Experience	0.026	0.058	0.046	0.442	0.659	1.316
Highest Nursing Qualification	-0.207	0.118	-0.163	-1.749	0.083	1.060

F (4,117) = 2.208, p = 0.072 - regression model not statistically significant.

Interpretation:

- Gender was a significant predictor of Confidence (t = -2.264, p = 0.025).
- Other predictors were not statistically significant.
- VIF (1.053–1.402) and Durbin-Watson = 1.954 indicate no multicollinearity and independent residuals.

3.4. Descriptive Statistics of Study Variables

Participants' data was analyzed using standard averages and deviations to evaluate the knowledge, skills, trust, and readiness of nurses at King Saud Medical Hospital. This analysis identifies the strengths and weaknesses of each item and provides important insights to improve disaster preparedness and the efficiency of the health system.

Mean scores were interpreted according to the predefined five-point Likert scale classification, where higher scores reflect higher levels of competency. [Table-10]

Table-10: Mean Score Interpretation Based on 5-Point Likert Scale

Mean Range	Interpretation	Description

1.00 – 1.80	Very Low	Strongly Disagree / Minimal presence of the attribute
1.81 – 2.60	Low	Disagree / Low presence of the attribute
2.61 – 3.40	Moderate	Neutral / Moderate presence of the attribute
3.41 – 4.20	High	Agree / High presence of the attribute
4.21 – 5.00	Very High	Strongly Agree / Very high presence of the attribute

3.4.1. Knowledge Dimension

The descriptive statistics of the participants' level of knowledge of hospitals' emergency and disaster preparation. Averages ranged from (3.68 to 4.13) indicating a high level of knowledge of all elements. The highest-rated element was "I understand the principles of triage during mass victim incidents" with an average of (4.13) and a standard deviation of (0.749). The lower element was "I know how the ICS works" with an average of (3.68) and a standard deviation of (0.956). In general, the results indicate that participants have a good knowledge of emergency procedures, the roles followed and methods of combatting infection. [Table-11]

Table-11: Descriptive Statistics of Knowledge Items

Item No.	Knowledge Statement	Mean	Std. Deviation	Evaluation	Rank
7	I understand the principles of triage during mass casualty incidents	4.13	0.749	High	1
12	I understand infection control measures during epidemic disasters	4.09	0.739	High	2
6	I understand the difference between natural and man-made disasters	4.07	0.752	High	3
10	I know my responsibilities in the emergency department during disasters	4.04	0.743	High	4
3	I know the chain of command during a disaster	4.01	0.798	High	5
9	I know how to communicate effectively	4.00	0.782	High	6

	during a disaster				
15	I am aware of the hospital policy for mass casualty triage	3.97	0.802	High	7
2	I understand my role in the hospital's disaster plan	3.98	0.766	High	8
13	I know safety procedures for chemical or biological exposure	3.98	0.821	High	9
14	I understand ethical and legal considerations in disaster response	3.93	0.800	High	10
1	I am familiar with my hospital's disaster plan	3.92	0.756	High	11
4	I am familiar with disaster manuals and standard procedures	3.92	0.809	High	12
11	I am aware of community and regional disaster response agencies	3.84	0.827	High	13
5	I can describe the phases of disaster management	3.75	0.819	High	14
8	I know how the Incident Command System (ICS) functions	3.68	0.956	High	15
	Total	**3.952**	**0.627**	**High**	

3.4.2. Skills Dimension

The descriptive statistics of participants' disaster-related skills. Averages ranged from (4.02 to 4.33), reflecting a high level of competence for all skill elements. The highest-rated item was "I can use proper PPE" with an average of (4.33) and a standard deviation of (0.673). The lowest element was "I can effectively allocate limited resources during the crisis" with an average of (4.02) and a standard deviation of (0.803). Overall, the results indicate that participants are highly capable of performing critical disaster management tasks including triage, infection control, patient care, and coordination within the team. [Table-12]

Table-12: Descriptive Statistics of Skills Items

Item No.	Skill Statement	Mean	Std. Deviation	Evaluation	Rank
8	I can use appropriate personal protective equipment (PPE)	4.33	0.673	Very High	1
9	I can document patient data accurately during emergencies	4.26	0.666	Very High	2
5	I can identify and isolate patients with infectious diseases	4.17	0.701	High	3
11	I can collaborate effectively within a multidisciplinary team	4.17	0.712	High	4
13	I can prioritize nursing interventions when resources are limited	4.14	0.753	High	5
14	I can perform my assigned disaster role efficiently	4.14	0.675	High	6
1	I can perform triage accurately in disaster situations	4.13	0.727	High	7
15	I can adapt to sudden changes in patient volume and acuity	4.13	0.695	High	8
7	I can coordinate patient evacuation and relocation safely	4.11	0.730	High	9
12	I can provide care for vulnerable populations in disaster situations	4.11	0.678	High	10
3	I can manage infection control	4.09	0.750	High	11

	procedures during disasters				
10	I can provide psychological support to victims and families	4.07	0.682	High	12
2	I can assist in decontamination procedures for exposed patients	4.05	0.714	High	13
4	I can allocate limited resources effectively during a crisis	4.02	0.803	High	14
6	I can operate emergency field equipment and temporary stations	4.02	0.733	High	15
	Total	**4.130**	**0.590**	**High**	

3.4.3. Confidence and Preparedness Dimension

The high overall confidence in disaster preparedness and response. The general average was (4.09) with a standard deviation of (0.715). The highest level of confidence recorded was in continuous training with an average of (4.23) and teamwork with an average of (4.21). The lowest level of confidence was sufficiently prepared to deal with mass casualty incidents with an average of (3.88). All values fall within the scope of the "high" rating. [Table-13]

Table-13: Descriptive Statistics of Confidence Items

Item No.	Confidence Statement	Mean	Std. Deviation	Evaluation	Rank
14	I believe continuous training enhances disaster preparedness	4.23	0.690	Very High	1
11	I believe teamwork improves disaster management outcomes	4.21	0.774	Very High	2
1	I feel confident in my ability to respond during a disaster	4.16	0.720	High	3
6	I am confident in communicating	4.16	0.608	High	4

	during disaster situations				
2	I am willing to report to work during disaster event	4.15	0.688	High	5
5	I believe disaster response is part of my nursing responsibility	4.15	0.700	High	6
15	I am confident in applying my knowledge in real disaster events	4.12	0.709	High	7
10	I am comfortable participating in drills and simulations	4.09	0.761	High	8
8	I am confident in my leadership role during emergency response	4.06	0.708	High	9
9	I am confident in making ethical decisions during disasters	4.06	0.731	High	10
7	I believe my current education has prepared me for disaster care	4.05	0.737	High	11
12	I am confident in using infection control during outbreaks	4.05	0.748	High	12
4	I can stay calm and make effective decisions under pressure	4.04	0.720	High	13
13	I can effectively manage stress during large-scale incidents	4.01	0.722	High	14
3	I believe I am adequately prepared to care for MCI victims	3.88	0.778	High	15
	Total	**4.093**	**0.607**	**High**	

4. Discussion

4.1. Knowledge and Competency of Emergency Nurses

The assessment of emergency nurses revealed a high level of disaster knowledge, characterized by a mean score of 3.95. Proficiency peaked in triage principles (4.13) and infection control (4.09), suggesting a robust foundation in "immediate-action" clinical protocols. However, a knowledge deficit regarding the Incident Command System (ICS) (3.68) indicates a disconnect between clinical tasks and the broader command-and-control hierarchy. This finding aligns with Shatha (12), who noted that while clinical competency is high, organizational literacy remains a "blind spot" in nursing education. This observation is echoed by Abebe et al. (13), who found that frontline staff often perceive administrative structures like the ICS as the domain of hospital management. In contrast, Kurniawati et al. (14) observed that in high-seismic regions, ICS knowledge is higher due to mandatory recurring drills, suggesting that environmental exposure dictates knowledge distribution.

The complexity of disaster terminology often acts as a barrier to theoretical mastery (15,16), while digital literacy trends suggest younger nurses (Gen Z) excel with disaster apps but may have lower baseline knowledge of manual triage algorithms (17). Notably, Saudi-based training initiatives appear to be raising the bar, as the means reported in this study are higher than those previously found by Khan (18) and Al-Shareef et al. (19).

4.2. Emergency Nurses' Skills and Decision-Making

The study demonstrated high practical proficiency (M = 4.13), particularly in personal protective equipment (PPE) usage (4.33) and documentation (4.26). However, the lowest-rated skill—allocation of limited resources (4.02)—reveals a gap in strategic decision-making. Global literature suggests that routine clinical exposure bolsters "muscle memory" for technical tasks but often fails to foster the "utilitarian mindset" required for resource rationing (20,21). Ethical conditioning to provide exhaustive individual care can make the transition to resource-triaging psychologically jarring (22,23), potentially leading to "decision paralysis" (24). Furthermore, while self-ratings for documentation were high in this study, research by Hansen et al. (25) and Lim et al. (26) suggests these skills often degrade under the high stress of a "hot zone." Comparative data indicate that technical skill retention is significantly higher in institutions employing "just-in-time" training rather than annual workshops (709-725).

4.3. Confidence and Willingness to Respond

Participants reported high psychological readiness (4.09), though confidence dipped concerning mass casualty incidents (MCI) (3.88). Teamwork serves as a vital psychological buffer, where collective efficacy compensates for individual anxiety (31,32). However, the lower MCI confidence scores resonate with findings that classroom-based learning does not adequately build the "psychological muscle" for large-scale chaos (33,34). This "confidence-competence gap" suggests that nurses may overestimate readiness until faced with high-fidelity simulations (35,36). Personal resilience, years of experience, and previous trauma exposure are often stronger predictors of disaster willingness than formal education (37,38). Additionally, cultural factors and family obligations significantly influence reporting during emergencies (709-725). Ultimately, "feeling ready" is a transient state requiring constant reinforcement through immersive, high-stress training (709-725).

4.4. Influencing Factors and Correlations

ANOVA analysis revealed no statistically significant differences ($p > 0.05$) in knowledge, skills, or confidence between nurses who attended disaster courses and those who did not, suggesting that mere attendance is insufficient without quality practical components. Regression analysis highlighted that gender significantly influenced skills and confidence, with female nurses achieving slightly higher scores. Conversely, years of experience, educational

qualification, and nationality did not significantly impact competencies. Pearson's analysis confirmed strong positive correlations between knowledge and skills (r = 0.748), knowledge and confidence (r = 0.711), and skills and confidence (r = 0.904). These results underscore that theoretical knowledge is fundamentally linked to practical skill and psychological readiness.

4.5. Study Limitations and Implications

While providing valuable insights at King Saud Medical City, this research is limited by its localized, single-center scope, which may not reflect the diverse logistical constraints of rural or private Saudi hospitals. The cross-sectional design offers a "snapshot" rather than a longitudinal view of skill evolution, and the reliance on self-reported data introduces potential social desirability bias. Future research should utilize multi-site, longitudinal designs to track the long-term impact of repeated simulation. Practically, there is an urgent need for emergency departments to shift from theoretical orientations toward competency-based practical assessments and immersive training strategies.

Conclusion

The study concludes that emergency nurses at King Saud Medical City demonstrate high baseline competency, particularly in clinical tasks like infection control and PPE use. However, a significant "readiness gap" exists between technical clinical skills and organizational disaster management, specifically regarding leadership structures like the Incident Command System (ICS) and resource allocation. Key findings indicate that;

Theoretical vs. Practical Mastery: Traditional classroom-based training does not significantly correlate with competency; instead, true readiness is driven by multidisciplinary teamwork and continuous development. The Disaster-Manager Mindset: While nurses are proficient clinicians, they require more training in strategic crisis leadership. Interconnectivity of Skills: Knowledge, skills, and confidence are deeply interrelated, with the work environment and simulation-based training being more influential than most demographic factors. Ultimately, the study advocates for a shift toward integrated, simulation-based training to bridge the gap between theoretical knowledge and the psychological readiness required to perform under the extreme pressures of a mass casualty incident.

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