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Relationship between emotional intelligence and disaster response self-efficacy: A comparative study in nurses

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ABSTRACT

Background: Nurses who constitute an important part of the health system play a critical role in all stages of disaster management, especially in providing care for disaster victims. It is essential for nurses to have adequate education and qualifications to reduce disaster-related mortality and morbidity rates in the community. The qualifications of nurses depend not only on their knowledge and skills but also on their emotional abilities such as empathy and stress management. Emotions can impact individuals' levels of self-efficacy in disaster response, and it may help explain the differences in self-efficacy among nurses.
Objective: This study aimed to investigate the relationship between emotional intelligence and disaster response self-efficacy, and compare the scores between hospital nurses and National Medical Rescue Team nurses.
Design: A cross-sectional design.
Settings: This research was conducted at Bezmialem Foundation University Hospital and National Medical Rescue Team in Istanbul, Turkey.
Participants: This study included 565 nurses from two different institutions.
Methods: A survey consisting of the Demographic Information Form, the Modified Schutte Emotional Intelligence Scale, and the Disaster Response Self-Efficacy Scale was administered to the nurses. The data collected from March to April of 2022 was analyzed using SPSS 25.0 program. The differences and relationships among variables were determined by using Chi-square tests, student's t-tests, Pearson correlation, and linear regression analyses.
Results: Of the 565 participants, 219 (38.8%) were hospital nurses and 346 (61.2%) were NMRT nurses. NMRT nurses scored significantly higher in emotional intelligence (131.45 ± 6.15 versus 129.75 ± 6.01) and disaster response self-efficacy (80.71 ± 11.38 versus 77.77 ± 11.33) than hospital nurses ($p < 0.05$). In addition, emotional intelligence was found to be significantly and positively correlated to disaster response self-efficacy ($r = 0.885$, $p < 0.05$).
Conclusions: The emotional intelligence and disaster response self-efficacy were positively correlated, and both levels of NMRT nurses higher than hospital nurses. These findings suggest that healthcare organizations should take the emotional intelligence of nurses as an important means to improve their disaster response selfefficacy. It can improve the quality of disaster response to obtain well self-efficacy by developing the emotional intelligence of nurses.

1. Introduction

Disaster is an event in which the coping capacity of society is inadequate, interrupts normal life and human activities, that causes physical, social and economic losses. The preparedness of the health system is essential in the face of disasters for improving survival rates while also reducing mortality and morbidity rates in the community [1]. Nurses who constitute an important part of the health system play a critical role in all stages of disaster management, especially in providing care for disaster victims. In order to minimize the dangers, risks, and particularly

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life-threatening damage that may occur, nurses take an active role in providing the best possible care to those affected by disasters [2]. Various studies have shown that nurses demonstrate more flexibility, adaptability, and capability in all phases of a disaster. For instance, Hsu et al. has found that the presence of nurses during a disaster can reduce mortality and morbidity rates from 70 % to 50 % [3].

In order to provide the necessary care to those affected by a disaster, all nurses need to have appropriate disaster response protocols and the professional skills associated with their respective nursing roles [4]. During a disaster, nurses initiate triage and evacuation together with other health professionals. Subsequently, they assess the current situation and needs, then fulfill their responsibilities such as food supply, sanitation, shelter, and controlling the spread of infectious diseases [5]. These competencies are essential in order to reduce the mortality and morbidity rates caused by disasters. However, the success of nurses cannot be achieved only with their theoretical knowledge and skills. In addition to these, communication skills, empathy, stress management, and problem-solving are also important. Nurses can have a significant impact by carefully listening to patients, addressing their emotions and thoughts, and providing support, which brings up the concept of emotional intelligence (EI) that has a historical development dating back to the 1900 s [6].

Emotional Intelligence, defined by Salovey and Mayer, is the ability to recognize and observe the emotions of others, as well as one's own emotions, and use this information to influence one's thoughts and actions [7]. In 1995, Goleman stated that we have rational and mental minds and both minds store memories that affect our behaviour and choices in his book "Why Emotional Intelligence is More Important than IQ?" [8]. Thus, the concept of emotional intelligence gained widespread attention and spread to many fields in this period. Since nursing is one of these fields, defining the nursing profession without mentioning emotions would be inadequate. As such, nurses must be able to manage their emotions, empathize with others, and motivate themselves in order to communicate effectively, understand the needs of their patients, and provide the necessary care [9]. Various studies in nursing have demonstrated that nurses with high levels of emotional intelligence are able to provide patient care more effectively and work better together [10–14].

Considering the issues mentioned above, the aim of this study is to improve the disaster science by analyzing the relationships between emotional intelligence and self-efficacy. To increase the robustness of our study findings, two groups were used in the study, which is reminiscent of the analytic generalization technique [15]. Consequently, the following research questions were identified:

Q1: What are the emotional intelligence and disaster response self-efficacy levels of National Medical Rescue Team (NMRT) nurses and hospital nurses?

Q2: Is there a significant difference in emotional intelligence and disaster response self-efficacy level between NMRT nurses and hospital nurses?

Q3: Is disaster response self-efficacy positively correlated to emotional intelligence?

2. Methods

2.1. Study design and participants

This descriptive cross-sectional study was conducted between March and April 2022. The study population was made up of 1079 nurses working at Bezmialem Foundation University Hospital and National Medical Rescue Teams (NMRT) in Istanbul. The criteria for participation were working full-time, having a registered nurse certificate, and participating voluntarily. The minimum sample size of 292 nurses was determined by the Yamane formula, which is used when the total target population is known [16]. In the beginning, a total of 322 samples were included in the study, with 161 individuals from each group. However, after data collection, the post hoc power analysis was found to be 0.64, therefore, to avoid type II error, the sample size was expanded until the power reached 0.80 and above [17]. Thus, the sample size was increased to 565 nurses, and a power analysis with a power of 0.85 was obtained at the end of the study.

2.2. Data collection procedure

After obtaining permission from the research ethics committees of the institutions, nurses were invited to participate in a 15-minute survey that included a Sociodemographic Information Form, the Modified Schutte Emotional Intelligence Scale (MSEIS), and the Disaster Response Self-Efficacy Scale (DRSES). Initially, the data were collected from nurses through a face-to-face administered survey. However, since the minimum sample size to be reached through a face-to-face survey was achieved by 65 % (189), they were later invited to fill out an online survey.

2.3. Data analysis

In this study, the findings were evaluated with SPSS 25.0 statistical program. Kolmogorov-Smirnov tests were used to assess the normality of the data. Descriptive statistics such as means, percentages and standard deviations were calculated, and since the data showed normal distribution, Student's *t*-test was used to compare the two groups. Additionally, correlation and regression analyses were conducted to investigate the relationship between the independent and dependent variables. The significance level for the analyses was set at 0.05.

2.4. Instruments

The first part of the study instrument included the Sociodemographic Information Form based on a literature review, which contains 8 items. The form includes questions about the gender, age, marital status, education level, workplace, length of service, exposure to disasters, and disaster experiences of the nurses.

The second part of the study instrument included the Modified Schutte Emotional Intelligence Scale (MSEIS), which was developed by Schutte et al. [18] in 1998 and revised by Austin et al. [19] in 2004 to include 41 items and three sub-dimensions: Optimism/Mood Regulation (12 items), Utilisation of Emotions (6 items), and Appraisal of Emotions (10 items). Participants rated each item on a 5-point Likert scale, with choices ranging from 1 (strongly disagree) to 5 (strongly agree). The minimum score on the scale is 41, and the maximum score is 205. The Turkish version of the MSEIS was conducted by Tatar et al. [20]. The language validity of the scale was assessed by five experts proficient in both English and Turkish. The results from Kendall's W test ($W = 0.131$; $X2 = 26.764$; $p > 0.05$) showed that there was no disagreement among the experts. The Cronbach's alpha coefficient was 0.82 in the Turkish validity and reliability study of the scale, and 0.725 in this study.

The third part of the study instrument included the Disaster Response Self-Efficacy Scale (DRSES), developed by Li et al. [21], and underwent Turkish validity and reliability tests conducted by Koca et al. [22] in 2018. The DRSES comprises 19 items and three sub-dimensions: Disaster Emergency Rescue Competency (11 items), Disaster Psychological Nursing Competency (4 items), and Disaster Role Quality and Adaptation Competency (4 items). Participants rated each item on a 5-point Likert scale, with choices ranging from 1 (strongly disagree) to 5 (strongly agree). The minimum score on the scale is 19 and the maximum score is 95. Translation and back-translation were used to evaluate language validity, which was assessed by five experts fluent in both English and Turkish. The content and construct validity of the DRSES were determined by calculating the mean CVI (0.99) and conducting an EFA. The Kaiser-Meyer-Olkin (KMO) coefficient was 0.94 and the results of Bartlett's test showed $X2 = 4273.669$, $p = 0.000$. The Cronbach's alpha coefficient was 0.96 in the Turkish validity and

reliability study of the scale, and 0.967 in this study.

2.5. Ethical aspects

The researchers sought permission from the managers of the institutions and obtained approval from the relevant research ethics committees for nurse participation in the study. The Bezmialem Foundation University Ethics Committee approved the research application on August 19, 2021 (document number E-54022451–050.05.04–28698) and the Istanbul Health Directorate Ethics Committee approved it on March 10, 2022 (document number E-15916306–604.01.01). The participants were informed about the purpose and significance of the study, and their participation was voluntary and kept confidential.

3. Results

3.1. Participant characteristics

In this study, 565 nurses were analyzed, including 219 hospital nurses and 346 NMRT nurses. The majority of hospital nurses were in the 25–34 age group (39.7 %), were married (58.9 %), had a bachelor's degree (42.5 %), had 10 or more years length of service (37.0 %), had been exposed to disasters (88.6 %), and had disaster experience (70.3 %).The majority of the NMRT nurses were also in the 25–34 age group (39.9 %), were married (54.9 %), had a bachelor's degree (47.4 %), had 10 or more years length of service (43.4 %), had been exposed to disasters (87.9 %) and had disaster experience (80.1 %) (Table 1)

Statistically significant differences were found in education level, length of service, and disaster experience between NMRT nurses and hospital nurses ($p = 0.04$, $p = 0.03$, $p = 0.02$, respectively). Conversely, no statistically significant differences were found in gender, age, marital status, and exposure to disaster between NMRT nurses and hospital nurses ($p > 0.05$).

3.2. The level of MSEIS and DRSES of nurses

NMRT nurses had a mean DRSES of 80.71 (SD = ±11.38) and a mean MSEIS of 131.45 (SD = ±6.15), while hospital nurses had a mean DRSES of 77.77 (SD = ±11.33) and a mean MSEIS of 129.75 (SD = ±6.01) (Table 2). T-test analyses were performed to compare disaster response self-efficacy and emotional intelligence of nurses at a significance level of 0.05. The results showed that NMRT nurses have a statistically significant higher utilisation of emotions ($t = 12.552$; $p < 0.05$) and total MSEIS score ($t = 0.016$; $p < 0.05$) compared to hospital nurses. However, no statistically significant differences in optimism/mood regulation and appraisal of emotions between the two groups ($p > 0.05$). Furthermore, the disaster response self-efficacy of NMRT nurses was higher than hospital nurses ($p < 0.05$), with disaster emergency rescue competency disaster psychological nursing competency, disaster role quality and adaptation competency and total DRSES score ($t = 0.021$, $t = 0.073$, $t = 0.120$, $t = 0.127$ respectively).

3.3. The relationship between DRSES and MSEIS

A Pearson correlation analysis was performed to examine the relationship between disaster response self-efficacy and emotional intelligence, as shown in Table 3. The results showed that there was a strong positive correlation ($p < 0.001$) between the total DRSES score and optimism/mood regulation ($r = 0.508$), utilisation of emotions ($r = 0.461$), appraisal of emotions ($r = 0.463$), and total MSEIS score ($r = 0.885$). A simple linear regression analysis was also performed to test the influence of emotional intelligence on disaster response self-efficacy. The results indicated that emotional intelligence positively and significantly predicted disaster response self-efficacy ($p < 0.001$), suggesting that emotional intelligence plays an important role in shaping disaster response self-efficacy ($\beta = 1.660$; 95 % CI = 1.587–1.732, $p < 0.01$).

Table 1
Comparison demographic characteristics of nurses.

Variables	Categories	Hospital n= 219	NMRT n=346	Total	χ^2	p
Gender, n (%)	Male	73 (33,3)	115 (33,2)	188 (33,3)	.001	.98
	Female	146 (66,7)	231 (66,8)	377 (66,7)		
Age, n (%)	≤ 24	67 (30,6)	78 (22,5)	145 (25,7)	5.81	.06
	25-34	87 (39,7)	138 (39,9)	225 (39,8)		
	≥ 35	65 (29,7)	130 (37,6)	195 (34,5)		
Marital status, n (%)	Married	129 (58,9)	190 (54,9)	319 (56,5)	.869	.35
	Not married	90 (41,1)	156 (45,1)	246 (43,5)		
Education Level, n (%)	High School	67 (30,6)	74 (21,4)	141 (25,0)	9.70	**.04***
	Associate Degree	28 (12,8)	36 (10,4)	64 (11,3)		
	Bachelor's Degree	81 (37,0)	153 (44,2)	234 (41,4)		
	Master's Degree	25 (11,4)	58 (16,8)	83 (14,7)		
	Doctoral Degree	18 (8,2)	25 (7,2)	43 (7,6)		
Length of service, n (%)	1-3 years	43 (19,6)	48 (13,9)	91 (16,1)	8.81	**.03***
	4-6 years	43 (19,6)	88 (25,4)	131 (23,2)		
	7-9 years	52 (23,7)	60 (17,3)	112 (19,8)		
	≥ 10 years	81 (37,0)	150 (43,4)	231 (40,9)		
Exposure to disaster, *n (%)*	Yes	194 (88,6)	304 (87,9)	498 (88,1)	.067	.80
	No	25 (11,4)	42 (12,1)	67 (11,9)		
Disaster experiences, n (%)	Yes	159 (72,6)	282 (81,5)	451 (79,8)	6.20	**.02***
	No	60 (27,4)	64 (18,5)	114 (20,2)		

*$p < 0.05$.

This model explained 78.4 % of the variance in disaster response self-efficacy.

4. Discussion

4.1. Relationship between emotional intelligence and demographic factor

Our study found that nurses had higher levels of emotional intelligence compared to what has been previously reported in the literature [23,24]. This high level of emotional intelligence suggests that nurses are aware of their emotions, have empathy towards their surroundings, and are motivated to achieved their goals [25]. Current research examining the correlation between age and emotional intelligence indicates that age is not a factor in emotional intelligence, and it develops as a result of individual effort [26,27]. From a gender perspective, various studies have suggested that emotional intelligence is higher in men [28], higher in women [29,30], or that there are no significant differences between genders [31]. However, Goleman has likened the relationship between gender and emotional intelligence to two intersecting bell curves and argues that men can empathize just as much as women and women can handle stress as much as men [8]. In light of these findings, our study is consistent with the existing literature regarding age and gender variables.

Table 2
DRSES and MSEIS differences of nurses.

	Sub-Dimensions	Institution	N	M	SD	CI	t	p
MSEIS	Optimism/Mood Regulation	Hospital	219	50,30	3,65	49.81 – 50.78	2,936	,155
		NMRT	346	50,73	3,43	50.37 – 51.09		
	Utilisation of Emotions	Hospital	219	13,10	1,66	12.88 – 13.32	12,552	**,010***
		NMRT	346	13,50	1,92	13.29 – 13.70		
	Appraisal of Emotions	Hospital	219	23,93	2,52	23.59 – 24.26	2,760	,121
		NMRT	346	24,28	2,64	24.00 – 24.55		
	Total MSEIS Score	Hospital	219	129,75	6,01	128.96 – 130.55 130.81 – 132.11	,016	**,001***
		NMRT	346	131,46	6,15			
DRSES	Disaster Emergency Rescue Competency	Hospital	219	44,24	7,70 7,57	43.22 – 45.26	,021	**,007***
		NMRT	346	46,03		45.23 – 46.83		
	Disaster Psychological Nursing Competency	Hospital	219	16,65	2,62 2,57	16.30 – 17.00	,073	**,020***
		NMRT	346	17,17		16.90 – 17.44		
	Disaster Role Quality and Adaptation Competency	Hospital	219	16,87	2,78 2,58	16.50 – 17.24	,120	**,006***
		NMRT	346	17,50		17.23 – 17.78		
	Total DRSES Score	Hospital	219	77,77	11,33 11,38	76.27 – 79.27	,127	**,003***
		NMRT	346	80,71		79.51 – 81.91		

*$p < 0.05$.

Table 3
Correlations among the scales and sub-dimensions.

Variables [a]	O/MR	UoE	AoE	TMS	DERC	DPNC	DRQaAC	TDS
Optimism/Mood Regulation	-							
Utilisation of Emotions	-,056	-						
Appraisal of Emotions	-,054	-,207**	-					
Total MSEIS Score	,477**	,638**	-,541**	-				
Disaster Emergency Rescue Competency	,528**	,442**	,436**	-,862**	-			
Disaster Psychological Nursing Competency	,446**	,421**	,406**	,767**	-,720**	-		
Disaster Role Quality and Adaptation Competency	,226**	,296**	,338**	,569**	,488**	-,675**	-	
Total DRSES Score	,508**	,461**	,463**	,885**	,948**	,868**	,715**	-

**$p < 0,001$.

As expected, it was found that as the education level of nurses increased, their emotional intelligence would also improve. The increase in emotional intelligence scores of nurses according to their level of education shows that education plays a vital role in the acquisition and development of emotional intelligence skills [32]. In addition, the increase in emotional intelligence scores in relation to the length of service supports the idea that emotional intelligence is a trait that can be developed through experience and throughout one's life [33]. This increase associated with length of service may be attributed to the fact that nurses become more identified with the institution over time and their potential to use their emotions effectively increases.

This study revealed that NMRT nurses exhibited significantly higher emotional intelligence levels than hospital nurses. According to Mert's research, prehospital providers were more adept at managing stress in challenging circumstances and dealing with distressing situations, displayed more conscientious attitudes and actions, and were more inclined to offer assistance [34]. While it may be seen as a disadvantage that NMRT nurses have less time to spend with patients, their position as the initial point of contact with the patient, and their focus on addressing the patient's urgent needs enable them to establish closer relationships with patients and have a greater impact on their emotional state. In addition, it is thought that the empathy of nurses may transform into sympathy with the increase in patient care time. Thus, the higher level of emotional intelligence of NMRT nurses compared to hospital nurses was predicted by this.

4.2. Relationship between disaster response self-efficacy and demographic factor

The disaster response self-efficacy scores of nurses were found to be higher than previous studies reported in the literature [35–37]. In our study, the increase in education level was associated with an increase in disaster response self-efficacy scores, which is consistent with the results of studies conducted in different countries [37,38]. Indeed, it was expected that nurses with higher education levels will have more self-efficacy. When the disaster response self-efficacy of nurses who had experienced at least one disaster was examined, it was found that they received higher scores than those who had no previous experience. It is believed that as nurses' disaster experience increases, their skills in responding to disasters will also increase. Therefore, it is suggested that the reason for the high disaster response self-efficacy scores of nurses who had previously worked in disasters is due to their experience.

It was found that NMRT nurses had significantly higher disaster response self-efficacy than NMRT nurses. The fact that NMRT nurses are usually the first to respond to crises and have the ability to make quick decisions in a short amount of time is considered to be the main reason for these differences. It is believed that NMRT nurses having sufficient knowledge and experience in disasters will contribute to positive outcomes such as effective organization in the event of a disaster, proper triage and identification of medical needs at the scene, and a shorter response time to the disaster.

4.3. Relationship between emotional intelligence and disaster response self-efficacy

No study was found in the literature that examined the relationship between emotional intelligence and disaster response self-efficacy of nurses, and this study has demonstrated the importance of emotional intelligence in disaster response. The significant impact of emotional intelligence on disaster intervention indicates that nurses need to raise more awareness on emotional intelligence. When considering the roles of nurses in disasters, it is necessary for nursing schools to organize seminars, conferences, and other events aimed at developing emotional intelligence skills, and for healthcare institutions to develop in-service training programs in this regard. Furthermore, considering the variety and frequency of disasters in our country, nursing student curricula

related to their responsibilities in disasters should be standardized and further supported.

Finally, the value of MSEIS was found to be slightly lower in this study while the alpha value of DRSES was found to be almost the same. It is thought that the lower Cronbach's alpha value of MSEIS compared to previous studies may be due to sample size and cultural differences between countries.

4.4. Limitations

This study was limited to nurses working in two institutions in Istanbul and did not include nurses from any other institution. As a result, the findings may not be applicable to the wider nursing profession, and the generalizability of the results may be limited.

4.5. Directions for future research

For future research, it is recommended to expand the population and sample with the study settings and conduct more comprehensive studies to gain a better determine of the effects of demographic variables and the differences between the scales in the study.

5. Conclusions

This study highlights the significance of emotional intelligence in affecting the disaster response self-efficacy of nurses. The main findings indicate that emotional intelligence correlates with disaster response self-efficacy among nurses. Healthcare organizations should support nurses in improving their emotional intelligence and disaster response self-efficacy, especially those with low levels. Organizational educators can organize workshops, conferences, and in-service education programs to increase emotional intelligence and disaster response self-efficacy among nurses. Moreover, experienced nurses should mentor those with less working experience, and post-graduate education should be encouraged. Further research is necessary to identify the most effective ways to enhance the emotional intelligence and disaster response self-efficacy of nurses.

CRediT authorship contribution statement

Ahmet Doğan Kuday: Resources, Investigation, Formal analysis, Writing – review & editing, Writing – original draft. **Özcan Erdoğan:** Conceptualization, Methodology, Project administration, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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