

# The Relationship among Crisis and Emergency Risk Communication, Managerial Support, and Nurses' Social Capital During COVID-19 Pandemic

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## Abstract

**Background:** The COVID-19 pandemic has significantly impacted the nursing team, emphasizing the need for effective emergency risk communication in public health situations. The current study aims to explore the relationship among CERC, managerial support, and nurses' social capital during recovery from the COVID-19 pandemic.

**Method:** The researchers utilized a descriptive correlational research design. The study was carried out at four large hospitals that provide mainly tertiary health care services. A systemic random sampling technique was adopted to select 839 nurses working at the selected settings. Three instruments were used; Crisis and Emergency Risk Communication, Top management Support, and Nurses' Social Capital questionnaires. The researchers used Spearman correlation, Mann–Whitney *U* test, Student *t* test, analysis of variance, and Kruskal–Wallis tests to analyze collected data.

**Results:** Significant positive correlations were noted between Crisis and Emergency Risk Communication as independent variables, and each of top management support and social capital as dependent variables.

**Conclusion:** COVID-19 pandemic had put significant pressure on nurses' social capital and their ability to communicate effectively. Thus, focusing on risk communication and managerial support are crucial for keeping staff social capital, especially during health crisis.

**Implications for Nursing Management:** Continuous training centered on risk communication during emergencies and health crises coupled with high managerial support would keep staff nurses' social capital.

## Keywords

Crisis and Emergency Risk Communication, managerial support, nurses' social capital, COVID-19 pandemic

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## Introduction

The COVID-19 pandemic has exacerbated challenges for healthcare professionals, particularly nurses, who make up 59% of global healthcare workers (Hopkinson & Jennings, 2021). To prepare for emergencies, nurses and nursing leaders should participate in continuing education programs to enhance their response during and after crises (Loke et al., 2021).

The nursing workforce's value is increasingly recognized by legislators and communities during the COVID-19 pandemic, which is considered the most significant universal health event in over a century (Gab Allah, 2021). The pandemic has significantly impacted everyone, affecting every aspect of life and complicating social interactions (Atar & Atar, 2020). Effective risk communication is crucial to reduce deaths, economic damage, and public health damage (Lai et al., 2020).

## Review of Literature

The COVID-19 pandemic has heightened the need for effective risk communication among health organizations, promoting community participation and compliance with protective measures to control infections and enhance public

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understanding (Schmälzle et al., 2017). Despite previous major outbreaks, few theoretical models have been developed to explain how people perceive risks, process data, and take measures to mitigate those (Choi et al., 2018).

Moreover, the COVID-19 pandemic poses a significant challenge to global control due to widespread nonadherence to recommended behaviors, emphasizing the importance of effective emergency risk communication (Heydari et al., 2021). The COVID-19 outbreak's early history reveals delayed decision-making and information disclosure, highlighting the ineffectiveness of risk communication in the early stages (Kavanagh, 2020). Specialists have analyzed the interactive process of managing the COVID-19 pandemic through risk communication and a Health message-centered approach to identify gaps in the process (Zhang et al., 2020). Emergency risk communication is an intervention that empowers vulnerable individuals to make informed decisions to protect their survival, health, and well-being from potential dangers (WHO, 2020).

Also, crisis preparedness and management are significantly influenced by this crucial element, which is widely acknowledged globally (Christof et al., 2019). The adoption of recommended behaviors during a public health crisis is positively influenced by the availability of information and confidence in leaders and government (Sommariva et al., 2018). Additionally, managing and communicating information may foster growth of relationships. Furthermore, social networking may enable individuals and groups to make better decisions (Frost et al., 2019). Lack of enablers hinders emergency risk communication during public health emergencies, leading to uncertainty and delays in policy decisions to prevent illness spread (Toppenberg-Pejcic et al., 2019).

Ineffective communication, lack of precise evidence, and confusion due to competing signals can lead to increased anxieties, knowledge avoidance, and noncompliance with protocols, potentially causing virus cases (Yong et al., 2020). Therefore, emergency risk communication is crucial for hospital emergency response, as it directly impacts staff, patients' care, and national healthcare delivery.

Additionally, the COVID-19 pandemic has negatively impacted the physical and psychosocial health of nurses due to inadequate human resources management, lack of personal protective equipment, and insufficient hospital beds (Sun et al., 2020). Also, multiple studies (Galehdar et al., 2021; Hu et al., 2020) have reported that during the COVID-19 pandemic, nurses experienced distress, sleep disturbance, and overtiredness. Proficient nursing administration helped relieve these issues. So, nurse managers played a crucial role during the pandemic by allowing flexible work schedules, managing inventories, and providing support to foster a positive work environment. They needed to support their team members by doing it (International Labour Organization (ILO), 2020; Raso, 2020; Rodrigues & Silva, 2020). Nursing managers are crucial during and after the pandemic, supporting and training the care team to provide high-quality patient care (Aydogdu, 2023).

A positive work environment in healthcare facilities is maintained through open communication, critical thinking, prompt decision-making, tolerance, and compassionate relationships between nursing staff and managers (Hoffmann & Battaglia, 2020; Moore, 2020; Raso, 2020). On the other hand, nurse managers should support their teams by providing education and enforcing regulations that inspire and empower their staff (Sampaio et al., 2021). Managerial support is defined as the belief held by staff that their managers support their new and creative ideas (Lukes & Stephan, 2017). This assistance is crucial to the successful accomplishment of organizational goals. In a similar vein, managerial support is crucial in influencing staff's general organizational behavior (Contreras et al., 2021).

Low-contagion nursing units benefit from staff social groups, enhancing mental health and reducing stress, according to the managerial concept of "social capital," which refers to interpersonal connections (Newman, 2020; Pham et al., 2019). Three distinct yet connected dimensions make up social capital: structural, relational, and cognitive social capital. The arrangement of connections within a particular network that permits information sharing is related to structural capital. While cognitive social capital involves shared goals and language among group members, relational social capital emphasizes trust and positive attitudes toward coworkers (Xiao et al., 2020).

Interpersonal relationships enhance information flow, social influence, personal social credit, and identity sense, making social capital a crucial factor (Wang, 2015). Earlier studies indicate that individuals who invest more in their social networks develop stronger social bonds, leading to reduced stress (Chen et al., 2015). Social capital provides social support, enhances coping skills, and reduces stressor demands, acting as a buffer to mitigate the effects of stress (Zhang et al., 2021).

COVID-19 has exacerbated social isolationist measures, hindering social support and affecting community management of emergencies, highlighting the importance of social capital during crises (García-Basteiro et al., 2020). Since social capital encompasses social support, cohesion, collaboration, trust, and resilience, it is crucial in these situations (Villalonga-Olives et al., 2021). Therefore, the aim of this study was to determine how nurses' social capital changed as a result of the COVID-19 pandemic.

Healthcare organizations must navigate various challenges and rapidly changing circumstances to maintain a safe and professional work environment for patients and nurses (Khan et al., 2021). The COVID-19 pandemic has significantly impacted the nursing team, leading to increased anxiety and a depressed environment (Asghar et al., 2022). Additionally, the COVID-19 pandemic underscored the critical role of emergency risk communication in public health situations, making it a crucial component of the pandemic response (Wieland et al., 2021). Nurse managers play a crucial role in supporting nurses throughout their careers, providing necessary support and training to ensure high-quality care

during and after the pandemic (Poortaghi et al., 2021). Till now, none of the published articles have addressed the relationship among Crisis and Emergency Risk Communication (CERC), managerial support, and nurses' social capital, especially during health pandemics. Hence, the researchers study the correlation between emergency risk communication, managerial support, and nurses' social capital during COVID-19, aiming to provide insights into effective nursing staff management.

### Aim of the study

The current study aims to explore the relationship among CERC, managerial support, and nurses' social capital during the COVID-19 pandemic.

## Methods

### Research Design

The researchers embraced a descriptive correlational research design to conduct this study.

### Research Questions

1. What is the relationship between CERC and nurses' social capital during health pandemics?
2. What is the relationship between managerial support and nurses' social capital during health pandemics?

### Research Hypotheses

1. The more effective the CERC, the higher the nurses' social capital during health pandemics.
2. The higher the management support during health pandemics, the higher the nurses' social capital

### Setting

Data were collected from nurses working at four hospitals that provide mainly tertiary health care services in Egypt. The first hospital is a university hospital that is affiliated with the Ministry of Higher Education. The second setting is a specialized liver institution while the third affiliated with the General Authority for Teaching Hospitals and Institutes. The purpose of these types of hospitals is to provide healthcare services for the local community population, while serving as a clinical training site for healthcare students as well. The fourth hospital affiliates to the Ministry of Health and aims at providing healthcare services for the local population only. All these hospitals contained isolation units during the COVID-19 outbreak.

### Sampling

A systemic random sampling technique was adopted by the researchers to select 839 nurses working at the selected settings. The researchers recruited 235 nurses from the university hospital, 209 from the Liver Institution, 225 from the third hospital, and 170 nurses from the fourth one.

*Inclusion criteria:* Any nurse/nurse manager who has three years of experience or more in his/her position was encouraged to join the study to ensure his/her presence at the hospital during the COVID-19 outbreaks. Nurses' information was collected from the nursing staff database within each hospital to locate nurses who fulfill the criteria for inclusion. The researchers prepared the sampling frame then they communicated nurses directly to explain the purpose of the study and gain their consent. About 93.2% of nurses completed all the study questionnaires.

### The Sample Size

The sample size was determined based on power calculations to ensure statistical significance and representativeness. The included number of nurses ( $n = 839$ ) from total targeted nurses (2889) nurses, was selected according to Adam (2020) sample size table, at 5% marginal error and 99% confidence interval. The formula was:

$$n = N1 / N \epsilon 2$$

Where  $n$  = minimum returned sample size

$N$  = the population size

$\epsilon$  = adjust margin of error [ $\epsilon = (pet)$ ]

$e$  = the degree of accuracy expressed as a proportion

$\rho$  = the number of standard deviations that would include all possible;  $t$  =  $t$ -value for the selected alpha level of confidence level

### Data Collection Instruments

Three questionnaires to collect data from the study participants were used. Crisis and Emergency Risk Communication: A survey consisting of 13 questions developed based on the stages of CERC developed by Yong et al. (2020) based on The CERC model which is composed of four stages with varied tasks in each (preparation, initial, maintenance, and resolution). Nurses' responses to each statement concerning communication strategies were measured on a 5-point Likert scale ranging from "1" (strongly disagree) to "5" (strongly agree). No total score was calculated to assess the overall perceived hospital COVID-19 CERC, as the questionnaire wasn't designed for this purpose. This questionnaire has demonstrated high internal consistency in previous studies (Yong et al., 2020) (Cronbach's

alpha coefficient was 0.97). This instrument was translated to Arabic using translation back translation and tested for reliability ( $r = 0.91$ ). The Top Management Support Questionnaire was developed by Sax and Torp (2015). The questionnaire consists of six items to assess the top management support. The response to each of the six statements about management support was measured on a 5-point Likert scale, where “1” represents “strongly disagree” and “5” represents “strongly agree.” This instrument was translated to Arabic using back translation and tested for reliability ( $r = 0.93$ ). The Nurses’ Social Capital questionnaire, developed by Read (2016), measures three dimensions: structural social capital, relational social capital, and cognitive social capital. It measures network size (1 statement), network social diversity (1 statement), and perceived social status (5 statements). Relational social capital includes trust (5 statements), norm of positive reciprocity (6 statements), and affective energy (5 statements). All items of relational social capital were rated on a 5-point Likert scale ranging from strongly disagree to strongly agree. Also, the cognitive social capital dimension contained three subdimensions (common ground, shared language, shared narratives) each consisting of six statements. Each dimension score was calculated by averaging items under each subscale. The Arabic version of WSCQ was examined for its reliability and revealed Cronbach alpha coefficient of different scale domains as follows:

Reliability of workplace social capital questionnaire for nurses (WSCQ-N)

The study instruments had demonstrated high validity in previous studies and their content and face validity were again verified by a panel of five experts in the field of nursing administration.

### Data Collection

The purpose of the study and how to complete study questionnaires were explained to all participants. The researchers collected data for the study from April 2023 to July 2023. This period witnessed the emergence of a new COVID-19 mutant called COVID-19 B.A-2.86. The researchers coordinated with the unit manager of each unit to collect data while nurses were on duty after the selection of hours of minimum workload. Also, nurses filled in the questionnaires alternatively. Filling them took around 15–20 min for each participant.

### Ethical Considerations

The researchers obtained ethical approval to carry out the study from the Research and Ethics Committee at The Faculty of Nursing (approval No. 940). Ethical approval was gained to collect data from the selected study setting. Another verbal consent was obtained from frontline nursing managers of each unit selected to coordinate for data collection during hours of minimum workload. The researchers included a cover letter at the beginning of the survey which

Social capital questionnaire	Reliability (Cronbach alpha coefficient)
Part A (structural)	
Network size	0.88
Network diversity	0.95
Perceived social status	0.92
Part B (relational)	
Trust	0.93
Norm of positive reciprocity	0.90
Affective energy	0.96
Part C (Cognitive)	
Common ground	0.96
Shared language	0.93
Shared narratives	0.94
Total questionnaire	0.92

defined the study procedures, its objectives, and guidelines for filling out the questionnaire. Voluntary participation and anonymity were assured. Utilization of data for research purposes only was also confirmed to all participants.

### Statistical Analysis

Collection, tabulation, and analysis of data were performed using SPSS (Statistical Package for the Social Sciences) version 20.0 on an IBM-compatible computer (SPSS Inc., Chicago, IL, USA). Responses to questions of different measured scales that represent categorical data were expressed as numbers and percentages. The correlation between the CERC scale and other measure items was done by Spearman correlation, and its relation to sociodemographic and work-related variables was measured using the Student  $t$  test, Mann–Whitney  $U$  test in bicategorical variables and analysis of variance and Kruskal–Wallis tests in multicategorical variables according to the distribution of such data. Linear regression analysis was conducted to assess independent predictors for the CERC scale. The statistical significance level was considered at ( $p \leq .05$ ).

### Results

The high percentages of the study sample are working in Menoufia University hospital (28%), most of them aged between 24 and 58 years old with a mean age of ( $33.71 \pm 5.0$ ), most of them are female (75.2%) and married (73.7%). In addition, approximately half of them are qualified by a bachelor’s degree (52.8%) and have years of experience ( $3-32$ ) with a mean experience ( $10.95 \pm 4.94$ ).

Regarding the source of information about COVID-19, participants reported receiving it mostly from supervisors (99.5%), work colleagues and peers (75.4%), social media, for example, Facebook and workplace groups (62.2%), and middle management, for example, head of department and division director (61%), with the least percentage from senior

**Table 1.** Distribution of Studied Nurses Regarding Their Crisis and Communication Strategies Used in Hospital in Response to COVID-19 ( $n = 839$ ).

Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The regular updates from the hospital on the COVID-19 situation are understandable and actionable.	28 (3.3)	46 (5.5)	317 (37.8)	383 (45.6)	65 (7.7)
2. The hospital adequately prepares me for the challenges I am likely to face.	35 (4.2)	90 (10.7)	180 (21.5)	443 (52.8)	91 (10.8)
3. The crisis communication plans are clear so far.	40 (4.8)	77 (9.2)	285 (34.0)	373 (44.5)	64 (7.6)
4. The hospital Senior Management possesses the necessary knowledge and expertise on the situation and has been consistent in the delivery of their message.	27 (3.2)	112 (13.3)	297 (35.4)	328 (39.1)	75 (8.9)
5. The information released by the hospital senior management has been accurate, concise, and timely and are repeated enough to keep staff safe.	27 (3.2)	76 (9.1)	418 (49.8)	256 (30.5)	62 (7.4)
6. My direct supervisor has consistently provided me with accurate, concise, and timely information for me to navigate in this disease outbreak.	9 (1.1)	94 (11.2)	273 (32.5)	388 (46.2)	75 (8.9)
7. I am sufficiently engaged in the preparedness planning.	34 (4.1)	85 (10.1)	457 (54.5)	193 (23.0)	70 (8.3)
8. The hospital has been able to understand my challenges and address my concerns during this outbreak.	32 (3.8)	60 (7.2)	366 (43.6)	312 (37.2)	69 (8.2)
9. The hospital has been able to provide explanations of the risks associated with the COVID-19 situation in a simple, concise, and direct manner.	28 (3.3)	131 (15.6)	316 (37.7)	314 (37.4)	50 (6.0)
10. The hospital has been clear in explaining the necessary actions I need to take to stay safe.	61 (7.3)	26 (3.1)	273 (32.5)	397 (47.3)	82 (9.8)
11. I am clear about what the hospital is doing in response to the COVID-19 situation.	39 (4.6)	27 (3.2)	299 (35.6)	418 (49.8)	56 (6.7)
12. The constant updates from the hospital Senior Management increase my trust in the credibility of the organization.	37 (4.4)	22 (2.6)	187 (22.3)	513 (61.1)	80 (9.5)
13. Platforms, such as emails and social media (Facebook @ Workplace Group-Pneumonia (Egypt)-Chat with Chief executive officer & Chairman, medical board) provide useful avenues for sharing of information and feedback.	36 (4.3)	67 (8.0)	353 (42.1)	353 (42.1)	30 (3.6)
<b>Total score</b>	<b>44.52 ± 8.43 (13–61)</b>				

management updates, guidelines and instructions (8.5%), and department emails (8.1%). Only 11.8% of them have staff reporting to them. Almost all of them have direct contact with COVID-19 patients (99.2%), and 98.7% are included in treating COVID-19 patients; most participants show that their primary work location is the emergency department (40.9%).

Table 1 shows the response of the studied nurses to the CERC scale: in all 13 items of the scale, it showed a major percentage of the response categories (neutral and agree) with a minimum percentage of other responses (extremely disagree, disagree, and extremely agree). In addition, the total mean score of communication strategies used in the hospital response to the COVID-19 scale is  $44.52 \pm 8.43$ , with a range of 13–61. Results show that the high percentage of studied nurses strongly disagree that the hospital has been clear in explaining the necessary actions that they need to take to stay safe (61, 7.3%), while the high percentage of them disagree that the hospital has been able to provide explanations of the risks associated with the COVID-19 situation in a simple, concise, and direct manner (131, 15.6%). In addition, low

percentages of them agree that they are sufficiently engaged in preparedness planning (193, 23%). However, a high percentage of them agree that the constant updates from the hospital's senior management increase their trust in the credibility of the organization (513, 61.1%). Also, a high percentage of them strongly agreed that the hospital adequately prepares them for the challenges they are likely to face (91, 10.8%). In addition, the total mean score of communication strategies used in the hospital response to the COVID-19 scale is  $44.52 \pm 8.43$ , with a range of 13–61.

The total mean score of top management support is  $18.64 \pm 4.18$  with a range (6–28). Most responses were in categories (disagree, neutral, and agree). In addition, low percentages of studied nurses agree that the top management actively seeks their opinions and ideas on strategic issues (160, 19%), is open to new ideas and initiatives from hospital risk management team member (217, 25.9%), appreciate that middle manager's experiments with new ideas and products (239, 28.5%), appreciate experiments on new solutions (190, 22.6%), ensures that the interest of middle managers is considered when making strategic decisions (201, 24%). On the other

**Table 2.** Distribution of Studied Nurses Regarding Perception of Top Management Support ( $n = 839$ ).

Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.Top management actively seeks middle managers' opinions and ideas on strategic issues	52 (6.2)	153 (18.2)	459 (54.7)	160 (19.1)	15 (1.8)
2. Top management is open to new ideas and initiatives from ERM team member	27 (3.2)	218 (26.0)	360 (42.9)	217 (25.9)	17 (2.0)
3.Top management appreciate that middle manager's experiments with new ideas and products	10 (1.2)	215 (25.6)	332 (39.6)	239 (28.5)	43 (5.1)
4.Top management appreciate that middle manager's experiments on new solutions	13 (1.5)	167 (19.9)	426 (50.8)	190 (22.6)	43 (5.1)
5.Top management ensures that the interest of middle managers are considered when making strategic decisions	10(1.2)	136 (16.2)	444 (52.9)	201 (24.0)	48 (5.7)
6.The organization establish a risk management committee at various level to measure the commitment of top management	16 (1.9)	136 (16.2)	278 (33.1)	337 (40.2)	72 (8.6)
<b>Total score</b>	<b>18.64 <math>\pm</math> 4.18 (6–28)</b>				

**Table 3.** Distribution of Studied Nurses Regarding to Social Capital Questionnaire ( $n = 839$ ).

Social Capital questionnaire	The studied nurses, $N = 839$	
<b>Part A (structural)</b>	<b>Mean</b>	<b>Range</b>
Network size	31.96 $\pm$ 3.78	(14–49)
Network diversity	8.95 $\pm$ 0.50	(4–9)
Perceived social status	17.29 $\pm$ 3.34	(5–25)
<b>Part B (relational)</b>		
Trust	17.83 $\pm$ 3.42	(5–25)
Norm of Positive Reciprocity	21.32 $\pm$ 3.60	(6–30)
Affective Energy	16.84 $\pm$ 3.95	(5–25)
<b>Part C (Cognitive)</b>		
Common ground	21.04 $\pm$ 4.18	(6–30)
Shared language	21.24 $\pm$ 4.80	(6–30)
Shared narratives	21.19 $\pm$ 4.38	(6–30)
Total score	177.66 $\pm$ 21.44	(78–227)

hand, high percentages of participants agree that the organization established a risk management committee at various levels to measure the commitment of top management 337 (40.2%). The total mean score of top management support is 18.64  $\pm$  4.18 with range (6–28) (Table 2).

Table 3 highlights the response of the studied nurses to social capital domains. Assessment of the structural domain reveals that the total mean score of network size was 31.96  $\pm$  3.78 with a range (14–49), network diversity with a mean score of 8.95  $\pm$  0.50 with a range (4–9) and perceived social status with a mean score of 17.29  $\pm$  3.34 with a range (5–25). The relational domain is composed of trust with a mean of 17.83  $\pm$  3.42 with a range (5–25), a norm of positive reciprocity with a mean of 21.32  $\pm$  3.60 with a range (6–30), and affective energy with a mean of 16.84  $\pm$  3.95 with a range (5–25). The cognitive domain contained 3 items. Common ground with a mean of 21.04  $\pm$  4.18 with a range (6–30), shared language with a mean of 21.24  $\pm$  4.80  $\pm$  4.80 with a range (6–30), and shared narratives with a mean of 21.19  $\pm$  4.38 with a range (6–30). Finally, the total mean score of

**Table 4.** Correlation of Crisis and Emergency Risk Communication with Top Management Support Scale and Social Capital Questionnaire Domains among Studied Nurses ( $n = 839$ ).

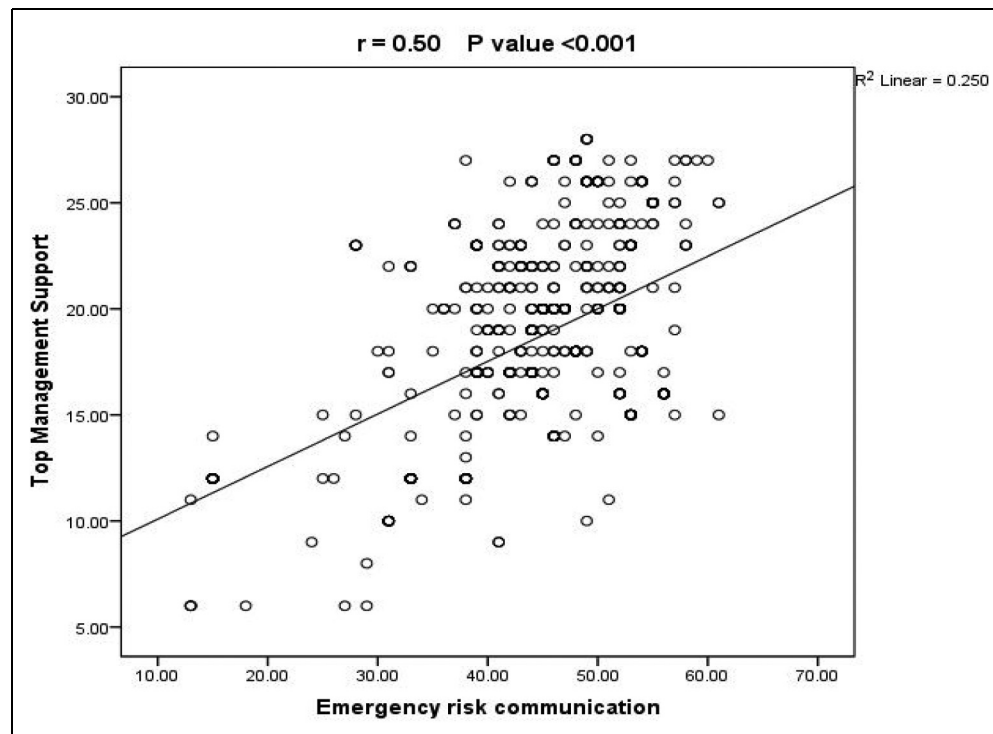
	Emergency risk communication, $N = 839$	
	<i>R</i>	<i>p</i> value
<b>Top Management Support</b>	<b>0.50</b>	<b>&lt;.001**</b>
<b>Social Capital questionnaire</b>	<b>0.69</b>	<b>&lt;.001**</b>
<b>Part A (structural)</b>		
Network size	–0.12	<.001**
Network diversity	–0.07	.04*
Perceived social status	0.65	<.001**
<b>Part B (relational)</b>		
Trust	0.56	<.001**
Norm of positive reciprocity	0.49	<.001**
Affective energy	0.59	<.001**
<b>Part C (Cognitive)</b>		
Common ground	0.58	<.001**
Shared language	0.58	<.001**
Shared narratives	0.43	<.001**

\*Significant at  $p < .05$ .

\*\*High significant at  $p < .001$ .

the social capital questionnaire score is 177.66  $\pm$  21.44 with a range (78–227).

Table 4 and Figures 1 and 2 reveal that there is a significant positive correlation noted between CERC as independent variables and each of top management support and social capital as dependent variables ( $r = 0.50$ ,  $p < .001$ ) ( $r = 0.69$ ,  $p < .001$ ), respectively. Also, there is a significant positive correlation between CERC and social capital domains, such as perceived social status, trust, norm of positive reciprocity, affective energy, common ground, shared language, and shared narratives ( $r = 0.65$ ,  $p < .001$ ), ( $r = 0.56$ ,  $p < .001$ ), ( $r = 0.49$ ,  $p < .001$ ), ( $r = 0.59$ ,  $p < .001$ ), ( $r = 0.58$ ,  $p < .001$ ), ( $r = 0.58$ ,  $p < .001$ ), and ( $r = 0.43$ ,  $p < .001$ ), respectively. In contrast, there is a significant negative correlation between



**Figure 1.** Correlation between crisis and emergency risk communication as independent variable, and top management support as dependent variable among studied nurses ( $n = 839$ ).

CERC and each of the network size and network diversity domains of social capital ( $r = -0.12$ ,  $p < .001$ ) ( $r = -0.07$ ,  $p = .04$ ), respectively.

Table 5 shows that crises and emergency risk communication scores significantly differ regarding the hospital included with the highest score at Shebin El-Kom Teaching Hospital and the lowest score at the Al-Bagor hospital. Also, crises and emergency risk communication scores show a significant negative correlation with the age of participants while not significantly correlated with years of experience. Also, single nurses have the highest score. As for qualification, those with doctorate degrees have the highest scores, followed by nurses with master's degrees, then bachelor's degrees, while those with associate degrees have the lowest CERC scores. In addition, work colleagues and peers as a source of information recorded the highest crises and emergency risk communication scores, while department emails showed the lowest scores, and finally, participants involved in treating COVID-19 cases recorded significantly high crises and emergency risk communication scores.

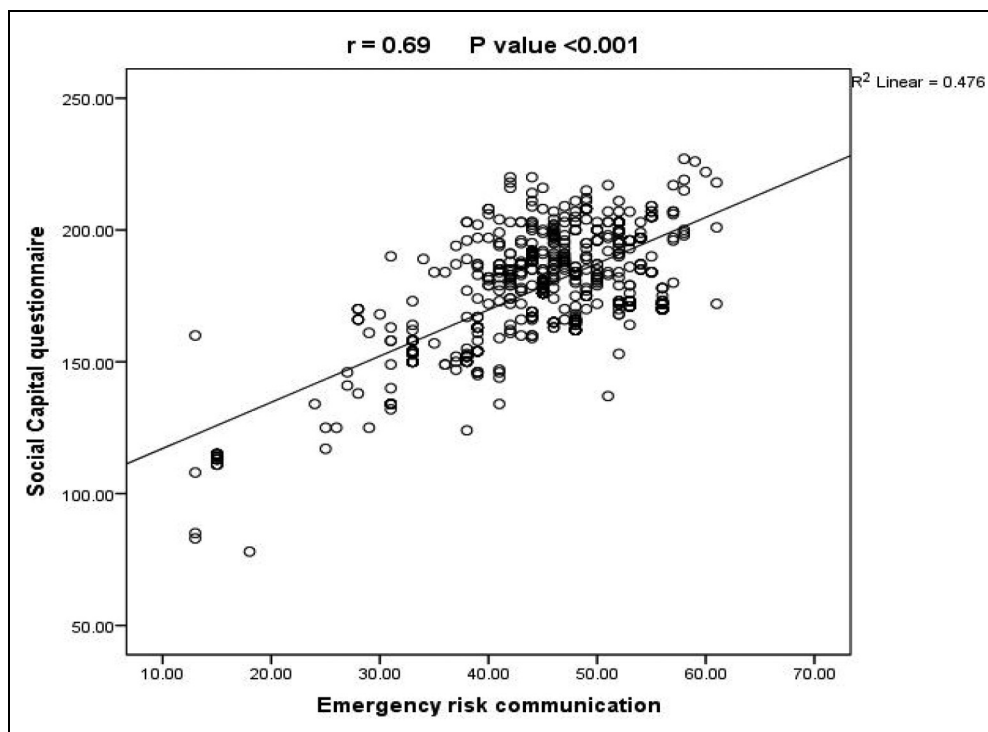
Multiple regression analysis (linear regression) revealed that, after adjustment of sociodemographic factors (age, gender, qualification, workplace, source of information, and inclusion in COVID-19 treatment cases), the total top management support scale was an independent predictor for improved risk communication strategy ( $R^2 = 0.25$ , standardized  $\beta = 0.071$  and  $p = .02$ ). Regarding the social capital scale, in the structural domain, network size and perceived

social status were independent predictors with  $R^2$  (0.144 and 0.418) and standardized  $\beta$  ( $-0.177$  and  $0.232$ ), respectively. All relational domains (trust, norms of positive reciprocity) were independent predictors, with  $R^2$  (0.314, 0.238, and 0.353) and standardized  $\beta$  ( $-0.096$ ,  $-0.244$ , and  $0.135$ ), respectively. In the cognitive part, shared language and shared narrative, as well as total social capital score, were independently predicted by the emergency risk communication score with  $R^2$  (0.340, 0.185, and 0.476) and standardized  $\beta$  (0.342,  $-0.312$ , and  $0.817$ ), respectively (Table 6).

## Discussion

Hospitals are vulnerable, requiring external support and frequent interaction. Risk communication is crucial for improving health resilience and community response to COVID-19 (Husnayain et al., 2020). Emergency risk communication is crucial for planning and responding to emergencies, and hospital managers should equip staff, especially frontline care providers, with the necessary tools and support to maintain well-being and social capital (Gab Allah, 2021). In the current study, researchers seek to explore the relationship among CERC, managerial support, and nurses' social capital during the COVID-19 pandemic.

High percentages of the study sample are working in Menoufia University hospitals, most of them aged between 24 and 58 years old, with a mean age of  $33.71 \pm 5.0$ ; most of them are married females. In addition, approximately half of them are qualified by bachelor's degree and



**Figure 2.** Correlation between crisis and emergency risk communication as independent variable, and social capital as dependent variable among studied nurses ( $n = 839$ ).

have experience between 3 and 32 years, with a mean experience of  $10.95 \pm 4.94$ . Almost all of the nurses in the study have direct contact with COVID-19 patients and were included in treating COVID patients. In addition, most participants showed that their primary work location was the emergency department.

Regarding the source of information about COVID-19, participants reported that they mostly receive updates from their direct supervisors (99.5%), work colleagues (75%), and social media (e.g., Facebook and Workplace Group) (62%), followed by middle management (61%), while only (8.5%) drew information from senior management updates and instructions. This may indicate that the written instructions and guidelines were somewhat delayed and not clear. On the contrary, a study conducted by Yong et al. (2020) revealed that a large proportion of study participants attained their information about the management of COVID-19 from senior management updates, guidelines, and instructions (77.6%), emails (62.6%), supervisors (62.2%), and about 34.6% of them obtained information and updates from social media (hospital Facebook and department groups). That study agrees with the current results in that both participants drew little information from social media. According to a study conducted by Nashwan et al. (2021), about half (51.2%) of the participating nurses stated that they mainly capitalized on information from the Ministry of Health and World Health Organization's websites and formal pages (Saber et al., 2018; WHO, 2020).

On the contrary, a study by Hossny et al. (2022) reported that during the pandemic, communication and collaboration between nurses and physicians improved, with WhatsApp groups fostering continuous communication and on-call appointments for healthcare teams. Another study by Lwin et al. (2018) revealed that Facebook was identified as the primary strategic tool for communication during outbreak phases, as highlighted in the CERC Model study by health authorities.

It was evident from the findings that the responses to items of the CERC were unfavorable. The total mean score of communication strategies adopted in response to the COVID-19 scale was  $44.52 \pm 8.43$ , which is considered not enough as compared to the maximum score (65). A high percentage of nurses strongly disagree that their hospitals clearly explained the necessary actions that they need to take for keeping their safety. A low percentage of them agreed that the hospital has been able to provide explanations of the risks associated with the COVID-19 situation in a simple, concise, and direct manner. Although low percentages of nurses agreed on being sufficiently engaged in the preparedness planning, high percentages agreed that the hospital adequately prepares them for the challenges they are likely to face and that the continuous updates from the hospital's senior management increase trust in the reliability of their hospitals. On the same line, a study by Zhang et al. (2020) declared that the ineffective risk communication hindered the emergent response in Wuhan's COVID-19 outbreak management.



**Table 5.** Association Between Crises and Emergency Risk Communication and Sociodemographic Characteristics of the Studied Nurses (*n* = 839).

Personal characteristics		The studied nurses <i>N</i> = 839	
		Mean $\pm$ SD	Test ( <i>p</i> value)
Working hospitals	Menoufia University Hospital	40.87 $\pm$ 11.08	<i>K</i> = 60.87
	Shebin El-Kom Teaching Hospital	47.42 $\pm$ 6.70	<.001**
	National Liver Institute	45.81 $\pm$ 4.42	
	Al-Bagor Hospital	44.28 $\pm$ 8.39	
Age	Mean $\pm$ SD (range)	<i>r</i> = -0.11	.001**
Gender	Male	39.86 $\pm$ 10.88	<i>t</i> test = 7.73
	Female	46.05 $\pm$ 6.79	<.001**
Marital status	Single	48.05 $\pm$ 6.23	<i>K</i> = 53.37
	Married	43.61 $\pm$ 8.73	<.001**
	Widowed	27.0	
	Divorced	38.52 $\pm$ 6.60	
Qualification	Nursing school	42.31 $\pm$ 12.57	<i>F</i> = 25.58
	Associated degree	33.29 $\pm$ 1.71	<.001**
	Bachelor's degree	43.71 $\pm$ 8.88	
	Master degree	45.55 $\pm$ 5.73	
	Doctorate' degree	46.95 $\pm$ 6.81	
Years of experience	Mean $\pm$ SD (range)	<i>r</i> = -0.06	.06
Source of information and updates on the management of COVID-19 in the hospital	Supervisors	44.54 $\pm$ 8.42	<i>F</i> = 3.22
	Middle Management (e.g., Head of Department, Division Director)	43.95 $\pm$ 9.39	.03*
	Social media (e.g., Facebook and Workplace Group).	44.95 $\pm$ 8.83	
	Colleagues and peers (e.g., chat groups, exchanges).	45.43 $\pm$ 8.05	
	Senior Management updates, guidelines and instructions	42.04 $\pm$ 8.20	
	Department emails	41.88 $\pm$ 7.96	
	Have staff reporting to you?		<i>t</i> test = 1.25
Have staff reporting to you?	No	45.51 $\pm$ 7.33	
	Yes	44.38 $\pm$ 8.57	.21
Direct contact e patients	No	42.57 $\pm$ 15.97	<i>U</i> = 0.14
	Yes	44.53 $\pm$ 8.36	.89
Primary work location	Outpatient areas	44.18 $\pm$ 9.36	<i>K</i> = 20.59
	Inpatient—ward(s)	42.84 $\pm$ 9.12	.001**
	Inpatient—Isolation wards	45.96 $\pm$ 7.94	
	Emergency Department	44.99 $\pm$ 8.20	
	Intensive care center	44.05 $\pm$ 0.21	
	Nonclinical areas (no patient contact).	57.0	
Directly involved in treating COVID-19	No	30.27 $\pm$ 12.11	<i>U</i> = 4.37
	Yes	44.71 $\pm$ 8.22	<.001**

\*Significant at *p* < .05.

\*\*High significant at *p* < .001.

The study found that the government's communication of outbreak information led to ambiguity, delayed decision-making, and ineffective risk communication, causing inadequate information sharing that would be primarily attributed to the ineffective risk communication.

In vein, a study by Vong et al. (2014) reported that one of the evident failures of China's management of the early phases of the (H7N9) virus outbreak in humans was the inadequate information to the public, and the delayed detection of the virus might be owed to the ineffective communication and delayed response to the emergency. However, Frost et al. (2019) reported that China had proven significantly improved risk communication abilities before, during, and after events' responses to H7N9 when compared to the SARS response.

The China National Health Center (NHC) improved response through preparedness, staff readiness, risk communication resources, internal approval mechanism, standard operating procedures, grapevine control, collaboration with universal organizations, and regular communication with healthcare and private agencies.

On the contrary, most of the participants in the Yong et al. (2020) study stated that regular hospital updates on COVID-19 were clear and actionable. A high percentage of participants (92.5% and 92.3%, respectively) stated that accurate, concise, and timely information helped to keep them safe and understand the hospital's response to the COVID-19 situation. In addition, a considerable percentage of the respondents stated that the hospital effectively addresses challenges and engages

**Table 6.** Correlation and Multiple Regression Analysis for Domains of Top Management Support Scale and Social Capital Questionnaire Domains as Independent Predictors for Emergency Risk Communication.

	Multiple regression analysis				
	$R^2$	Standardized $\beta$	$p$ value	95% CI	
				L	U
<b>Relation between emergency risk communication and top Management Support parameters</b>					
Top management actively seeks middle managers opinions and ideas on strategic issues.	0.076	0.305	<.001	0.11	0.69
Top management is open to new ideas and initiatives from ERM team member.	0.166	0.061	.39	0.004	0.54
Top management appreciates that middle manager's experiments with new ideas and products.	0.160	0.032	.67	0.001	0.69
Top management appreciates that middle manager's experiments on new products.	0.186	0.19	.04	0.07	0.77
Top management ensures that the interest of middle managers is considered when making strategic decisions.	0.20	0.008	.46	0.0001	0.12
The organization establishes a risk management committee at various levels to measure the commitment of top management.	0.233	0.198	.03	0.006	0.59
<b>Total top Management Support</b>	0.25	0.071	.023	0.02	0.27
<b>Relation between emergency risk communication and Social Capital questionnaire</b>					
<b>Part A (structural)</b>					
Network size	0.144	-0.177	<.001	-0.688	-0.11
Network diversity	0.049	0.02	.457	0.001	0.478
Perceived social status	0.418	0.232	<.001	0.08	0.687
<b>Part B (relational)</b>					
Trust	0.317	-0.096	.025	-0.411	-0.041
Norm of Positive Reciprocity	0.238	-0.244	<.001	-0.851	-0.102
Affective Energy	0.353	0.135	.01	0.09	0.742
<b>Part C (Cognitive)</b>					
Common ground	0.333	0.072	.21	0.004	0.841
Shared language	0.340	0.342	<.001	0.017	0.561
Shared narratives	0.185	-0.312	<.001	-0.471	-0.012
<b>Total Social Capital</b>	0.476	0.817	<.001	0.176	0.911

$R^2 = 0.584$ ,  $p < .001$ .

in preparedness planning. However, a quarter of respondents suggest clearer guidelines and professional clarification and preferred social media and emails for information sharing.

The study by Hossny et al. (2022) found that hospital management is responsible for developing weaker services and support care teams. Nurses disagreed with top management's active engagement with managers' opinions and initiatives but agreed that risk management committees evaluate top management commitment. In agreement, a study by Gab Allah (2021) found that while 48.1% of nurse managers perceived organizational support as high, this percentage is low, especially during pandemics. Hossny et al. (2022) found that participants received high levels of support at individual, material, and organizational levels.

A study by Wong and Kohler (2020) correlates that enhanced nurses' social capital leads to improved mental health outcomes, better access to health services, better patient care, clinical risk management, patients' safety, evidence-based practice adoption, and unit effectiveness (Jafari et al., 2018). In the current study, the studied nurses' responses to social capital domains reveal a moderate level of social capital ( $177.66 \pm 21.44$ ).

From the researchers' point of view, the pandemic and chronic stress in the nursing profession have led to increased tension, work overload, and conflict among nurses, potentially causing psychological imbalances. Furthermore, nurses' social networks and diversity have declined due to social isolation and perceptions of nurses as a source of infection. All these conditions, coupled with the massive challenges they face, reduced their relational capital in the form of decreased self-trust, reciprocity, and affective energy. In vain with this explanation, Zhang et al. (2021) stated that the sudden onset and uncertainty of the pandemic caused many nurses to feel confused about whether or how to discuss their feelings of anxiety with others and even denied seeking help from their social networks.

Also, nurses failed to regulate the negative effects of perceived stress on their professional identity because workplace social capital was somewhat low during the early waves of the pandemic. In agreement, a study by Pirdelkhosh et al. (2022) showed that nurses had a moderate level of social capital during COVID-19 pandemic.

After extensive research, the relationship between emergency risk communication and top management support as

significant factors in emergency risk management effectiveness is hardly cited especially in the field of healthcare. The present study revealed a significant positive correlation between CERC as independent variable, and top management support as a dependent variable. This was proved also by multiple regression analysis which revealed that the total top management support scale was an independent predictor for improved risk communication strategy. This means that when there is effective risk communication, nurses better feel supported from the hospital management.

In the same line, a study about Human resource management and the COVID-19 crisis conducted by Hamouche (2021) reported that the key challenge faced practitioners was to support managers and employees during the crisis and to offer precise information even if it might not be easy in the times of uncertainty. The vise-verse relationship had been also reported as a study by Hassan (2019) in Malaysia revealed that support from top management is likely to have substantial effects in emergency risk management effectiveness among Malaysian public organizations. In addition, the stronger the top management support the more effective the management of risk. Toppenberg-Pejcic et al. (2019) suggest that middle managers and hospital leaders play a crucial role in emergency communication, utilizing risk communication training, exercises, and simulations to support local leaders (Frost et al., 2019).

Furthermore, there was a significant positive correlation between CERC and social capital domains. Results of multiple regression analysis also revealed that social capital scale, in certain structural domains, all relational domains, in cognitive part; (shared language and shared narrative) as well as total social capital score were independently predict emergency risk communication score. This means the better the risk communication, the better the nurses' social capital including the previously mentioned domains. Xu et al.'s (2019) review highlights the importance of strong relational networks in fostering a healthy workplace, promoting effective communication, and aiding informed decision-making among leaders and practitioners (Vong et al., 2014). In congruence, China NHC reported that improved preparedness, workforce readiness, risk communication, standard operating procedures, grapevine control, and global partnerships in response to health crises, leading to increased trust among medical staff. Congruently, the observed trust level after outbreaks had rose between the SARS and H7N9 response (Frost et al., 2019). That study argued that improvement of emergency risk communication contributed to improved level of trust among practical medical staff.

However, current study findings revealed a significant negative correlation between CERC and each of network size and network diversity domains of social capital. In vain, Savoia et al. (2017) argued that perception and information about public health hazards are affected by interpersonal networks, which can influence adherence to guidelines and recommendations in emergency risk communication.

Crises and emergency risk communication scores significantly differed regarding the hospital included with highest

score in National Liver Institute and lowest score in University Hospital. Also, score showed a significant negative correlation with age of participants while not significantly correlated with years of experience. Also, single nurses have higher CERC scores. This may be attributed to decreased pressure from work-family conflict and having less responsibilities and fear of infecting their children. In contrast, a study revealed that married participants were more likely to report that their hospital had been able to understand the challenges they encountered and discourse their concerns during the outbreak (83.7% vs.75.7%). Also, nurses with doctoral degrees have high scores, this may be attributed to having more knowledge and skills gained from their educational preparation. In addition, nurses receiving information from colleagues and peers scored highest in crises and emergency risk communication, while those receiving it through department emails scored lowest. Yong et al. (2020) reported that demographic variables including occupation, age, marital status, work experience, gender, and work setting affect the hospital's CERC.

### Strengths and Limitations

This study will contribute to the broader body of research on managing health pandemics, particularly within the context of emergency risk communication and managerial roles. It will provide valuable data for comparative studies and may serve as a foundation for further research in similar healthcare settings. The large sample size included facilitates generalization of the current study results in similar healthcare settings. Overall, this study addresses a critical aspect of managing and dealing with health pandemics. Collection of data was somewhat difficult as the researchers' collected data during working hours and had to wait long times to select a suitable time according to the unit workload. Lack of similar studies was an obstacle to the interpretation of the present study results. The self-reporting nature of the study also means that there could be a certain degree of social desirability in this study. Males are underrepresented in our study, and hence our study results cannot be generalized in terms of gender.

### Implications for Nursing Management


In light of the present study findings, Healthcare organizations should establish a clear policy on CERC, with strategies from top health authorities and hospital managers communicated to all nurse managers. Better risk communication, enhancing communication channels, and expressing more empathy and care for nursing staff are all curtailed during health crises. Depending on more rapid social media apps that are controlled and managed by the hospital authorities would be more beneficial than emails. Designing software apps specifically designed for emergency communication that links all hospital team members will greatly speed up communication.


As hospital social capital is crucial for nurses' work, managers should understand and improve it through policies, empathy, and strengthening social relationships during health pandemics. Healthcare organizations should organize more training focused on emergency risk communication and risk management for their managers to be prepared to lead their organizations effectively and smoothly in times of crisis and emergencies. CISA Tabletop Exercise Packages and simulation would be helpful training tools on how to address a variety of threat scenarios. This training would be more helpful if it's organized at both national and local levels, as the health care systems employed at hospitals greatly depend on the country's health systems and authorities. Also, further research studies focused on assessing enablers and barriers to effective CERC at the four stages of CERC Model (preparation, initial, maintenance, and resolution) are recommended.

## Conclusion

The hypotheses of the current study was all true as proved by study results. Thus, research suggests that effective emergency communication is indispensable to help staff maintain trust and arm them with knowledge and attitude required to successfully navigate hard situations. Proper and prompt exchange of risk information certainly will help health care professionals, particularly nurses, to save thousands of lives while perceiving managerial support and keeping their well-being.

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## Ethics approval and consent to participate

The researchers obtained an ethical approval to carry out the study from the Research and Ethics Committee at the Faculty of Nursing, Menoufia University.

## Consent for publication

Both authors approved the version to be published.

## Author contributions

Amal R. Gab Allah: Conceptualization, methodology, and interpretation sections, writing—review and editing. Shimaa M. Salem: Investigation, validation, writing—original draft, formal analysis.

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## Data availability

Data are available for public use after permission from the authors.

## Supplemental Material

Supplemental material for this article is available online.

## Use of AI software

The researchers didn't use any AI software in writing the research manuscript.

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