# Mediating Effect of Perceived Organizational Support on the Resilience and Mental Health of ICU Nurses

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**Abstract:** *Objective:* To investigate the mediating effect of organizational support on the relationship between resilience and anxiety-depression-stress by researching ICU nurses. *Methods:* A total of 675 ICU nurses in Shaanxi Province were surveyed using the organizational support scale, the resilience evaluation scale for medical staff, and the Depression-Anxiety-Stress Scale (DASS-21). *Results:* The resilience of ICU nurses had significant correlation with the level of organizational support ($r = 0.448$, $P < 0.01$), but was negatively correlated with depression ($r = -0.238$, $P < 0.001$), anxiety ($r = -0.287$, $P < 0.01$), and stress ($r = -0.213$, $P < 0.01$); the level of organizational support of ICU nurses was also negatively correlated with depression ($r = -0.452$, $P < 0.01$), anxiety ($r = -0.410$, $P < 0.01$), and stress ($r = -0.490$, $P < 0.01$). The sense of organizational support played a mediating role between the resilience of ICU nurses and their depression-anxiety-stress, the mediating effect accounted for 78% of the total effect. *Conclusion:* The perceived organizational support and resilience is an important external protective factor for the mental health and ability of ICU nurses. The management departments should continue to pay attention to the mental health of ICU nurses, take effective measures to improve the sense of organizational support and resilience of nurses, and ensure the good mental health of ICU nurses.

**Keywords:** Perceived organizational support; Resilience; Mental health; ICU nurse; Intermediary analysis

## 1. Introduction

Due to occupational particularity of medical personnel, more than 1/3 of the population may have short-term or long-term mental health problems [1-2], especially intensive care unit (ICU) nurses who are under intense pressure and high risk for long periods. Ying *et al.* [3] found that with the increase in the number of critically ill patients in public health emergencies, ICU nurses are faced with huge work pressure and the possibility of infection, which makes them more prone to mental health problems [4], especially anxiety, depression, and post-traumatic stress, etc., which further affect their work, family, and other social relationships [5]. Therefore, it is particularly important to ensure their physical and mental health [6]. Resilience refers to an individual's ability in facing difficulties, setbacks, and other adversities [7]. Richardson *et al.* [8] proposed that individuals with higher levels of resilience are more likely to actively cope with crises and difficulties, which plays an important protective role against depression, anxiety, and other negative emotions. Perceived organizational support refers to the perceived belief of employees in organizational care and support as well as the resulting positive experience. Sufficient organizational

support can regulate the employees' negative emotions and work behaviors [9], thus improving work engagement. There have been confirmatory studies on the relationship between resilience, organizational support, and depression-anxiety-stress, but there has been no domestic research on how the three affect each other. Therefore, in this paper, the status quo of organizational support and resilience of ICU nurses in 5 third-class A hospitals are studied, the mechanism of organizational support and resilience of ICU nurses on their mental health problems are explored, in hopes of providing reference for hospital management to take effective measures to protect and improve nurses' mental health and resilience.

## 2. Methods
### 2.1. Design, settings, and sampling
In this study, the convenience sampling method was adopted to select ICU nurses from 5 third-class A hospitals in Shaanxi Province who meet the inclusion criteria in January 2023 as the research subjects. The inclusion criteria are as follows: (i) professionally qualified and on-the-job ICU nurses, (ii) have worked in ICU for more than 1 year, (iii) signed an informed consent and participated voluntarily. The number of items in this study were 58, the sample size needed was 5–10 times of the number of items in the study, which meant that 290–580 samples were needed. Considering a 20% drop off, the inclusion range of sample size was expanded to 348–696 cases, and a total of 675 questionnaires were collected. Among 675 nurses that participated in the survey, 65 (9.6%) were male and 610 (90.4%) were female; the mean age of nurses was $32.99 \pm 6.48$ years, and 338 (50.1%) nurses were between 31 and 40 years old. Bachelor degree holders accounted for a large number of the participants at 555 (82.2%) nurses; those with primary and intermediate professional titles accounted for 270 (40%) nurses and 273 (40.4%) nurses, respectively. 76.9% of nurses had the experience of anti-pandemic support or performing PCR during the pandemic prevention and control period. 87% of the nursing staff were infected during the Omicron pandemic at the end of the year, and 188 of them (27.9%) reported that they were not in good condition to return to work after infection and stated that they were less competent or completely incompetent. 89 people (13.2%) said that they needed help from hospitals and departments, such as protective equipment in case of public health emergencies, protection and isolation of family members, prioritization of post-infection physical examination for medical staff, and training related to emergency and critical care rescue. The data obtained from the study can be observed in **Table 1**. The subjects of this study all gave informed consent, and this study was approved by the Ethics Committee of the hospital.

**Table 1.** Basic information of 675 ICU nurses in 5 third-class A hospitals in Shaanxi Province in January 2023

| Characteristics | Classifications | *n* (%) |
| --- | --- | --- |
| Gender | Male | 65 (9.6) |
| | Female | 610 (90.4) |
| | | |
| Age | 20–30 | 259 (38.4) |
| | 31–40 | 338 (50.1) |
| | 41–50 | 69 (10.2) |
| | > 50 | 9 (1.3) |

| Characteristics | Classifications | *n* (%) |
|---|---|---|
| Marital status | Unmarried | 143 (21.2) |
| | Married | 65 (9.6) |
| | Married with children | 467 (69.2) |
| Education level | Vocational nursing school | 4 (0.6) |
| | Junior college | 111 (16.4) |
| | Undergraduate | 555 (82.2) |
| | Postgraduate | 5 (0.7) |
| Working years | 1–5 | 147 (21.8) |
| | 6–10 | 264 (39.1) |
| | 11–15 | 121 (17.9) |
| | 16–20 | 67 (9.9) |
| | > 20 | 76 (11.3) |
| Whether they required help from organization | Yes | 89 (13.2) |
| | No | 586 (86.8) |
| Professional title | Nurse | 105 (15.6) |
| | Junior nurse | 270 (40.0) |
| | Nurse in charge | 273 (40.4) |
| | Deputy chief nurse | 24 (3.6) |
| | Chief nurse | 3 (0.4) |
| Nature of employment | Private sector employee | 601 (89.0) |
| | Government employee | 74 (11.0) |
| Whether they had experience in supporting the pandemic | Yes | 519(76.9) |
| | No | 156(23.1) |
| Working state | Completely incompetent | 4(0.6) |
| | Less competent | 184(27.3) |
| | Generally competent | 145(21.5) |
| | More competent | 139(20.6) |
| | Fully competent | 203(30.1) |

## 2.2. Measurements

Four components were analyzed in this study: (a) demographic information, (b) Depression-Anxiety-Stress Scale-21 (DASS-21), (c) health care workers resilience table, and (d) organizational support scale. Authorization for the use of these scales was obtained at the beginning of the study.

The demographic information was designed by our team, which included seven general demographic data surveys: gender, age, marital status, education level, working years, professional title, nature of employment, as well as the questions "Did you participate in the COVID-19 response support?", "Will you be able to perform your duties when you return to work?" and "Do you need department/hospital assistance

related to the outbreak?".

The DASS-21 is an effective tool for self-assessment of depression, anxiety, and stress [10]. There are 21 items in three dimensions, among which 3, 5, 10, 13, 16, 17, and 21 are depression subscales. 2, 4, 7, 9, 15, 19, 20 are the anxiety subscales; 1, 6, 8, 11, 12, 14, 18 are pressure subscales. Scoring criteria: items are assigned with scores of "0–does not apply to me," "1–rarely applies to me," "2–sometimes applies to me," and "3–always applies to me." The score of each subscale is totaled and multiplied by 2, the total score ranged from 0 to 42 points. Based on the depression subscale, depression is classified as normal (0 to 9), mild (10 to 13), moderate (14 to 20), severe (21 to 27), and very severe (28 or more). In the anxiety subscale, anxiety is classified as normal (0 to 7), mild (8 to 9), moderate (10 to 14), severe (15 to 19), and very severe (20 or more). The pressure subscale classified pressure as normal (0 to 14), mild (15 to 18), moderate (19 to 25), severe (26 to 33), and very severe (34 or more). In this study, the Cronbach's α reliability coefficient was 0.958, and the Cronbach's α reliability coefficient of depression, anxiety, and pressure were 0.891, 0.873, and 0.892, respectively.

The scale was compiled by Zhu [11] *et al.* to evaluate the level of resilience of medical staff according to their occupational characteristics. There are 4 dimensions: coping behavior, interpersonal connection, rational thinking, and adaptability, with a total of 18 items. Likert 5 rating was used to score the items with 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree), in which the total score ranges from 18 to 90 points. The higher the score, the better the level of resilience. Cronbach's α coefficient of this scale in this study was 0.958.

Perceived Organizational Support Scale of Shen [12] was selected as the basis, and was appropriately revised by the research team. The items included "the department/unit cares about my opinion," "the department/hospital cares about my personal well-being," "the department/hospital praises my positive efforts," "the department/hospital often ignores my grievances and complaints," "my department/hospital will not praise me even when I do my best," "the department/hospital hardly cares about my job satisfaction," "the department/hospital rarely cares about me," and "the department/hospital will be proud of my achievements." There were 8 items in total. Likert 5 ratings were adopted, with a score of 1–5 corresponding to "strongly disagree" – "strongly agree". Items 1, 2, 3, and 8 were scored in the forward direction, and 4, 5, 6 and 7 were scored in the reverse direction, with the total score ranging from 8 to 40 points. The higher the score, the more organizational support the individual perceived. In the study, the Cronbach's α coefficient of this scale was 0.884.

## 2.3. Survey method

An online survey platform (Questionstar) was used, the research team contacted the nursing department of the hospital in advance by E-mail and explained the purpose of the study. With the permission of the manager, the survey subjects were invited to scan the code and enter the online platform to fill in the questionnaire anonymously, emphasizing that the survey contents were confidential and only used for research. The e-questionnaire link was set to be used only once per IP address. Among the 750 questionnaires collected, 675 were included in the final analysis after missing data, answer time less than 100s, and invalid questionnaires were excluded, and the effective rate was 89.40%.

## 2.4. Data analysis

Statistical analysis was performed using SPSS25.0 software, and counting data were described by frequency and percentage. Status data conforming to normal distribution were described by mean ± SD and *t*-test or variance analysis. Resilience, perceived organizational support, depression-anxiety-stress were Pearson correlated, with resilience of ICU nurses as the independent variable, perceived organizational support as the mediating variable, and depression-anxiety-stress as the dependent variable. Stepwise

multiple regression analysis was conducted. According to the Bootstrap method, Process 4.0 plugin was used to test the mediation effect, and $P < 0.05$ was considered to be statistically significant.

## 3. Results

### 3.1. Common method deviation test

Harman in SPSS was used to conduct common method bias test for each scale item. Exploration factor analysis showed that there were 6 factors with eigenvalue > 1, and the variance explanation percentage of the first common factor was 34.01% (< 40%), which indicated that no significant common method bias.

### 3.2. Scale score

**Table 2** shows the score of organizational support, resilience, and DASS-21 scores of the ICU nurses. The ICU nurses' sense of organizational support score was $28.33 \pm 6.93$ points; The score of resistance was $74.89 \pm 12.31$ points, including coping behavior $26.03 \pm 4.08$ points, interpersonal connection $16.96 \pm 2.91$ points, rational thinking $15.91 \pm 3.33$ points, and adaptability $15.99 \pm 3.29$ points.

**Table 2.** Scores of organizational support, resistance and DASS-21 of ICU nurses

| Project | Classifications | Scoring range (Scoring rate, Δ/ percentage∗ [%]) | Average score (mean ± SD) |
|---|---|---|---|
| Perceived organizational support | | 8–40(-) | 28.33 ± 6.93 |
| Resilience | | 18–90(-) | 74.89 ± 12.31 |
| | Coping behavior | 6–30 (86.77Δ) | 26.03 ± 4.08 |
| | Interpersonal connection | 4–20 (84.80Δ) | 16.96 ± 2.91 |
| | Rational thinking | 4 –20 (79.55Δ) | 15.91 ± 3.33 |
| Depression | | 0–42 (-) | 10.86 ± 9.65 |
| | Normal | 0–9 (49.2∗) | - |
| | Mild depression | 10 –13 (13.9∗) | - |
| | Moderate depression | 14–20 (21.9∗) | - |
| | Major depression | 21–27 (7.0∗) | - |
| | Severe depression | > 28 (8.0∗) | - |
| Anxiety | | 0–20 (-) | 13.24 ± 9.91 |
| | Normal | 0–7 (30.7∗) | - |
| | Mild anxiety | 8–9 (8.9∗) | - |
| | Moderate anxiety | 10–14(22.7∗) | - |
| | Major anxiety | 15–19(13.6∗) | - |
| | Severe anxiety | > 20(24.1∗) | - |
| | Adaptability | 4–20 (79.95Δ) | 15.99 ± 3.29 |

*(Continued on next page)*

| Project | Classifications | Scoring range (Scoring rate, Δ/ percentage∗ [%]) | Average score (mean ± SD) |
|---|---|---|---|
| Pressure | | 0 – 42(-) | 14.13 ± 10.21 |
| | Normal | 0 – 14(58.2∗) | - |
| | Mild pressure | 15 – 18(13.6∗) | - |
| | Moderate pressure | 19 – 25(12.6∗) | - |
| | Heavy pressure | 26 –33(10.5∗) | - |
| | Severe stress | > 34(5.0∗) | - |

The mental health statuses of 675 ICU nurses were obtained. Among them, 13.9% were mildly depressed (10–13), 21.9% were moderately depressed (14–20), and the average score of the depression dimension was 10.86 ± 9.65. Those with moderate anxiety (10–14) accounted for 22.7%, those with major anxiety (15–19) accounted for 13.6%, and those with severe anxiety (> 20) accounted for 24.1%. The average score of the anxiety dimension was 13.24 ± 9.91 points. 13.6% of nurses had mild pressure (15–18) and 12.6% had moderate pressure (19–25); the average score of the pressure dimension was 14.13 ± 10.21 points.

### 3.3. Levels and correlations of three variables

The correlation analysis results in **Table 3** showed that the perceived organizational support of ICU nurses had a significant positive correlation with the level of resilience, which included the four dimensions of resilience (coping behavior, interpersonal connection, rational thinking, and adaptability). Among ICU nurses, depression-anxiety-stress was negatively correlated with their resistance and sense of organizational support.

**Table 3.** Correlation analysis (*r* value) between resistance, perceived organizational support (POS) and depression-anxiety-stress in ICU nurses

| Variable | Coping behavior | Interpersonal connection | Rational thinking | Adaptability | POS | Pressure | Anxiety | Depression | Resilience |
|---|---|---|---|---|---|---|---|---|---|
| Coping behavior | 1 | | | | | | | | |
| Interpersonal connection | 0.787 | 1 | | | | | | | |
| Rational thinking | 0.707 | 0.770 | 1 | | | | | | |
| Adaptability | 0.706 | 0.728 | 0.860 | 1 | | | | | |
| POS | 0.325 | 0.461 | 0.443 | 0.417 | 1 | | | | |
| Pressure | -0.154 | -0.211 | -0.239 | -0.271 | -0.452 | 1 | | | |
| Anxiety | -0.142 | -0.194 | -0.203 | -0.245 | -0.410 | 0.881 | 1 | | |
| Depression | -0.216 | -0.258 | -0.272 | -0.303 | -0.490 | 0.888 | 0.856 | 1 | |
| Resilience | 0.897 | 0.900 | 0.916 | 0.906 | 0.448 | -0.238 | -0.287 | -0.213 | 1 |

### 3.4. Testing the mediation role of perceived organizational support

Resilience of ICU nurses was taken as the independent variable, mental health problems (depression-anxiety-stress) as the dependent variable, and perceived organizational support as the mediating variable.

**Table 4** shows the regression analysis performed to test the mediating effects. In the first step of the test (Model I), resilience had a significant influence on depression, anxiety, and stress (β = -0.256, F = 47.396, $P < 0.001$), indicating that the overall effect was valid, and nurses' resilience could significantly negatively predict a 6.4% variation in nurses' depression-anxiety-stress. In the second step of the test (Model II), resilience had a significant effect on the mediating variable which is perceived organizational support (β = 0.448, F = 168.645, $P < 0,.01$). The model was significant, and the perceived organizational support could significantly positively predict the variation of resistance (19.9%). In the third step of the test (Model III), the effect of resistance on depression-anxiety-stress was not significant (β = -0.058, $P > 0.05$). However, the perceived organizational support had a significant effect on depression, anxiety, and stress (β = -0.444, $P < 0.001$), indicating that the mediating effect of perceived organizational support in the model was valid and was fully mediated, as shown in **Figure 1**.

**Table 4.** Regression analysis of the relationship between resistance, depression, anxiety, and perceived organizational support of ICU nurses

| Model | Dependent variable | Independent variable | B | SE | β | t | R | $R^2$ | F |
|---|---|---|---|---|---|---|---|---|---|
| Model I | Depression, anxiety and stress | Resistance | -0.594 | 0.086 | -0.256 | -6.884*** | 0.066 | 0.064 | 47.396*** |
| Model II | (POS) | Resistance | 0.252 | 0.019 | 0.448 | 12.986*** | 0.2 | 0.199 | 168.645*** |
| Model III | Depression, anxiety and stress | Resistance | -0.134 | 0.088 | -0.058 | -1.518 | 0.224 | 0.221 | 96.713*** |
| | | (POS) | -1.827 | 0.156 | -0.444 | -11.683*** | | | |

Note: *** $P < 0.001$
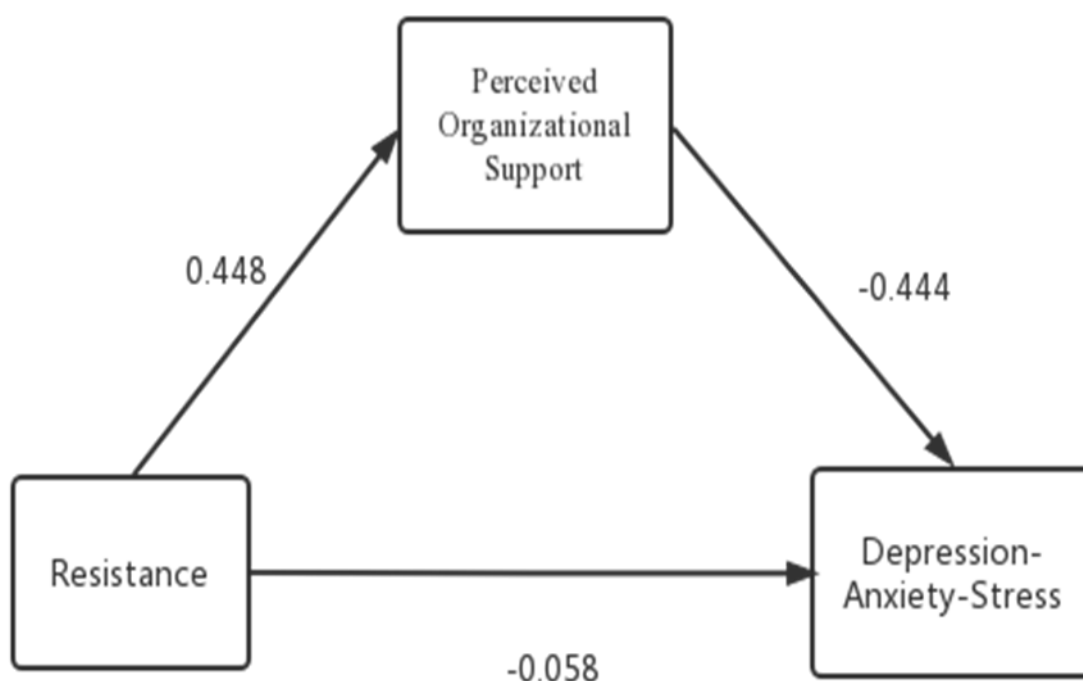


**Figure 1.** Path diagram of mediating effect test

## 4. Discussion

### 4.1. The status quo of perceived support, resilience, and depression-anxiety-stress in the organization of ICU nurses

In this study, the resilience of ICU nurses was at a moderate level, and the results were similar to those of Han *et al.* [13]. The average score of coping behavior items was the highest. An analysis showed that ICU nurses were well-equipped with good stress coping capacities due to the constant critical condition and rapid change of patients in the ICU and long-term work needs [14]. Therefore, the management department should provide emotional care and practical support for ICU nurses, such as carrying out psychological resilience training, cognitive behavioral therapy, and other professional counseling, in order to encourage nurses to actively express their concerns and needs. Furthermore, management departments should also organize activities such as team building sessions with professional identity as the theme.

### 4.2. Correlation between resilience of ICU nurses and perceived organizational support and depression-anxiety-stress

The results of this study showed that perceived organizational support was positively correlated with coping behavior, interpersonal connection, rational thinking and adaptability, and negatively correlated with depression-anxiety-stress [15]. Thus, higher organizational support levels can promote the implementation of ICU nurses' resistance, which leads to better response ability and decision-making in the face of various pressures or emergencies. In addition to that, it is less likely for the ICU nurses to have depression, anxiety, pressure and other negative emotions. It is further shown that the sense of organizational support of ICU nurses is the promoting factor for the implementation of their resilience [16]. Therefore, management should fairly and reasonably develop various incentives such as performance evaluation system, professional title promotion system, further study system and etc., to provide career development opportunities for ICU nurses. The career growth of ICU nurses should be prioritized in order to build up a positive psychology and to improve the ICU nurses' resilience, so that they can maintain a healthy psychological and physical state when going into clinical work.

### 4.3. Analysis of the mediating effect of perceived organizational support on resilience, depression, anxiety, and stress among ICU nurses

The results showed that perceived organizational support mediated the relationship between resilience and depression-anxiety-stress in ICU nurses, and indirectly predicted the depression-anxiety-stress in nurses through perceived organizational support [17]. Organizational support perception is an important resource for ICU nurses under high pressure, workload, and risk. According to the person-environment fit theory, interventions can be implemented from both external environment and personal potential to help nursing staff cope with pressure and difficulties successfully [18]. Specifically, if ICU nurses can get more recognition, care and support for their work from units, departments and leaders, it will promote the growth of their inherent potential, produce stronger resilience, reduce mental health problems such as depression, anxiety, and stress, and thus better guarantee the nurses' work performance and their career development.

**Disclosure statement**

The authors declare no conflict of interest.

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