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# Coping styles play intermediary roles between resilience and clinical communication ability among nursing students in traditional Chinese Medical university

## A structural equation model analysis

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## Abstract

To prove the positive association between resilience and clinical communication ability among Chinese nursing students, and to determine whether coping styles play a mediating role in the relationship between them.

Four hundred and seventy-one nursing students from a traditional Chinese Medical university were enrolled in this study. They completed some questionnaires, which included the Chinese Version of the Simplified Coping Style Questionnaire (SCSQ), Connor-Davidson Resilience Scale Chinese Version, and Clinical Communication Ability Scale. Structural equation modeling was utilized to analyses the relationships between coping styles, resilience, and clinical communication ability.

Resilience was positively associated with clinical communication ability ($P < .01$). Coping styles which included positive coping and negative coping both significantly affected clinical communication ability ($P < .01$) and intermediated the relationship between resilience and clinical communication ability ($P < .01$).

Resilience is positively related to clinical communication ability among Chinese nursing students, and coping styles intermediated the relationship between them, which may provide scientific evidence to aid in developing intervention strategies to improve interpersonal skills.

**Abbreviations:** CCAS = clinical communication ability scale, NC = the negative coping, PC = the positive coping.

**Keywords:** clinical communication ability, coping style, mediating effect, nursing students, resilience

## 1. Introduction

Clinical communication ability, a empathic skill of patients and their families can be listened and responded effectively and to be conveyed information clearly from health care providers.[1] Furthermore, communication is a core critical competency for healthcare professionals. It could affect patient views and improve outcomes of care if good constructive, productive communication happened.[2] With the development of positive psychology, researchers began to focus on positive psychological reactions by investigating the positive qualities and resources of individuals themselves, instead of negative emotions, to achieve psychological rehabilitation.[3] Resilience means the capacity to "bounce back" from adversity or even dramatic positive changes. It is the ability to recover quickly or change and grow from adversities, setbacks, and failures.[4] Coping is used to manage all of demands as the cognitive and behavioral strategies when a person confront stressful situations.[5] Resilience could improve communication ability and promote positive development.[6–8] Positive coping (PC) can bring about communicative well-being if someone carries out social intercourse with positive emotions and behaviors.[4] Therefore, we deduced that resilience might enhance relevance between coping styles and clinical communication ability (CCA). However, research has not yet explored this relationship. Based on the above assumptions, the aims of this study are to examine the positive correlation between resilience

and CCA among the nursing students of traditional Chinese Medical university, and to explore the mediating effect between them, which can provide a reference for the intervention of strengthening clinical communication ability.

## 2. Methods

### 2.1. Participants and procedures

In this study, a cross-sectional design was adopted. Four hundred and seventy one nursing students which including 382 women and 89 men were recruited using a sampling-convenience method. The inclusion criteria were as follows: nursing students who were studying in the traditional Chinese Medical university and were willing to participate in this study. To guarantee anonymity, their identifiers and names were not revealed in this study. This study was approved by the Institutional Review Board of Zhejiang Traditional Chinese Medical University.

### 2.2. Instruments

**2.2.1. Demographic questionnaire.** The demographic characteristics of the participants included gender (1 = female, 2 = male), grade (1 = 1st grade, 2 = 2nd grade, 3 = 3rd grade, 4 = 4th grade), age, personality type (1 = introverted type, 2 = neutral type, 3 = extroverted type), whether they liked nursing specialty or not (1 = yes, 2 = no), and whether they were a single child or not (1 = yes, 2 = no). The relationship with parents (1 = very good, 2 = relatively good, 3 = vague generalization), the relationship with teachers (1 = very good, 2 = relatively good, 3 = vague generalization), whether they took part in interpersonal training or not (1 = yes, 2 = no).

**2.2.2. Chinese version of the simplified coping style questionnaire (SCSQ).** The questionnaire was suit for assessing coping styles in the Chinese population,[9] the SCSQ includes 2 subscales: the PC dimension (12 items) and the negative coping (NC) dimension (8 items), which consists of 20 items together. Each item was rated on a 4-point scale. There were the mean scores of the corresponding items of the scores of the 2 dimensions, respectively. The test-retest reliability coefficient of the SCSQ was 0.89, and Cronbach $\alpha$ was 0.90.[10] In this study, the Cronbach $\alpha$ of PC was acceptable ($\alpha = 0.918$), Furthermore, the Cronbach $\alpha$ of NC was 0.896.

**2.2.3. Connor-Davidson resilience scale Chinese version.** The Resilience scale is self-rated for measuring resilience, which comprise 3 dimensions and 25 items,[11] which has good reliability and validity.[12] The Chinese version of Connor-Davidson Resilience Scale Chinese Version consists 3 dimension: tenacity (13 entries), strength (8 entries), and optimism (4 entries).[13] A 5-point score: 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = almost always was used to evaluate the degree of resilience. The total score ranges from 0 to 100, with higher scores means a higher level of resilience. The consistency coefficients of the 3 subscales were 0.88, 0.80, and 0.60 respectively. Cronbach $\alpha$ coefficient of the total scale is 0.91.[13] This is widely used in adolescent students.[14] In this study, Cronbach $\alpha$ was 0.93.

**2.2.4. Clinical communication ability scale (CCAS).** The scale was first constructed by Steyn.[15] It was revised in 2010, which was suitable for Chinese nursing students.[16,17] The scale had 6 subscales: listening receptively (5 items), establishing rapport and respect (6 items), sharing control (4 items), confirming the patient (5 items), conveying information effectively (3 items), and checking perceptions (5 items), which sum up to 28 items altogether. It is a Likert 4 rating scale, "1 = Never use," "2 = occasionally use," "3 = often use," "4 = always use." The total score of the scale was 28 to 112. The positive question score ≥2.5 points of each item indicates the communication ability satisfaction, the higher the score, the more communication ability is. In this study, Cronbach $\alpha$ was 0.798.

### 2.3. Data analyses

Descriptive statistics were computed regarding the characteristics of the sample and research variables, Student $t$ test and one-way analysis of variance were conducted to compare the CCA in terms of the categorical socio-demographic characteristics. Pearson correlation analyses were conducted to perceive the associations between all continuous variables using SPSS 25.0 (IBM, Beijing, China). Two-tailed hypothesis tests at a 0.05 level were considered statistically significant. Structural equation modelling (SEM) was made and tested using AMOS 24.0 with boot-strapping and a robust maximum likelihood estimator to examine the mediating effects of coping styles on the relationship between resilience and CCA. The quality of the model was evaluated with the following fit indices: the chi-square ($\chi^2$) statistic; root means square error of approximate-on (RMSEA), goodness-of-fit index (GFI), the degree of freedom (df), Tucker-Lewis fit index (TLI), and comparative fit index (CFI). An adequate and acceptable model fit values were: RMSEA $\leq 0.08$, GFI $\geq 0.90$, TLI $\geq 0.90$, and CFI $\geq 0.90$.[18]

## 3. Results

### 3.1. Demographic characteristics and clinical communication ability

The average age of participants is 20.36 years (SD = 1.34; range, 17–21). Women comprised the largest proportion of respondents (81.10%). More than half of the participants were not a single child (67.1%). The scores of CCA among nursing students were (75.31 ± 7.02). 2nd grade (23.14%), 3rd grade (28.87%), and 4th grade (24.42%) had better CCA than 1st grade (23.57%, $F = 7.22$, $P < .01$). Those people who had introverted type (28.87%) and neutral type (48.20%) was reported worse CCA than extroverted type (22.93%) ($F = 5.00$, $P < .05$). Those participants who attended interpersonal training (81.74%) had better clinical communication skills than those who had not (18.26%, $t = 3.34$, $P < .01$). There were no other demographic differences in the scores of CCA (see Table 1).

### 3.2. The correlations among coping styles, resilience, and CCA are presented in Table 2

CCA and its 6 dimensions, establishing rapport and respect, confirming the patient, listening receptively, sharing control, checking perceptions, informing effective, were all positively correlated with resilience ($r = 0.126$–$0.643$, $P < .01$). Additionally, CCA and its dimensions were positively correlated with PC ($r = 0.242$–$0.514$, $P < .01$), but were negatively correlated with NC ($r = -0.172$ to $-0.360$, $P < .01$). Further, PC was positively correlated with resilience ($r = 0.501$, $P < .01$). On the contrary, NC was negatively correlated with resilience ($r = -0.305$, $P < 0.01$) (Table 2).

**Socio-demographic characteristics and differences in clinical communication ability (N = 471).**

| variable | N | Mean ± SD | t/F | P |
|---|---|---|---|---|
| Gender | | | | |
| Female | 382 | 75.45 ± 7.11 | 0.96 | .34 |
| Male | 89 | 74.70 ± 6.61 | | |
| Family with single child | | | | |
| Yes | 316 | 75.64 ± 6.78 | 1.44 | .15 |
| No | 155 | 74.65 ± 7.47 | | |
| Grades | | | | |
| 1st grade | 111 | 72.81 ± 6.33 | 7.22** | .00 |
| 2nd grade | 109 | 75.21 ± 6.38 | | |
| 3rd grade | 136 | 76.49 ± 8.02 | | |
| 4th grade | 115 | 76.42 ± 6.47 | | |
| Personality type | | | | |
| Introverted type | 136 | 74.99 ± 6.42 | 5.00* | .01 |
| Neutral type | 227 | 74.63 ± 6.76 | | |
| Extroverted type | 108 | 77.15 ± 7.96 | | |
| Like nursing speciality | | | | |
| Yes | 335 | 75.44 ± 6.88 | 0.54 | .59 |
| No | 133 | 75.05 ± 7.35 | | |
| Relationship with parents | | | | |
| Very good | 277 | 75.02 ± 7.17 | 2.41 | .09 |
| Relatively good | 126 | 76.43 ± 5.86 | | |
| Vague generalization | 68 | 74.41 ± 8.13 | | |
| Relationship with teachers | | | | |
| Very good | 54 | 75.26 ± 7.22 | 0.60 | .55 |
| Relatively good | 189 | 75.62 ± 6.74 | | |
| Vague generalization | 228 | 74.44 ± 7.16 | | |
| Interpersonal training | | | | |
| Yes | 385 | 75.82 ± 6.61 | 3.34* | .00 |
| No | 86 | 73.05 ± 8.27 | | |

* $P < .05$.
** $P < .01$.

### 3.3. The mediating effect of coping styles between resilience and CCA

Potential variable path model was conducted to analyze the effect of resilience on CCA, which was presented in Fig. 1. As seen in Fig. 1, resilience was positively related to CCA ($\beta = 0.16$, $P < .01$). Moreover, the resilience was positively related to PC ($\beta = 0.15$, $P < .01$) and negatively related to NC ($\beta = -0.10$, $P < .01$). Meanwhile, PC was also positively related to CCA ($\beta = 0.64$,

$P < .01$), NC was negatively related to CCA ($\beta = 0.21$, $P < .01$), which all demonstrate that coping styles mediate the effect of resilience on CCA among nursing students. According to the hypothesis model, the structural equation model parameter estimation and mediating effect test were used to test the multiple mediating models by variance maximum likelihood method and bootstrap test. A model with resilience as an independent variable, CCA as a dependent variable and coping styles as mediating variables was established. The final model is obtained, as shown in Fig. 1. The structural equation model-fitting index is in Table 3, all meet the statistical requirements, and the model fits well. The results showed that resilience can directly affect CCA (effect quantity is 0.158), and resilience can also affect CCA through the action of PC. The effect value of this path is 0.0963, and it can also affect CCA through the action of NC. The effect value of this path is −0.0214. Synthesizing 3 paths, the total predictive effect of resilience on CCA is 0.232. Among them, the partial mediating effect of coping style accounts for 50.73% of the total effect. Bias correction of nonparametric percentage bootstrap (repeat sampling 2000 times) was used to test the mediating effect. As shown from Table 4, the confidence intervals corresponding to each path did not contain 0, validating the partial mediation of coping style between resilience and CCA.

## 4. Discussion

It was further verified that direct effect lied in resilience on CCA and original proof for the mediating role between them was found. Furthermore, the results of this study provided us with a new idea that it can improve clinical communication ability by using emphasizing the important role of resilience and coping styles among nursing students.

A previous study had confirmed that resilience was positively associated with CCA.[6] Furthermore, resilience, is a capability that he can adopt positive adaptation when a person confront from all kinds of adversity.[19,20] The trait of resilience can increase an individual's optimistic attitude when he experienced negative life events.[21] Optimistic persons were inclined to communicate with others readily and had better relationships with other people he met with.[22] The study result that nursing students with high resilience do have good CCA had been verified once again.

Coping styles were significantly relate to CCA among nursing students either, especially PC; optimists do not value risk and

**Correlations between coping styles, resilience, and clinical communication ability (N = 471).**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1CCA | 1 | | | | | | | | | |
| 2ERR | 0.540** | 1 | | | | | | | | |
| 3LR | 0.679** | 0.268** | 1 | | | | | | | |
| 4CTP | 0.703** | 0.209** | 0.470** | 1 | | | | | | |
| 5SC | 0.513** | 0.08 | 0.093* | 0.227** | 1 | | | | | |
| 6IE | 0.506** | 0.099* | 0.199** | 0.228** | 0.345** | 1 | | | | |
| 7CP | 0.624** | 0.209** | 0.245** | 0.258** | 0.247** | 0.259** | 1 | | | |
| 8RE | 0.643** | 0.126** | 0.299** | 0.390** | 0.559** | 0.483** | 0.542** | 1 | | |
| 9PC | 0.514** | 0.274** | 0.319** | 0.389** | 0.272** | 0.242** | 0.332** | 0.501** | 1 | |
| 10NC | −0.360** | −0.209** | −0.188** | −0.341** | −0.195** | −0.172** | −0.173** | −0.305** | −0.613** | 1 |

CCA = clinical communication ability, CP = checking perceptions, CTP = confirming the patient, ERR = establishing rapport and respect, IE = informing effective, LR = listening receptively, NC = negative coping, PC = positive coping, RE = resilience, SC = sharing control.
* $P < .05$.
** $P < .01$.
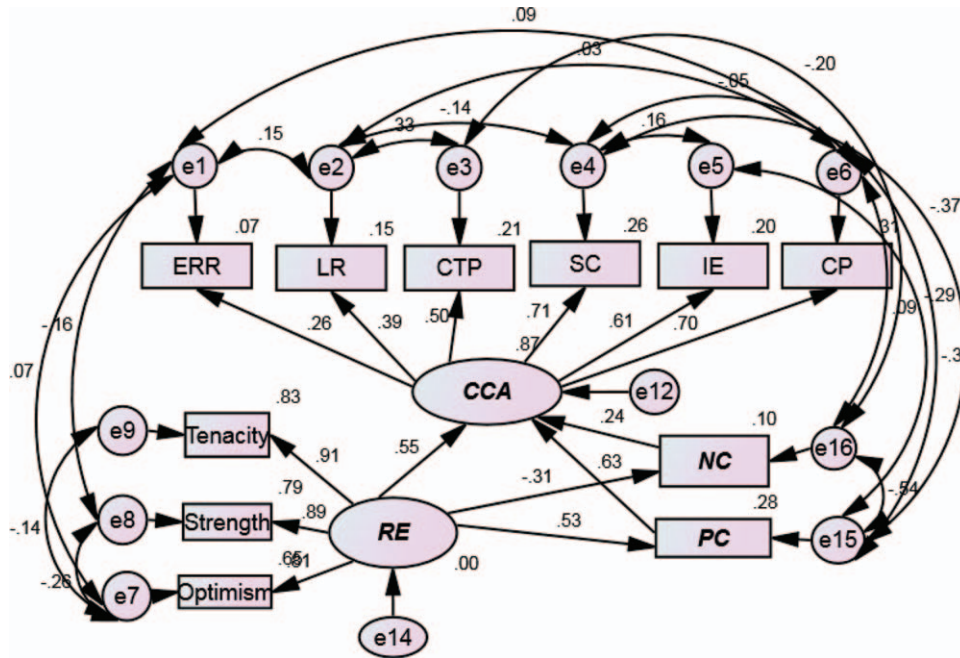
**Figure 1.** Results of SEM analysis of the influence of coping styles on clinical communication ability and resilience among the whole sample. All the coefficients in the figure are unstandardized and significant at level 0.01. CCA = clinical communication ability, CP = checking perceptions, CTP = confirming the patient, ERR = establishing rapport and respect, IE = informing effective, LR = listening receptively, NC = negative coping, PC = positive coping, RE = resilience, SC = sharing control.

opportunity as harm and threat, but as a challenge to individuals, so they took a proactive and constructive approach to deal with it. These people will improve their lives, build resources and create better living conditions and higher levels of performance actively.[4] PC can produce positive emotions and behaviors, so it can enhance personal experience and resources, enhance professional and personal development, and also lead to a happy state of communication.[23] PC is characterized by problem-solving behavior and positive appraisal. In contrast PC and NC are opposed. NC often adopts emotional coping and palliative coping. Individuals with NC are prone to distorted thinking, inappropriate self-evaluation, and even negative evaluation.[4] NC played an intermediary role in self-efficacy and emotional exhaustion.[4] In this study, although the resilience is negatively related to NC (−0.31), it is worth noticing that NC can predict the clinical communication ability either. It might be inferred that the ways of NC, such as escaping, and constraining force, which can avoid contradictions in interpersonal interaction

effectively. In a way, they all promote the communication skill, whether PC or NC. However, no any other study has explored the relationships between NC and communication ability.

Coping styles might impact clinical communication ability as mediating variables. Individuals with high resilience tend to adopt PC.[24,25] It had demonstrated that trait resilience was negatively related with negative-affect coping (−0.47), and positively correlated to positive-acceptance coping (0.21).[26] Coping strategies are postulated to be a personal factor that increases resiliency.[27] Seeking social support and other PC mechanisms are positively related to resilience.[28] At the same time, social support and self-efficacy indirectly or directly influence exercise and information seeking and communication.[29] Resilience can be influenced by PC indirectly through self-efficacy and hope.[30] It showed that PC, self-efficacy, and hope protect resilience from a systematic review.[31] It can be concluded that whether positive or NC someone took, coping styles can lead to positive effects of resilience on CCA. However,

**Table 3**

Goodness-of-fit statistics for the multiple group analysis.

| Goodness-of-fit statistics | $\chi^2$ (df) | P | CFI | GFI | TLI | RMESA |
|---|---|---|---|---|---|---|
| Model with restricted structural weights | 51.43 (24) | <0.001 | 0.986 | 0.981 | 0.969 | 0.049 |

**Table 4**

Analysis of the effects of resilience and coping style on communication ability.

| Effect | Path | Estimate | Bootstrap standard errors | Effect quantity | Total effect | Bootstrap (95% CI) |
|---|---|---|---|---|---|---|
| Direct effect | RE-CCA | 0.158 | 0.038 | 68.10% | 0.232 | [0.103–0.232] |
| Indirect effect | RE-PC-CCA | 0.0963 | 0.157 | 41.51% | | [0.41–0.937] |
| | RE-NC-CCA | −0.0214 | 0.08 | 9.22% | | [0.086–0.355] |

the impact was enhanced when he tends to adopt PC rather than NC from the results of this study.

This study found that there were differences in CCA between different socio-demographic variables. Students who were in 2nd, 3rd, 4th grades had better communication ability than 1st grade, which may be that they were getting used to the college life and familiar with others and had a willingness to communicate with patients with the accumulation of nursing knowledge. Secondly, participants with extroverted type characteristics had better clinical communication ability than introverted type and neutral type, which may suggest that they are good at expressing their feelings and needs, and were more likely to communicate with others easily. Extroverted personality is the protective factor of communication ability; neuroticism and psychotic personality are the risk factors of communication ability.[32] Providing specific training in communication skills is a way to enhance communication between nurses and their patients.[33] Finally, it is demonstrated that students with interpersonal training have better clinical communication skills than those without training.

Communication skills training courses can improve communication skills by enabling healthcare providers to communicate in a form of concern and empathy.[34] For example, the nurse communication skills training program has a significant effect on participants' self-efficacy and communication skills improvement.[33] Simulation [35]. Team-based learning,[36] role-play in health education enhances students' therapeutic and communicative skills,[37] all of the above are solid evidence and methods to improve the CCA of nursing students.

The results of this study showed that coping style and resilience contribute to the improvement of clinical communication skills of nursing students, Communication skills education is very important for nursing students themselves and for their patients.[38] Therefore, it is very necessary to help nursing educators and managers to develop intervention strategies to improve students' clinical communication skills. Developing resilience training or adopting experiential training techniques such as video presentations, role-play scenarios, and group discussions to enhance the participation and promotion of CCA based on Knowles' Adult Learning Theory,[38] and resilience training strategies can help transition from clinical nurse to academic.[39] For example, a program based on cognitive behavioral therapy can improve resilience.[40] Some interventions can also enhance clinical communication skills through coping styles, especially the impact of positive responses. In the literature, some studies indicated that the education programs are effective in coping styles, for example, progressive muscle relaxation and mindfulness meditation interventions,[41] the cognitive therapy,[42,43] and supportive counseling[44] can significantly improved coping styles.

This study is to explore the mediating role of coping style in the relationship between nursing students' resilience and clinical communication ability, but there are still some limitations. Firstly, this study is a cross-sectional rather than longitudinal design. Furthermore, only some influencing factors of communication ability of nursing students are analyzed. Therefore, we cannot infer the causality of these factors, and we should also consider the mediating effects of other influencing factors in the future, so we should interpret the results of this study with caution. Secondly, the samples of this study were sampled from a university of traditional Chinese medicine in Zhejiang Province. Interpretation of these results may be limited when considering other regions. Thus, longitudinal studies and large-scale samples from different regions will need to be designed to validate the results of this study.

## 5. Conclusions

The results of this study showed that resilience can directly affect the CCA of nursing students. That coping styles mediate the relationship between them had been proved, PC played a role in promoting, NC can also play a role in improving CCA. In particular, the latter is not the result of our prediction hypothesis. It is worthy of the attention of nursing educators and managers is that it can directly improve CCA and resilience of nursing students, or can also achieve the purpose of improving CCA through the adjustment of their coping styles. Therefore, this study can provide a basis for empirical research on intervention strategies to improve clinical communication skills.

## Author contributions

**Conceptualization:** Ling Li, Rongyu Hua, Lili Yang.
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