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Research Paper

Stress and coping styles among nursing students during the initial period of the clinical practicum: A cross-section study



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ABSTRACT

Objectives: This study aimed to explore the level of stress, types of stressors, type of coping styles, and factors influencing stress levels and coping styles among nursing students during the initial period of the clinical practicum.

Methods: A cross-sectional survey design was used. In September 2017, participants were recruited from a tertiary hospital in Zhejiang Province, China, using a convenience sampling method. A demographic characteristics questionnaire, the Intern Nursing Student Stressor Scale, and the Simple Coping Style Questionnaire were used to collect data. Data were analyzed using descriptive analysis, independent sample *t*-tests, one-way analysis of variance, Pearson's correlation analysis, and multiple linear regression analysis.

Results: A total of 158 nursing students were recruited, most of whom were female, undergraduates, and from rural areas. The nursing students perceived a moderate level of stress during the initial period of the clinical practicum. The need for knowledge and skills was the most common source of stress. Positive coping styles were most commonly adopted. Nursing students who were undergraduates, only children, and chose nursing major involuntarily experienced higher stress levels than those who were junior college students, not only children, and chose nursing major voluntarily. Nursing undergraduates were more likely to use positive coping styles than junior college students. Male nursing students and those experiencing higher stress levels related to the “environment and equipment of the wards” and the “nature and content of the work” were more likely to use negative coping styles.

Conclusion: Nursing educators should offer targeted guidance based on the stress reported during the clinical practicum and the demographic characteristics of the nursing students. Guidance should be provided to encourage nursing students to adopt effective coping strategies and reduce stress.

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What is known?

- Stress from the clinical practicum is a common issue among nursing students worldwide, especially during the initial period of the clinical practicum.
- Stress can have either favourable or unfavourable results, depending on how nursing students cope with different stressors. Most studies on the stress of nursing students and influence factors in China were published years ago explored the situation at that time.

What is new?

- Nursing students who were undergraduates, only children, and chose nursing major involuntarily experienced higher stress levels than those who were junior college students, not only children, and chose nursing major voluntarily.
- Nursing undergraduates were more likely to use positive coping styles than junior college students; male nursing students and those experiencing higher stress levels related to the “environment and equipment of the wards” and “nature and content of the work” were more likely to adopt negative coping styles.
- Nursing educators should implement targeted training programs based on the characteristics of nursing students to reduce the stress they may experience during the initial period of the clinical practicum.

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1. Introduction

The clinical practicum is an important component of nursing education. During this period, nursing students develop their basic practical skills, clinical judgment, and communication skills and gradually transition into professional nurses. The clinical practicum exposes nursing students to an unfamiliar environment that is very different from the college/university campus environment. The dynamic and complex clinical environment in which nursing students face many unavoidable stressors and challenges, especially during the first three months of the clinical practicum, is defined as the initial period [1].

Stress refers to a situation that occurs when an individual's internal or external demands are perceived as consuming or exceeding their own adaptation or coping resources [2]. There is evidence that nursing students experience the highest level of stress during the initial period of the clinical practicum [3,4]. Previously identified stressors experienced during the clinical practicum included a lack of knowledge and skills, heavy assignments and workload, fear of making mistakes, caring for patients, and dealing with emergencies [3,5–8]. It has been reported that nursing students' stress levels are affected by factors such as gender, monthly family income, years of study, voluntary choice of the profession, interest in the clinical practicum, and health status [3,9–12]. Moderate levels of stress can motivate nursing students to excel by stimulating their potential and desire to learn. However, chronic or excessive stress not only negatively affects the physical and mental state of nursing students [13] but also decreases their clinical performance [14], which may ultimately jeopardize the quality of patient care [6]. Although nursing students are not immune to clinical stressors, their coping styles can affect the nature and intensity of their stress responses.

Coping styles are cognitive and behavioural strategies that individuals adapt to perceived internal and external stressors [2]; these are divided into positive and negative coping styles. Positive coping aims to reduce stress by making positive appraisals and finding solutions. However, negative coping aims to deal with stressful events by engaging in negative thoughts and poor behaviours, such as avoidance and venting. Systematic reviews have shown that nursing students adopt more positive coping styles than negative coping styles during the clinical practicum [6,15]. A few studies have found that the location of the home, mothers' educational level, and self-efficacy may affect one's choice of coping styles [11,16,17]. The coping style plays an important role in the stress adaptation process. Previous studies have shown that nursing students' stress levels during the clinical practicum are closely related to their coping styles. Specifically, nursing students' stress levels are negatively associated with positive coping styles and positively correlated with negative coping styles [18,19].

There have been many studies worldwide exploring the perceived stressors and coping styles of nursing students during the clinical practicum. However, clinical training programs for nursing students vary across countries, and nursing students from different countries have different views on the stressors of the clinical practicum [20,21]. In China, researchers have contributed more attention to the types of stressors and coping styles among nursing students than the influencing factors. Most studies examining the factors influencing stress levels and coping styles among Chinese nursing students during the practicum were conducted approximately ten years ago. Due to reforms in nursing education and the developments of hospitals, these factors may have changed accordingly. There is a constant need for researchers to determine the factors influencing nursing students' stress levels and coping styles, especially during the initial period of the clinical practicum. In addition, researchers need to screen out further stressors that

have a significant impact on the coping styles of nursing students. Clinical educators may prevent or reverse adverse outcomes through early identification and interventions to ameliorate these factors. This study aimed to investigate types of stressors, coping styles, and factors influencing nursing students' coping styles during the initial period of the clinical practicum. The following hypotheses are proposed: 1) Nursing students' overall stress levels during the initial period of the clinical practicum are affected by their demographic characteristics. 2) Nursing students' coping styles during the initial clinical practicum are affected by their demographic characteristics and perceived stressors.

2. Methods

2.1. Design

A descriptive cross-sectional study was carried out in a tertiary hospital in southeast China in September 2017.

2.2. Participants

Convenience sampling was used to recruit eligible nursing students in the initial period of their clinical practicum. The participants' inclusion criteria were completing the first three months of clinical practicum and voluntary participation in this study. One hundred fifty-eight nursing students who were willing to participate were recruited for this study. According to Kendall's sample size estimation method [22], a sample size should be 5–10 times the number of independent variables. Anticipating a 20% non-response rate, finally, 158 individuals were recruited for this study, which met the requirements.

2.3. Instruments

The questionnaire package contained three parts: the Demographic Characteristics Questionnaire, the Intern Nursing Student Stressor Scale, and the Simple Coping Style Questionnaire.

2.3.1. Demographic characteristics questionnaire

The researchers developed the demographic characteristics questionnaire based on a literature review. It includes seven variables assessing the nursing students' sex (male, female), educational level (undergraduate or junior college students), location of the home (city or rural), only child (yes or no), class leader (yes or no), voluntary choice of nursing major (yes or no), and academic achievement rank (top 25%, 26%–50%, 51%–75%, under 75%).

2.3.2. Intern Nursing Student Stressor Scale

The Intern Nursing Student Stressor Scale was developed by Cao et al. [23] and was used to examine the stress (level of stress and type of stressors) perceived by nursing students. The scale consists of 32 items and six subscales: supervision and evaluation, teaching arrangements for clinical practicum, need for knowledge and skills, patient status, nature and content of the work, environment and equipment of wards. Each item was ranked from 0 (no pressure) to 3 (severe pressure). The levels of stress are defined based on the average score of the total scale as follows: a mean ≤ 1.00 indicates a low level of stress, a mean score of 1.01–2.00 indicates a moderate level of stress, and a mean score of 2.01–3.00 indicates a high level of stress. The test-retest reliability coefficient and Cronbach's α coefficient of the overall scale are 0.89 and 0.86, respectively [23]. The Cronbach's α of the overall scale was 0.94 in the present study.

2.3.3. Simple Coping Style Questionnaire

The Simple Coping Style Questionnaire (SCSQ) was developed

by Xie based on the Coping Questionnaire [24]. The SCSQ consists of 20 items, which are divided into two dimensions: positive coping styles (items 1–12) and negative coping styles (items 13–20). Each item is rated using a 4-point Likert scale ranging from 0 (never) to 3 (very often). A higher average score on a certain dimension indicates a stronger likelihood that an individual will adopt that coping style. The scale was shown to be reliable, with Cronbach's α values of 0.78 and 0.89 for positive and negative coping styles, respectively [25]. In the present study, the overall Cronbach's α of the scale was 0.77, and the Cronbach's α values of the subscales ranged from 0.73 to 0.83.

2.4. Data collection

The nursing students were recruited when they attended a group lecture at the hospital. At the end of the lecture, the researchers explained the content and purpose of this study using uniform instructions and distributed the questionnaire to the nursing students who agreed to participate. The nursing students were also instructed to avoid communicating with each other or sharing information when filling in the questionnaire. Students were told to leave the completed questionnaires at their seats for collection by the researcher. After checking that each questionnaire was complete, the researchers excluded those with missing values or inadequately completed. A total of 170 questionnaires were distributed, and 158 valid questionnaires were returned, representing an efficiency rate of 92.9%.

2.5. Data analysis

IBM Statistical Package for Social Sciences (SPSS) version 19 was used for data analysis. Statistical methods included descriptive statistics, *t*-tests, one-way analysis of variance (ANOVA), Pearson's correlation analysis and multiple linear regression. Frequencies and percentages were used to describe the demographic characteristics. The histograms, skewness, and kurtosis of the scores for stress and coping styles were examined. The means and standard deviations were reported for normally distributed data, the medians (P_{25} , P_{75}) for on-normally distributed data. The *t*-test and ANOVA were used to explore the demographic differences in the stress levels and coping styles of the nursing students. Pearson's correlation analysis was used to examine the relationship (intensity and direction) between stress levels and the coping styles of the nursing students. Multiple linear regression was used to determine the factors associated with nursing students' stress levels and coping styles. Categorical variables were converted to dummy variables prior to entering them into the multiple linear regression model. The statistical significance level was set at a *P* value < 0.05 (2-tailed).

2.6. Ethical considerations

An ethical review of this study was allowed for exemption by the hospital where data were collected. Before data collection, permission to conduct the study was obtained from the hospital nursing intern manager. The principle of voluntary participation was followed, and the informed consent of all participants was obtained before they participated in the investigation. To ensure participants' privacy, all returned questionnaires were locked in drawers, and only the research team members had access to them.

3. Result

3.1. Demographic characteristics of the nursing students

As shown in Table 1, a total of 158 samples were recruited for

this study. Most of the participants were female (92.4%), undergraduates (70.3%), and from rural areas (75.3%). Almost a quarter of the participants were only children of their families (25.9%), and more than one-third (38.0%) of the participants were class leaders. In addition, more than half of the participants (58.9%) chose the nursing profession voluntarily, and more than one-third of the participants' academic achievement rank was in the top 25%.

3.2. Stress levels and type of stressors of the nursing students

The overall stress level of nursing students during the initial period of the clinical practicum was moderate (*Mean* = 1.09, *SD* = 0.47). The following stress domains were reported by nursing students, from most common to least common: the need for knowledge and skills, teaching arrangements for clinical practicum, nature and content of the work, supervision and evaluation, patient status, and environment and equipment of the wards (Table 2).

3.3. Coping styles adopted by the nursing students

In the initial period of the clinical practicum nursing students adopted more positive coping styles than negative ones. In terms of the individual items, the top three most frequently reported responses by nursing students were "try to see the good side of things," "changing your mind and rediscovering what matters in life," and "talking to people and sharing your problems" (Table 3).

3.4. Relationship between stress and coping styles of the nursing students

Table 4 shows the relationship between the stress levels and coping style of the nursing students. Pearson's correlation coefficient results showed no significant correlations between positive coping styles and the six domains of stressors and total stress scores, while negative coping styles were significantly positively correlated with the six domains of stressors and total stress scores.

3.5. Differences in nursing students' stress levels and coping styles during the clinical practicum according to demographic characteristics

The univariate analysis indicated that the stress scores of the nursing students during the initial period of the clinical practicum differed significantly in three demographic variables: educational level, only child status, and choosing the nursing profession voluntarily. The scores of positive and negative coping styles differed significantly by educational level and sex, respectively (Table 1).

3.6. Factors influencing nursing students' stress and coping styles

Three multiple linear regression analyses were run to explore the factors influencing nursing students' stress and coping styles in the initial period of their clinical practicum. The first regression analysis with stress as the dependent variable and significant variables in the univariate analysis as the independent variable showed that the main factors associated with the stress of nursing students were education level, being an only child or not, and choosing the nursing profession voluntarily or not. In the two multiple regression analyses, positive and negative coping styles were used as dependent variables. The demographic factors and stress dimensions associated with positive and negative coping styles were considered independent variables to construct the regression model. The results showed that education level was the only factor influencing positive coping styles. Stress related to the

Table 1
Comparison of scores on stress and coping styles among nursing students with different demographic characteristics (n = 158).

Variables	n (%)	Stress			Positive coping style			Negative coping style		
		Score	t/F	P	Score	t/F	P	Score	t/F	P
Sex			0.24	0.810		1.87	0.064		2.89	0.004
Male	12(7.6)	1.06 ± 0.56			1.44 ± 0.59			1.39 ± 0.58		
Female	146(92.4)	1.10 ± 0.46			1.70 ± 0.46			0.96 ± 0.48		
Education level			3.30	0.001		2.22	0.028*		1.76	0.081
Undergraduate	111(70.3)	1.16 ± 0.50			1.74 ± 0.49			1.04 ± 0.52		
Junior college students	47(29.7)	0.93 ± 0.35			1.55 ± 0.43			0.89 ± 0.41		
Location of home			0.40	0.691		0.20	0.838		0.17	0.864
City	39(24.7)	1.12 ± 0.51			1.67 ± 0.41			1.01 ± 0.41		
Rural	119(75.3)	1.08 ± 0.46			1.69 ± 0.50			0.99 ± 0.53		
Only child			2.72	0.007		1.78	0.077		0.67	0.502
Yes	41(25.9)	1.26 ± 0.50			1.27 ± 0.54			1.04 ± 0.53		
No	117(74.1)	1.03 ± 0.45			1.72 ± 0.45			0.98 ± 0.49		
Class leader			0.05	0.962		0.24	0.807		0.31	0.754
Yes	60(38.0)	1.09 ± 0.44			1.69 ± 0.50			1.01 ± 0.48		
No	98(62.0)	1.09 ± 0.49			1.68 ± 0.47			0.99 ± 0.53		
Choosing nursing profession voluntarily			2.57	0.011		0.73	0.469		0.01	0.996
Yes	93(58.9)	1.01 ± 0.43			1.66 ± 0.49			0.99 ± 0.49		
No	65(41.1)	1.21 ± 0.51			1.72 ± 0.45			0.99 ± 0.52		
Academic achievement rank			1.12	0.342		0.21	0.888		1.49	0.222
Top 25%	62(39.2)	1.15 ± 0.52			1.71 ± 0.42			1.08 ± 0.48		
26%–50%	54(34.2)	1.05 ± 0.40			1.69 ± 0.43			0.91 ± 0.47		
51%–75%	32(20.3)	1.00 ± 0.43			1.64 ± 0.61			0.93 ± 0.54		
Under 75%	10(6.3)	1.23 ± 0.54			1.63 ± 0.62			1.06 ± 0.61		

Note: Data are n (%) or Mean ± SD.

Table 2
Stress levels and type of stressors of nursing students during the initial period of clinical practicum (n = 158).

Domains/items	Domain rank	Item rank	Score
I. Supervision and evaluation	4		0.94 ± 0.60
The instructor's evaluation of you		13	1.12 ± 0.83
Other nurses' evaluation of you		23	0.86 ± 0.71
Other medical personnel's evaluation of you		22	0.86 ± 0.71
Patients' and their families' evaluation of you		11	1.22 ± 0.82
Care of patients according to ward standards		21	0.91 ± 0.76
Teachers' attitude towards you		17	1.00 (0.00, 2.00)
The attitude of other medical personnel towards you		25	0.85 ± 0.73
The extent to which the teacher in charge helped you		18	1.00 (0.00, 1.00)
II. Teaching arrangements for clinical practicum	2		1.22 ± 0.66
Planning for clinical internship		12	1.19 ± 0.83
Rotation program for clinical placements		20	0.91 ± 0.79
Methods of clinical examination		9	1.37 ± 0.81
Arrangements for night work		8	1.41 ± 0.95
III. Need for knowledge and skills	1		1.57 ± 0.58
Level of knowledge possessed by self		3	1.60 ± 0.71
Requirements for operating skills in practicum		4	1.47 ± 0.76
Ability to deal with patient emergencies		1	1.99 ± 0.86
The gap between school teaching and clinical needs		6	1.46 ± 0.81
The ability to apply what you have learned to your patients'		7	1.44 ± 0.71
Likelihood of error		5	1.46 ± 0.81
IV. Patient status	5		0.87 ± 0.55
Age of the patient		31	0.70 ± 0.71
Gender of the patient		32	0.00 (0.00, 1.00)
The patient's pained expression		15	1.04 ± 0.71
Attitudes of patients and families		10	1.24 ± 0.78
V. Nature and content of the work	3		1.00 ± 0.56
The content of daily work		14	1.10 ± 0.76
Disposing of the patient		24	0.85 ± 0.70
Living care for patients		30	0.73 ± 0.69
Communication with patients		29	0.76 ± 0.72
Contact with unfamiliar patients		26	0.83 ± 0.78
Exposure to infectious diseases		2	1.71 ± 0.86
VI. Environment and equipment of the wards	6		0.87 ± 0.57
In a new environment		16	1.01 ± 0.83
Organizational structure of the practicum ward		28	0.77 ± 0.72
The environment of the ward (smell, light, noise, etc.)		27	0.77 ± 0.73
Clinical situation of the equipment		19	0.92 ± 0.67
Mean score for all domains			1.09 ± 0.47

Note: Data are Mean ± SD or Median (P₂₅, P₇₅).

Table 3
Coping styles of nursing students during the initial period of clinical practicum (n = 158).

Domains/items	Subscale rank	Item rank	Score
I. Positive coping styles	1		1.68 ± 0.48
Relief from work, study or some other activity		12	1.59 ± 0.83
Talking to people and sharing your problems		3	1.75 ± 0.87
Trying to see the good side of things		1	1.97 ± 0.82
Changing your mind and rediscovering what matters in life		2	1.83 ± 0.80
Not taking the problem too seriously		11	1.63 ± 0.78
Stand your ground and fight for what you want		6	1.70 ± 0.85
Identify several different ways to solve problems		8	1.65 ± 0.76
Seek advice from relatives, friends or classmates		10	1.63 ± 0.86
Changing some of the old practices or own problems		7	1.68 ± 0.71
Draw on the approaches of others to similarly difficult situations		5	1.72 ± 0.81
Seeking hobbies and actively participating in cultural and sports activities		14	1.41 ± 0.87
Try to restrain feelings of disappointment, remorse, sadness and anger		9	1.63 ± 0.88
II. Negative coping styles	2		0.99 ± 0.50
Try to take a break or vacation and put the problem (worry) away for a while		13	1.51 ± 0.96
Solving problems by smoking, drinking, taking drugs and eating		20	0.00(0.00, 1.00)
Believes that time will change the situation and that the only thing to do is to wait		16	1.00(0.00, 1.00)
Trying to forget the whole thing		18	0.81 ± 0.78
Relying on others to solve problems		19	0.79 ± 0.71
Accept the reality, because there is no other way		15	1.11 ± 0.93
Imagining that some miracle might happen to change the situation		17	1.00(0.00, 1.00)
Comfort yourself		4	1.75 ± 0.93

Note: Data are Mean ± SD or Median (P₂₅, P₇₅).

Table 4
Relationship between stress and coping styles of nursing students during the initial period of clinical practicum (n = 158).

Domains of stress	Positive coping styles	Negative coping styles
Overall stress	0.004	0.43**
Supervision and evaluation	0.03	0.33**
Teaching arrangements for clinical practicum	-0.04	0.26**
Need for knowledge and skills	0.07	0.23**
Patient status	0.06	0.41**
Nature and content of the work	-0.07	0.45**
Environment and equipment of the wards	-0.06	0.48**

Note: Data are Pearson correlation coefficient. **P < 0.01.

“environment and equipment of the wards,” and “nature and content of the work,” and students’ gender were the main factors associated with negative coping styles (Table 5).

4. Discussion

This study described the stress levels, stressors and coping styles of nursing students during their initial clinical practicum. In addition, we explored the relationship between nursing students’ stress levels and coping styles and their respective influence factors.

4.1. Stress levels, stressors and coping styles of nursing students

Consistent with the results of a previous study [26], nursing

students in this study experienced moderate levels of stress during the initial stage of the clinical practicum. The “need for knowledge and skills” was the most common stressor reported by nursing students in this study, which corresponds to the findings of other studies [3,27]. The reasons may be as follows. First, clinical nursing practice plays a major role in patient health care and requires both theoretical knowledge and practical skills from the nursing students. However, prior to clinical practicum, nursing students had only short simulation exercises in the laboratory and no clinical practicum experience, which resulted in a lack of clinical skills. Second, the theoretical knowledge that students acquired on campus was not enough to meet the requirements in clinical practicum as the nursing discipline had developed rapidly. Finally, as stated in Lazarus’s stress theory, the stress experienced by

Table 5
Factors influencing stress and coping styles of nursing students during the initial period of clinical practicum (n = 158).

Dependent variables	Independent variables	β	SE	t	P	Adjusted R ²
Stress	Undergraduate students	0.22	0.08	-2.80	0.006	0.10
	Only child	0.20	0.08	-2.45	0.015	
	Choosing nursing profession voluntarily	-0.15	0.07	2.08	0.039	
Positive coping style	Undergraduate students	0.18	0.08	-2.22	0.028	0.02
Negative coping style	Stress from environment and equipment of the wards	0.26	0.09	2.92	0.004	0.27
	Male	0.34	0.13	-2.60	0.010	
	Stress from nature and content of the work	0.19	0.09	2.07	0.040	

nursing students during clinical practicum may be due to the perceived gap between the needs of a specific clinical situation and the resources or abilities that are available for performing the task or meeting those needs [28]. Therefore, we suggest that educators should take care to incorporate actual clinical aspects when teaching students, such as showing them the latest clinical advances through videos, case studies, and scenario exercises. Laboratory managers should update the content and equipment in students' simulation exercises to be aligned with clinical needs. Nursing students should improve their practical skills by practicing diligently in a simulated environment before the clinical practicum.

In this study, positive coping styles were more often adopted by nursing students than negative coping styles, consistent with many previous studies [15,29]. The explanations are as follows. First, nursing students have gained a preliminary understanding of the nursing profession after years of university education, making them less susceptible to shocks from the realities of the clinical practicum and more inclined to adopt positive coping styles. Second, most universities offer courses such as interpersonal communication and nursing psychology, which could effectively guide students to adopt positive ways of dealing with stressful events. We recommend that nursing students continue to use positive coping styles to manage stress from the clinical practicum and calm their minds.

4.2. Relationship between stress and the coping styles of nursing students

Our study demonstrated that negative coping styles were positively correlated with overall stress levels among nursing students, while positive coping styles were not correlated with stress levels. These results echo the findings of previous studies. For instance, Bodys-Cupak et al. [17] found that nursing students who reported high stress levels in the clinical practicum were more likely to choose negative coping strategies such as denying, releasing, stopping actions and blaming themselves. This indicates that as stress levels increase, nursing students tend to adopt more negative coping styles. The reasons for this are as follows: positive and negative coping styles are relative, and their effects are not absolute; negative coping styles such as comforting oneself and trying to take a break may be less costly than solving the problem and can momentarily suppress the negative emotions caused by the current stressor. However, negative coping does not address the root cause of the problem, and the potential threat of stress to nursing students remains unresolved [30]. Research had confirmed that positive coping is a long-term, effective strategy for reducing the stress experienced during the nursing practicum [11,31]. Although the nursing students in this study used positive coping styles more often than negative coping styles to deal with stressors, the former was not fully utilized during the initial period of the clinical practicum.

4.3. Factors associated with the stress levels of nursing students during the initial period of the clinical practicum

The present study revealed that nursing students' education level, whether they were only children, and whether they voluntarily chose the nursing profession significantly influenced their stress levels during the initial period of the clinical practicum. Specifically, nursing students who were undergraduates experienced a higher level of stress than junior college students, which is supported by a previous study. This may be because the undergraduates are highly educated and have high requirements and self-orientation for themselves. However, the reality of clinical care is complex, and the workload is heavy and falls far short of the

expectations of the nursing students. The disparity between ideal and reality can make students experience a huge psychological gap, thereby increasing stress levels.

In this study, nursing students who were only children experienced higher stress levels than those who were not only children. This finding is supported by Sun et al. [32], who found that nursing students who are only children experienced higher stress during the clinical practicum. This may be related to their upbringing and family environment. Most only children grow up in a relatively pampered environment and receive excessive attention and care during formative years growing up, which may lead to a lower level of psychological tolerance [33], so complicated nursing work and unfamiliar clinical environments will cause them greater stress. In addition, compared with nursing students from multi-child families, nursing students who are only children may lack experience with collaboration and interaction. The constant self-centred pattern of their upbringing could easily lead to their reluctance to initiate and communicate with patients and to their rejection of the clinical environment, which in turn increases their stress.

Furthermore, we also found that the overall stress levels of students who chose the nursing profession involuntarily were higher than those who chose the nursing profession voluntarily. Similarly, Hamaideh et al. [11] reported that choosing nursing major voluntarily or not was an influencing factor of nursing students' perceived stress. Some studies have found that nursing students who voluntarily choose their profession tended to have a greater sense of professional identity [34]. Nursing students with a greater sense of professional identity may have stronger motivations to learn and adapt to the clinical environment more quickly, so their stress levels during the clinical practicum are lower [32]. Moreover, it has been found that students who choose the nursing profession voluntarily have higher self-confidence, optimism, and a higher sense of professional gain and require less social support [35,36]. Therefore, they experienced lower stress levels than nursing students who did not voluntarily choose the nursing profession. To reduce the clinical practicum stress among nursing students, clinical instructors should carry out corresponding interventions based on the students' characteristics.

4.4. Factors associated with the coping styles of nursing students during the initial period of clinical practicum

In this study, nursing students who were undergraduates scored higher on positive coping styles than those who were junior college students. Undergraduates are more educated than junior college students and are more mature and able to analyse problems more objectively; thus, undergraduates are more likely to adopt a mature and positive approach in dealing with various stressful events.

Nursing students with a higher stress level related to the "environment and equipment of the wards" were more likely to adopt negative coping styles, which was a novel finding in this study. Previous studies found that higher stress levels related to the clinical environment led to a higher likelihood that nursing students will choose avoidance behaviours [5,37]. This may be related to the short rotation cycle. Nursing students need to rotate to a new ward once per month, which leads to a low sense of belonging in the new unit [38]. In this situation, the nursing students were more likely to adopt negative coping styles such as "accepting reality because there is no other way" and "comforting themselves."

This study also indicated that male nursing students were more likely than female nursing students to adopt negative coping styles to deal with stress in the clinical practicum, which is different from the results of previous research [39]. Most teachers and nursing students in the clinical practicum are female, and there are few male nursing students. This gender difference makes it difficult for

males to seek support from peers and teachers, so they often choose negative styles (such as silence and bearing it alone) to cope with stress. In addition, male nursing students also have little time and energy to relieve stress through physical activities and recreation due to the demands of the clinical practicum. Moreover, the differences in expectations between males and females influence their coping styles. Men are often expected to be stronger and braver, making them reluctant to talk to others or ask for help when they are in trouble.

Nursing students with a higher stress level related to the “nature and content of the work” were more likely to adopt negative coping styles, which was another novel finding in this study. The content of the work is the task that the nursing students must undertake during the clinical practicum. During the internship period, nursing students may have difficulty adapting quickly to a heavy clinical workload with their inadequate abilities. Additionally, potential clinical risks may also increase the psychological burden of the nursing students. Thus, when nursing students find it difficult to change this situation in the short term, they may choose a negative way instead to deal with this pressure, such as by “trying to take a break or vacation to put problems (worries) aside for a while” or by “comfort yourself.”

4.5. Limitations

Several limitations should be noted for this study. First, this survey is a descriptive cross-sectional study, which focused only on the initial period of the clinical practicum of nursing students. Second, this study recruited participants from only one hospital, limiting the generalizability of the results. In the future, we will further examine the predictive factors of nursing student stress levels and coping styles during the clinical practicum in a longitudinal multi-centre study.

5. Conclusion

From the results of this study, nursing students experience moderate levels of stress during the initial period of the clinical practicum; the need for knowledge and skills is the most common stressor. Although most nursing students used positive coping styles, negative coping styles were more strongly associated with nursing students' stress levels than positive coping styles. Strategies aimed at improving the knowledge and skills of nursing students should be developed to reduce nursing students' stress levels. Strategies geared toward changing the negative coping styles of nursing students should be developed. Some factors were found associated with the stress levels and coping styles of the nursing students during the clinical practicum, which could be used to guide nursing educators and clinical instructors in carrying out targeted interventions to reduce students' stress and in helping students adopt effective coping styles.

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Data availability statement

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

CRediT authorship contribution statement

Jing Liu: Conceptualization, Methodology, Formal analysis,

Writing – original draft. **Yeqin Yang:** Conceptualization, Writing – review & editing, Project administration. **Junya Chen:** Investigation, Formal analysis, Writing – review & editing. **Yi Zhang:** Investigation, Writing – review & editing. **Yawei Zeng:** Investigation, Writing – review & editing. **Jufang Li:** Conceptualization, Methodology, Writing – review & editing, Project administration.

Declaration of competing interest

There is no conflict of interest of this study.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2022.02.004>.

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