

Hope, death anxiety and simplified coping style scores of nursing students during the outbreak of COVID-19

A cross-sectional study

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Abstract

Nursing students are the main force of future nursing development, and their hope and death anxiety are important aspects of their coping styles and clinical practice.

The present study examined the relationships between hope, death anxiety and simplified coping style scores of nursing students during the outbreak of COVID-19.

Between February and April 2020, a cross-sectional descriptive study was performed using a Sojump online survey, and 870 nursing students completed the herth hope (HH), death anxiety scale (DAS) and simplified coping style questionnaire. The data were analyzed using *t*-tests, one-way analysis of variance (ANOVA), and multiple linear regression in SPSS 23.0 (IBM Corp, Armonk, NY).

The average HH, DAS and active and passive coping scores of the 870 nursing students were 3.07 ± 0.32 , 3.01 ± 0.37 , 2.84 ± 0.48 , and 2.25 ± 0.50 , respectively. Participants with contact experience with individuals with suspected or confirmed COVID-19 were more likely to adopt passive coping styles than students without contact experience ($t=5.019$, $P=.025$). Being older and having higher inner positive readiness and expectancy, a lower inner sense of temporality and future, and lower time awareness were predictors of passive coping styles ($P < .05$). Living in cities (vs towns) and having a higher inner positive readiness and expectancy, a higher inner sense of temporality and future and lower cognition of death were predictors of active coping styles ($P < .05$).

The findings of this study suggest that hope and death anxiety are important aspects of the coping styles of nursing students. Nursing educators should emphasize the role of hope, further deepen the death education mode, and perform scientific and reasonable death education programmes to reduce the death anxiety level of nursing students to promote their coping styles in crisis.

Abbreviations: COVID = coronavirus disease, DAS = death anxiety scale, HH = herth hope.

Keywords: death anxiety, hope, nursing students, simplified coping style

1. Introduction

On January 30, 2020, the World Health Organization declared the coronavirus disease (COVID-19) outbreak a Public Health Emergency of International Concern.^[1] On June 1, 2020, there

were 5,939,234 confirmed cases and 367,255 confirmed deaths worldwide, and this pandemic has posed challenges in many countries.^[2] Prominent among these issues are the impacts on health and social care systems. A strategy update from the WHO

Editor: Shogo Hayashi.

LC and XG contributed equally to this work.

This work was supported by Science & Technology Department of Sichuan Province, study on the influencing factors of dysphagia in the elderly and establishment of clinical evaluation model (2018SZ0247), Research on the construction and application of multidisciplinary whole-process nutrition management model for senile patients with frailty based on artificial intelligence (2021YFS0154) and West China Nursing Discipline Development Special Fund Project, Sichuan University (HXHL19017).

The study adhered the Tenets of the Declaration of Helsinki and was approved by the West China Hospital of Sichuan University Biomedical Research Ethics Committee (ethics number: 2019-658).

The authors have no conflicts of interests to disclose.

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

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How to cite this article: Cheng L, Guo X, Liu H, Chen Q, Cui R. Hope, death anxiety and simplified coping style scores of nursing students during the outbreak of COVID-19: a cross-sectional study. *Medicine* 2021;100:34(e27016).

Received: 16 February 2021 / Received in final form: 9 July 2021 / Accepted: 3 August 2021

<http://dx.doi.org/10.1097/MD.0000000000027016>

states that “*One of the defining features of COVID-19 is the huge stress placed on health systems and health workers by the large proportion of COVID-19 patients who can require quality clinical care*”.^[3] However, the global shortage of nurses was approximately 5.9 million in 2018. Nurses play a critical role in keeping the world healthy, and they have made outstanding contributions, especially at the frontline of the COVID-19 response.^[4] The tagline for World Health Day 2020 is to support nurses and midwives for their efforts as a way to express thanks.

The outbreak of COVID-19 challenges the view that nurses’ mental health is their personal responsibility and exposes the over-emphasis on their resiliency in the face of under-staffing and often intense emotional work.^[5,6] The psychological state and coping styles of medical staff are related and play important roles in the future development of nursing health.^[7–9] One report showed that nurses treating COVID-19 patients experienced intense stress and emotional exhaustion, which elicited fear, anger, frustration, and worry, and were faced with frequent end-of-life care as patients suffered a more rapid deterioration.^[10] These nurses coped with difficult situations using breathing and physical exercises, and staff were encouraged to take breaks and were provided with information about reactions and coping.^[11]

The sudden outbreak of COVID-19 brought unprecedented challenges and burdens to healthcare workers. Their responsibility and bravery garnered public recognition, but their mission, profession, physical and mental health also made some people, including nursing students, rethink their choice of a nursing career when facing a life-threatening illness. More attention must be paid to the thoughts, coping styles, preparation, perceptions and affordability of nurses and nursing students in the future in the face of these disasters and events. Nursing students are also in an important formative period in their life and professional values, and it is very important to cultivate their ability to deal with public health emergencies. Nursing students are the main component of the nursing workforce, and their physical and mental development, career development and career recognition in nursing directly affect the balance and development of the nursing profession.

One attribute of hope in the Hope Process Framework is spirituality, which fosters hope in healthcare providers,^[12,13] and hope reduces burnout and promotes job satisfaction as a positive internal force.^[14] Individuals with more hope are less likely to have negative emotions and are more inclined to adopt positive attitudes and coping strategies when facing practical problems.^[12,15] Hope is also described as a means of escape from the cycle of suffering, and it is seen as a comfort to the elderly population.^[16] Miller showed that hope was central to life and an important factor in an individual’s ability to cope with disease and death.^[12,17] Most studies focused on hope in individuals with diseases or the elderly. Few studies examined the hope of nursing students, but hope is an important resource in their practice and provision of care to others.^[13,18]

“Death anxiety refers not to the anxiety which is felt in the case of an urgent threat towards a person’s life, it refers to the anxiety experienced in daily life”.^[19] Death anxiety arises when we witness events that may lead to death.^[19] Helping patients and their families accept death, promoting the spread of the concept of life-cycle service and practicing end-of-life care have become important responsibilities for nurses worldwide.^[20] One of the roles of nurses is to be the director of life and death education, but if the nurse is unable to face death, there will be conflicts, and the nurse will not meet the demands of clinical care.^[21] Previous

studies showed that health providers have high death anxiety due to long-term mortality events, which may adversely affect the quality of care given to terminally ill patients.^[21–23]

The content of death education is undergoing examination and development.^[24] Although some scholars examined the death education curriculum, these studies primarily focused on clinical practice. Some medical colleges and universities perform death education activities, but difficulties between theory and practice remain.^[24,25] Nursing students experience difficulties in dealing with death and dying.^[25,26] On the one hand, students have limited opportunities to acquire knowledge and skills in clinical practice, which limits their awareness of death. On the other hand, awareness comes from the student’s own perception and technical expertise of death education.^[27] Therefore, educators should pay attention to the death state of nursing students during the COVID-19 outbreak and establish a plan for death education.

Therefore, it is necessary to engage in the early identification and intervention of death anxiety in health providers. Nursing students have high levels of fear, anxiety and psychological death avoidance.^[21,23] It is necessary to improve death education to increase the cognition of death and guide nursing students to face death actively to reduce their level of death anxiety.

Savitsky et al (2020) found that the prevalence of moderate and severe anxiety was 42.8% and 13.1% respectively among nursing students in Israel during the Covid-19 pandemic, while stronger resilience and usage of humor were associated with significantly lower anxiety levels.^[28] Huang et al (2020) also found that the importance of providing psychological support and training in coping strategies to cope with emotional responses in China during Covid-19 outbreak.^[29] However, previous studies have not identified specific sources of anxiety, such as death anxiety. In addition, all the studies started from the negative emotions of nursing students and expanded their emotional reactions. We should also pay attention to the positive emotional reactions, such as hope. Therefore, it is more meaningful to explore the coping styles from both positive and negative emotions. Several scholars studied the factors associated with reduced death anxiety, such as a secure attachment style and a sense of meaning in life.^[30–32] Meaning in life is defined as “the degree to which an individual comprehends and sees significance in their life, as well as the extent to which they feel that they have a purpose in life”.^[33–35] Therefore, meaning in life is a multidimensional construct with 3 components: comprehension, significance and purpose.^[35,36] Based on previous literature, the present study examined the relationships between hope, death anxiety and simplified coping style scores in nursing students during the COVID-19 outbreak.

2. Methods

2.1. Study design and ethical considerations

A cross-sectional design was used in this study. The STROBE cross-sectional reporting guidelines were used.^[37] The West China Hospital of Sichuan University Biomedical Research Ethics Committee approved the study (ethics number: 2019–658). Participants voluntarily and anonymously participated. We presented 2 questions at the beginning of the questionnaire survey asking our research population whether they agreed to participate in the survey and whether they agreed to take the survey as part of an academic study. Only the respondents who agreed were included in the final analysis to ensure informed

consent was granted and was obtained in the form of an electronic signature. All of the data collected remained confidential and were used only for this research study.

2.2. Data collection

The data were collected between February and April 2020 using a Sojump online survey (Questionnaire Star survey website), which enabled the rapid and effective distribution of an online questionnaire to our research population. We used the self-selection online survey method, a non-probability sampling method,^[38] to recruit nursing students via social network links. Nursing students who met the following inclusion criteria were eligible to participate: a) provided informed consent; and b) had not graduated. We chose this method because everyone in China was under movement restrictions at the time of the study due to COVID-19. Therefore, a social network platform allowed a more rapid, accessible, and effective distribution of the questionnaire.^[39]

The survey was distributed to nursing students in 3 main stages. In the first stage, intensive sampling was accomplished through social networks, such as WeChat and QQ, to contact eligible students, teachers, college managers and instructors. In the second stage, snowball sampling^[40] was performed to achieve broader coverage. In the third stage, a summary evaluation of the socio-demographic variables revealed that Hubei Province was a high-risk area and had a small sample size. Therefore, we focused on expanding the sample size for Hubei Province.

2.3. Quality control

Before the survey, we selected several students for a preliminary investigation of the questionnaire completion time and the wording and clarity of the questionnaire. The questionnaire was modified accordingly. During the investigation, a teacher was assigned to supervise the completion of the questionnaires and collect the adjustment recommendations. After the investigation, we strictly screened the data to ensure accuracy.

2.4. Participants

A total of 1028 students participated in the survey using the Questionnaire Star survey website. However, 158/1028 (15.37%) of the questionnaires were removed from the sample according to the following exclusion criteria: a) the surveys were incompletely filled out; b) the questionnaires were completed by non-nursing students; c) the respondents did not consent using the first 2 questions; and d) the same response options were chosen consistently. Ultimately, 870 eligible surveys were analyzed.

2.5. Instruments

The survey included questions to assess participants' demographic characteristics (age, gender, ethnicity, residence, religion, contact experience, observation period, and whether or not infected), herth hope (HH), the death anxiety scale (DAS), and the simplified coping style questionnaire. The questionnaires were slightly modified to reflect the characteristics of the COVID-19 crisis.

The HH was developed and validated by Herth.^[41,42] Chan and colleagues translated the original scale to produce a 12-item scale and verified its psychometric properties in a Chinese

population.^[43] Responses are provided on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree), with the total possible score ranging from 12 to 48 points. A higher score indicates greater hopefulness. Scores of 12 to 23 are classified as low, 24 to 35 as medium and 36 to 48 as high. The Chinese version has adequate internal consistency, good content validity and appropriate convergent and discriminant validity and construct validity. The Cronbach's alpha coefficient in the present study was 0.842.

The DAS was developed and validated,^[44–46] and it consists of 15 items. The reported Cronbach's alpha coefficient is 0.71, and the scale has good construct validity. The present study used a 5-point scale ranging from 1 (strongly agree) to 5 (strongly disagree) as modified by Yang and colleagues based on subsequent content.^[47] The total score ranged from 0 to 75. Higher scores indicate higher levels of death anxiety. A score of 35 was defined as high death anxiety. The Cronbach's coefficient of the total scale was 0.530 in the present study. We also made minor changes to some of the items. Item 4, "I am scared when I think about having surgery," was changed to Item 4, "I am scared when I think about receiving treatment for COVID-19". Item 6, "I'm not afraid of getting cancer," was changed to Item 6, "I'm not afraid of getting COVID-19". Item 13, "I get scared when I hear people talking about the end of the world," was changed to Item 13, "I get scared when I hear people talking about COVID-19".

The simplified coping style questionnaire has good reliability and validity.^[8,48] It is a 20-item self-reported questionnaire that includes 2 dimensions, active coping (12 items) and passive coping (8 items), with higher scores representing greater active/passive coping styles. Responses are provided on a 4-point scale according to how frequently respondents adopt each item, from 1 "never" to 4 "very often". The Chinese questionnaire is frequently used. The present study added 2 items for a total of 22 items. The new items reflected active coping styles: "Express emotions through WeChat messages, microblogs, QQ and other social networking sites" and "Seek solutions through networking platforms". The Cronbach's alpha coefficients for active coping styles and passive coping styles were 0.843 and 0.733, respectively.

2.6. Data analysis

The scores for the HH, DAS, active coping and passive coping and the descriptive statistics (frequency, percentage, mean and standard deviation) were analyzed in SPSS 23.0 (IBM Corp, Armonk, NY). Using t-tests and one-way analysis of variance (ANOVA) showed the factors affecting HH, DAS, active coping and passive coping. Multiple regression analysis results showed regression variables of active coping and passive coping. All tests were two-tailed, and statistical significance was set at $P < .05$.

3. Results

3.1. Demographic characteristics

Participants had a mean age of 21.82 years (SD=2.49; range=14–42). Among the respondents, 90.5% were female (n=787), and 94.1% were ethnically Han (n=819). A total of 48.4% came from rural cities, and 31.3% were from urban cities. Most (94.6%) participants had no religion. Only 5.4% reported a religion, which included Christianity, Catholicism or Buddhism. Of the participants, 0.7% reported contact experience with

Table 1
Demographic characteristics (N = 870).

Variable	N (%)	Mean \pm SD				
		HH	DAS	AC	PC	
Gender	Male	83 (9.5)	37.29 \pm 4.77	45.71 \pm 7.11	40.13 \pm 6.59	17.95 \pm 4.43
	Female	787 (90.5)	36.84 \pm 3.78	45.00 \pm 5.41	39.78 \pm 6.66	18.02 \pm 3.97
t(F)			1.004	1.168	0.216	0.023
Ethnicity	Han	819 (94.1)	36.83 \pm 3.88	45.13 \pm 5.56	39.78 \pm 6.56	17.99 \pm 3.97
	Ethnic minority	51 (5.9)	37.76 \pm 3.86	44.23 \pm 6.17	40.29 \pm 8.12	18.43 \pm 4.67
t(F)			2.797	1.277	0.288	0.582
Residence	Rural	421 (48.4)	36.76 \pm 3.60	45.05 \pm 5.73	39.76 \pm 6.47	17.79 \pm 4.00
	Town	177 (20.3)	37.02 \pm 3.73	45.27 \pm 5.83	39.13 \pm 6.90	18.07 \pm 3.91
	Urban	272 (31.3)	36.98 \pm 4.39	44.99 \pm 5.23	40.32 \pm 6.76	18.33 \pm 4.09
t(F)			0.412	0.130	1.748	1.494
Religion	Yes	47 (5.4)	37.00 \pm 3.84	45.85 \pm 7.40	39.17 \pm 7.10	18.87 \pm 4.65
	No	823 (94.6)	36.88 \pm 3.89	45.03 \pm 5.48	39.8 \pm 56.63	17.97 \pm 3.97
t(F)			0.045	0.956	0.458	2.268
Contact experience	Yes	6 (0.7)	34.33 \pm 1.86	40.67 \pm 6.86	38.50 \pm 6.72	21.67 \pm 4.84
	No	864 (99.3)	36.90 \pm 3.89	45.11 \pm 5.58	39.82 \pm 6.66	17.99 \pm 4.00
t(F)/P			2.606	3.760	0.234	5.019*
Observation period	Yes	4 (0.5)	34.25 \pm 2.22	45.75 \pm 2.06	35.50 \pm 6.61	18.50 \pm 7.59
	No	866 (99.5)	36.90 \pm 3.89	45.07 \pm 5.61	39.83 \pm 6.65	18.01 \pm 4.00
t(F)			1.847	.058	1.687	0.059
Whether or not infected	Yes	3 (0.2)	37.00 \pm 2.83	37.50 \pm 4.95	40.00 \pm 1.41	21.50 \pm 0.71
	No	855 (98.3)	36.92 \pm 3.89	45.08 \pm 5.59	39.84 \pm 6.65	18.00 \pm 4.02
	Unclear	13 (1.5)	34.38 \pm 3.18	45.61 \pm 5.42	37.69 \pm 7.06	17.85 \pm 4.10
t(F)			2.739	1.898	0.668	0.765

N = number, SD = standard deviation, HH = herth hope, DAS = death anxiety scale, AC = active coping, PC = passive coping.

* $P < .05$, ** $P < .01$. $t = 5.019$, $P = .025$.

suspected or confirmed COVID-19 patients ($n = 6$), 0.5% reported that they were under observation ($n = 4$), 0.2% reported that they had been infected with COVID-19 ($n = 3$). Most (98.3%) participants reported that they had not been infected with COVID-19, and 1.5% reported that they were uncertain. Participants with contact experience with suspected or confirmed patients were more likely to adopt passive coping styles than participants without contact experience ($t = 5.019$, $P = .025$) (Table 1).

3.2. Hope, death anxiety scale, and active and passive coping

The mean HH score was above the moderate level ($M = 3.07$, $SD = 0.32$). Among the HH subscale scores, the highest score was

for inner positive readiness and expectancy, followed by interconnectedness with self and others, and the lowest score was for inner sense of temporality and future. The mean DAS score was also above the moderate level ($M = 3.01$, $SD = 0.37$). The following ranking of the subscale scores from high to low was observed: emotion state, cognition of death, time awareness, and stress and suffering. The mean active and passive coping scores were relatively low ($M = 2.84$, $SD = 0.48$ and $M = 2.25$, $SD = 0.50$, respectively) (Table 2).

3.3. Regression analysis of active and passive coping

The total scores for active and passive coping were the dependent variables. The independent variables were demographic characteristics, HH subscale scores and DAS subscale scores. The

Table 2
The scores of herth hope, death anxiety scale, active coping and passive coping (Mean \pm SD, N = 870).

Items	The number of items	The score of items	The mean score of items
HH	12	36.88 \pm 3.89	3.07 \pm 0.32
Inner positive readiness and expectancy	4	12.59 \pm 1.48	3.15 \pm 0.37
Interconnectedness with self and others	4	12.21 \pm 1.60	3.05 \pm 0.40
Inner sense of temporality and future	4	12.08 \pm 1.46	3.02 \pm 0.37
DAS	15	45.07 \pm 5.60	3.01 \pm 0.37
Emotion state	6	18.73 \pm 2.89	3.12 \pm 0.48
Cognition of death	3	8.91 \pm 2.11	2.97 \pm 0.70
Time awareness	2	5.86 \pm 1.62	2.93 \pm 0.81
Stress and suffer	4	11.58 \pm 2.23	2.89 \pm 0.56
Active coping	15	39.81 \pm 6.65	2.84 \pm 0.48
Passive coping	8	18.01 \pm 4.02	2.25 \pm 0.50

N = number, SD = standard deviation, HH = herth hope, DAS = death anxiety scale.

Table 3
Regression analysis of active coping, passive coping (N=870).

Independent variables	Dependent variables					
	Active coping			Passive coping		
	B(95% CI)	t	P	β	t	P
Constant	(0.601~1.767)	3.985	.000	(1.705~3.025)	7.037	.000
Gender1 (Male vs Female)	-0.021 (-0.135~0.068)	-0.654	.513	0.030 (-0.064~0.166)	0.876	.381
Age	-0.009 (-0.019~0.015)	-0.271	.787	0.073 (0.002~0.040)	2.129	.034
Residence1 (Rural vs City)	-0.037 (-0.103~0.031)	-1.044	.297	-0.067 (-0.143~0.009)	-1.730	.084
Residence2 (Town vs City)	-0.081 (-0.179~-0.012)	-2.246	.025	-0.013 (-0.111~0.078)	-0.346	.729
Minority1 (Han vs Minority)	0.007 (-0.111~0.138)	0.215	.830	-0.015 (-0.174~0.109)	-0.451	.652
Religion1 (Yes vs No)	-0.035 (-0.202~0.057)	-1.103	.270	0.056 (-0.022~0.270)	1.662	.097
Contact experience1 (Yes vs No)	0.008 (-0.304~0.397)	0.260	.795	0.063 (-0.012~0.780)	1.901	.058
Observation period (Yes vs No)	-0.023 (-0.595~0.270)	-0.738	.461	0.009 (-0.425~0.552)	0.255	.799
Infection1 (Yes vs No)	0.000 (-0.881~0.889)	0.009	.993	0.034 (-0.495~1.507)	0.992	.322
Infection2 (Unclear vs No)	0.012 (-0.196~0.285)	0.365	.715	0.014 (-0.215~0.329)	0.411	.681
Inner positive readiness and expectancy	0.168 (0.111~0.320)	4.048	.000	0.141 (0.073~0.310)	3.180	.002
Interconnectedness with self and others	0.070 (-0.022~0.188)	1.553	.121	-0.053 (-0.186~0.052)	-1.102	.271
Inner sense of temporality and future	0.195 (0.147~0.361)	4.654	.000	-0.159 (-0.340~0.098)	-3.546	.000
Emotion state	0.051 (-0.024~0.124)	1.324	.186	-0.027 (-0.112~0.055)	-0.671	.502
Cognition of death	-0.101 (-0.112~-0.024)	-3.047	.002	0.020 (-0.035~0.064)	0.574	.566
Time awareness	0.034 (-0.024~0.063)	0.901	.368	-0.090 (-0.105~0.007)	-2.223	.026
Stress and suffer	-0.006 (-0.069~0.059)	-0.147	.883	-0.038 (-0.106~0.038)	-0.933	.351
F		11.603			3.696	
P		0.000			0.000	

β refers to standardized regressive coefficient.

inclusion criterion was $\alpha=0.05$, and the exclusion criterion was $\alpha=0.10$. The enter method was used for analysis. The regression model was statistically significant ($P<.01$). The level of VIF (Variance Inflation Factor) of Active Coping and Passive Coping ranged from 1.104 to 2.131 and 1.015 to 2.131, respectively. When the level of VIF is no more than 10, there is no obvious issue of collinearity in regression.^[49]

Age, residence (town vs city), inner positive readiness and expectancy, inner sense of temporality and future, cognition of death and time awareness were statistically significant ($P<.05$). Older age, higher inner positive readiness and expectancy, lower inner sense of temporality and future and lower time awareness were predictors of passive coping styles. Living in a city (vs town), higher inner positive readiness and expectancy, higher inner sense of temporality and future and lower cognition of death were predictors of active coping styles (Table 3).

4. Discussion

The present study was performed between February and April 2020 in China. We examined nursing students' hope, death anxiety and simplified coping style scores during the outbreak of COVID-19 and the factors associated with the adoption of an active or passive coping style.

The findings indicated that participants with contact experience with suspected or confirmed COVID-19 patients were more likely to adopt passive coping styles than participants without contact experience. This difference may be related to the epidemiology and clinical characteristics of COVID-19. COVID-19 is highly transmissible, and the infection rate is high. Once infected, there is no specific drug available for treatment, and medical care primarily involves symptomatic supportive therapy.^[50] Therefore, participants with contact experience with suspected or confirmed patients are relatively powerless and more

likely to adopt a passive coping style. Few students reported being exposed in this study, and further examination of these results are needed. Such as whether students have sufficient knowledge of the disease. However, there was no significant difference in the HH, DAS or active and passive coping style scores based on the other demographic characteristics examined, for the following possible reasons. First, everyone faced the same dilemma of the sudden outbreak of COVID-19, and everyone was helpless. Second, this pattern was due to the unified, strict, effective lockdown and closed community management. Everyone had to stay at home, and the action trajectory was consistent. Third, the nature of the nursing profession and the improved quality of nursing education improved the professional quality of nurses and their sense of responsibility. Therefore, there were no large differences in their attitudes or coping styles in the context of public health emergencies.

Coping styles in the present study referred to specific responses and strategies taken according to certain purposes and expectations. Active and passive coping styles are often defined in terms of the effects of the specific responses and strategies during the outbreak of COVID-19.^[28,29] First, when the cities were under lockdown, all of the residents were confined to their homes, and everyone's coping style was limited. All coping styles were based on what people could do at home. Second, positive coping styles depend on the positive effects of specific responses and strategies. For example, an internet addiction may be a negative response or strategy, but during the period of the outbreak, this addiction may be the best way to obtain outside information and self pleasure. Therefore, coping styles fluctuated during the pandemic.

We also found that the mean hope score was above the moderate level, which differs from Alshraifeen et al^[51] but is consistent with Ripamonti et al^[52] This result is due to the different populations surveyed. HH is often used in patients,

especially cancer patients, who are greatly influenced by the symptoms and prognosis of the disease. The physical state of cancer patients strongly affects mental health.^[53] Previous studies showed that the HH score was related to age and education level, with younger age and higher levels of education correlating with higher HH scores.^[54,55] Among the HH subscale scores, the highest score was for inner positive readiness and expectancy, which indicated that nursing students had good psychological quality and positive goals, attitudes and actions in emergency situations. The lowest score was for inner sense of temporality and future, which suggests that nursing students are afraid and uncertain about their current and future situation. We should focus on enhancing their confidence in current and future situations. We also found that nursing students longed for love and care from their relatives, friends and society when facing difficulties, and they had a humanistic nature and a spirit of dedication and benevolence.

Previous studies showed that higher levels of hope played an important role in reducing negative emotions,^[56,57] because higher levels of hope led to lower anxiety levels. However, the mean DAS score was above the moderate level. This result may be related to the uncertainty of the mortality and prognosis of COVID-19.^[58] However, nursing students' deliberate avoidance of death increases their negative emotional experiences during emergencies, such as the COVID-19 outbreak.^[23] A prior study supported the hypothesis that death anxiety was a transdiagnostic construct that had no correlation with meaning in life or attachment style, and it was associated with various mental health conditions.^[59] In theoretical and practical courses, nursing students inevitably encounter content about death, which is not often discussed in traditional Chinese culture, and they may choose avoidance, but events related to death may cause them to think about death, which exacerbates negative emotions.^[58] Therefore, they are more likely to show emotional problems. Due to the development of hospice courses and the spread of death education, nursing students gain some understanding of death and time awareness, which reduces stress and suffering.

The mean active and passive coping scores were relatively low, but nursing students had an advantage in the adopting of active coping. The predictors of passive and active coping styles indicated that age may affect passive coping styles. Older participants had more pressure from employment and study, and stress and anxiety positively correlate with an individual's passive coping style.^[9] Participants who lived in cities had better healthcare and protective measures than participants who live in towns, and they tended to adopt active coping styles. However, nursing students with a lower inner sense of temporality and future easily lost purpose when facing a crisis and tended to adopt passive coping styles. In contrast, nursing students with a higher inner sense of temporality and future retained hope using active coping styles. Participants with lower time awareness scores have an insufficient understanding of the transience and finiteness of life and lack cognition of death. Therefore, they meet crises with passive coping styles. However, participants with higher inner positive readiness and expectancy tended to adopt both coping styles.

Active and passive coping styles are relative to the interpretation of the results, which means that active coping styles may produce negative results, and passive coping styles may produce ideal results. For example, the item "comfort themselves" is a form of passive coping that may relieve stress during a severe

crisis. The results of different coping styles depend on the time, event and individual.^[7,48]

4.1. Limitations

This study has several limitations. First, our use of non-probability sampling procedures and measures may have limited the representativeness of the study, but the study included a large number of participants. We performed the survey online via social networks to reach a wide research population in a short time during the COVID-19 crisis due to social distancing. However, this kind of online self-answered method may target certain socio-demographic groups. We tried to expand the sample size in high-risk areas after a summary evaluation of the socio-demographic variables. Second, the self-reported questionnaires may not truly reflect the thoughts of nursing students due to flaws in this method of data collection, but this limitation may not have negatively influenced the results. Finally, our conclusions are based on cross-sectional data, which resulted in a one-time measurement of the variables. Due to contact experience ($n=6$) and observation periods ($n=4$), the low sample size from these 2 groups may have impacted the conclusions of the results. We need more research results based on current instruments of death anxiety and hope to verify the trends and appearances during the outbreak. Previous studies were performed before the onset of the pandemic, and a subsequent large-scale longitudinal investigation in this population would be necessary to further our understanding of hope, death anxiety and coping style and to draw comparisons between different periods. Nevertheless, we believe that these limitations do not nullify our conclusions.

5. Conclusions

The findings of this study suggest that hope and death anxiety are important aspects of the coping styles of nursing students. One attribute of hope is spirituality, and hope is a very important part of clinical practice. Nursing students are the main force of the future of nursing development, and their death anxiety directly affects their attitude towards life. This finding suggests that nursing educators should emphasize the role of hope and further deepen the death education mode by implementing scientific and reasonable death education programmes to reduce the death anxiety level of nursing students. The present study also provides a theoretical basis for interventions and improvement in death education and coping styles. Based on these results, we did not construct a structural equation model due to the limited data for a framework linking the concepts of hope, death anxiety and coping. However, we hope to further elucidate the mechanism in future studies based on strong data.

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