

A Large-Scale Survey on Perceived Risk, Risk Emotions and Humanistic Care Needs Among Nurses During the Covid-19 Pandemic

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Purpose: The purpose of this study is to understand the risk perception, risk emotions and humanistic care needs of nursing staff during the Novel Coronavirus 2019 (Covid-19) pandemic.

Methods: A cross-sectional survey was conducted on the perceived risk, risk emotions and humanistic care needs of 35,068 nurses in 18 cities of the Henan Province, China. We collected a total of 35,188 questionnaires, of which 35,068 were effectively returned, with an effective return rate of 99.7%. The collected data were summarized and statistically analyzed using Excel 97 2003 and IBM SPSS software.

Results: Nurses' risk perceptions and emotions vary during the covid-19 pandemic. In order to provide nurses with targeted psychological intervention to prevent nurses from suffering from unhealthy mental states. The results show that the total score of the nurses' risk perceptions of Covid-19 was 3.66 ± 0.39 , the highest score of nurses' risk perception part is 5 points, and ≥ 3 points represent high risk and 88.3% of nurses believed that the Covid-19 risk was high. There were significant differences in the nurses' total perceived risk scores for Covid-19 based on gender, age, prior contact with patients with suspected or confirmed Covid-19 and previous participation in other similar public health emergencies ($P < 0.050$). Of the nurses included in the study, 44.8% had some level of fear relating to Covid-19 and 35.7% were able to remain calm and objective. There were significant differences in the total scores for risk emotions relating to Covid-19 based on gender, age and prior contact with patients with suspected or confirmed Covid-19 ($P < 0.050$). Of the nurses included in the study, 84.8% were willing to receive humanistic care and 77.6% of these expected to be provided with humanistic care by institutions in the healthcare sector.

Conclusion: Nurses with different basic data have different risk cognition and risk emotions. Different psychological needs should be considered, and targeted multi-sectoral psychological intervention services should be provided to help prevent nurses from developing unhealthy psychological states.

Keywords: Covid-19, public health emergencies, risk perception, risk emotion, humanistic care

Introduction

Covid-19 has had a severe negative impact on physical and mental health, the social economy, politics, culture and other aspects of human existence, COVID-19 not only harms physical and mental health, but also causes social and economic shrinkage, and has had a profound impact on human political culture.¹⁻³ Hospitals provide medical security and psychological services during public health emergencies. As the core force responding to public health emergencies, nurses are responsible for diagnosis, treatment and nursing work on the front lines in the fight against disease. There are more psychological stressors for those involved in the treatment, prevention and control of Covid-19 than in the general population because of the high exposure risk, heavy workload, closed working environment and traumatic stimulation.⁴ Therefore, nurses are at a higher risk of mental health problems and should receive more attention than the general

population.⁵ Risk perceptions refer to individuals' feelings about and understanding of various objective risks in their external environment.⁶ Risk perception research benefits risk analysis, risk assessment, risk management and other work.⁷ Therefore, studying the mechanism of risk perceptions and coping behaviours during public health events is of great significance.⁸

At present, research on risk perceptions of Covid-19 mainly focuses on the risk perceptions of the public,^{9–11} college students^{12,13} and young soldiers.^{14,15} There is a lack of research on nurses' risk perceptions, risk emotions and humanistic care needs. This study surveyed specialised nursing staff involved in Covid-19 pandemic prevention and control in the Henan Province to uncover their risk perceptions, risk emotions and humanistic care demands. We paid particular attention to nurses' mental health problems and the implementation of humanistic care to provide a reference for the establishment and improvement of responses to this significant public health emergency. This study provides a theoretical basis for the construction of a psychological support system for medical staff in public health emergencies.

Methods

Study Design and Sample

A questionnaire survey was used in this research to investigate the risk perceptions, risk emotions and humanistic care needs of nursing staff during the Covid-19 pandemic. Using the convenience sampling method, registered nurses from 18 cities in the Henan Province were selected as the subjects of this study. All the respondents gave informed consent to voluntarily participate in the survey. The inclusion criteria were as follows:

1. Registered nurses in hospitals in the Henan Province.
2. Nursing staff in secondary and tertiary hospitals having worked ≥ 1 year.
3. Nursing staff able to use smart mobile terminals to complete the questionnaire.
4. Nursing staff who provided informed consent.

The exclusion criteria were missing information ($>20.0\%$) or illogical answers on the questionnaire.

Ethical Considerations

Studies involving human participants are reviewed and approved by the medical ethics committee of the Henan Province People's Hospital (IRP approval number 2020–03-74). The study participants gave written informed consent to participate in the study. This study conformed to the ethical guidelines of the 1975 Declaration of Helsinki.

Measurements/Instruments

General Data

The questionnaire included questions on gender, age, region, marital status, hospital grade, working department, professional title, number of years working, education, health status, prior experience of public health emergencies and contact with patients with suspected or confirmed Covid-19.

Risk Perceptions, Risk Emotions and Humanistic Care Needs of Nursing Staff

Based on the theoretical system of emotional and cognitive evaluation,¹⁶ the questionnaire was a self-assessment jointly discussed and compiled by members of our research group, with extensive reference to the literature related to psychological stresses on medical personnel in public health emergencies. The questionnaire included three sections to evaluate the risk perceptions, risk sentiments and humanistic care needs of the nursing staff in relation to Covid-19.

The first part of the questionnaire dealt with risk perceptions of Covid-19 and consisted of five items, including the prevalence, severity, controllability, unpredictability and impact of Covid-19, scored on a five-point Likert scale. Each item with a score ≥ 3 was considered high risk and < 3 was considered low risk.

The second part dealt with risk emotions related to Covid-19 and included three aspects: calmness, fear and worry, with seven items in total. This was scored on a five-point Likert scale from very worried (1) to not at all worried (5), with a lower score indicating a higher level of risk emotions.

The third part dealt with humanistic care demands related to Covid-19, including whether the nurse would accept humanistic care, the content of the humanistic care needs and who would provide the care. Response options were “yes” or “no” for whether or not the nurse would receive humanistic care. For the content of the humanistic care, they were able to write what they felt they needed, and for who would provide the care, they were able to write the name of a provider. The questionnaire exhibited good reliability and validity, with a Cronbach's $\alpha = 0.78$.

Data Collection

Because of the need to prevent the spread and control the pandemic, from April 15 to April 20, 2020, relying on the Henan Nursing Association, the research group invited nurses who met the inclusion criteria to participate in an anonymous survey by filling in an electronic questionnaire on an online platform. The researcher set the start and end times for the electronic questionnaire and tracked the recovery of the questionnaires in the network background. The questionnaire used unified guidelines to explain the purpose and significance of the survey and clarify the requirements and precautions for filling out the questionnaire. We collected a total of 35,188 questionnaires for this survey. The missing values were correctly addressed and eliminate invalid questionnaires determined by logic error checks and filling time that is too short or too long. Invalid questionnaires were determined using logical error verification and questionnaires that had taken too long or not long enough to fill out were eliminated. Thus, a total of 35,068 questionnaires were effectively recovered, with an effective recovery rate of 99.7%.

Data Analysis

The data were exported from the network background, checked by two researchers, summarised and statistically analysed using Excel 97 2003 and IBM SPSS Statistics V21.0. Descriptive statistical analysis was conducted. Continuous variables were described by mean and standard deviation, and categorical variables, by absolute and relative frequency. Student's *t*-test was used to compare the means. The correlation between variables was assessed using the Pearson correlation coefficient (PCC). The adopted significance level was 5% ($p \leq 0.05$).

Results

Characteristics of the Participants

This study involved 35,068 nursing staff from 18 cities in the Henan Province, with approximately 1948 participants per city. The participants included 33,936 women and 1131 men, with an age range of 18–59 y and an average age of 32.09 ± 6.99 y. In this study, 14,444 participants worked in secondary hospitals and 20,624 worked in tertiary hospitals. Our survey showed that 64.8% of the nursing staff had a bachelor's degree and 61.2% were primary care nurses. A total of 10,521 were in the internal medicine department, 7581 in the surgical department, 2676 were operating room nurses and 2585 were intensive care unit nurses. Other participants worked in the emergency department (1650, 4.7%), infectious disease department (660, 1.9%), outpatient department (1593, 4.5%) and other departments (7802, 22.3%). During the two weeks prior to the survey, 2541 nurses developed cold and flu symptoms and 6230 had been in contact with patients with suspected or confirmed Covid-19. A total of 5908 nurses had prior work experience in public health emergency treatment.

Risk Perception of Covid-19 Among Nursing Staff

The total score for the nurses' Covid-19 risk perception was 5, and the average was 3.66 ± 0.39 . The scores of 88.3% of the respondents were categorised as high risk (total average score ≥ 3 points; see Table 1).

There were significant differences in the total Covid-19 risk perception scores based on gender, age, exposure to patients with suspected or confirmed Covid-19 and prior experience in similar public health emergencies ($P < 0.05$). Female nurses scored higher than male, nurses aged ≤ 30 y scored higher than those aged >30 y, nurses who had been

Table 1 Risk Perception of COVID-19 Among Nursing Staff (n =35,068)

Items	Scores ($\bar{x} \pm S$)	Item Score ≥ 3 Points Number(%)
I think the COVID-19 situation is very serious in my area. ^a	3.55 \pm 0.80	32,571(92.9)
I have a general understanding of the COVID-19 situation. ^b	3.72 \pm 0.68	34,308(97.9)
It can have a very serious effect on your body if you are infected. ^c	4.52 \pm 0.90	32,972(94.1)
It's very likely that COVID-19 will kill the patient. ^c	3.88 \pm 0.75	32,236(92.0)
The COVID-19 epidemic and its spread are very difficult to control. ^b	2.64 \pm 0.93	17,922(51.1)
Total score ^b	3.66 \pm 0.39	30,944(88.3)

Notes: ^aRepresenting 35,050 valid candidates; ^bRepresenting 35,044 valid candidates; ^c Representing 35,047 valid candidates.

Table 2 Demographic Differences in COVID-19 Risk Perception Scores of Nursing Staff

Variables	Categories	COVID-19 Risk Perception Scores	t	p
Gender	Men	3.57 \pm 0.41	-8.47	0.000
	Women	3.67 \pm 0.38		
Age, y	≤ 30	3.68 \pm 0.41	9.52	0.000
	>30	3.65 \pm 0.40		
Suspected/confirmed COVID-19 patients	Yes	3.69 \pm 0.39	4.94	0.000
	No	3.66 \pm 0.38		
Participated in other similar public health emergencies	Yes	3.65 \pm 0.40	-1.98	0.048
	No	3.66 \pm 0.38		

exposed to patients with suspected or confirmed Covid-19 scored higher than those who had not and nurses who had no prior experience in similar public health emergencies scored higher than those who had prior experience (see Table 2).

Nurses' Risk Emotions Toward Covid-19

For statistical purposes, we classified nurses who chose “very worried” or “worried” as “yes” and those who chose “not worried” or “not at all worried” as “no”. Based on the percentage of nurses who were classified as “yes”, 44.8% exhibited some degree of fear and 35.7% were able to remain calm and objective. The main concerns of caregivers regarding the impact of Covid-19 were, in descending order, the severity of Covid-19 (80.3%), the impact of Covid-19 on their lives and work (72.8%), the economic impact of Covid-19 (72.2%), the health of their families (69.5%), personal infection with Covid-19 (60.1%) and personal health (48.9%).

Table 3 Demographic Differences in Emotional Status Risk to Nurses for COVID-19

Variables	Categories	COVID-19 Risk Perception Scores	t	p
Gender	Men	2.35 \pm 0.80	5.42	0.000
	Women	2.23 \pm 0.69		
Age, y	≤ 30	2.20 \pm 0.70	-8.97	0.000
	>30	2.27 \pm 0.70		
Suspected/confirmed COVID-19 patients	Yes	2.18 \pm 0.71	-6.16	0.000
	No	2.24 \pm 0.70		
Participated in other similar public health emergencies	Yes	2.24 \pm 0.73	0.78	0.436
	No	2.24 \pm 0.70		

Humanistic Care Needs of Nursing Staff

A total of 84.8% of nurses felt that they needed humanistic care. The content they demanded, in descending order, related to Covid-19 panic, fear, anxiety and other negative emotions (82.2%); compulsive worry about oneself and one's family being infected (80.8%); doubt, panic, anger, loneliness and other negative emotions related to isolation (59.6%); excessive hoarding of masks and disinfectant supplies and irrational behaviour (47.7%); and gastrointestinal disorders, insomnia, decreased appetite and other somatic symptoms (44.6%). The institutions from which nurses expected to receive humanistic care measures were the health sector (77.6%), academic groups related to humanistic care (75.9%), Health education professional organization (54.2%), civil administration groups (52.7%), social groups (42.7%) and the education sector (40.7%; see Table 4).

Female nurses scored significantly higher than male nurses in five categories: negative emotion ($\chi^2 = 8.76, p < 0.005$), obsessive thinking ($\chi^2 = 9.55, p < 0.050$), isolating emotions ($\chi^2 = 21.01, p < 0.001$), irrational behaviours ($\chi^2 = 32.84, p < 0.001$) and somatic symptoms ($\chi^2 = 8.48, p < 0.050$).

Nurses aged ≤ 30 y scored significantly higher than those aged > 30 y in negative emotions ($\chi^2 = 96.65, p < 0.001$), isolation emotions ($\chi^2 = 490.98, p < 0.001$), irrational behaviours ($\chi^2 = 569.94, p < 0.001$) and somatic symptoms ($\chi^2 = 269.71, p < 0.001$).

Nursing staff who had been in contact with patients with suspected or confirmed Covid-19 scored significantly higher than those who had not on isolation emotions ($\chi^2 = 63.12, p < 0.001$) and somatic symptoms ($\chi^2 = 78.43, p < 0.001$).

Table 4 Humanistic Care Needs of Nursing Staff

Options	Items	Numbers (%)	Gender		Gender		Suspected/Confirmed COVID-19 Patients		Suspected/Confirmed COVID-19 Patients	
			Men (%)	Women (%)	≤ 30 (%)	> 30 (%)	Yes (%)	No (%)	Yes (%)	No (%)
Humanistic care needs content	Negative feelings ¹⁾	28,819 (82.2)	892 ^a (78.9)	27927 ^a (82.3)	15037 ^a (84.2)	13782 ^a (80.1)	5093 (81.7)	23,726 (82.3)	4766 ^a (80.7)	24053 ^a (82.5)
	Obsessive-compulsive thoughts ²⁾	28,318 (80.8)	873 ^a (77.2)	27445 ^a (80.9)	14,453 (80.9)	13,865 (80.6)	5060 (81.2)	23,258 (80.7)	4768 (80.7)	23,550 (80.8)
	Feelings caused by the quarantine ³⁾	20,917 (59.6)	749 ^a (66.2)	20168 ^a (59.4)	11676 ^a (65.3)	9241 ^a (53.7)	3995 ^a (64.1)	16922 ^a (58.7)	3512 (59.4)	17,405 (59.7)
	Irrational behaviors ⁴⁾	16,722 (47.7)	634 ^a (56.1)	16088 ^a (47.4)	9637 ^a (53.9)	7085 ^a (41.2)	3011 (48.3)	13,711 (47.5)	2747 ^a (46.5)	13975 ^a (47.9)
	Somatization symptoms ⁵⁾	15,631 (44.6)	552 ^a (48.8)	15079 ^a (44.4)	8729 ^a (48.8)	6902 ^a (40.1)	3092 ^a (49.6)	12539 ^a (43.5)	2764 ^a (46.8)	12867 ^a (44.1)
Department expected to provide humanistic care	The health sector	27,213 (77.6)	962 ^a (85.1)	26251 ^a (77.4)	14177 ^a (79.3)	13036 ^a (75.8)	4905 ^a (78.7)	22308 ^a (77.4)	4598 (77.8)	22,615 (77.6)
	Academic groups related to humanistic care	23,108 (65.9)	688 ^a (60.8)	22420 ^a (66.1)	11541 ^a (64.6)	11567 ^a (67.3)	4051 (65.0)	19,057 (66.1)	4083 ^a (69.1)	19025 ^a (65.2)
	Health education professional organizations	19,017 (54.2)	563 ^a (49.8)	18454 ^a (54.4)	9562 ^a (53.5)	9455 ^a (55.0)	3391 (54.4)	15,626 (54.2)	3386 ^a (57.3)	15631 ^a (53.6)
	Civil affairs departments	18,489 (52.7)	718 ^a (63.5)	17771 ^a (52.4)	9875 ^a (55.3)	8614 ^a (50.1)	3382 ^a (54.3)	15107 ^a (52.4)	3119 (52.8)	15,370 (52.7)
	Social groups	14,958 (42.7)	493 (43.6)	14,465 (42.6)	7979 ^a (44.7)	6979 ^a (40.6)	2705 (43.4)	12,253 (42.5)	2637 ^a (44.6)	12321 ^a (42.3)
	Education departments	14,279 (40.7)	526 ^a (46.5)	13753 ^a (40.5)	7722 ^a (43.2)	6557 ^a (38.1)	2637 ^a (42.3)	11642 ^a (40.4)	2470 (41.8)	11,809 (40.5)

Notes: Negative feelings¹⁾ means Negative feelings of panic, fear, and anxiety related to COVID-19; Obsessive-compulsive thoughts²⁾ means Obsessive-compulsive thoughts about catching an infection and passing it to one's family; Feelings caused by the quarantine³⁾ means Feelings of doubt, panic, anger, or loneliness caused by the quarantine; Irrational behaviors⁴⁾ means Irrational behaviors such as excessive hoarding of masks, disinfectants, and daily necessities; somatization symptoms⁵⁾ means Gastrointestinal disorders, insomnia, decreased appetite, and other somatization symptoms. "a" means statistically significant.

Those who had not previously participated in public health emergencies scored higher than those who did not on negative emotions ($\chi^2 = 11.06, p < 0.001$) and irrational behaviours ($\chi^2 = 4.02, p < 0.050$) and scored lower on somatic symptoms ($\chi^2 = 14.05, p < 0.001$).

Discussion

Perceived Risk Status of Nurses During the Covid-19 Outbreak

Nurses' risk perceptions of a public health emergency refer to their own assessment of the nature, extent and possible hazards of the emergency and their individual evaluations of the resources available to help them cope in the face of the emergency.¹⁷ In the survey, 88.3% of the nurses perceived Covid-19 as a high risk. The maximum score for the risk perception component is 5 points. A mean score ≥ 3 is considered high risk. As mentioned earlier, 65.3% of the respondents had a bachelor's degree, and another 16.8% indicated that they had Significant experience in emergency treatment. This may be because the study subjects were medical professionals, and the government has taken measures to popularise knowledge related to Covid-19 and organise professional training. Public health emergency information and related professional knowledge acquisition are positive determinants of risk cognition. Research subjects had high risk perceptions, which was conducive to them actively seeking more information about Covid-19 and adopting health-promoting behaviours to better cope with Covid-19. However, 11.7% of the nurses in this study still lacked risk cognition, which needs to be improved. Liu¹⁸ showed that the core emergency response capacity of Chinese medical personnel for major infectious diseases was at a low level and urgently needed to be improved.

Female nurses scored higher than male nurses, which may be related to the tendency of females to have more sensitive personality traits. The results of this research were supported by similar research.^{19,20} Nurses aged ≥ 30 y had more clinical experience and a lower fear of the disease. Workers who had been in contact patients with suspected or confirmed Covid-19 were at greater risk and, therefore, had a more fear of the disease. Nurses who had previously participated in public health emergencies were more familiar with emergency management than those who had not, so they were less fearful of Covid-19. A relatively high level of fear will cause nurses to pay more attention to Covid-19, which will help to improve their risk perceptions. Therefore, it is necessary to carry out targeted interventions on the risk awareness level of nursing staff, such as teaching to increase nurse knowledge, organizing competitions, conducting public health emergency risk assessment, and conducting nurse rescue skills training. There is also a need to provide cognitive interventions to help nurses learn psychological and behavioral skills to respond to public health events.

Nurses Risk Emotions During the Covid-19 Pandemic

Medical personnel and rescue workers have been shown to be prone to psychological problems.²¹ Nursing staff working on the front lines during the Covid-19 outbreak exhibited mental stress reactions,^{22,23} and it has been shown that stimuli can provoke emotional reactions when an individual is under pressure. According to the results of this survey, in the face of the Covid-19, the first reaction of 44.8% of nurses was a degree of fear while 35.7% remained calm and objective. The reason for this may be that different individuals respond differently to stressful events. An individual's perception of the severity of the risk does not necessarily increase with an increase in the intensity of the stressor.

In public health emergencies, it has been shown that healthcare workers commonly experience negative emotions.¹⁸ Our survey showed that the concerns of the nursing personnel regarding the Covid-19 outbreak primarily focused on its severity, the risk of becoming infected with Covid-19 while working, personal health and family health. The appropriate degree of concern reflected the nurses' attention to their own health and that of their families. This concern encourages nurses to take protective measures to ensure the safety of themselves and their families. Due to the outbreak of COVID-19, the spatial and psychological distance between public health emergencies and nursing staff has been reduced. Covid-19 has caused nurses' psychological stress and negative emotions, and excessive psychological stress has negatively affected nurses' work and health. However, a certain level of negative emotions can increase nurses' psychological alertness, which can result in positive changes in their work.¹⁷ This suggests that we should take psychological interventions to help nurses maintain stress at an appropriate level to create positive psychology, guide the development of psychological interventions and positive competencies for public health events,

and train and guide nurses to develop stable and positive professional psychological group responses in infectious medical emergencies.

Humanistic Care Demands of Nurses During the Covid-19 Outbreak

The results suggested that nurses had a variety of negative emotions and needed humanistic care. The nurses who come into contact with patients with Covid-19 were more likely to have psychological problems, such as panic, fear and anxiety. Therefore, it is necessary to conduct targeted consultation on the psychological problems caused by Covid-19 and provide humanistic care. In terms of humanistic care, consideration should be given to giving professional recognition to nurses, accepting the suggestions and opinions of nurses as members of the health care department, coordinating professional psychological care and communication among multiple departments, and creating a healthy and positive psychological atmosphere.

The results of this study showed that female nurses aged <30 y, nurses who had been in contact with patients with suspected or confirmed Covid-19 and nurses who participated in public health emergency work required more psychological and humanistic care. From the perspective of departments providing humanistic care, nurses are more likely to accept humanistic care provided by professional and authoritative organisations. In clinical work, staff need to be provided with an environment that allows for rest and the opportunity to engage in sporting activities, and a mental health team needs to be established to help staff cope with the stresses of their work. These measures will help medical staff to achieve good mental status, which will enable them to continue to perform their duties during an outbreak.^{24–26} When facing a public health emergency, nurses dealing with insufficient resources and mental reserves tend to experience negative emotions and responses. Therefore, medical and healthcare systems need to be established to support nurses involved in public health emergencies, using modern methods to improve nurses' early-warning mechanism relating to their mental health and to regularly monitor their mental status. The development and operation of a humanistic care team requires the joint efforts of multiple departments. Therefore, relevant departments should pay attention to the close relationship between physiology, society and psychology. In addition to strengthening the medical knowledge of nurses, it is also necessary to pay attention to the cooperation of professionals in psychological, social and humanistic nursing institutions to provide humanistic care for nurses in the epidemic.

Limitations

This study has some limitations. It was a cross-sectional study and therefore did not observe the nurses' long-term psychological changes. Longitudinal research should be carried out as a follow-up to this research. The self-report evaluation method of this study may lead to bias.

Conclusions

Nursing staff in the Henan Province of China perceive Covid-19 as high risk, but this risk perception can still be improved to promote nurses' health protective behaviours. However, nurses had a variety of risk emotions, which can have negative effects, and there were differences in risk perceptions and emotions among the nurses. The results showed that it is necessary to provide targeted psychological help to nurses and to particularly pay attention to the psychological status of female nurses aged <30 y who have not previously been involved in public health emergency assistance and have been in contact with patients with Covid-19. Nurses are more inclined to obtain humanistic care if it is provided by authoritative departments, such as the healthcare sector and the academic community. This result suggests different psychological needs should be considered to provide targeted multi-sectoral psychological intervention services and help prevent unhealthy psychological states in nurses.

Relevance for Clinical Practice

This study investigated the risk perceptions, risk emotions and humanistic care needs of hospital nurses during the Covid-19 outbreak in China and compared them based on demographic characteristics. The key aspects of nurses' risk perceptions and risk emotions during the epidemic were obtained, and the related factors were discussed. The findings could provide

useful advice to policymakers during the Covid-19 pandemic and help them to implement tailored interventions to improve the mental health of nurses.

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Disclosure

The authors report no conflicts of interest in this work.

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