Influencing Factors for Nursing Students' Anxiety During COVID-19 Pandemic

Yang Xue[a], He Feng[b],*

International College, Krirk University, Thailand
[a]895141982@qq.com, [b]fengheysn@163.com
*Corresponding author

Keywords: COVID-19, Nursing Student, Anxiety, Nurse Education

Abstract: Objective: This study was conducted to investigate the anxiety status of nursing students during the COVID-19 epidemic and analyze the influencing factors in order to provide the basis for psychological intervention. Methods: A cross-sectional study was conducted on school nursing students using a convenience sampling method with a self-administered questionnaire and the Self-rating Anxiety Scale (SAS). Results: During the COVID-19 pandemic, nursing students' SAS scores were 38.93 ±7.53, which were higher than those of the Chinese normative anxiety level and lower than those of nursing students during the SARS pandemic. During the COVID-19 epidemic, education (p = 0.003), perception of media coverage of COVID-19 (p = 0.010), knowledge of COVID-19 (p = 0.001), and the effect of COVID-19 on employment intentions (p = 0.001) were all influential factors of anxiety. Conclusion: The COVID-19 pandemic has had an impact on the psychology of nursing students, and measures are needed to alleviate nursing student anxiety, especially among college and university students. Students who believe the epidemic is more serious than the news report and students who lack COVID-19-related knowledge need to be given more attention, guided to a correct understanding of the news reports, and actively carry out COVID-19-related health education and psychological interventions in conjunction with the actual situation.

Corona virus disease 2019(COVID-19) [1] is caused by the new coronavirus (SRAS-COV-2) infection caused by the clinical manifestations of fever, cough, muscle aches as common symptoms, a small number of cases of diarrhea, nausea, vomiting of acute infectious diseases, mainly through respiratory droplets, can also be transmitted through contact transmission and even digestive tract transmission, rapid transmission, wide range of infection [1-3]. At present, the virus is still circulating in many countries and regions around the world, and with the continuous mutation and continuous spread of the virus, it seriously affects social public health security and has attracted widespread concern [4-5]. The virus caused a certain degree of social panic during the epidemic in China, and the study showed that for the study of people aged 18~59, 98.54% of the respondents were afraid of the virus, and 94.45% expressed concern that their family members or themselves were infected by the virus. The Psychosomatic Medicine Branch of the Chinese Medical Association (2020)[6] pointed out that sudden public health epidemics will be accompanied by psychological trauma crises, seriously affecting the prevention and control of the epidemic, social

stability and safety. The study by Chang Jinghui et al. (2020) [7] pointed out that college students have different degrees of anxiety under the COVID-19 epidemic. Anxiety is an unpleasant complex emotional state such as tension, restlessness, worry, and annoyance caused by an individual's inability to cope with imminent or existing threats or dangers [8], which will lead to psychological stress response, Mao Fuqiang et al. (2004) [9] The study found that college students will have more serious psychosomatic symptoms during the SARS epidemic, which should attract great attention and attention. In order to understand the anxiety state of nursing students during the COVID-19 epidemic, a survey of nursing students was conducted to understand the anxiety status of nursing students during the COVID-19 epidemic and explore relevant influencing factors, so as to provide a basis for institutions to better understand mental health when responding to emergencies, actively carry out mental health work, and provide psychological intervention for students.

1. Information and Methodology

1.1 Survey Subjects

From March 1, 2020 to March 1, 2022, convenient sampling methods were adopted to select secondary school, junior college and undergraduate nursing students. Inclusion Criteria: ① nursing students; ② Students who voluntarily participate in this research. Exclusion Criteria: Students with a clear diagnosis of mental illness.

1.2 Method

With the help of the Questionnaire Star network survey platform, a questionnaire survey was conducted among nursing students. In order to avoid nursing students submitting questionnaires repeatedly, each WeChat account can only submit it once. In this study, a total of 1378 questionnaires were collected and screened according to the answering time and options, and the questionnaires with too short answering time <60s were excluded, and the questionnaires with obvious regularity between the options were excluded. In the end, 1167 valid questionnaires were collected, and the pass rate of the questionnaire was 85%.

1.3 Survey Tools

Self-developed general information questionnaire Include the basic personal information of the nursing student: age, education level, grade; and students' views on news and public opinion, their understanding of diseases, and the impact of disease epidemics on employment intentions.

Self-rating anxiety scale, SAS (William W.K. Zung.1971)[10] The subjects were asked to fill in 20 entries truthfully based on their feelings in the past week. All entries are scored 1-4 points from "little or no time" to "most or all time", with 2, 5, 6, 11, 12, 14, 16, 17, 18 and 20 being reverse scoring entries. Anxiety standard score (reserved integer) = (selected option score sum) × 1.25, higher scores indicate more severe anxiety, and standard score results indicate ≥50 points indicate anxiety. 50~59 is divided into mild anxiety, 60~69 is moderately anxious, and ≥70 is divided into severe anxiety. This scale is widely used to measure anxiety levels and has good reliability and validity.

1.4 Statistical Methods

The questionnaire stars are exported to Excel, invalid questionnaires are eliminated, and the data is double-checked and the score is determined. Data analysis is carried out using the SPSS 25.O

software package. Counting data is expressed in frequency and percentage; the measurement data follow the normal distribution and are represented by 'x $\pm$ s, and the t-test or ANOVA are used for comparison between groups. Variables with statistical differences in univariate analysis were selected for inclusion in multiple linear regression analyses. The two-sided test was taken and the difference was statistically significant with P<0.05.

2. Outcome

2.1 General Information and Anxiety Scores of Nursing Students

Among the 1167 nursing students surveyed, 1051 (90%) came from Sichuan Province and 116 (10%) from other regions, with an average age of (19.65±1.44) years, as shown in Table 1. The average score of SAS standard for nursing students was (43.08±6.95) points, which was statistically significant compared with the domestic norm (29.78+0.46) [11] (P=0.00). Among them, there were 189 students with a standard ≥score of 50 points, and the detection rate of anxiety was 16.19%, as shown in Table 2.

Table 1: General information of nursing students (n=1167)

Variables		n(%)
Gender	Female	1054(90.3)
	Man	113(9.7)
Age (years)	≤18	295(25.3)
	>18	872(74.7)
Academic qualifications	Secondary School	125(10.7)
	College	944(80.9)
	Undergraduate	98(8.4)
Opinions on media coverage of COVID-19	The outbreak is less severe than reported	111(9.5)
	The outbreak is consistent with the reported outbreak	951(81.5)
	The epidemic is more serious than reported	105(9.0)
Knowledge of COVID-19	Don't know	5(0.4)
	Know but not familiar with it	435(37.3)
	Know and can explain to others	727(62.3)
Impact of COVID-19 on employment intentions	No effect	909(77.9)
	Yes	258(22.1)

Table 2: Anxiety in nursing students compared to normative model

	SAS ($\overline{x} \pm s$)	n	P
nursing students	43.08±6.95	1167	0.000
normative model	29.78±0.46		

2.2 Factors Related to Anxiety Scores for Nursing Students during the COVID-19 Pandemic

Univariate analysis of the results showed that there were statistically significant differences in anxiety scores between educational background (p=0.003), perceptions of COVID-19 in media coverage (p=0.010), awareness of COVID-19 (p=0.012), and impact of COVID-19 on employment

intention (p<0.001). There were no significant differences in anxiety levels among nursing students of different ages and genders (P = 0.529, 0.759) , as shown in Table 3.

Table 3: Single factor analysis of SAS scores of nursing students

Variables		SAS Scores	t/F	p
Gender	Female	43.04±6.75	0.630	0.529
	Man	43.48±8.63		
Age (years)	≤18	43.19±7.00	-0.307	0.759
	>18	43.05±6.95		
Academic qualifications	Secondary School	43.94±6.86	5.971	0.003[*]
	College	43.20±6.79		
	Undergraduate	40.89±8.20		
Opinions on media coverage of COVID-19	The outbreak is less severe than reported	42.55±6.69	4.635	0.010[*]
	The outbreak is consistent with the reported outbreak	42.93±6.72		
	The epidemic is more serious than reported	45.09±8.82		
Knowledge of COVID-19	Don't know	50.80±9.44	4.427	0.012[*]
	Know but not familiar with it	43.48±6.77		
	Know and can explain to others	42.80±7.02		
Impact of COVID-19 on employment intentions	No effect	42.54±6.60	5.028	<0.001[*]
	Yes	44.98±7.78		

*p<0.05

2.3 Linear Regression Analysis of Nursing Student Anxiety Scores

The regression model was constructed by taking the SAS score of nursing students as the dependent variable and the grouping data with differences in univariate analysis as the independent variable (see Table 4 for assignment). The coefficient of determination (R-square) was 0.038, indicating that the proportion of the model that could explain the dependent variable was 3.8%, and multivariate analysis suggested that during the COVID-19 epidemic, educational background (p=0.004), perception of COVID-19 in the media coverage of COVID-19 (p=0.006), awareness of COVID-19 (p=0.035), and the impact of COVID-19 on employment intention (p <0.001) were all contributing factors. See table 5 for details.

Table 4: Variable assignment table

Variables	Assignment
Academic qualifications	Secondary School=1; College=2; Undergraduate=3
Opinions on media coverage of COVID-19	The outbreak is less severe than reported=1
	The outbreak is consistent with the reported outbreak=2
Knowledge of COVID-19	The epidemic is more serious than reported=3
	Don't know=1
	Know but not familiar with it=2
Impact of COVID-19 on employment intentions	Know and can explain to others=3
	No effect=1
	Yes=2

Table 5: Linear regression analysis of SAS scores of 51167 nursing students

Variables	B	Standard error	Beta	t	*p*	95%CI	
						Upper	Lower
Academic qualifications	-1.324	0.460	-0.083	-2.878	0.004*	-2.227	-0.421
Opinions on media coverage of COVID-19	1.271	0.460	0.079	2.729	0.006*	0.357	2.185
Knowledge of COVID-19	-0.856	0.406	-0.061	-2.109	0.035*	-1.652	-0.060
Impact of COVID-19 on employment intentions	-2.427	0.483	-0.145	-5.022	<0.001*	-3.375	-1.479
Constants	49.727	1.859		26.749	<0.001*	46.079	53.374

*p<0.05

3. Discuss

3.1 Anxiety Levels Were Higher Among Nursing Students During the COVID-19 Pandemic

The survey suggests that the anxiety level of nursing students during the COVID-19 epidemic is lower than during the SARS epidemic and higher than the Chinese norm. Among the 1167 subjects, the detection rate of anxiety was 16.19%, and the gross score of anxiety was higher than that of the Chinese norm [11], and lower than the anxiety level of SARS nursing students [11-12]. In fact, the number of infections and deaths during the COVID-19 epidemic far exceeded that during the SARS epidemic, but the epidemic has been brought under control due to timely and effective prevention and control measures taken by the state [13]. Effective prevention and control measures, a sound epidemic prevention system, and the openness and transparency of epidemic information have a certain impact on alleviating the anxiety level of nursing students. The nursing students who participated in the survey, as a student group, rarely bear the main economic and living pressure of the family, most of them are still raised by their parents, the environment in which they are isolated at home is relatively safe, and they also have a certain degree of understanding and mastery of CPVID-19 epidemic prevention knowledge.

3.2 Multiple Factors Influence the Anxiety level of Nursing Students during the COVID-19 Pandemic

3.2.1 The Level of Anxiety in Nursing Students Correlates with the Level of Knowledge of the Disease

This study found that nursing students who can master COVID-19-related knowledge and can explain communication to others, and the level of anxiety is lower, consistent with the study of Fu Chunjiang et al. [17], indicating that the more thorough and comprehensive the nursing students' understanding of COVID-19-related knowledge, the more protective measures are in place, the better their psychological state, the stronger their self-confidence, and the more positive they can face the current epidemic. The research of Zou Xiaohui et al. [14] shows that medical students still have limited knowledge of COVID-19 and a large learning space, and this study also found that some nursing students still do not understand or partially understand COVID-19-related knowledge, so they can not apply what they have learned, let alone spread the knowledge they have learned to help others. Therefore, through various forms of health education lectures, nursing schools carry out targeted explanations and practices according to the key and difficult points of the epidemic, especially students who do not have good knowledge need to actively pay attention and focus on help, "knowing oneself and knowing the other, and fighting a hundred battles" is an effective way to

reduce the anxiety level of nursing students.

3.2.2 The Level of Anxiety for Nursing Students Correlates with Academic Qualifications

This study found that the anxiety level of undergraduate nursing students was lower than that of secondary nursing students and junior college nursing students (Table 3), which was inconsistent with the survey results of Li Xiaolin et al. (2004) [11] during the SARS epidemic, which showed that undergraduate students had a high level of anxiety, which may be caused by the fact that undergraduate students and older college students spend more time in clinical practice. During the new crown epidemic, whether it is undergraduate students, college students or secondary school students, they have not entered the clinic, and part of the time is taught online, which reduces the psychological pressure of students to enter clinical practice and the fear of directly facing viruses and diseases, reduces the risk factors for infection associated with hospitals, and improves students' sense of security. In addition, secondary school students are relatively small in grade and have a more unstable emotional state; College students have less than one year less than undergraduate students, which may be age-related, with age, more experience, social adaptability enhanced, help to improve psychological endurance, the older the better the mentality in the face of emergency events, which is consistent with the research results of Chang Jinghui et al. (2020) [7].

3.2.3 Media Coverage is Associated with Different Views

Further analysis found that undergraduate nursing students and secondary nursing students had the same views on news reports (p=0.58), and were more likely to think that the epidemic was consistent with news reports, while college nursing students were more likely to think that the epidemic was milder than news reports. Since the outbreak of the epidemic, overwhelming news reports have appeared on TV and social platforms, and people cannot avoid contact with various news reports about the epidemic, coupled with a place that is strictly guarded, it is easy for students to misunderstand, and they always feel that the epidemic is more serious than expected. Nursing students who believe the outbreak is mild than news reports are more likely to downplay the destructiveness of COVID-19. Nursing students who think that the epidemic is more serious than news reports, constantly make up for the severity of the epidemic in their hearts, invisibly put more pressure on themselves, and their anxiety levels have also increased. At present, the public opinion environment is free, the epidemic data is released in real time, and the news reports on official channels are authentic and reliable, and students should be guided to view news reports objectively.

3.2.4 Effect on Career Aspiration with Increasing Anxiety Levels

In this survey study, most nursing students had no effect on employment intention, or some nursing students felt that they had an impact on employment intention, and the anxiety level was significantly higher than that of students without effect, which is different from the study of Wang Qing et al. (2021), Xu Zhengqin et al. (2020) [15-16] showing that employment intention was not affected. The reason for this may be that this study began to collect data at the height of the COVID-19 epidemic, when the epidemic was fierce, spread quickly, and spread widely (Chen N, Zhou M, Dong X, et al.2020)[1], which caused psychological stress and anxiety among students, resulting in an impact on employment intentions. In addition, with the extension of the COVID-19 epidemic, the time for nursing students to enter clinical clerkships or internships is also relatively prolonged, and due to the reduction of practice time, they are afraid of entering the clinic, and they are easy to be confused about subsequent employment, thus affecting their willingness to work. Nursing students' professional cognition should be strengthened, operational training should be strengthened, career planning should be included, and employment willingness should be enhanced.

4. Conclusion and Exploration

4.1 Nursing Students at all Educational Levels have Increased Anxiety Levels during the Epidemic of acute Infectious Diseases, and Schools Should Pay Attention to it and Actively Take Effective Countermeasures

Nursing students had higher levels of anxiety than norm during both the SARS epidemic and the COVID-19 epidemic [17-18]. As a reserve force for medical teams, it is especially important for nursing students to remain calm during the pandemic. Schools shall conduct long-term training and training for students in two periods. (1) Special epidemic control stage: 1) Use multimedia platforms to strengthen nursing students' learning of COVID-19 knowledge, carry out online courses to explain the clinical manifestations, transmission routes, and correct epidemic prevention knowledge of COVID-19, fill the knowledge gaps of nursing students, and improve students' independent learning ability. 2) At the same time, students should be guided to view news reports correctly, understand the channels of students' information sources, do not pay too much attention to negative reports of the epidemic, call on students not to believe in rumors and spread rumors, and cultivate the ability to think independently. 3) Schools or hospitals should regularly push the glorious deeds of front-line nursing staff to enhance the sense of professional identity of nursing students. 4) Ji Xiaoqin et al. pointed out that the anxiety level of nursing students who participated in clinical practice was higher than that of nursing students who did not participate in clinical practice [19]. Hospitals should focus on training nursing students who are still on duty during the epidemic, provide them with sufficient protective equipment, guide students to do effective prevention and control measures while providing high-quality nursing services for patients, pay attention to the psychological changes of nursing students, provide psychological support for nursing students in a timely manner, and carry out individual psychological interventions, such as online psychological interventions, based on actual conditions. 5) For students with anxiety, schools should open green channels for online psychological counseling, and encourage students to seek help from family, friends, teachers, and psychological counselors in time to relieve anxiety in time. Inform nursing students of the importance of staying relaxed and getting enough sleep to reduce anxiety [20]. If anxiety affects normal study and life, seek professional help in time. 6) Nursing students during home isolation should actively exercise to strengthen their own resistance, reduce the risk of infection with new coronary pneumonia and achieve the purpose of diverting attention. (2) Normalization and control stage of the epidemic: All colleges and universities can timely update the knowledge publicity of the new crown virus and the study of policies and regulations, carry out epidemic prevention and control scenario drills for key and difficult points, strengthen the practice and assessment of putting on and taking off isolation clothing, and identify the application of various epidemic prevention items, etc., to give nursing students sufficient confidence to respond to the counterattack of the epidemic. On-campus psychological counselors can carry out offline psychological group intervention and individual face-to-face psychological intervention according to the actual situation, help nursing students correctly understand themselves, help alleviate anxiety, and refer mental illnesses to medical treatment in time.

4.2 Accelerate the Construction of Nursing Disciplines, Promote Undergraduate Education in Nursing, and Nurses with Bachelor's Degree are the Backbone of Future Nursing Teams

In this study, 98 undergraduate nursing students scored 40.90±8.21 on SAS criteria, including 14 ≥50 points, and the anxiety detection rate was 14.28%; The average score of 994 college nursing students in SAS was 13.20±6.79, of which 154 were ≥50 points, and the anxiety detection rate was

15.49%; The average score of 125 secondary school nursing students in SAS was 43.94±6.85, of which 21 were ≥50 points, and the anxiety detection rate was 16.8%. It shows that during the COVID-19 epidemic, undergraduate nursing students have lower anxiety detection rate and more stable employment intention than secondary nursing students and junior college nursing students. Foreign Institute of Medicine studies reported that nurses with bachelor's degree participated in the process of nursing patients, which was related to pressure injuries, postoperative deep vein thrombosis, hospital-acquired infections and the reduction of postoperative mortality in patients in hospitals [21]; In emergency care, higher nurse education is associated with lower mortality and risk of rescue failure (Coster S, Watkins M, and Norman IJ, 2017; Audet & Li-Anne, 2018) [22]. A multicenter observational study by Haegdorens F, Van Bogaert P, De Meester K (2019) further confirmed that nursing staff education is inversely proportional to patient mortality. The National Academy of Sciences mentioned in "Future Nursing" released in 2016 that by 2020, the proportion of nurses with a bachelor's degree will be increased to 80%. This shows the importance of training nurses with a bachelor's degree. According to the statistics of Shang Shaomei, Wu Ying, and Feng Liangui (2020.5.20), by the end of 2020, 24.4% of registered nurses with bachelor's degree or above in China will reach. There is still a certain gap between nursing undergraduate education in China and developed countries. By the end of 2019, China had enrolled more than 600 vocational colleges and universities specializing in nursing, more than 260 undergraduate colleges, more than 110 master's colleges and 27 doctoral colleges. All institutions should carry out a new round of teaching evaluation in accordance with the "Healthy China 2030" strategy and the current overall trend of education reform to ensure and improve the quality of nursing talents and promote the sustainable development of the nursing profession.

References

[1] Chen N, Zhou M, Dong X, et al.(2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. The Lancet, 395(10223), 507-513.

[2] ZHANG H, KANG Z, GONG H, et al.(2020). The digestive system is a potential route of 2019-nCov infection: a bioinformatics analysis based on single-cell transcriptomes. BioRxiv.

[3] Jiang P, N, W, Yu, et al. (2022). Research progress on novel coronavirus (SARS-CoV-2) variants[J]. Journal of Chinese Zoonoses, 38(2):157-164.Taken from DOI:10.3969/j.issn.1002-2694.2021.00.030.

[4] Xiao Y, Chen L, Zhang L, et al. (2020). Research on public cognition, attitude and behavior of novel coronavirus pneumonia[J]. Journal of Tropical Medicine,20(2):145-149.] Taken from DOI:10.3969/j.issn.1672-3619.2020.02.001.

[5] Chang Jinghui, Yuan Yuxin, Wang Dong (2020). Analysis of mental health status and influencing factors of college students under the epidemic of novel coronavirus pneumonia[J]. Journal of Southern Medical University, Vol.40 (2):171-176.

[6] Jianbin Liu, Jian Qi.(2018) Anxiety, depression and A-B personality types in the employment of independent college graduates[J]. Education Modernization, 5(28): 251-253. DOI:10.16541/j.cnki.2095-8420.2018.28.100.

[7] Mao Fuqiang, Zhao Peng, Zou Hua, et al. (2004) Relationship between SARS stress-related disorder and personality characteristics and coping style in college students[J]. Journal of Tianjin Medical University, 10(4):507-509. Taken from DOI:10.3969/j.issn.1006-8147.2004.04.007.

[8] William W.K. Zung. (1971)A rating instrument for anxiety disorders[J]. Psychosomatics,12(6),371-379.

[9] Li Xiaolin, Li Xiaoling, Zhang Qi.(2004) SARS stress and mental health: A survey of psychological stress and anxiety in the SARS period of nurses and students[J].West China Medical Journal,2004,19(4):596-598.)

[10] Fu Chunjiang, Chen Li, Lei Liangxin, Investigation and analysis of college students' anxiety during SARS epidemic[J], Journal of Health Psychology, 2003, 11(6): 434-436

[11] Yuxiao Bai, Xun Nie, Chenxin Wen. Epidemic Prediction of 2019-nCoV in Hubei Province and Comparison with SARS in Guangdong Province[J]. SSRN,2020.

[12] Zou Xiaohui, Huang Yongzhen, Chen Ying et al. (2021). Research on the cognition, attitude and behavior of medical students on novel coronavirus pneumonia [J].Journal of Yichun University,Vol.43(3):72-76.)

[13] Wang Qing, Li Xiaojuan, Liu Haini et al. (2021) The impact of the new crown pneumonia epidemic on the employment choice of nursing students[J].Sino-foreign Enterprise Culture,2021(8):47-48

[14] Xu Zhengqin; Duan Linghong; Hu Zijin et al. (2020) Investigation and study on undergraduate nursing students'

professional cognition and employment willingness under the background of new crown pneumonia epidemic prevention and control Healthy Women 26: 62-64

[15] JIA Ning, FAN Ning, LU Zhongyi. Journal of Hebei Normal University (Education Science Edition), 2003, 5(5): 57-60.) DOI:10.3969/j.issn.1009-413X.2003.05.008.

[16] Li Yayun, Xu Feng, Xin Shengping, et al. Study on the anxiety status of college students during SARS epidemic[J]. Journal of Health Psychology,2004,12(2):122-124.) DOI:10.3969/j.issn.1005-1252.2004.02.016.

[17] JI Xiaoqin, YU Rong, MOU Min, CHEN Lihong, ZHAO Huiling, ZHOU Qi, DENG Xin, YANG Xiuli. Research and analysis on the psychological development of cultural nursing undergraduates in ethnic minority areas of Sichuan during the epidemic of novel coronavirus pneumonia[J]. Medical Education Research and Practice, 2020, 28(02): 225-228.)

[18] Cai Fangfang, Yuan Qin. Psychological status investigation and intervention countermeasures of front-line clinical medical staff fighting against novel coronavirus pneumonia[J].General Nursing,2020,18(07):827-828.)

[19] Coster S, Watkins M, Norman IJ. What is the impact of professional nursing on patients' outcomes globally? An overview of research evidence. Int J Nurs Stud. 2018 Feb;78:76-83. doi: 10.1016/j.ijnurstu.2017.10.009. Epub 2017 Oct 19. PMID: 29110907.

[20] Audet, Li-Anne et al. "Associations between nurse education and experience and the risk of mortality and adverse events in acute care hospitals: A systematic review of observational studies." International journal of nursing studies vol. 80 (2018): 128-146. doi:10.1016/j.ijnurstu.2018.01.007

[21] Haegdorens F, Van Bogaert P, De Meester K, Monsieurs KG. The impact of nurse staffing levels and nurse's education on patient mortality in medical and surgical wards: an observational multicentre study. BMC Health Serv Res. 2019 Nov 21;19(1):864. doi: 10.1186/s12913-019-4688-7. PMID: 31752859; PMCID: PMC68687

[22] Shang Shaomei. WU Ying. FENG Liangui. LI Hong. Healthy China: Calling for Multi-level Nursing Talents[EB/OL].2020.5.12