

Worrying results on resignation intention for ICU physicians in China: a big data report from 34 provinces

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Abstract. – OBJECTIVE: The clinical work of ICU doctors is characterized by high intensity and medical risks, which lead to a highly stressful state for a long time and the occurrence of resignation due to long-term burnout. This study analyzes the correlation between the personal life, hospital work, social opinion, and psychological assessment of ICU physicians and their resignation intention.

SUBJECTS AND METHODS: This study is a multicenter questionnaire on the factors influencing resignation intention among ICU physicians. The study was completed through Critical Care E Institute (CCEI) and China Calm Therapy Research Group Academic Organization (CNCSG) by contacting critical care physicians in 3-A hospitals in 34 provinces in China. The questionnaire was in electronic format, and the results were filled in using the WeChat scan code. The survey included 22 indicators which included basic information about physicians (including gender, marriage, children, and income, etc.), hospital work (weekly working hours, on night duty, hospital environment, the evaluation of hospital's emphasis on medical staff, etc.), and SCL-90 psychological assessment.

RESULTS: A total of 1,749 ICU physicians completed the questionnaire. The results showed that 1,208 physicians (69.1%) intended to resign. There were statistical differences between the group's resignation intention and without resignation intention on 13 indicators. These indicators include professional title, night shift every few days, hospital hours/week, income satisfaction, work environment satisfaction, career prospect, and SCL-90 score, etc. (all $p < 0.05$, respectively). The remaining nine indicators were not statistically different between the two groups (all $p > 0.05$, respectively). Logistics analysis showed that working years, hospital hours (h/week), income satisfaction, work environment satisfaction, pride in hospital work, career prospects, and total SCL-90 score were all independent influences

on physicians' choice of resignation intention (all $p < 0.05$, respectively). The ROC curves' results showed that all seven indicators' predictive diagnostic value was low, with AUC areas ranging from 0.567 to 0.660. However, the combined diagnostic model of seven indicators has moderate diagnostic value. The AUC area of the model was 0.740 (95% CI: 0.718-0.760), with a sensitivity of 75.99% and specificity of 60.07%.

CONCLUSIONS: Physicians' income, working years, work environment satisfaction, career prospects, and psychological well-being can influence the choice of physicians' resignation intention in Chinese intensive care units. Government administration and hospitals can develop appropriate policies to enhance doctors working in hospital, thus reducing physicians' resignation choices.

Key Words:

Physicians, Resignation intention, Income, Working years, Hospital environment, Career prospects, Questionnaire.

Abbreviations

CCEI: Critical Care E Institute, CNCSG: Chinese Neurocritical Care Study Group.

Introduction

As society advances and the medical paradigm shifts, physicians often face pressure from patients, hospitals, society, and their families¹⁻³. As early as 2008, a study on Chinese hospitals showed that about 15% of physicians were in a sub-healthy state, and more than 40% were in chronic burnout⁴. ICU is a particular clinical unit that treats patients with critical and emergency conditions. Usually, patients who need to be seen

in this unit are generally in severe and rapidly changing conditions, which requires doctors to perform various emergency and effective resuscitation techniques. Therefore, physicians in this department are subjected to a high-stress level with high work intensity and medical risk^{5,6}. Studies have⁷⁻⁹ shown that ICU physicians are more prone to anxiety, depression, and other psychological disorders than other hospital departments. The negative psychological state directly affects the quality of doctors' work. For example, doctors may have less compassion and tolerance for their patients, lack responsibility for work, be indifferent to the development of the department, and even aversion to participating in collective hospital activities^{10,11}. The various reasons mentioned above may lead to a decrease in the quality of medical care and satisfaction of medical care for patients. In severe cases, this may even lead to medical errors by doctors, causing significant damage to patients and hospitals. In addition, the closed ward and the sounding medical equipment led to a poor resting environment for medical and nursing staff in the ICU department. These factors can make ICU doctors suffer from excessive physical and psychological stress for a long time. When ICU physicians reach their stress limit, they may choose to apply to other departments or even resign, ultimately leading to losing ICU physicians in the hospital.

The SCL-90 Mental Health Symptom Self-Assessment Scale can assess individuals' mental health symptoms in terms of feelings, emotions, thinking, behavior, living habits, interpersonal relationships, eating, and sleeping^{12,13}. In one study¹⁴, a questionnaire on 79 ICU healthcare workers showed that the total SCL-90 score and each factor score were higher than China's normative levels of mental health. This was confirmed in another study¹⁵ that used the SCL-90 in a survey of ICU medical staff. Their study showed that ICU unit medical staff scored higher than the national normative level on all factors except for two factors, interpersonal sensitivity and terror ($p < 0.05$). In addition, ICU medical staff mental health scores were higher in somatization, depression, anxiety, paranoia, and psychoticism than in non-ICU staff ($p < 0.05$). Therefore, the SCL-90 score can reflect different aspects of the mental health of the hospital ICU physician. A previous questionnaire study on the mental health of ICU doctors in China showed that doctors' mental health is worrying. There is an urgent need to take effective measures to improve their mental

health¹⁶. A total of 1,749 valid questionnaires were collected in this study, and the results showed that about 50% of the respondents were identified as having psychological symptoms. Estimates of somatization, depression, and anxiety were significantly higher for ICU physicians than for the general population (all $p < 0.001$, respectively). Multivariate analysis revealed that education, professional title, working hours/week, and frequency of night shifts were risk factors for psychological symptoms among ICU physicians.

In the study, we comprehensively attempted to analyze resignation intention from 22 indicators. The indicators include the basic situation of ICU physicians (gender, marital and child status, income, etc.), hospital work situation (working hours/week, night shift status, hospital working environment, etc.), and psychological assessment. We hope that the government health department and hospital management will formulate policies to address the factors influencing ICU physicians' resignation intention. Furthermore, the government should help to enhance their motivation and presence in the hospital work.

Subjects and Methods

Inclusion of Patients

This study belongs to a multicenter questionnaire involving indicators influencing the resignation intention of ICU physicians throughout China. Through two academic organizations, Critical Care E Institute (CCEI) and China Calm Therapy Research Group Academic Organization (CNCSG), this study contacted the chief committee of critical care medicine in 201 cities and 34 provinces in China. The questionnaire was sent as a Quick Response (QR) code to the critical care committee group of the chiefs of the critical care medicine departments of the three major hospitals in each province. Subsequently, the hospital directors sent the questionnaire to the ICU departments. Finally, the physicians in each department scanned and completed the questionnaire. The questionnaire was conducted from December 2018 to January 2019. The questionnaire included 22 indicators, including basic information about physicians (gender, marriage, children, income, etc.), hospital work (working hours/week, on night duty, hospital work environment, etc.), and psychological assessment. The study received and passed ethical review by the Ethics Committee of the First Hospital of Hebei

Medical University. Completion of the questionnaire for physicians was voluntary. Physicians who do not wish to participate had the chance to withdraw directly or midway at any time. The system automatically collects the questionnaire results if the questions are answered completely.

Inclusion and Exclusion Criteria

Inclusion criteria included (1) physicians still on staff during the study period; (2) possibility to complete the questionnaire using WeChat; (3) to complete the questionnaire within a certain time frame of 300-3,600 s; (4) fulfilling the anonymity requirement; (5) answering the questionnaire completely.

Exclusion criteria included: (1) complete the questionnaire after the specified time; (2) perfunctory and interference questionnaires (completing the questionnaire in <300 s or >3600 s); (3) answering the questionnaire in real names; (4) not complete all questions.

Testing Indicators

We assessed physicians' resignation intention by analyzing 22 indicators, including their life, work, and related social influences. The detailed indicators and groupings include: gender (male/female), education degree (associate/ bachelor/master/ Ph.D); professional title (primary/ middle/ vice-senior/ senior); marriage (yes/ no); child status (yes/ no); hospital working life (0-5/ 6-10/ 11-15/ >15 years); number of ICU beds (3-10/ 11-15/ 16-20/ >20); extra beds (daily extra bed serious/ often/ occasionally/ almost never); number of physicians/beds (1:5-10/ 1:11-15/ 1:16-20/ 1:>20/ no regular); night shift every few days (2/ 3/ 4/ 5/ 6/ >6/ no shifts); hospital working hours/week (<40 h/ 40-60 h/ >60 h); income satisfaction (dissatisfied/ general/ satisfied); work environment satisfaction (dissatisfied/ general/ satisfied); pride in hospital working (very proud/ general/ no pride/ bored); personal satisfaction with the hospital's compassion and care (good/ general/ poor); the influence of social opinion guidance on physicians (very positive/ general positive/ general/ general negative/ very negative); physicians' satisfaction with the hospital's compassion and care (positive/ general/ negative); time required to get to/from work (<30 min/ 30-60 min/ 60-90 min/ 90-120 min/ >120 min); number of days off in the past year (0 days/ 1-7 days/ 8-14 days/ >14 days); self-assessment of career prospects (1-10 points); training and study away (yes/ no); awareness of ICU presence in the hospital (very important/ comparatively

important/ not important/ not essential/ despised); and total SCL-90 score.

SCL-90 Score

The 90-item Symptom Checklist 90 (SCL-90), also known as the Self-Report Inventory (SIRI), has a list of 90 symptoms. This 90-item scale contains a wide range of psychiatric symptomatology, from feelings, emotions, thinking, consciousness, behavior, habits, relationships, eating, and sleeping. The SCL-90 can be used to investigate the mental health problems of different occupational groups. As a self-assessment scale, the specific meaning of "mild, moderate, and severe" should be experienced by themselves, and there is no mandatory regulation.

Statistical Analysis

All statistical analyses of the data involved in this study were performed using the software SPSS 25.0 (IBM Corp., Armonk, NY, USA). Chi-square tests were used to calculate and describe the count data (ratios). The *t*-test (normal distribution) or the Mann-Whitney U test (non-normal distribution) was used to compare two continuous data. Logistic regression statistically analyzed the indicators influencing physicians' resignation intention. The regression analysis was performed using two-step approach. Univariate regression was conducted first; subsequently, indicators with $p \leq 0.1$ were subjected to the second step of the analysis. The diagnostic value of each independent influencing factor of resignation intention was described using ROC curves. GraphPad 9.0 (Insightful Science, San Diego, CA, USA) software was used to graph the ROC curves. Differences were considered statistically significant when $p < 0.05$.

Results

Baseline Information for Physicians

A total of 1,749 physicians were included in this study. Among the including physicians, 1,208 (69.1%) had a resignation intention, and 541 (30.9%) were in the group without a resignation intention. There were statistical differences between the two groups in the hospital working life (years), professional title, ICU beds, number of days on night shift, hospital working hours (weeks), income satisfaction, working environment satisfaction, pride in hospital work, satisfaction with the hospital's consideration and

care for physicians, social opinion, perception of ICU's status, career prospect expectation, and total SCL-90 score (all $p < 0.05$, respectively). The nine remaining indicators were not statistically different (all $p > 0.05$, respectively). More details are shown in Table I.

Logistic Regression Analysis of Physicians' Resignation Intention

Logistic regression analysis of physicians' resignation intention was conducted using a two-step. First, we analyzed each influencing factor by using univariate regression analysis.

Table I. Baseline information of ICU physicians.

Testing indicators	Groups	Turnover intention (n=1,208)	No-turnover intention (n=541)	X ² /Z	p
Gender	Male	725	315	497	481
	Female	483	226		
Degrees	Associate	19	7	7.004	72
	Bachelor	668	288		
	Master	440	190		
	Ph.D	81	56		
Marriage	Yes	1,047	477	748	387
	No	161	64		
Children	Yes	943	434	1.040	308
	No	265	107		
Participation time (year)	0-5	283	125	52.898	<0.001
	6-10	359	102		
	11-15	238	79		
	>15	328	235		
Professional title	Primary	334	129	40.906	<0.001
	Intermediate	528	180		
	Sub-senior	264	157		
	Senior	82	75		
ICU beds	3-10	322	109	13.533	4
	11-15	254	100		
	16-20	256	128		
	>20	376	204		
Extra bed	Serious	105	35	2.684	443
	Frequently	260	121		
	Occasionally	424	189		
	Hardly	419	196		
Night-shift physician bed ratio	1:5-10	623	274	5.347	253
	1:11-15	286	143		
	1:16-20	164	80		
	1:20+	87	26		
Night shift (days)	No-regular	48	18	24.257	<0.001
	2	32	11		
	3	179	66		
	4	439	188		
	5	307	112		
	6	143	80		
	>6	45	30		
	Off-duty	63	54		
Hospital hours (h/week)	<40	18	18	29.382	<0.001
	40-60	514	292		
	>60	676	231		
Satisfaction with income	Dissatisfaction	831	235	115.560	<0.001
	General	345	235		
	Satisfaction	32	71		
Satisfaction with work environment	Dissatisfaction	644	166	115.560	<0.001
	General	445	230		
	Satisfaction	119	145		
Hospital work pride	Very proud	43	74	144.871	<0.001

Table continued

Table I (continued)

Testing indicators	Groups	Turnover intention (n=1,208)	No-turnover intention (n=541)	X ² /Z	p
Hospital satisfaction with physician compassion and care	General	460	303	103.300	<0.001
	No pride	528	130		
	Boredom	177	34		
	Pretty good	98	117		
Perception of social opinion	General	564	294	25.525	<0.001
	Less favorable	546	130		
	General front	54	56		
Travel time to work (min)	General	301	149	2.280	684
	General negative	853	336		
	<30	553	242		
	30-60	457	219		
	60-90	116	50		
Annual leave days	90-120	48	20	3.417	345
	>120	34	10		
	0	563	245		
	1-7	480	209		
Advanced studies	8-14	146	72	45.188	<0.001
	>14	19	15		
	Yes	723	329		
Evaluation of ICU's status in the hospital	No	485	212	45.188	<0.001
	Very important	165	118		
	Comparatively important	514	269		
	Unimportant	256	88		
	Not essential	81	21		
Career Prospects	Despised	192	45	9.588	<0.001
		5.0 (3.0, 6.0)	6.0 (5.0, 8.0)		
Total SCL-90 score		74.5 (41.0, 125.0)	53.0 (22.5, 92.5)	7.903	<0.001

Subsequently, the indicators with $p \leq 0.1$ were included in the regression model for multivariate analysis. A total of 15 indicators met the inclusion conditions. Multivariate analysis revealed that seven independent indicators influenced physicians' resigning intention. Among the indicators, hospital working life (years) was an independent influencing factor for physicians' resignation intention ($p=0.005$); however, there was no statistical difference between the groups with >5 years and those with <5 years ($p < 0.05$). Moreover, all physicians within 0-15 years had the resignation intention; however, after working >15 years, physicians did not want to resign. Hospital working hours/week was also an independent factor influencing the resignation intention ($p=0.010$). The resignation intention was 1.489 times higher in the group working >60 h/week than in the group working <40 h/week ($p=0.022$); there was no statistical significance between the group working 40-60 h and the group working <40 h ($p > 0.05$).

Satisfaction with current income was an independent factor influencing physicians' resignation intention ($p < 0.001$). Compared to physicians

dissatisfied with their current income, the resignation intention decreased by 34.3% and 65.9% for patients considered general and more satisfactory, respectively; the differences were statistically significant ($p=0.002$ and <0.001 , respectively). Satisfaction with the work environment also influenced the resignation intention among the ICU physicians' ($p=0.028$). Relative to the dissatisfied group, the satisfied group had a lower resignation intention ($p=0.009$); there was no statistical difference between the two groups and the general group ($p=0.082$). Physicians' pride in the hospital was also an independent factor for resignation intention ($p=0.001$). Compared to the very proud group, the general, no pride, and bored groups had 1.637, 2.608, and 2.058 times higher turnover intentions, respectively; the differences were all statistically significant (all $p < 0.05$, respectively).

The expectation of career prospects also influenced physicians' resignation intention ($p=0.041$). The total SCL-90 score also influenced the resignation intention ($p=0.005$), each increase of 1 point was associated with a 0.3% increase in resignation intention. All the results above are shown in Table II.

Table II. Logistic regression analysis of physicians' resignation intention.

Testing indicators	Multivariate analysis		Univariate Analysis	
	<i>p</i>	OR (95% CI)	<i>p</i>	OR (95% CI)
Participation time (year)/(0-5)	1		<0.001	
6-10	97	1.458 (0.934-2.277)	5	1.555 (1.147-2.108)
11-15	77	1.602 (0.951-2.699)	90	1.331 (0.956-1.851)
>15	432	0.800 (0.458-1.397)	<0.001	0.616 (0.471-0.807)
Hospital hours (h/week)/(<40)	10		<0.001	
40-60	116	1.873 (0.857-4.091)	98	1.760 (0.902-3.436)
>60	22	2.489 (1.139-5.439)	2	2.926 (1.497-5.720)
Satisfaction with income /(Dissatisfaction)	<0.001		<0.001	
General	2	0.657 (0.504-0.856)	<0.001	0.415 (0.333-0.517)
Satisfaction	<0.001	0.341 (0.201-0.578)	<0.001	0.127 (0.082-0.198)
Satisfaction with work environment /(Dissatisfaction)	28		<0.001	
General	82	0.782 (0.593-1.032)	<0.001	0.499 (0.395-0.630)
Satisfaction	9	0.604 (0.415-0.880)	<0.001	0.212 (0.157-0.285)
Hospital work pride/(Very proud)	1		<0.001	
General	38	1.637 (1.028-2.607)	<0.001	2.613 (1.746-3.909)
No pride	<0.001	2.608 (1.553-4.380)	<0.001	6.990 (4.583-10.659)
boredom	29	2.058 (1.075-3.941)	<0.001	8.959 (5.298-15.149)
Career Prospects	41	0.935 (0.877-0.997)	<0.001	0.787 (0.748-0.827)
Total SCL-90 score	3	1.003 (1.001-1.005)	<0.001	1.007 (1.005-1.009)

ROC Curve Results

In the multivariate regression analysis, we performed a diagnostic analysis of the seven factors that independently influenced physicians' resignation intention. However, all factors predictive of physician resignation intention were poor (AUC values ranged from 0.567-0.660). The best diagnostic sensitivity was career prospects (78.39%), and pride in hospital work has the best specificity (69.69%). Detailed results are shown in Table III and Figure 1.

We constructed a predictive model using a combination of seven indicators. The results showed that the predictive model had moderate diagnostic value

with an AUC of 0.740 (95% CI: 0.718-0.760); the sensitivity was 75.99%, the specificity was 60.07%, and the Youden index was 0.361 (Figure 2).

Discussion

Healthcare workers are a high-risk occupational group regarding mental health, especially in special departments such as ICU and emergency departments. ICU physicians are subjected to more psychological stress than in other clinical departments due to the working environment and work intensity. Increased psychological stress

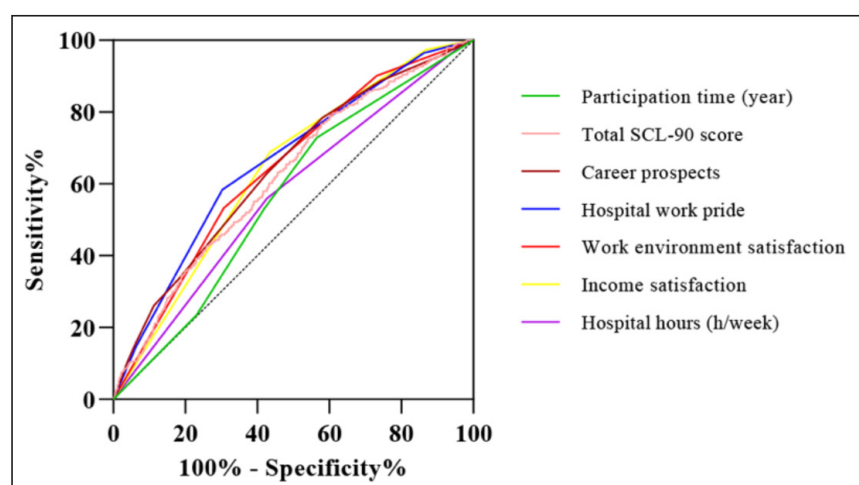


Figure 1. The ROC curve for seven indicators.

Table III. The ROC curve in independent influences in multiple regression analysis.

Testing indicators	AUC	95% CI	Z	p	Youden index	Associated criterion	Sensitivity (%)	Specificity (%)
Work environment satisfaction	642	0.619-0.664	10.570	<0.001	226	≤1	53.31	69.32
Income satisfaction	640	0.617-0.662	10.784	<0.001	254	≤1	68.79	56.56
Career Prospects	641	0.618-0.664	10.075	<0.001	204	≤6	78.39	41.96
Hospital hours (h/week)	569	0.546-0.593	5.334	<0.001	133	>2	55.96	57.30
Hospital work pride	660	0.637-0.682	12.357	<0.001	281	>2	58.36	69.69
Total SCL-90 score	618	0.595-0.641	8.136	<0.001	185	>38	76.16	42.33
Participation time (year)	567	0.543-0.590	4.482	<0.001	163	≤3	72.85	43.44

often results in decreased quality of patient care, medical errors, and an increased probability of resignation and career change¹⁷⁻¹⁹. This study comprehensively assessed 22 indicators influencing the choice of resignation intention among Chinese ICU physicians. The results showed that 1,208 (69.1%) had resignation intention among the 1,749 physicians. Nearly 70% of the ICU physicians surveyed resignation intention. Our results considered that Chinese ICU physicians face very high psychological pressure due to a combination of personal, family, hospital, and social factors, leading to a burnout situation for most of them. Wu et al²⁰ reported that the number of ICUs increased from 146 in 2005 to 324 in 2015. During the same period, ICU beds increased from 188% to 3,956% in 2015, accounting for 1.76% of the total hospital beds; or 3.69 ICU beds per 100,000 people. Moreover, human resources data for 2011 and 2015 show that the number of ICU physicians and nurses increased by 39% and 58%, respectively²¹. However, this progress is very different from the US ICU units. In the United States, ICU beds have steadily increased from 69,300 in 1985 to 103,900 in 2010, accounting for 7.8% to 16.2% of total hospital beds^{22,23}. However, China has a population of over one billion, while the United States has a population of 330 million. Therefore, the lack of ICU physicians in China will undoubtedly increase the burden and psychological stress of their everyday work²⁴. This study showed that the length of participation in the workforce was an independent influencing factor for physicians' resignation intention ($p=0.005$). However, the ICU physician's 15th year of employment was a turning point in their choice of resignation intention. This study showed that all ICU physicians with <15 years of experience were likely to have resignation intention. This may be because when the doctors worked in one unit for longer, most turned to family and career stability and instead no longer easily switched careers and changed work units⁵.

Due to the uniqueness, the physician group tends to work more than 8 hours per day. This situation may be more prevalent in the ICU physician group. Long time working in the hospital may affect the physicians' daily mood and can impact their resignation intention. In this study, the resignation intention among physicians working >60 h per week was 1.489 times higher than in the group working <40 h per week ($p=0.022$). The reality of the hospital situation dictates that the younger group is bound to work longer than the more qualified physicians due to their lack of seniority and experience. At the same time, groups of young physicians perform many frontline clinical tasks (e.g., collecting medical histories, writing medical records, and basic clinical operations). In an environment of a severe shortage of medical resources, frontline physicians are often working at an overload. Therefore, the work hours/week in the hospital influences the choice of ICU physicians' resignation intention. The level of job income will undoubtedly impact the resignation intention from any given

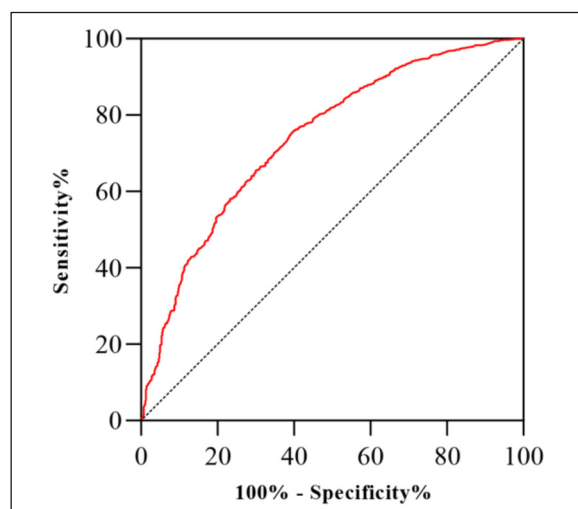


Figure 2. The ROC curve for model.

work group. In this study, compared to physicians dissatisfied with their current income, the resignation intention decreased by 34.3% and 65.9%, compared to general and more satisfactory. This trend shows that ICU physicians' resignation intention tends to decrease gradually as their satisfaction with income increases²⁶.

The hospital environment also impacts the prognosis of physicians and patients. Gaffney²⁷ showed that the adequacy of hospital equipment directly affected patient mortality in a study of care in large hospitals in the United States during the COVID-19 pandemic. Our study also analyzed physicians' work environment and perceptions of the hospital. The results showed that satisfaction with the current work environment and pride in the hospital also influenced physicians' resignation intention. In particular, the physicians who were satisfied with the hospital work environment had a lower resignation intention than the dissatisfied group. A study of satisfaction in ICU nursing in China showed that excessive workload, the stress from the ICU work environment, and the lack of understanding of nursing by patients and their families could affect nurses' satisfaction²⁸.

We used a 10-point scale and asked physicians to assess personal career prospects. The results showed that physicians who rated themselves with lower scores were more likely to resign. Furthermore, for every score decrease in expectations, the resignation intention increased by 6.5%. The SCL-90 investigated the ICU physician group's mental health problems. Li et al¹⁴ used the SCL-90 scale to conduct a questionnaire on 79 ICU physician cases, which showed that the total and factor scores of the SCL-90 were higher than the normal values. In this study, the total SCL-90 scores of physician resignation intention were significantly higher than the no resignation intention group ($p < 0.05$). This study shows that ICU physicians' resignation intention may have a more significant psychological and mental burden due to their age, experience, and professional title in the hospital. These undoubtedly impact their resignation intention.

In this study, we investigated the resignation intentions of ICU physicians across China. Although many physicians were included, this study still has some shortcomings. Most of the data for this study were obtained from ICU physicians at major tertiary hospitals in each province. For data collection in future studies, we may expand to primary hospitals in China to improve the totality

of the sample data. Although physicians may choose the same level of a particular factor, there may be differences between different regions of China in terms of living expenses, housing costs as a percentage of income, children's education costs, and the health of the elderly. Therefore, we need to quantify the intention of ICU physicians to resign. Also, due to confidentiality, statistical analysis of physicians' age was not conducted. The parameter of physicians' work years may compensate for this missing condition. Our research team would also continue to optimize and improve the questionnaire based on the previous studies. Hopefully, in subsequent studies, the findings will be more objective and realistic and provide a reference for government administration and hospitals to re-formulate policies.

Conclusions

ICU physicians' income, working years, working environment, attitude towards the hospital, expectations of career prospects, and psychological can influence their resignation intention. Hospitals can develop appropriate stimulation policies for these factors to reduce their psychological pressure and increase doctors' willingness to work in the hospital. We hope these policies reduce physicians' willingness to resignation intention and better serve their patients.

Availability of Data and Materials

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

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Authors' Contributions

DZ: overall data management and statistical analyses, interpretation of the results and article writing. FG: design of the study, data collection, control, and management, as well as comment, read, and approve the final manuscript. WL and JC: design of the manuscript, interpretation of the results, the manuscript's content, commented on draft versions, and read and approved the final manuscript.

Ethics Approval

Relevant guidelines and regulations for this study conducted all protocols. The study received and passed ethical review by the Ethics Committee of the First Hospital of Hebei Medical University.

Informed Consent

Completion of the questionnaire for physicians was voluntary. Physicians who do not wish to participate could withdraw directly or midway at any time.

Conflict of Interests

The authors declare that they have no competing interests.

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