



BMJ Open Latent profile analysis of nurses' perceived professional benefits in China: a cross-sectional study

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ABSTRACT

Objective To identify profiles of nurses' perceived professional benefits as well as their predictors.

Design Cross-sectional study.

Setting The study was carried out online in China.

Methods From 6 July to 27 July 2022, a total of 1309 registered nurses participated in the survey by convenient sampling. We collected the Nurses' Perceived Professional Benefits Questionnaire and demographic data. Using latent profile analysis (LPA), subgroups of nurses' perceived professional benefits were identified. Moreover, univariate and multinomial logistic regression analyses were conducted to find the factors that were linked with the profiles.

Results The survey was validly completed by 1309 nurses, with a 92.9% effective return rate. The findings of the LPA demonstrated three unique profiles: low-perceived professional benefits (11.8%), moderate-perceived professional benefits (57.1%) and high-perceived professional benefits (31.1%). There was a correlation between marital status, the number of night shifts per month and leadership role.

Conclusions According to our research, registered nurses have three unique professional benefit profiles. In order to sustain the nursing workforce, despite the fact that nurses get a high level of professional benefits, interventions are necessary to increase nurses' perception of their professional value.

INTRODUCTION

Despite the fact that nursing is a high-risk, high-stress profession, nurses are able to achieve benefit findings.^{1–3} In recent years, the concept of nurses' perceived professional benefits (NPPBs) arises naturally, and has gradually attracted the attention of researchers. NPPBs refer to nurses' perceptions of the gains and benefits they receive in their profession during the hiring process, as well as their belief that working in nursing can promote their overall growth and development.^{4,5} Essentially, perceived professional benefits can be classified as an emotional experience and cognitive evaluation, which has two aspects: actual benefits and spiritual benefits.⁴ However, there is a lack of in-depth

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This was a national survey data regarding perceived professional benefit among Chinese nurses.
- ⇒ The latent profile analysis approach was used in this study to investigate heterogeneous subgroups of nurses' perceived professional benefit.
- ⇒ This study was limited by the web-based cross-sectional design and convenient sampling method.
- ⇒ The cross-sectional design of the study makes it impossible to identify causal relationships between latent profiles and influencing factors.

research on the group heterogeneity of perceived professional benefits among nurse populations.

Background

It is estimated that 69% of the global health workforce consists of nurses.⁶ Yet, the present physical and mental health of nurses is not encouraging, as they confront high levels of stress, burnout, turnover and their own ageing.^{7–9} Nursing is no longer a desirable and appealing profession,¹⁰ which makes nurse shortages as a widespread worldwide concern.¹¹ These issues have a direct bearing on the sustainability and continued growth of the nursing workforce. In recent years, nursing in China has experienced remarkable growth, and the most recent statistics indicate that China has more than 5 million registered nurses.¹² Chinese nurses are extremely susceptible to burnout, and a high desire to leave is a serious concern.^{13,14} However, there is a dearth of comprehensive study and viable remedies.

The mental health of nurses is receiving increasing attention from managers and researchers in the context of positive psychology. It is beginning to be recognised that nurses' own positive psychology promotes job satisfaction and professional identity, lessens burnout and hence reduces turnover rates.^{15,16}



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The profession of nursing can be beneficial to nurses in a number of ways. Previous studies^{17 18} reported that nursing preceptorship offers many benefits, and nurses may find themselves being more committed to the position as a result. A qualitative study¹⁹ found that nurses who were involved in caring for dying patients got a lot of experience and benefited considerably; they could create a personal philosophy on death and life, in addition to professional growth. Nurses who served as advanced practice nurse roles perceived numerous benefits, including improved patient care quality and safety, professionalism, personal development, career development, intrinsic satisfaction with the role and impact on other professional groups.²⁰ A person's perception of professional benefit is an endogenous motivation for his or her development and has a positive effect on that person's career. According to prior studies, improving the perceived professional benefit of nurses reduces burnout reduction and enables nurses to approach their work with a good attitude and obtain more favourable comments.^{21 22}

Measures created by researchers to evaluate the perceived professional benefits of nurses were still in little supply. The Preceptor's Perspective of Benefits and Rewards measure was designed by Dibert and Gold-berg²³ to evaluate the perceived benefits of clinical preceptor nurses; however, it is not relevant to general clinical nurses. A questionnaire entitled Nurses' Perceived Professional Benefits Questionnaire (NPPBQ) was developed to assess how Chinese nurses perceive the gains and benefits of their employment.^{5 24} This questionnaire has been used in a lot of research to date. While we now have a better grasp of nurses' perceptions of professional benefits, but the heterogeneity of the population is still lacking, screening strategies for future precision interventions cannot be developed for identifying low-benefit populations.

To our knowledge, it has not been shown that sufficient evidence exists to answer the questions of whether NPPBs differ in groups and what factors contribute to these differences. The current study was created to bridge that gap. This study's objective was to examine the characteristics and determinants of NPPBs as well as the predictors of these latent profiles.

MATERIALS AND METHODS

Study design

An online survey with convenient sampling was used in this study to conduct a cross-sectional analysis. This study was designed and reported in accordance with the guidelines for Strengthening the Reporting of Observational Studies in Epidemiology.²⁵

Sample size estimation

An examination of the latent profiles of perceived professional benefits among nurses was conducted in this study. Latent profile analysis (LPA) needs a sample size larger

than 500^{26 27}; therefore, the minimum sample size for this study was 500.

Participants

Participants in this study required to meet the inclusion criteria and be registered nurses. To be considered, candidates had to satisfy the following criteria to be considered: (1) having worked as a nurse in a medical facility and (2) being willing to participate in this study. The following were the exclusion criteria: logical errors or missing information in questionnaire answers.

Measurements

Demographic

This study gathered and evaluated demographic data including age, gender, greatest degree of education, marital status and other participant characteristics.

Nurses' Perceived Professional Benefits Questionnaire

The questionnaire was designed by Hu and Liu⁵ to investigate the gains and benefits that nurses perceived from their jobs. The authors then reduced it to 17 items by 2020.²⁴ The questionnaire has five dimensions: personal growth, a good nurse-patient relationship, recognition from family and friends, a positive occupational perception and team belonging. Items are scored on a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=not sure, 4=agree, 5=strongly agree). Cronbach's alphas for the questionnaires were 0.94, and the NPPBQ subquestionnaires' alphas were 0.84, 0.83, 0.74, 0.79 and 0.85.

Data collection

During the dates of 6 July and 27 July 2022, data were gathered. Wenjuanxing (www.wjx.cn) was used to develop a web-based questionnaire. Two researchers reviewed the online questionnaire for rigour and verified the feasibility of the questionnaire by completing it within the team. A poster was created to present the link and QR code. It was clearly shown on the poster who would be included and excluded from the survey. We distributed the questionnaire nationwide in China and did not limit the source and setting of nurses. The researcher contacted administrators or general nurses to disseminate the questionnaire. WeChat was used to send the poster and information letter. The survey can be completed by clicking on the link or scanning the QR code; completed questionnaires can be returned directly to the web.

Statistical analyses

The use of LPA is frequently used to determine the number of subpopulations in a given sample. LPA is a statistical method that uses potential categorical variables to explain the link between exogenous continuous-type indicators, permitting the assessment of the correlation between exogenous indicators and the maintenance of local independence among exogenous indicators.²⁷ LPA was conducted using Mplus V.7.4 software. Log likelihood, Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), adjusted BIC, entropy,

Table 1 Potential profile analysis indicators (N=1309)

Model	LL	AIC	BIC	aBIC	Entropy	LMR p value	BLRT p value	Category probability
Class 1	14709.353	29438.706	29490.476	29458.711	–	–	–	–
Class 2	13420.425	26872.850	26955.682	26904.857	0.905	<0.001	<0.001	0.654/0.346
Class 3	12583.629	25211.257	25325.152	25255.268	0.936	0.007	<0.001	0.118/0.571/0.311
Class 4	12307.807	24671.613	24816.570	24727.627	0.940	0.036	<0.001	0.151/0.014/0.530/0.306

aBIC, adjusted BIC; AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; BLRT, bootstrapped likelihood ratio test; LL, log likelihood; LMR, Lo-Mendell-Rubin likelihood ratio test.

Lo-Mendell-Rubin and the bootstrapped likelihood ratio test were used to assess model fit and determine the appropriate number of categories. In order to decide which model best fit the data, the models from each category's fitting results were combined with the aforementioned indicators. The data were examined using the SPSS V.26.0 statistical program. We used frequency and composition ratios for categorical data, whereas mean and SD were used for continuous variables. The X^2 test was performed to compare categorical variables across groups. Analysis of variance (ANOVA) was used to compare continuous variables among multiple groups. A multivariate logistic regression model was employed to analyse the variations in demographic variables. A statistically significant difference was indicated by $P < 0.05$.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

Participant characteristics

A total of 1409 nurses completed the questionnaire, while 58 nurses denied participation, for a total number of 1351 questionnaires received. Forty-two surveys were considered invalid due to insufficient or inaccurate information. A total of 92.9% of the final 1309 surveys were

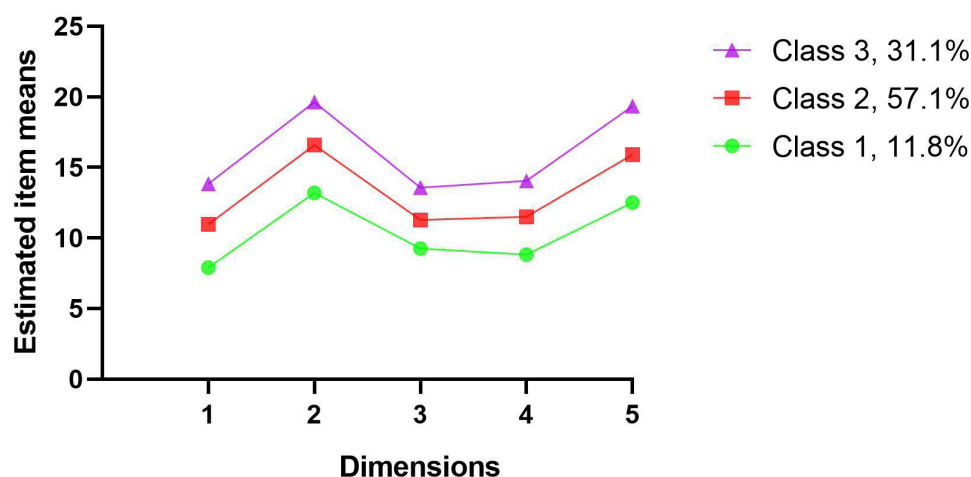
correctly returned. The ages of the participants varied from 18 to 59 years old, with a mean age of 32.25 (SD: 6.18) years old. The bulk of participants were female (86.7%), whereas the minority were male (3.2%).

Characteristics of the different classes

On the basis of the NPPBQ's five dimensions, it was established that a model with three latent classes provided the greatest match. A class represents different categorisation methods, such as a class 1 for a single subgroup, a class 2 for two heterogeneous subgroups and so forth. **Table 1** provides the results. While the AIC and BIC in class 4 were lower in class 4 than in class 3, the entropy was greater; nonetheless, the lowest category probability in class 4 was 1.4%, which is unsatisfactory. As a consequence, we decided that the best-fitting model is class 3. Using a three-class model, **figure 1** illustrates the mean scores for each category within the NPPBQ's dimensions. The percentages increase from class 1 to class 3 as follows: 11.8% (155 nurses), 57.1% (747 nurses) and 31.1% (407 nurses). For the sake of brevity, based on the profile scores, we named class 1 as the low-perceived professional benefits, class 2 as the moderate-perceived professional benefits and class 3 as the high-perceived professional benefits.

The scale and dimension scores of different profiles

The findings of a one-way ANOVA indicated statistically significant differences in the scale and dimension scores


Figure 1 Latent profiles of Nurses' Perceived Professional Benefits Questionnaire.

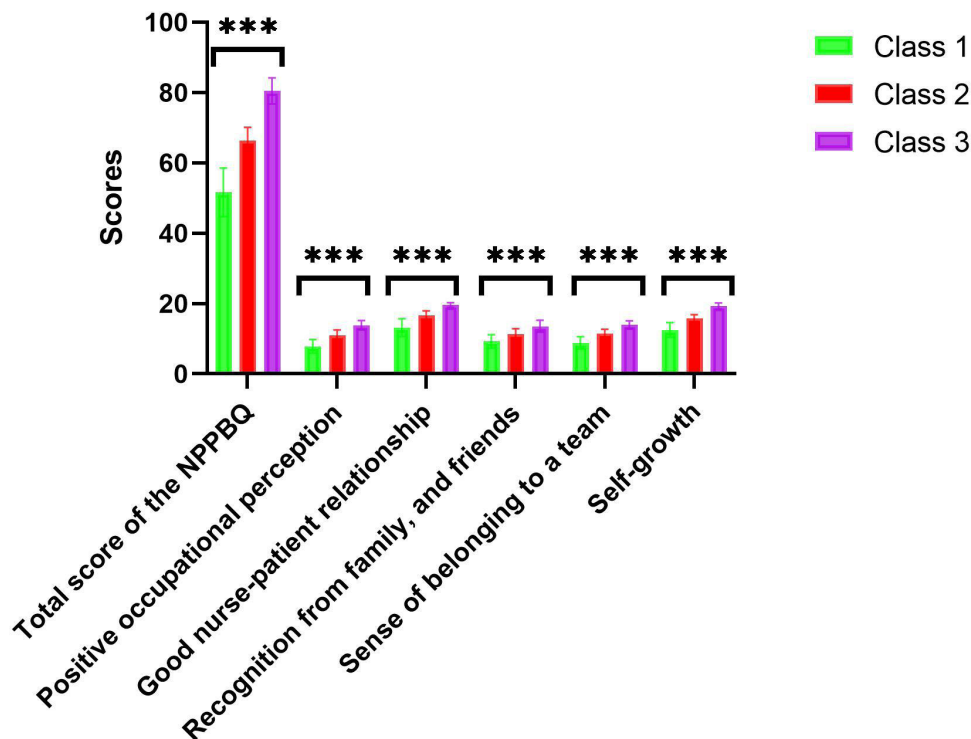


Figure 2 The scale and dimension scores of different profiles. NPPBQ, Nurses' Perceived Professional Benefits Questionnaire. *** $P < 0.001$.

of different profiles (both $P < 0.001$). The results that were shown in [figure 2](#) demonstrate the outcomes.

Demographic and related characteristics of each profile

The ANOVA and X^2 tests indicated statistically significant differences between the three profiles differed statistically in terms of age, marital status, children, professional title, leadership role, working years and number of night shifts per month. [Table 2](#) shows a summary of the results.

A multivariate logistic regression model was constructed using the variables with statistically significant differences as determined by ANOVA and X^2 tests. Of the three profiles, the class 3 was chosen as a reference to find the predictors linked with NPPBQ. As shown in [Table 3](#), nurses who were single/divorced/widowed were more likely to belong to low-perceived professional benefits (OR: 1.984, 95% CI: 1.028 to 3.828). The number of night shifts worked per month was associated with low-perceived professional benefits (OR: 0.633, 95% CI: 0.405 to 0.988), compared with those with more than five night shifts; those without night shifts tended to fall into the high-perceived professional benefits. Nurses without a leadership role were more likely to be in the moderate-perceived professional benefits (OR: 1.489, 95% CI: 1.028 to 2.157). Other variables were not statistically significant in the multivariate logistic regression.

DISCUSSION

The purpose of this research was to identify distinct profiles of NPPBs. Furthermore, the current study

employed multinomial logistic regression to investigate predictors of these profiles.

In this study, we investigated 1309 nurses who validly completed the questionnaire. As a result, three latent profiles were identified: low-perceived professional benefits, moderate-perceived professional benefits and high-perceived professional benefits. Our research revealed that the majority of nurses had moderate or higher levels of perceived professional benefits, with just 11.8% of nurses belonging to the category of nurses with low-perceived professional benefits. Most studies reported nurses had an upper-moderate level of perceived professional benefits,^{28 29} and our findings are consistent with those of previous studies. Most importantly, our study clarified the heterogeneous subgroups of NPPBs and their specific distribution.

In the last 3 years, nurses have been a key part of the fight against the COVID-19 outbreak. Despite heavy job pressure, nurses have had a feeling of professional calling and value,³⁰ which has effectively enhanced their sense of professional benefit.¹ At the same time, the critical role of nurses in defending people's lives and health has earned the society's respect and recognition, as well as a positive social image,^{31 32} which can further enhance nurses' sense of professional benefit. Our survey was conducted during the COVID-19 epidemic, and nurses' perceptions of professional benefit may be elevated.

Another finding of our study revealed that the membership of profiles can be predicted by some characteristics such as the number of night shifts, leadership role and

Table 2 Demographic and characteristics by latent profile (N=1309)

Variables	Class 1	Class 2	Class 3	χ^2/F	P value
Age (SD)	30.94 (5.37)	31.76 (5.91)	33.64 (6.71)	16.545	<0.001
Gender				0.600	0.741
Male	6 (3.9)	25 (3.3)	11 (2.7)		
Female	149 (96.1)	722 (96.7)	396 (97.3)		
Highest degree				1.602	0.449
Junior college and below	29 (18.7)	111 (14.9)	60 (14.7)		
Bachelor's and above	126 (81.3)	636 (85.1)	347 (85.3)		
Marital status				25.768	<0.001
Single/divorced/widowed	62 (40.0)	218 (29.2)	80 (19.7)		
Married	93 (60.0)	529 (70.8)	327 (80.3)		
Children				26.943	<0.001
Yes	87 (56.1)	481 (64.4)	311 (76.4)		
No	68 (43.9)	266 (35.6)	96 (23.6)		
Professional title				23.589	<0.001
Junior level	102 (65.8)	448 (60.0)	207 (50.9)		
Intermediate level	50 (32.3)	280 (37.5)	172 (42.3)		
Senior level	3 (1.9)	19 (2.5)	28 (6.9)		
Leadership role				17.086	<0.001
Yes	18 (11.6)	86 (11.5)	82 (20.1)		
No	137 (88.4)	661 (88.5)	325 (79.9)		
Working years				32.903	<0.001
≤5	52 (33.5)	217 (29.0)	79 (19.4)		
6–15	91 (58.7)	438 (58.6)	241 (59.2)		
≥16	12 (7.7)	92 (12.3)	87 (21.4)		
Average monthly income (¥)*				7.990	0.239
≤3000	23 (14.8)	75 (10.0)	43 (10.6)		
3001~6000	93 (60.0)	415 (55.6)	217 (53.3)		
6001~9000	27 (17.4)	179 (24.0)	105 (25.8)		
≥9001	12 (7.7)	78 (10.4)	42 (10.3)		
Number of night shifts per month				17.797	0.001
0	42 (27.1)	233 (31.2)	164 (40.3)		
1–4	22 (14.2)	143 (19.1)	73 (17.9)		
≥5	91 (58.7)	371 (49.7)	170 (41.8)		

*US\$1 equals ¥7.31, exchange rate on 29 September 2023.

marriage status. Nursing is a continuous, 24-hour profession, and nurses' work normally takes the form of night shifts. It is widely proven that night shifts negatively impact the physical and emotional health of nurses.^{33–36} Nurses working rotating night shifts were normally younger, and they had the lower scores of job satisfaction, quality of sleep and quantity of sleep³⁷; these factors resulted in low-perceived professional benefits. Consistent with past research, our findings indicate that the greater the frequency of night shifts, the lower the perceived professional benefit.²⁹

According to our results, 57.1% of nurses perceived professional benefits as moderate. The majority of nurses in the moderate-perceived professional benefits group lacked a work title, while the majority of nurses in the highly perceived professional benefits group held a leadership role. This has been validated by other research, and our work provided more support for this notion.²⁹ Holding a managerial position at a hospital is a means of advancing one's career, and nurses highly value this opportunity.

Table 3 Predictors of latent profile membership

Variables	Class 1 vs class 3			Class 2 vs class 3		
	β	OR	95% CI	β	OR	95% CI
Age (SD)	0.004	1.004	0.941 to 1.070	0.005	0.995	0.957 to 1.034
Marital status						
Single/divorced/widowed	0.685	1.984*	1.028 to 3.828	0.115	1.122	0.716 to 1.760
Married (ref)						
Children						
No	0.177	1.194	0.622 to 2.293	0.240	1.272	0.822 to 1.967
Yes (ref)						
Professional title						
Junior level	0.368	1.444	0.334 to 6.241	0.359	1.433	0.661 to 3.105
Intermediate level	0.378	1.460	0.370 to 5.766	0.429	1.535	0.764 to 3.085
Senior level (ref)						
Leadership role						
No	0.139	1.984	1.028 to 3.828	0.398	1.489*	1.028 to 2.157
Yes (ref)						
Working years						
≤ 5	0.781	2.184	0.666 to 7.161	0.411	1.508	0.748 to 3.042
6–15	0.721	2.057	0.847 to 5.000	0.228	1.256	0.773 to 2.039
≥ 16 (ref)						
Number of night shifts per month						
0	0.458	0.633*	0.405 to 0.988	0.223	0.800	0.601 to 1.064
1–4	0.354	0.702	0.400 to 1.231	0.089	1.094	0.768 to 1.558
≥ 5 (ref)						

* $P < 0.05$.
ref, reference.

Our study found that nurses who were single/divorced/widowed were more likely to belong to low-perceived professional benefits, which is consistent with earlier findings.²⁹ This may be because, unlike single/divorced/widowed nurses, married nurses receive more social support from their spouses and other family members.

We hypothesised that job fulfilment and social support are important influencing mechanisms that affect nurses' perceived professional benefits. The number of night shifts and leadership roles are important indicators of nurses' job fulfilment. Marital status is an important factor in social support. Each of these factors can have varying degrees of impact on the actual benefit or spiritual benefit.⁴ Considering that nurses perceive professional benefits as a result of personal, organisational, environmental and social factors, a well-developed theoretical framework is required to explain this phenomenon.

Unfortunately, our research failed to demonstrate that the profiles can be predicted by other factors in the model variables. Our findings in the univariate analysis results were consistent with earlier research. Nevertheless, because the bulk of prior research did not employ multi-factor models, it was impossible to compare our findings

with those of others. In addition, certain putative contributing elements were not adequately proven, and further research is required to confirm them in the future.

Our research has theoretical and practical implications for the future study of NPPBs. First, the number of night shifts, leadership role and marriage status are the most significant factors affecting NPPBs, and in the future, we should focus on the degree of influence of these three factors and explore the mechanisms from the theoretical level. Second, managers should pay active attention to the perceived professional benefits of clinical nurses, create a favourable working environment and professional growth atmosphere, and promote the professional success of nurses. Given that 11.8% of nurses still have a low-perceived professional benefit, more tailored intervention programmes are still needed in the future.

Strengths and limitations

To the best of our knowledge, this is the first study to use the LPA approach to explore heterogeneous subgroups of NPPB with a large sample size, and we presented a unique perspective and a basis for future research on the perceived career benefits of nurses. The research was

limited in some ways. First, this was a web-based survey, and the sample process and self-reporting strategy may have resulted in some bias. Second, we only polled nurses in mainland China, and our sample only reflected the current situation in a single nation. Lastly, the constraints of the study's design prohibited an in-depth assessment of the psychological factors behind nurses' perceptions of their professional benefit. As a result, more rigorously designed studies will be required in the future to investigate this issue in depth.

Conclusion

Our study identified three professional benefit profiles among nurses. The results of our study indicated that nurses enjoy a high level of professional benefits. Notwithstanding the study's limitations of the study and the present condition of nursing, it is vital that we engage in several levels to encourage a stable nursing workforce, including policy, organisation, financial income and career development, so that nurses experience a sense of professional gain.

Contributors JH and SCL were responsible for the conception and study design. YQF, WXW and LHM performed the data collection. YQF, WXW and WXX contributed to the analysis of the data. SCL and JH were involved in drafting the manuscript and revising it. All authors have read and approved the final manuscript. JH is responsible for the overall content as the guarantor.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Obtained.

Ethics approval The Ethics Committee of the First People's Hospital of Zunyi (2022-016) approved the study, and participants gave permission for data collection. Prior to completing the survey, participants will be provided with information about the purpose of the study and the major substance of the research. They will then be able to provide their informed consent through a yes or no response. In addition, participants were also informed that the study's findings would be given in aggregate form and that no participant could be identified. If a person declined to complete the questionnaire, the collection was immediately ended.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. Data are available upon reasonable request. Data are available from the corresponding author and the first author on reasonable request.

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REFERENCES

- Wang X, Chen F, Dai P, *et al*. Perceived professional benefits and associated factors among nurses during the COVID-19 pandemic: A cross-sectional study. *Nurs Open* 2023;10:1461–70.
- Jiang H, Huang N, Tian W, *et al*. Factors associated with post-traumatic stress disorder among nurses during COVID-19. *Front Psychol* 2022;13:745158.
- Liu S, Duan X, Han P, *et al*. Occupational benefit perception of acute and critical care nurses: A qualitative meta-synthesis. *Front Public Health* 2022;10:976146.
- Zhou H, Zhu Y, Zhang X, *et al*. Psychological capital and perceived professional benefits: testing the mediating role of perceived nursing work environment among Chinese nurses. *J Psychosoc Nurs Ment Health Serv* 2018;56:38–47.
- Hu J, Liu X. The preparation of nurses' occupational benefit questionnaire and its Reliability and validity test. *J Chin People's Liberation Army* 2013;30:1–5.
- Malone B. A perspective on the state of the world's nursing report. *Nurs Adm Q* 2021;45:6–12.
- Ivziku D, de Maria M, Ferramosca FMP, *et al*. What determines physical, mental and emotional workloads on nurses? A cross-sectional study. *J Nurs Manag* 2022;30:4387–97.
- Morgan B, Jordan L, Rivera LA. Considerations for an aging nurse anesthetists workforce. *Geriatr Nurs* 2020;41:1017–9.
- Tamata AT, Mohammadnezhad M, Mohammadnezhad M: A systematic review study on the factors affecting shortage of nursing workforce in the hospitals. *Nurs Open* 2023;10:1247–57.
- van der Cingel M, Brouwer J. What makes a nurse today? A debate on the nursing professional identity and its need for change. *Nurs Philos* 2021;22:e12343.
- Udod S. Udod S: A call for urgent action: innovations for nurse retention in addressing the nursing shortage. *Nursing Reports* 2023;13:145–7.
- China statistical Yearbook. n.d. Available: <http://www.stats.gov.cn/sj/ndsj/2022/indexch.htm>
- Zeng L-N, Zhang J-W, Zong Q-Q, *et al*. Prevalence of burnout in mental health nurses in China: A meta-analysis of observational studies. *Arch Psychiatr Nurs* 2020;34:141–8.
- Chen JP, Dai YM, Qin Y, *et al*. Factors influencing turnover intention among male nurses in China: A large-scale descriptive Correlational study. *Int Nurs Rev* January 28, 2023.
- Yu JF, Ding YM, Jia RY, *et al*. Professional identity and emotional labour affect the relationship between perceived Organisational justice and job performance among Chinese hospital nurses. *J Nurs Manag* 2022;30:1252–62.
- Lin L, Liu X, He G. Mindfulness and job satisfaction among hospital nurses: the mediating roles of positive affect and resilience. *J Psychosoc Nurs Ment Health Serv* 2020;58:46–55.
- Macey A, Green C, Jarden RJ. ICU nurse Preceptors' perceptions of benefits, rewards, supports and commitment to the Preceptor role: A mixed-methods study. *Nurse Educ Pract* 2021;51:S1471-5953(21)00031-7.
- Natan MB, Qeadan H, Egbaria W. The commitment of Israeli nursing Preceptors to the role of Preceptor. *Nurse Educ Today* 2014;34:1425–9.
- Zheng R-S, Guo Q-H, Dong F-Q, *et al*. Chinese oncology nurses' experience on caring for dying patients who are on their final days: a qualitative study. *Int J Nurs Stud* 2015;52:288–96.
- Christiansen A, Vernon V, Jinks A. Perceptions of the benefits and challenges of the role of advanced practice nurses in nurse-led out-of-hours care in Hong Kong: a questionnaire study. *J Clin Nurs* 2013;22:1173–81.
- Wu B, Zhao Y, Xu D, *et al*. Factors associated with nurses' willingness to participate in care of patients with COVID-19: A survey in China. *J Nurs Manag* 2020;28:1704–12.
- Liu X, Ju X, Liu X. The relationship between resilience and intent to stay among Chinese nurses to support Wuhan in managing COVID-19: the serial mediation effect of post-traumatic growth and perceived professional benefits. *Nurs Open* 2021;8:2866–76.
- Dibert C, Goldenberg D. Preceptors' perceptions of benefits, rewards, supports and commitment to the Preceptor role. *J Adv Nurs* 1995;21:1144–51.
- Hu Y, Hu J, Li L, *et al*. Development and preliminary validation of a brief nurses' perceived professional benefit questionnaire (NPPBQ). *BMC Med Res Methodol* 2020;20:18.
- von Elm E, Altman DG, Egger M, *et al*. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *Int J Surg* 2014;12:1495–9.
- Nylund KL, Asparouhov T, Muthén BO. Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal* 2007;14:535–69.



- 27 Spurr D, Hirschi A, Wang M, *et al.* "Latent profile analysis: A review and "how to" guide of its application within vocational behavior research". *Journal of Vocational Behavior* 2020;120:103445.
- 28 Ma HW, Dan X, Xu SH, *et al.* Current status of nurses' perceived professional benefits and influencing factors in 3A-level hospitals in Tianjin. *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi* 2017;35:443–7.
- 29 Zhan T, Li H, Ding X. Can social support enhance sense of coherence and perceived professional benefits among Chinese registered nurses? A mediation model. *J Nurs Manag* 2020;28:488–94.
- 30 Savitsky B, Radomislensky I, Hendel T. Nurses' occupational satisfaction during COVID-19 pandemic. *Appl Nurs Res* 2021;59:S0897-1897(21)00022-7.
- 31 Mohammed S, Peter E, Killackey T, *et al.* "The "nurse as hero" discourse in the COVID-19 pandemic: A Poststructural discourse analysis". *Int J Nurs Stud* 2021;117:S0020-7489(21)00019-5.
- 32 Beghini D, Cicoletta D de A, Freitas K de, *et al.* Heroines in COVID-19 times: visibility of nursing in the pandemic. *Rev Gaucha Enferm* 2021;42:S1983-14472021000200424.
- 33 James L, Elkins-Brown N, Wilson M, *et al.* The effects of three consecutive 12-hour shifts on cognition, Sleepiness, and domains of nursing performance in day and night shift nurses: A quasi-experimental study. *Int J Nurs Stud* 2021;123:S0020-7489(21)00188-7.
- 34 Weaver SH, de Cordova PB, Vitale TR, *et al.* Experiences and perceptions of nurses working night shift: a qualitative systematic review. *JBI Evid Synth* 2023;21:33–97.
- 35 Borroni E, Frigerio G, Polledri E, *et al.* Metabolomic profiles in night shift workers: A cross-sectional study on hospital female nurses. *Front Public Health* 2023;11:1082074.
- 36 Jørgensen JT, Røzings MP, Westendorp RGJ, *et al.* Shift work and incidence of psychiatric disorders: the Danish nurse cohort study. *J Psychiatr Res* 2021;139:132–8.
- 37 Ferri P, Guadi M, Marcheselli L, *et al.* The impact of shift work on the psychological and physical health of nurses in a general hospital: a comparison between rotating night shifts and day shifts. *Risk Manag Healthc Policy* 2016;9:203–11.