

EMPIRICAL RESEARCH QUANTITATIVE

The relationship between job crafting and work engagement among nurses in China: A latent profile analysis

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Abstract

Aim: To identify subtypes of job crafting among Chinese nurses and to explore the characteristics of different subtypes and their relationship with work engagement.

Design: A cross-sectional study.

Methods: A survey of 350 clinical nurses was conducted between December 2022 and January 2023. Identify profile categories for nurses' job crafting using a latent profile analysis. Logistic regression and ANOVA were used to explore the characteristics of different categories of nurses' job crafting in terms of sociodemographic, work engagement variables.

Results: Ultimately 3 latent profiles are identified: low job crafting (Class 1, $N=177$, 50.7%), moderate job crafting (Class 2, $N=136$, 38.9%), high job crafting (Class 3, $N=37$, 10.5%). Nurses who are female, aged 31 to 40 and married are more likely to be grouped into Class 2. Nurses with a middle level of title are more likely to be grouped as Class 3. Nurses with high levels of work engagement are more likely to be grouped as Class 2 and Class 3 rather than Class 1.

Conclusion: The job crafting has a distinctly classified character among Chinese nurses. 89.6% of nurses were at a low to medium level of job crafting, work engagement is an important predictor of nurses' job crafting. Nursing Managers should focus on the low job crafting group and develop targeted interventions to help nurses improve their job crafting and work engagement levels.

Patient or Public Contribution: None.

KEYWORDS

nurses, job crafting, work engagement, latent profile analysis

1 | INTRODUCTION

With the advent of the era of big data, artificial intelligence technology is rapidly evolving and continues to reshape the healthcare industry (Ng et al., 2022). An ageing population, a shortage of nurses, an epidemic of infectious diseases leading to uncertainty

and complexity in the healthcare environment, increased organizational variability and the challenges nurses often face in their work (examples include correct nursing decisions in an explosion of information, the integration of artificial intelligence with job content, COVID-19 leading to a change in the work environment, and the disproportionate number of nurses to the number of

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patients) (Ren et al., 2021; Yoo & Lee, 2022; Zhang, 2023), nurses are under great professional pressure and nurses have had to adapt to changes in their working environment (Latsou et al., 2022). It is, therefore, increasingly important to improve the ability of nurses to adapt their working conditions. In the field of organizational management, this behaviour is known as 'job crafting' and refers to the individual's initiative to adapt work requirements and resources to achieve a personal-work match, thereby increasing the meaning of work and building experience (Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001). Previous research has shown that job crafting exists and develops in all industries and at all levels of personnel and is associated with many positive outcomes (innovative behaviour, job performance, work engagement) (Martínez-Díaz et al., 2023; Nielsen et al., 2014; Tian et al., 2021). Therefore, in the context of today's changing health care environment, job crafting may be the key for nurses to adapt to work changes, respond to change, and meet the challenges of providing more efficient, quality and safe care to patients.

Job crafting is the spontaneous act of balancing the demands of a job with one's abilities and access to resources in order to achieve a better match between personal characteristics and work attributes (Tims & Bakker, 2010; Wang et al., 2020). Based on the Job Demands-Resources model (JD-R) (Bakker & Demerouti, 2007), Tims and Bakker identify four types of job crafting: (1) increasing structural job resources, e.g. adequate job resources, career development opportunities, job autonomy; (2) increasing social job resources, e.g. social support, supervisory guidance or job feedback; (3) increasing challenging job demands, e.g. promoting personal growth, increasing the need for personal fulfilment; (4) decreasing hindering job demands, e.g. situations that prevent or interfere with goal achievement, role ambiguity, overload and conflict. This concept has generated a great deal of interest over the past decade or so. Studies in Colombia and Saudi Arabia report that job crafting increases the well-being of health care providers at work (Alharthi et al., 2023; Dominguez et al., 2018). In a cross-sectional study, Chinese nurses were found to reduce the impact of attendance on physical and mental ill-health through job crafting behaviours (Liu et al., 2022). Previously in South Africa and Japan, job crafting enabled doctors and nurses to optimize their functioning in the workplace and was an important strategy for high work engagement (Bakker, 2018; Kato et al., 2023). Individuals with a high level of job crafting have better work performance, are engaged at work, and are less likely to burnout (Slowiak & DeLongchamp, 2022). Although studies have been conducted to explore the factors associated with job crafting, there is little research on job crafting among nurses, especially in the context of the Chinese healthcare environment, nurses job crafting requires more investigation.

In previous studies of nurses' job crafting, individual levels of job crafting were represented by calculating the total or mean scores on the Job crafting scale, without distinguishing the cut-off points for different levels of job crafting (Cheng, Ding, et al., 2020; Tang et al., 2020). In addition,

previous studies have used a 'variable-centred' approach to explore the factors associated with job crafting, and have defaulted to homogeneous individuals, ignoring the issue of heterogeneity between groups (Dutta et al., 2023; Liu et al., 2023). However, latent profile analysis (LPA), is an 'individual-centred' method of statistical analysis that distinguishes between apparently homogeneous individuals with the same characteristics into different profiles with distinctive features, and uses objective statistical indicators to make the classification more accurate and valid (Collins & Lanza, 2009). At the same time, the greatest variation is found outside the profiles, while the smallest variation is found within the profiles, allowing managers to take targeted interventions. This statistical analysis method has been widely and effectively used in the fields of psychology and organizational behaviour (Fernández et al., 2020; Gabriel et al., 2015), but has not been used in job crafting research. Thus, LPA can provide a new perspective for exploring job crafting among Chinese nurses.

Work engagement is considered a positive, satisfying and emotionally stable occupational state (Boyle et al., 2023; Schaufeli et al., 2002). It has three core characteristics: (a) vigour: energy and drive at work, perseverance in the face of difficulties; (b) dedication: meaningful pursuits and challenges, good self-affirmation; (c) absorption: total immersion in the work. Individuals who are highly committed to their work are always enthusiastic about their work, they complete it efficiently and achieve good quality work (Dan et al., 2023). This has a beneficial impact on both the employee and the organization (Szóts-Kováts & Kiss, 2023). The literature suggests that increased work resources and challenging work demands are associated with beneficial outcomes such as positive employee mood, increased creativity and good work engagement, and that reducing hindering work demands can improve employee well-being (Ghazzawi et al., 2021; Suhariadi et al., 2023). Employees who are high in job crafting are more engaged in their work (Rafiq et al., 2023). Nurses with high work engagement are passionate and effective at their works, proactive in providing quality care to patients, and they have better performance (Wu et al., 2022). Therefore, exploring the characteristics of work engagement in different profiles of nurses' job crafting can identify target groups for targeted interventions to effectively improve nurses' job crafting and work engagement.

This study proposes the following hypotheses: (1) there are different profiles of job crafting among Chinese nurses; (2) there are differences in job crafting among different profiles of nurses in terms of demographic characteristics and work engagement.

2 | METHODS

2.1 | Participants and procedure

This study used a cross-sectional research design and a questionnaire survey among nurses from three grade 3A hospitals in Shaanxi Province and Shandong Province. Inclusion criteria were: (1) obtaining a professional qualification for nurses in the People's Republic

of China; (2) being formally employed by the hospital and practicing clinical nursing for 1 year or more; (3) informed consent and voluntary participation. Exclusion criteria were: (1) nurses in further training or internship; (2) those on leave (sick leave, maternity leave, etc.).

We follow the recommendation made by Nylund- Gibson and Choi (2018) that the sample size for the study should not be less than 300 subjects when applying latent profile analysis.

2.2 | Data collection

The study was conducted from December 2022 to January 2023 in Shaanxi and Shandong Provinces, China. We used an online questionnaire platform (Questionnaire Star) to distribute and collect data. Informed consent was obtained from hospital administrators prior to conducting the study and the link to the online questionnaire was shared to the nurse community with the support and assistance of hospital administrators. The questionnaire's front page described the purpose and significance of the study and the instructions for completing the questionnaire, which could only be completed after the participant had clicked on the "Informed and consent to participate in the study" button. In order to avoid receiving duplicate questionnaires, invalid questionnaires (inconsistent with the facts: "age 2000", same answer for all questions), we set the platform to be filled in only once per IP address, to take no less than 10min to complete, and to use intelligent logic checks to identify them. Two researchers checked all valid questionnaires to ensure the accuracy of the data.

2.3 | Measures

2.3.1 | Demographic characteristics

We collect demographic information such as gender, age, marital status, working experience, Professional title, educational level, working hours daily, and monthly income.

2.3.2 | Job crafting

Job crafting was measured using the Chinese version of the Job Crafting Scale developed by Tims et al. (2012) and translated by Lou (T. Liu et al., 2022). The scale includes increasing structural job resources (5 items; e.g. "I try to learn new knowledge and skills from my work"); increasing social job resources (5 items; e.g. "I actively seek advice or suggestions from colleagues at work"); increasing challenging job demands (5 items; e.g., "I try to seek more challenges or breakthroughs when I have room to do so"); decreasing hindering job demands (6 items; e.g., "I try to reduce the negative impact of work on my emotions"), on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), has good reliability and validity and

is widely used in the country. In the present study, the Cronbach's alpha-efficient for the scale was 0.932.

2.3.3 | Work engagement

Work engagement was measured using the Chinese version of the Work Engagement Scale developed by Scale Schaufeli (Soane et al., 2012) and translated by Zhao (Guangli, 2011). The scale contains three dimensions of vigour (3 items), dedication (3 items) and absorption (3 items), with 9 entries, and is scored on a 7-point Likert scale from 0 (never) to 6 (every day). The total score is 53, with higher scores representing a higher level of employee commitment to work. The scale has good reliability and validity and is widely used in national studies (Hui-Ren et al., 2023). In the present study, the Cronbach's alpha-efficient for the scale was 0.946.

2.4 | Ethical considerations

This study was guided by the ethical standards in the Declaration of Helsinki. An electronic version of the informed consent form was provided to all participants before the start of the study. At the same time, they were informed that they could withdraw from this study at any time. We assured that all information would be used for this study only and that we would keep it strictly confidential. This study was reviewed and approved by the Independent Ethics Committee of the First Affiliated Hospital of the Air Force Military Medical University.

2.5 | Data analysis

SPSS 26.0 was used for descriptive analysis (means and standard deviations were used to describe the measurement data, and frequencies and percentages were used for the count data). Mplus 8.3 statistical software was used for latent profile analysis. Model fit estimation for the latent profile analysis was carried out using the four dimensions of job crafting as exogenous indicators and sequentially increasing the number of latent profiles of job crafting. Model fit evaluation metrics: Akaike information criterion (AIC), Bayesian information criterion (BIC), sample size-adjusted BIC (aBIC), bootstrapped likelihood ratio test (BLRT), Lo-Mendell-Rubin likelihood ratio test (LMR), Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR) and entropy. The smaller the values of AIC, BIC and aBIC, the better the model fits; the Entropy takes a value between 0 and 1, the closer to 1, the more accurate the classification of the model; LMR and BLRT are used for model comparison, with significant p -values ($p < 0.05$), indicating that K models are better than $K-1$ profile models. After determining the optimal model, chi-square tests and ANOVA were used to identify statistically significant indicators. Logistic regression analysis was used to evaluate the influence of

latent profiles. $p < 0.05$ indicates that the difference is statistically significant.

3 | RESULTS

3.1 | Participant characteristics

A total of 360 questionnaires were distributed in this study and 350 valid questionnaires were returned, with a valid return rate of 97.22%. There were 308 females (88.0%) and 42 males (12.0%); the mean age was 32.98 years ($SD = 7.05$) and the mean length of service was 10.31 years ($SD = 7.71$). General information is presented in Table 4.

3.2 | Latent profiles of job crafting

A total of five latent profiles were fitted to the model and the results of the model fit are shown in Table 1. aIC, BIC and aBIC values gradually decreased as the number of profiles increased. However, when the number of profiles reached five, the LMR values were not significant. When the number of profiles reached four, the AIC, BIC, and aBIC values were the smallest and the Entropy value was the largest, and the LMR and BLRT values showed $p < 0.01$, but the probability of one of the profiles was only 7.7%, and the classification accuracy was poor and did not have classification significance. When the third profiles were used, the AIC, BIC and aBIC values were lower, the Entropy values were higher and the LMR and BLRT values were significant. Therefore, three profiles were finally selected as the best-fit models: Class1 (C1, $N = 177$, 50.7%), Class2 (C2, $N = 136$, 38.9%), and Class3 (C3, $N = 37$, 10.5%). To further confirm the confidence of the classification results, the correct classification probabilities for the three latent profiles were calculated to be 94.8%, 97.0% and 92.5%, respectively (Table 2).

Table 3 and Figure 1 both show the level of job crafting among nurses in the three categories. Category 1, with 177 nurses (50.7% of the total), had the lowest scores in all dimensions of job crafting and was, therefore, named the “low job crafting” group. There were 136 nurses in the second category, accounting for 38.9% of the total number of nurses, who scored in the moderate range in all dimensions and were named the “moderate job crafting” group; 37 nurses in the third category, accounting for 10.5% of the total number of

nurses, scored the highest in all dimensions of job crafting and were, therefore, named the “high job crafting” group.

3.3 | Sociodemographic characteristics of the different classes

The results of the univariate analysis (Table 4) showed that the three categories in terms of age ($\chi^2 = 15.461$, $p < 0.05$), marital status ($\chi^2 = 7.233$, $p < 0.05$), professional title ($\chi^2 = 18.043$, $p < 0.05$), working hours daily ($\chi^2 = 10.932$, $p < 0.05$) and monthly income ($\chi^2 = 9.823$, $p < 0.05$) the differences were statistically significant ($p < 0.05$). There were no statistically significant differences in other demographic characteristics ($p > 0.05$).

3.4 | Influencing factors of job crafting in different groups of nurses

Logistic regression models were developed using the latent profile of job crafting as the dependent variable and Class 1 as the control group. The results showed (Table 5) that compared to Class 1 (Class 1), nurses who were female ($OR = 3.083$, $p < 0.05$), aged 31 to 40 years ($OR = 3.072$, $p < 0.05$) and married ($OR = 0.341$, $p < 0.05$) were more likely to be classified in Class 2; nurses with a middle title ($OR = 7.112$, $p < 0.05$) were more likely to be classified in Class 3. In terms of between-group differences in work engagement, Class 3 had the highest level of work engagement (Table 6).

4 | DISCUSSION

Job crafting as a process of individual initiative and spontaneous work redesign can help nurses cope with the impact on nursing working conditions in the context of big data and pandemics (Mansour &

TABLE 2 Average latent class probabilities for most likely latent class membership (row) by latent class (column).

Class	C1 (%)	C2 (%)	C3 (%)
C1	0.948	0.000	0.052
C2	0.000	0.970	0.030
C3	0.070	0.005	0.925

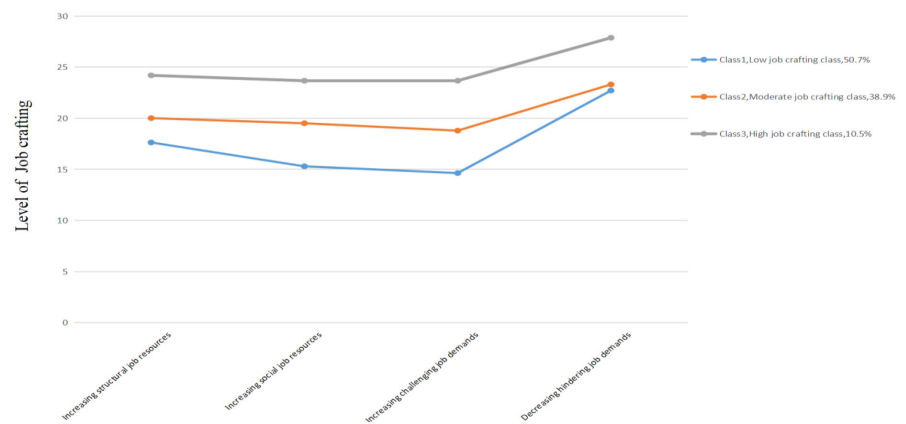
TABLE 1 Model fit statistics for latent class analysis models specifying one to five classes.

Model	AIC	BIC	aBIC	Entropy	LMR	BLRT	Category probability
1	7111.119	7141.983	7116.604	-	-	-	-
2	6671.897	6722.050	6680.810	0.851	<0.01	<0.01	0.640/0.360
3	6395.276	6464.719	6407.616	0.878	<0.05	<0.01	0.506/0.106/0.389
4	6300.109	6388.841	6315.877	0.909	<0.01	<0.01	0.497/0.103/0.077/0.323
5	6241.359	6349.378	6260.552	0.933	0.08	<0.01	0.143/0.449/0.317/0.012/0.074

TABLE 3 Job crafting of nurses in different categories.

	N	Job crafting	Increasing structural job resources	Increasing social job resources	Increasing challenging job demands	Decreasing hindering job demands
C1: Low job crafting	177	70.12 ± 4.74	17.62 ± 1.62	15.21 ± 2.03	14.61 ± 1.91	22.67 ± 2.47
C2: Moderate job crafting	136	81.69 ± 3.73	19.99 ± 1.52	19.59 ± 1.49	18.78 ± 1.86	23.33 ± 2.22
C3: High job crafting	37	99.35 ± 5.12	24.19 ± 1.10	23.65 ± 2.02	23.68 ± 1.67	27.84 ± 2.85
F		760.981	117.048	427.412	105.575	69.983
p		<0.001	<0.001	<0.001	<0.001	<0.001
LSD		3 > 2 > 1	3 > 2 > 1	3 > 2 > 1	3 > 2 > 1	3 > 2 > 1

FIGURE 1 Response patterns for latent classes.



Nogues, 2022). Job crafting enables nurses to actively and purposefully apply the initiative of resources such as technology and knowledge in their work to achieve an improved nursing practice environment and achieve a personal-organizational fit (Harbridge et al., 2022). In the process, it helps to increase nurses' competence, sense of meaningfulness and well-being at work, which in turn increases the level of work engagement (Baghdadi et al., 2021; Chang et al., 2020). Nurses are a group with high levels of occupational stress. Promoting personal growth and professional development by increasing work resources and reducing psychological stress facilitates nurses' increased ability to adapt to the workplace and improves the psychosocial work environment for nurses (Cheng, Yang, et al., 2020). Therefore, it is necessary to encourage nurses to adopt job crafting. In recent years, more and more scholars have begun to focus on this issue of job crafting (Kang & Cho, 2020; Kapica & Baka, 2021). However, but there are few studies on job crafting among nurses in China, and fewer studies on whether job crafting affects Chinese nurses' work engagement. Therefore, this study aims to identify the latent profiles of job crafting among Chinese nurses, and the factors influencing different categories of job crafting, and to explore the relationship between job crafting and work engagement among nurses.

Of the 350 nurses, 177 (50.7%) were in the low job crafting group. Although all nurses were able to engage in job crafting, not all nurses adopted job crafting behaviours at work. Our findings showed that the majority of nurses were at a low level of job crafting. In the low job crafting group, reducing hindering work demands outweighed increasing job resources and challenges. The reason for

this may be that during a pandemic, nurses face too many hindrances in performing their work tasks (Ingusci et al., 2021), such as operating in protective gear, changes in epidemic prevention policies, unclear treatment information and role ambiguity, which exceed the nurses' ability to handle them, making this group's desire to decreasing hindering job demands higher.

Of the sample of 350 nurses, 136 (38.9%) were in the moderate job crafting group, a group characterized by an equal need for increased structural and social job resources, along with a similar level of need for all four. Indicating that this group of nurses were eager and willing to engage in job crafting behaviours at work to increase challenging job content, but were limited by the urgency of job resources and the presence of factors at work that prevented effective performance of work tasks, their knowledge and skills were not fully utilized to perform those they were willing to, frustrating their desire for job crafting.

In addition, only 37 (10.5%) of the nurses in the sample were in the high job crafting group, nurses were at a high level of job crafting, the desire to add something challenging to the work done to promote professional growth and meet the need for personal fulfilment. They were more willing to change some aspects of their work to bring it closer to their personal preferences or to make it more meaningful. It is suggested that nurses in the high job crafting group are supportive of and committed to organizational change in the changing healthcare environment. This may be related to the fact that individuals will show different reactions, hospital policies, and resources in the face of organizational change (Szóts-Kováts & Kiss, 2023).

TABLE 4 The differences in the job crafting types of nurses in demography.

Variable	Overall	Low JC	Moderate JC	High JC	χ^2/F	<i>p</i>
Gender						
Male	42 (12.0%)	17 (9.6%)	22 (16.2%)	3 (8.1%)	3.739	0.154
Female	308 (88.0%)	160 (90.4%)	114 (83.8%)	34 (91.9%)		
Age						
20–30	133 (38.0%)	79 (44.6%)	45 (33.1%)	9 (24.3%)	15.461	<0.05
31–40	172 (49.1%)	86 (48.6%)	66 (48.5%)	20 (54.1%)		
≥41	45 (12.9%)	12 (6.8%)	25 (18.4%)	8 (21.6%)		
Marital status						
Unmarried	95 (27.1%)	59 (33.3%)	27 (19.9%)	9 (24.3%)	7.233	<0.05
Married	255 (72.9%)	118 (66.7%)	109 (80.1%)	28 (75.7%)		
Educational level						
Junior college	76 (21.7%)	44 (24.9%)	25 (18.4%)	7 (18.9%)	5.562	0.234
Undergraduate	258 (73.7%)	128 (72.3%)	101 (74.3%)	29 (78.4%)		
≥Master's degree	16 (4.6%)	5 (2.8%)	10 (7.4%)	1 (2.7%)		
Professional title						
Junior	177 (50.6%)	94 (53.1%)	62 (45.6%)	21 (56.8%)	18.043	<0.05
Middle	146 (41.7%)	76 (42.9%)	62 (45.6%)	8 (21.6%)		
Senior	27 (7.7%)	7 (4.0%)	12 (8.8%)	8 (21.6%)		
Working hours daily						
≤7	24 (6.9%)	6 (3.4%)	12 (8.8%)	6 (16.2%)	10.932	<0.05
8–10	319 (91.1%)	166 (93.8%)	123 (90.4%)	30 (81.1%)		
≥11	7 (2.0%)	5 (2.8%)	1 (0.7%)	1 (2.7%)		
Working experience						
≤5	103 (29.4%)	62 (35.0%)	35 (25.7%)	6 (16.2%)	8.907	0.063
6–10	110 (31.4%)	57 (32.2%)	40 (29.4%)	13 (35.1%)		
≥11	137 (39.1%)	58 (32.8%)	61 (44.9%)	18 (48.3%)		
Monthly income						
≤3000	66 (18.9%)	31 (17.5%)	27 (19.9%)	8 (21.6%)	9.823	<0.05
3001–6000	168 (48.0%)	99 (55.9%)	55 (40.4%)	14 (37.8%)		
≥6001	116 (33.1%)	47 (26.6%)	54 (39.7%)	15 (40.5%)		

4.1 | Latent classes and demographic variables

In recent years, there has been a growing interest in job crafting for nurses as an important way of coping with organizational change. Previous research has shown that the more years nurses have worked, the higher their level of job crafting (Badawy et al., 2017). Cross-sectional studies have shown that nurses who work between 6 and 8 h per day have higher levels of job crafting (Alharthi et al., 2023). There are many factors that influence nurses' job crafting, such as objective factors (work environment) (Chang et al., 2020) and subjective factors (core self-evaluation) (Tims & Akkermans, 2017). In our study, we explored nurses' job crafting from different perspectives and the results are presented in Tables 4 and 5. The results in Tables 4 and 5 are not consistent because we developed multivariate logistic regression models that included all demographic factors.

In terms of gender, those in the moderate job crafting group were mostly female compared to those in the low job crafting group, and

in the moderate job crafting, women had three times the level of job crafting as men, which is consistent with previous studies (Alharthi et al., 2023). This may be due to the fact that in China, nursing is a profession mostly practised by women and there are fewer male nurses (Li et al., 2023). The study suggests that male nurses have a lower professional identity due to traditional cultural beliefs, which hinders their work enthusiasm and efficiency and reduces work initiative (Chen et al., 2020), resulting in lower job crafting behaviour in men than in women. We also found that nurses aged 31 to 40 had a moderate level of job crafting. Possible reasons for this are that nurses aged 31 to 40 are at an important stage in their career development, they are more receptive to organizational change than nurses of their age, have gained some work experience and are able to take the initiative to adapt to changes in their work environment by crafting their work (Bakker, 2018). In addition, our findings showed that the moderate job crafting group was more often sourced from married nurses compared to those in the low job

TABLE 5 Multinomial logistic regression analysis of influencing factors affecting profile of job crafting ($N=350$).

Variable	Low JC VS moderate JC				Low JC VS high JC			
	Reference: Low JC				Reference: Low JC			
	OR	p	OR 95%CI		OR	p	OR 95%CI	
Lower			Upper	Lower			Upper	
Gender (ref.: male)								
Female	3.083	0.006	1.378	6.896	2.747	0.190	0.607	12.436
Age (ref.: ≥ 41)								
20–30	3.490	0.062	0.938	12.990	2.350	0.497	0.199	27.739
31–40	3.072	0.033	1.097	8.600	1.059	0.952	0.163	6.897
Marital status (ref.: unmarried)								
Married	0.341	0.023	0.135	0.865	1.169	0.848	0.238	5.740
Educational level (ref.: \geq Master's degree)								
Junior college	2.693	0.190	0.611	11.860	0.340	0.475	0.018	6.582
Undergraduate	1.704	0.445	0.434	6.694	0.202	0.256	0.013	3.202
Professional title (ref.: Senior)								
Junior	0.392	0.214	0.090	1.717	1.350	0.783	0.160	11.411
Middle	0.705	0.600	0.191	2.602	7.112	0.046	1.040	46.658
Working hours daily (ref.: >10)								
≤ 7	0.230	0.242	0.020	2.701	2.142	0.627	0.099	46.279
8–10	0.592	0.650	0.062	5.686	6.870	0.171	0.435	108.543
Working experience (ref.: ≥ 11)								
≤ 5	0.757	0.636	0.239	2.394	2.203	0.500	0.222	21.841
6–10	1.328	0.439	0.648	2.723	1.421	0.570	0.423	4.774
Monthly income (ref.: ≥ 6001)								
≤ 4000	0.799	0.592	0.351	1.817	0.726	0.653	0.179	2.941
4001–6000	1.693	0.089	0.923	3.105	1.424	0.529	0.473	4.285

TABLE 6 Differences in work engagement across the latent classes.

	C1 (N=177) M \pm SD	C2 (N=136) M \pm SD	C3 (N=37) M \pm SD	F	p	LSD
Work engagement	39.53 \pm 8.03	47.73 \pm 12.22	54.43 \pm 12.87	36.518	<0.001	3>2>1
Vigour	12.54 \pm 2.71	14.74 \pm 4.13	18.38 \pm 4.36	47.051	<0.001	3>2>1
Dedication	13.36 \pm 2.98	15.54 \pm 4.20	18.05 \pm 4.41	30.209	<0.001	3>2>1
Absorption	13.63 \pm 3.38	15.54 \pm 4.63	18.00 \pm 5.12	20.676	<0.001	3>2>1

crafting group. Although married nurses have dual responsibilities at work and at home, support from family protects nurses from the adverse effects of occupational stress (Cronin-Stubbs & Brophy, 1985). Nurses can recharge their batteries by having their families provide psychological security to be motivated at work and feel more in control of their work (Kapu et al., 2019), crafting their work according to their strengths, and support and embrace organizational change. As a result, married nurses have higher levels of job crafting compared to unmarried nurses (Alharthi et al., 2023). At the same time, the middle title nurses' present a high job crafting group compared to the low job crafting group. This may be due to the fact that nurses with middle titles are the mainstay of clinical work and have accumulated a wealth of experience and resources in their work (Xu

et al., 2022). In addition, as there is limited room for advancement in the nursing profession, if they want to advance in their titles, they need to continuously acquire new skills and knowledge through job crafting to optimize their professional environment and achieve career development (Roczniwska et al., 2023).

4.2 | Latent classes and work engagement

Based on positive psychology, work engagement is a state of work in which the individual is energized, committed and focused (Holm et al., 2023). Engaged individuals feel positive and satisfying things about their work, rather than negative factors that get in the way

(Al-Hamdan & Bani Issa, 2022). Nurses with higher levels of engagement are more energetic and enthusiastic in their work, which facilitates the mobilization of work resources and the positive acquisition of work feedback to adjust and organize work in a timely manner (Seppälä et al., 2020). Our findings found that low job crafting (C1) scored significantly lower in work engagement than moderate job crafting (C2) and high job crafting (C3), which in turn suggests that individuals with high levels of job crafting are more engaged in their work, which is consistent with previous research (Robledo et al., 2019). By re-designing and re-organizing work, applying work resources and maximizing personal capabilities, individuals are able to optimize the match between work demands and personal resources, which is conducive to work engagement and the appreciation of work meaning (Letona-Ibañez et al., 2021). Individuals with high levels of job crafting are able to proactively change their work environment, increase their job resources through job crafting behaviours, effectively match job demands with competency needs and become the architects of their own work content, which increases their job satisfaction, organizational performance and work engagement (Kapica & Baka, 2021). Based on this, scholars have found that job crafting increases work engagement and well-being, which in turn contributes to job crafting, creating a good cycle of gain (Mülder et al., 2022). Therefore, nursing managers should help nurses to appreciate the meaning of work, and encourage and support nurses to adopt job crafting behaviours at work through a range of measures such as reforming work systems, developing relevant policies and adopting innovative management styles, which will be an effective way to increase their work engagement.

5 | LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

There are several limitations to this study: (1) the questionnaire we collected was self-reported and may have produced common method bias and subjectivity bias; (2) the cross-sectional study was unable to determine the causal relationships between variables. Longitudinal studies could be done in the future to trace the path of change in the crafting of nurses' job; (3) the sample size was not large enough for sampling in only two Chinese provinces, and the sample was limited in scope and did not take into account the differences between different sectors, which limited the extrapolation of the results. Therefore, in the next step of the study, our team will expand the sampling scope and increase the sample size to make the study sample more representative.

6 | CONCLUSIONS

This study explored the characteristics of latent profiles of job crafting and their relationship with work engagement among Chinese nurses. The study found that there were three latent job crafting categories (low job crafting group, moderate job crafting

group and high job crafting group) among Chinese nurses, with unique patterns in the distribution of different latent categories in terms of gender, age, marital status and professional title. In addition, there were differences in the work engagement of nurses in the different job crafting latent categories; 50.7% of the nurses were in the low job crafting group, with the low level of work engagement compared to the moderate and high job crafting groups. In the era of the development of intelligent trends, understanding the characteristics of the categories of nurses' job crafting enables targeted measures to be taken so as to promote nurses' work engagement.

7 | RELEVANCE TO CLINICAL PRACTICE

Nursing managers should help nurses to appreciate the meaning of work and adopt a job crafting approach in line with organizational goals. Providing nurses with the necessary work resources, encouraging nurses to participate in organizational decision-making and actively participating in professional development training are effective ways to improve the psychosocial work environment for nurses and provide levels of work engagement.

AUTHOR CONTRIBUTIONS

Study design: HLZ, WJM, JHL; Data collection: XLX, GXL; Data analysis: HLZ, XLX; Study supervision: HJL; Manuscript writing: HLZ.

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None.

CONFLICT OF INTEREST STATEMENT

None.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request and ethical approval. The data are not publicly available due to ethical restrictions.

ETHICAL APPROVAL

This study was guided by the ethical standards in the Declaration of Helsinki. An electronic version of the informed consent form was provided to all participants before the start of the study. At the same time, they were informed that they could withdraw from this study at any time. We assured that all information would be used for this study only and that we would keep it strictly confidential. This study was reviewed and approved by the Independent Ethics Committee of the First Affiliated Hospital of the Air Force Military Medical University.

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