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Latent profiles of ethical climate and nurses' service behavior

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Abstract

Background: Hospital ethical climate has important implications for clinical nurses' service behavior; however, the relationships are complicated by the fact that five types of ethical climate (caring, law and code, rules, instrumental, and independence) can be combined differently according to their level and shape differences. Recent developments in person-centered methods (e.g., latent profile analysis (LPA)) have helped to address these complexities.

Aim: From a person-centered perspective, this study explored the distinct profiles of hospital ethical climate and then examined the relationships of the profiles with clinical nurses' service behavior (both in-role and extra-role service behavior).

Research design: A quantitative study was conducted using cluster random sampling. Latent profile analysis and binary coded hexadecimal (BCH) analysis were conducted using Mplus 8.2.

Participants and research context: A total of 871 clinical nurses in China were surveyed using the Ethical Climate Scale and Nurses' Service Behavior Questionnaire.

Ethical considerations: Ethical approval was obtained from the IRB of the First Affiliated Hospital of Jinan University (No. KY-2020-090).

Results: A four-profile hospital ethical climate model provided the best fit for the data. The four different profiles not only varied in level, but also in shape: high normative and low egoism (45.8%), high ethical climate (19.9%), low ethical climate (3.6%), and moderate ethical climate (30.8%). These profiles differentially predicted clinical nurses' overall, in-role, and extra-role service behaviors.

Conclusions: The results reveal new insights into the nature of hospital ethical climate and how different clinical nurses in these profiles can be best managed to accomplish different forms of service behavior.

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Keywords
hospital ethical climate, in-role service behavior, extra-role service behavior, latent profile analysis, clinical nurses

Introduction

In the current fierce market competition environment, in addition to superb medical technology and good hardware facilities, hospitals have to maintain their competitive advantages through advanced management consciousness and the provision of all-round, high-quality services for patients.[1] As patient-centered services are high in value and can improve patient satisfaction and safety,[2] research on the factors influencing clinical nurses' service behavior plays a vital role in improving the efficiency and performance of clinical nursing work.[3]

The service behavior of clinical nurses is defined as their nursing care or helpful behavior directed toward their patients. As the professional action of nursing care is process-like, skill-based, comprehensive, ethical, and participatory and has both personal and interpersonal aspects,[4] clinical nurses' service behavior is a kind of patient-oriented "ethical laden practice."[5] However, previous studies have tended to ignore the morality of clinical nurses' service behavior.[6] Furthermore, according to existing research,[1,7] there are two kinds of clinical nurses' service behaviors: in-role and extra-role. In-role service behavior involves the extent to which clinical nurses understand patients' needs and desires and can thus provide help or solutions for patients. Extra-role service behavior involves the extent to which clinical nurses' noncompulsory and constructive behaviors may enable serving and helping patients. As they are discretionary and strongly linked to service orientation involving the satisfaction of clients with job-related issues,[8] clinical nurses' service behavior is a kind of patient-oriented ethical behavior.[7] Additionally, as the two types of service behavior may have different factors and results, it is critical to test both aspects when studying the antecedents, outcomes, and mechanisms of service behavior.[9]

According to Lützén et al.,[10] a hospital's ethical climate is defined as the "implicit and explicit values that drive healthcare delivery and shape the workplaces in which care is delivered"; these deeply affect nurses' thoughts and feelings in clinical work, ultimately affecting their work behavior. Scholars such as Dalmolin et al.[11] have indicated that a positive ethical climate leads to satisfied or happier workers, more balanced and healthier environments, and provision of qualified and safe care. A positive ethical climate is thus an essential factor affecting nurses' service behavior and clinical practice.[12] However, while both domestic and foreign studies in nursing ethics have tended to focus on the connection between ethical climate and nurses' job satisfaction, moral distress, and turnover intentions,[11,13] research on the effect of ethical climate on clinical nurses' ethical behavior remains limited.

In addition to the most studies conducted in the United States,[13] previous research on ethical climate conducted in China,[14] Australia,[15] Israel,[16] and Belgium[17] has frequently employed the ethical climate questionnaire (ECQ) created by Victor and Cullen,[18] who identified five ethical climate types: caring (a concern for the well-being of others); law and code (whether any laws are broken); rules (whether the organization's policies and procedures are being followed); instrumental (a focus on self-interest); and independence.[19] Based on this conceptual framework,[18] numerous theoretical and empirical studies completed over the past few decades have substantially increased our understanding of the factors and outcomes of ethical climate.[11,20] However, most existing studies have adopted the variable-centered method, focusing on the relationship between ethical climate and other variables.[21] Although this method can effectively verify the relationship between variables, it ignores the following points: (1) in different organizational environments, different categories of ethical climate may exist at the same time and (2) there may be significant differences between different types of ethical climate and other variables.[13]

Previous researchers have generally explored the relationship between ethical climate and service behavior in different domains by taking a variable-centered approach.[14,22] In the variable-centered approach, a single set of "averaged" parameters can be estimated,[23] but the unique and independent relationships of each type of ethical climate with other variables are neglected.[1] Furthermore, the variable-centered method assumes that all individuals from a sample under the climate are drawn from a single population.[24] This cannot fully reflect the fact that nurses experience each ethical climate differently in practice.[13] According to Gabriel et al.,[25] latent profile analysis (LPA) provides an innovative approach for answering a variety of substantive research questions that is frequently not possible with more traditional methods, such as analysis of variance (ANOVA), regression, cluster analysis, and factor analysis, and it can assist nurse researchers in understanding multifaceted relationships, intricate patterns, and clusters of symptoms that are needed to help guide interventions.[26]

Background

A person-centered approach—LPA

The person-centered approach[27] helps us to identify how different subpopulations of clinical nurses engage with distinct combinations of five ethical climate types. LPA is a new person-centered statistical analysis method focusing on the heterogeneity between individuals and can ensure that the differences between profiles are the largest, while differences within profiles are the smallest.[7,28] LPA yields distinct groups recognizing that the quantity (level) differs from the quality (shape) in the profile indicators, while exploring their association with external, other, and auxiliary observed variables,[29] which means the latent profiles in a profile solution can differ in a variety of ways, including differences in the unique pattern of high and low mean scores on the indicators (shape differences), and differences in the mean score across all indicators (level differences).[27,30]

In the current study, the level difference across profiles suggests that one profile may indicate that clinical nurses within high levels of caring, law and code, rules, instrumental and independence climate, whilst another profile may contain individuals within low levels of caring, law and code, rules, instrumental and independence climate. The shape difference could suggest that one profile represents a high level of law and code and rules climate, but a low level of caring, instrumental and independence climate, whereas another profile represents a moderate level of caring climate, a low level of law and code and rules climate and a high level of instrumental and independence climate. Therefore, this study attempts to identify whether profiles show shape and level differences. Person-centered analyses are exploratory, selecting the optimal solution in a mainly exploratory manner.[31] We use the person-centered approach to explore the structure and the function of distinct profiles of hospital ethical climate.

Ethical climate and service behavior

As a kind of the organizational climate, hospital ethical climate significantly affects the professional and ethical practice of clinical nurses, and as a result, it should be attached importance to in evaluating clinical nurses' service behaviors. However, the literature is largely silent on how ethical climate affects clinical nurses to imply service behaviors.[12] According to the current literature, the ethical climate not only affects which issues organizational members consider to be ethics-related, but also plays a decisive role in the generation of moral standards that organization members can understand, weigh and solve these problems.[15] On one hand, the ethical climate works through formal culture. Formal culture refers to the aspects such as leadership, structures, reward systems, policies, decision-making processes and socialization mechanisms.[32] This therefore suggests that hospital ethical climate may play a role in facilitating employees' in-role service

behavior. On the other hand, hospital ethical climate also plays an important role by the informal atmosphere, such as in languages, role models, behavioral norms, rituals, and historical anecdotes,[32] which suggests that the ethical climate will lead to a higher level of extra-role service behavior.

In the year of 1975, Schneider strongly believed that because of the diversity of climate types that exist within an organization, it is imperative that researchers focus on those dimensions of climate that are associated with specific variables, rather than focusing on the climate in general.[33] However, evidence specific to the effect of different ethical climate profiles on clinical nurses' in-role service behavior and extra-role service behavior remains limited. Using a person-centered approach lets us understand how different profiles of ethical climate affect clinical nurses' service behavior, which provides unique insights for research on ethical climate and nurses' service behavior, as well as providing direction and reference for the development and improvement of clinical nursing ethics.

Aim

To address the abovementioned gaps in the research, the purposes of this study are firstly to identify the distinct latent profiles of hospital ethical climate based on clinical nurses' perceptions, and secondly to examine the differences between these distinct profiles and clinical nurses' in-role and extra-role service behavior. The following research questions guide this study with no specific hypothesis:

Research Question 1. Whether different ethical climate profiles showing shape and level differences exist at the same time and what are their features?
Research Question 2. Whether clinical nurses in these distinct ethical climate profiles provide service behavior differently?

Method

Ethical considerations

Ethical approval was obtained from the IRB of the First Affiliated Hospital of Jinan University (No. KY-2020-090) before conducting the investigation. All data were treated as secure and confidential.

Design, setting, and participants

The study was mainly built on a quantitative design and survey research. This research adopted cluster random sampling. The three cities with the largest population in Hebei Province, China (i.e., Shijiazhuang, Handan, and Baoding) were selected as sampling areas, and then a tertiary hospital (>500 beds each) was randomly selected from each city, as the tertiary hospital was considered general and sophisticated, providing high-quality service and a high level of education and research across regions.[34] The qualified clinical nurses were randomly selected from three shifts: morning, evening, and night. The inclusion criteria of the sample were as follows: (1) holding the nurse practice certificate of the People's Republic of China; (2) providing clinical nursing services to patients; (3) and having at least 6 months of working experience. The exclusion criteria were as follows: clinical nurses who were studying in the hospital or not formally enrolled.

It is widely understood that the use of larger samples in surveys tends to provide results more precise and stable. According to Nylund et al.,[35] a minimum sample size of about 500 should lead to enough accuracy in identifying a correct number of latent profiles. Additionally, in Spurk et al.'s review,[36] 54.3% of the studies had a sample size larger than 500, and thus used a large enough sample when relying on a rule of thumb. As the non-proportionate quota sampling method was used, in our study, sample size of 1000 registered nurses

was designed, which is in line with recommendations form Monte Carlo simulations on the power of fit values within categorical latent variable modeling.[37]

During the period of November 2020 to February 2021, the fourth author personally distributed the survey questionnaires to 1000 clinical nurses working in the three tertiary hospitals of China. Verbal informed consent was obtained from the participants after the researchers explaining the purpose, risks, and benefits of the study as suggested in prior research.[38] The participation was voluntary and no personally identifiable information was collected. In addition, at the beginning of the questionnaire, there was a cover letter containing information concerning purpose, anonymity, and confidentiality. The letter also included instructions and fill-in method for those clinical nurse participants.

As consulting the agreement of nurse leader, all the samples completed the questionnaires during their work hours. Participants were told that the purpose of this study was to learn more about clinical nurses. After that, the survey instrument included demographic conditions, the ethical climate of his/her hospital, and their service behavior was distributed to each nurse by the researchers, with the assistance of nurse managers. The subjects were instructed to read the items carefully and to respond to the associated questions, and they were informed of their right to withdraw from the survey at any time. Completed questionnaires were returned into letterboxes, designed for that purpose and situated in each unit. The fourth author collected the filled questionnaires at the end of the data collection and 964 questionnaires were completed and returned. After 93 invalid questionnaires were excluded, 871 valid questionnaires were finally collected, yielding an effective response rate of 87.1%.

Measures

Measurement items were adapted from existing scales in the literature to ensure the reliability and content validity of the latent variables. All survey items were recorded on a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The ECQ was initially developed by Victor and Cullen,[18] and we used a Chinese version of ECQ to assess clinical nurses' perceptions of the ethical climate in their hospitals. The Chinese version of the 20-item scale includes five dimensions: law and code (4 items), caring (4 items), instrumental (5 items), independence (4 items), and rules (3 items).[6] The five-dimensional scale has been used widely in previous research and demonstrated to be reliable and valid.[39] In our study, Cronbach's α of caring, law and code, rules, instrumental, and independence were 0.855, 0.873, 0.815, 0.828, and 0.829, respectively. The Cronbach's α value of the overall ethical climate was 0.87. The results of CFA indicated a good fit for the five-dimensional model to the data (χ^2/df = 5.50, SRMR = 0.051, CFI = 0.922, RMSEA = 0.072, and TLI = 0.907). Both the reliability and construct validity of the ECQ have been confirmed.

The clinical nurses' service behavior scale was developed by Chen,[40] as presented in the Appendix, which includes two dimensions for a total of eight items: in-role service behavior (five items) and extra-role service behavior (three items). This scale has been tested in China and has good reliability and validity.[1,6,7,12] Cronbach's α was 0.885 for service behavior, 0.908 for in-role service behavior, and 0.847 for extra-role service behavior. These values indicate a high degree of internal reliability.

Common method variance test

In the use of self-report surveys, the data may be vulnerable to common method variance (CMV). According to the previous studies,[41] in this study, we followed strict confidentiality and voluntarism principles and asked participants to be honest in their answers to each question. Through protecting respondent anonymity and reducing evaluation apprehension, these methods effectively control the bias of the common method in the study's procedures. Additionally, a test of the one-factor model using CFA can partly address CMV concerns.[42] If the method variance largely accounts for covariations among study measures, CFA results should

suggest a good fit for the one-factor model. In this study, the results showed that the model fit was poor, $\chi 2 = 7552.751$, df = 350, SRMR = 0.161, RMSEA = 0.150 [90% CI = 0.147 to 0.154], CFI = 0.523, TLI = 0.484, which indicating that there is no significant common method variance problem in this study.

Data analysis

The current study used SPSS 23.0 and Mplus 8.2 statistical software in data analysis. First, a two-tailed t test and ANOVA were applied to test the group differences of dependent variables. Second, the means, standard deviations, and correlations of variables are tested. Third, LPA was applied to construct the latent profiles of ethical climate.[43] Consistent with Nylund et al.,[35] major fit indexes are the log likelihood ratio (LL), Akaike information criterion (AIC), Bayesian information criteria (BIC), entropy, likelihood ratio test (LMRT), and bootstrap likelihood ratio test (BLRT). There are no cutoff scores for LPA fit statistics. Rather, the best model has the following fit statistics:[25] the smaller the AIC, BIC, and SSA–BIC values are, and the larger the entropy value is, the better the fit. Values of entropy above 0.80 are generally considered acceptable.[44] LMRT and BLRT are often used to evaluate the fit difference of latent profile models. If the p value reaches the level of significance ($p < 0.05$), it indicates that the model with k number of profiles is significantly better than the model with $k-1$ profiles.[28] Finally, the binary coded hexadecimal (BCH) command in Mplus[25] was used to analyze whether these latent profiles for ethical climate differentially affected clinical nurses' overall, in-role, and extra-role service behaviors. This command conducts Wald tests to compare the mean scores of the outcomes across groups and was found to offer robust results even for nonnormal distributed variables.[28]

Results

Descriptive statistics

The demographic characteristics, job condition variables and group differences in kinds of service behavior are shown in Table 1. Females accounted for 94.9%, most of them young (93% were under 40 years old) and having received university education (45.4% had a bachelor's degree or above). The clinical nurses who were aged 40 and older, have master's degree or above and worked over 20 years exhibited higher overall, in-role, and extra-role service behavior, while the clinical nurses who worked as the co-chief have higher overall and in-role service behavior.

The means, standard deviations, and correlations for the variables are shown in Table 2. The total mean value of hospital ethical climate was 3.494 (±0.600), and the scores in the sub-dimensions were as follows: rules 4.315 (±0.724); law and code 4.294 (±0.745); caring 3.567 (±0.970); instrumental 2.883 (±0.967); and independence 2.770 (±1.026). The total mean value for clinical nurses' service behavior was 4.085 (±0.675), and 4.301 (±0.703) for in-role and 3.725 (±0.901) for extra-role service behaviors. In addition, ethical climate was positively correlated with overall ($r = 0.546$**), in-role ($r = 0.471$**), and extra-role service behaviors ($r = 0.478$**). In the sub-dimension test for ethical climate, only instrumental was not related to in-role service behavior ($p > .05$).

Latent profile analysis

LPA was conducted in Mplus to identify the potential profiles of ethical climate and whether the profiles have significantly different effects on service behavior. Referring to the research of Nylund et al.[35] and Wu et al.,[45] we began by specifying three latent profiles and increased the number until the increase in model fit no longer merited the reduction in parsimony achieved by specifying another latent class. The fitting indices of the four models are shown in Table 3. In the 5 and 6 profile models, the p value of LMR was less significant than that of

Table 1. Demographic characteristics (n = 871) and comparisons of service behavior.

Demographics	n (%)	Extra-role service behavior			In-role service behavior			Extra-role service behavior		
		M ± SD	F/t	p	M ± SD	F/t	p	M ± SD	F/t	p
Gender			0.387	.534		0.097	.755		0.132	.716
Female	827 (94.9)	4.08 ± 0.67			4.31 ± 0.70			3.72 ± 0.90		
Male	44 (5.1)	4.10 ± 0.77			4.22 ± 0.80			3.91 ± 0.94		
Age			81.211	<.001		103.385	<.001		24.35	<.001
≤20	36 (4.1)	2.59 ± 1.19			2.59 ± 1.22			2.60 ± 1.24		
21–30	586 (67.3)	4.12 ± 0.57			4.33 ± 0.58			3.75 ± 0.86		
31–40	188 (21.6)	4.19 ± 0.56			4.46 ± 0.55			3.73 ± 0.86		
>40	61 (7.0)	4.35 ± 0.45			4.49 ± 0.41			4.11 ± 0.71		
Education level			22.778	<.001		30.799	<.001		6.216	<.001
Technical school	54 (6.2)	3.40 ± 1.23			3.48 ± 0.02			3.26 ± 0.17		
Junior college	421 (48.3)	4.09 ± 0.68			4.30 ± 0.70			3.73 ± 0.93		
Bachelor's degree	388 (44.5)	4.17 ± 0.48			4.41 ± 0.49			3.77 ± 0.79		
Master's degree or above	8 (0.9)	4.27 ± 0.41			4.28 ± 0.40			4.25 ± 0.56		
Work years			12.701	<.001		14.575	<.001		5.101	<.001
≤5	474 (54.4)	3.95 ± 0.76			4.15 ± 0.81			3.62 ± 0.95		
6–10	237 (27.2)	4.18 ± 0.56			4.44 ± 0.55			3.76 ± 0.86		
11–15	79 (9.1)	4.30 ± 0.43			4.55 ± 0.43			3.89 ± 0.73		
16–20	27 (3.1)	4.49 ± 0.36			4.70 ± 0.31			4.12 ± 0.74		
>20	54 (6.2)	4.32 ± 0.47			4.50 ± 0.40			4.02 ± 0.80		
Position			0.766	.465		0.987	.373		0.233	.792
General nurse	750 (86.1)	4.10 ± 0.76			4.31 ± 0.80			3.75 ± 0.92		
Deputy head nurse	118 (13.5)	4.09 ± 0.62			4.31 ± 0.64			3.73 ± 0.86		
Head nurse	3 (0.3)	3.99 ± 0.83			4.19 ± 0.89			3.66 ± 1.14		
Professional title			9.292	<.001		16.071	<.001		1.375	.249
Primary nurse	417 (47.9)	3.97 ± 0.78			4.13 ± 0.82			3.68 ± 0.96		
Senior nurse	334 (38.3)	4.17 ± 0.56			4.44 ± 0.55			3.72 ± 0.86		
Supervisor nurse	102 (11.7)	4.26 ± 0.48			4.50 ± 0.45			3.86 ± 0.78		
Co-chief nurse	18 (2.1)	4.31 ± 0.45			4.53 ± 0.40			3.94 ± 0.68		

the 3 and 4 profiles. Although the entry value of the 3 profile model is the highest, the values for AIC, BIC, and SSA–BIC decrease the most from the 3 to the 4 profile model. The 4 profile model thus appears to be the most reasonable.

The latent profile structure of ethical climate is shown in Figure 1 and Table 4. For latent profiles with shape differences, prior research mainly pays attention to its differences in the unique pattern of high and low mean scores on the indicators and differences in the degree of differentiation among indicators within a profile.[46] And research labels these profiles according to the actual meaning of one or two dominant indicators.[28] Profile 1 was the first and largest of the four profiles, 399 participants made up the profile

Table 2. Descriptive statistics.

Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1 Ethical climate	3.494	0.600	1								
2 Caring	3.567	0.970	0.672**	1							
3 Law and code	4.294	0.745	0.592**	0.453**	1						
4 Rules	4.315	0.724	0.544**	0.384**	0.796**	1					
5 Instrumental	2.883	0.967	0.723**	0.211**	0.069*	0.042	1				
6 Independence	2.770	1.026	0.717**	0.237**	0.072*	0.069*	0.663**	1			
7 Service behavior	4.085	0.675	0.546**	0.431**	0.638**	0.584**	0.140**	0.223**	1		
8 ISB	4.301	0.703	0.471**	0.366**	0.719**	0.713**	0.041	0.083*	0.901**	1	
9 ESB	3.725	0.901	0.478**	0.384**	0.337**	0.346**	0.227**	0.337**	0.825**	0.498**	1

N = 871; *p < 0.05, **p < 0.01, ***p < 0.001 (2-tailed); ISB: In-role service behavior; ESB: Extra-role service behavior.

Table 3. Model fit statistics from LPA.

No. of profiles	LL	FP	AIC	BIC	SSA–BIC	LMRT *p value*	BLRT *p value*	Entropy
3	−3622.333	22	7288.666	7393.598	7323.732	<.001	<.001	0.901
4	−3334.928	28	6725.856	6859.406	6770.485	<.001	<.001	0.872
5	−3262.634	34	6593.269	6755.436	6647.460	.039	<.001	0.871
6	−3203.259	40	6486.518	6677.304	6550.274	.0098	<.001	0.833

LL: Log likelihood; FP: Free parameters; AIC: Akaike information criterion; BIC: Bayesian information criterion; SSA–BIC: Sample-size adjusted BIC; LMRT: Lo–Mendell–Rubin test; BLRT: Bootstrapped likelihood ratio test.

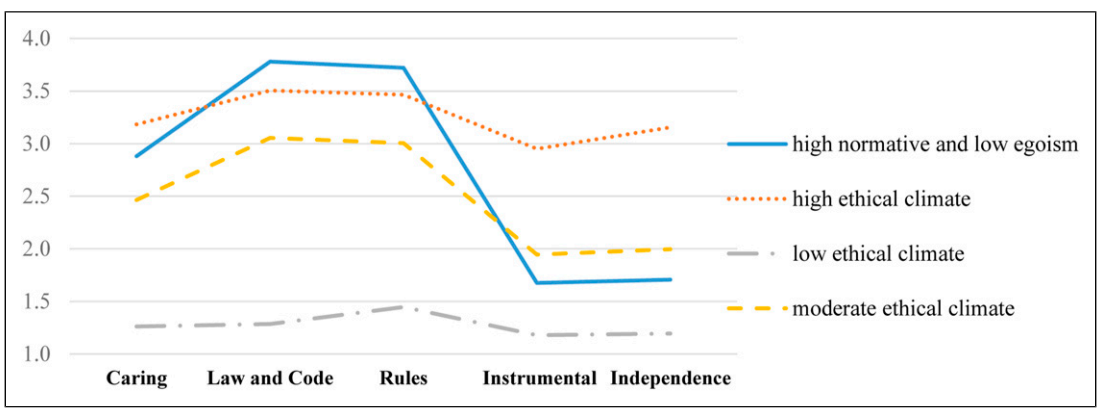

Figure 1. Latent profiles of ethical climate.

(45.8 of the sample), which displayed the highest level of law and code (M = 4.363, SD = 0.641), and rules climate (M = 4.398, SD = 0.593); moderate level of caring (M = 3.730, SD = 0 0.866); but relatively low level of instrumental (M = 2.969, SD = 0.999) and independence climate (M = 2.847, SD = 1.045). Profile 1 is qualitatively distinct, thus, we labeled Profile 1 as *high normative and low egoism* based on the instrument characteristics.

Table 4. Descriptive information for the four-profile model.

Profile	% of sample	Caring		Law and Code		Rules		Instrumental		Independence	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	45.8	3.730	0.866	4.363	0.641	4.398	0.593	2.969	0.999	2.847	1.045
2	19.9	4.121	0.708	4.434	0.565	4.487	0.567	3.009	1.016	2.867	1.080
3	3.6	1.629	0.387	3.379	1.275	3.548	1.395	2.432	0.823	2.307	0.935
4	30.8	3.191	0.814	4.180	0.810	4.172	0.792	2.713	0.835	2.629	0.897

1: High principle and low egoism; 2: High ethical climate; 3: Low ethical climate; 4: Moderate ethical climate.

For latent profiles with level difference, researchers main focus on its differences in the mean score across all indicators.[28] Accordingly, we named Profiles 2–4 based on their quantitively distinct in climate level.[24] As shown in Figure 1 and Table 4, Profile 2 consisted of 173 participants (19.9% of the sample), which was characterized by high levels of all five types of ethical climates (caring [M = 4.121, SD = 0.708]; law and code [M = 4.434, SD = 0.565]; rules [M = 4.487, SD = 0.567]; instrumental [M = 3.009, SD = 1.016]; and independence climate [M = 2.867, SD = 1.080]), so this profile was named *high ethical climate*. For Profile 3, 3.6% of the total sample (31 clinical nurses) have the lowest levels of perceptions of all five types of ethical climate: caring (M = 1.629, SD = 0.387); law and code (M = 3.379, SD = 1.275); rules (M = 3.548, SD = 1.395); instrumental (M = 2.432, SD = 0.823); and independence climate (M = 2.307, SD = 0.935); we named this profile *low ethical climate*. Finally, 268 clinical nurses accounting for 30.8% of the total sample engaged in slightly up-average levels of law and code (M = 4.180, SD = 0.810) and rules climate (M = 4.172, SD = 0.792), medium values for caring (M = 3.191, SD = 0.814), and slightly below-average levels of instrumental (M = 2.713, SD = 0.835) and independence climate (M = 2.629, SD = 0.897). Therefore, we labeled this Profile 4 as *moderate ethical climate*.

Thus, for Research Question 1, we identified three profiles of hospital ethical climate that were generally similar quantitatively (although there were differences among the levels), with one profile designated as high normative and low egoism that was observed to be qualitatively different, which was with significant shape differences.

Comparing service behaviors across ethical climate profiles

We used the BCH-procedure in Mplus to compare differences across four ethical climate profiles in the outcome variables, clinical nurses' service behaviors (both in-role and extra-role service behavior). Mean levels of service behavior, in-role service behavior and extra-role service behavior across the four ethical climate profiles are graphically depicted in Figure 2, while the exact mean levels of these outcomes and the statistical significance of each pairwise comparison of outcome levels across profiles are reported in Table 5.

Regarding the overall service behavior outcome, both clinical nurses under the high normative and low egoism (M = 4.289), and high ethical climate (M = 4.353) profiles displayed highest scores for service behavior, followed by moderate ethical climate (M = 3.879) and low ethical climate (M = 1.810) profiles. Compared to all other profiles of level differences (Profile 2, M = 4.396; Profile 3, M = 1.780; Profile 4, M = 4.062), clinical nurses under the high normative and low egoism profile exhibited the highest scores of in-role service behavior (M = 4.628). Compared with high normative and low egoism (M = 3.724), and moderate ethical climate (M = 3.879) and low ethical climate (M = 1.810) profiles, clinical nurses under a high ethical climate profile (M = 4.28) have the highest scores of extra-role service behavior. Additionally, our findings

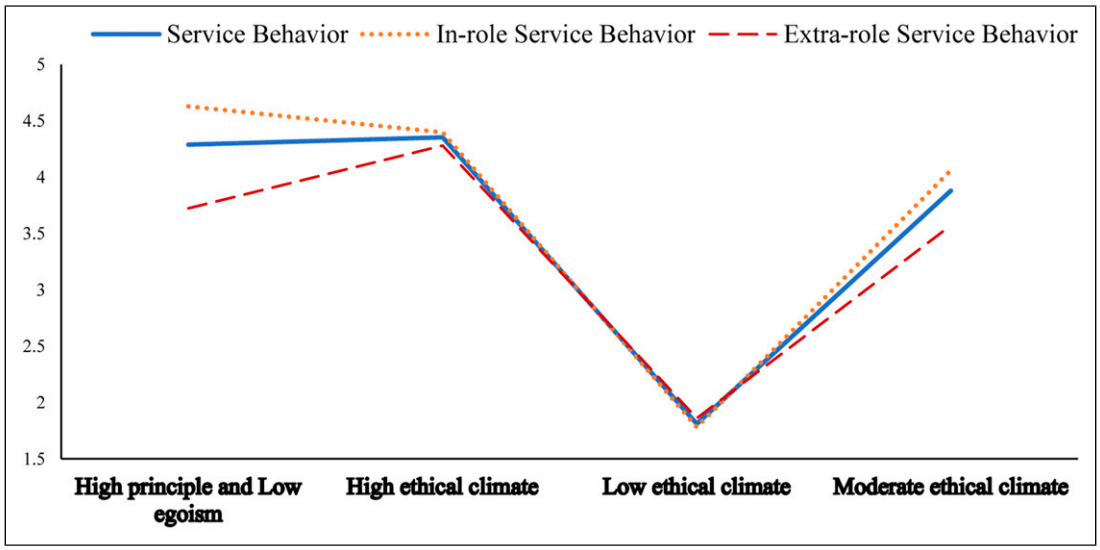

Figure 2. Comparisons of the outcomes in each profile.

demonstrated that clinical nurses in low ethical climate profile exhibited the lowest levels of overall (M = 1.810), in-role (M = 1.780), and extra-role service behavior (M = 1.860).

Thus, for Research Question 2, we identified that clinical nurses in these distinct ethical climate profiles differentially predicted their overall, in-role, and extra-role service behavior.

Discussion

This research assessed the structures and functions of ethical climate profiles with a person-centered approach (LPA) to test the correlation between hospital ethical climate and clinical nurses' service behavior (both in-role and extra-role service behavior). Generally, our evaluation allowed the following: (1) a nuanced assessment of the multidimensional nature of ethical climate; and (2) elucidation of the diversity of service behavior that exist when clinical nurses under different ethical climate profiles.

Our person-centered analysis method addressed the limitation in previous literature, which predominantly used a variable-centered approach. In variable-centered related studies, researchers always examined ethical climate as the sum of its dimensions (i.e., as an aggregate model) or as a common factor underlying its dimensions (i.e., as a latent model), which only focus on the levels of the ethical climate. Person-centered perspective provides a new model through which ethical climate could be conceptualized as a profile model; wherein clinical nurses were under various types of ethical climate in distinct patterns. In this way, we provided a new perspective in assessing how different types of ethical climate combine and interact within hospitals.

We used LPA to demonstrate four different subpopulations that can exhibit different combinations of ethical climate, which contributed greatly to previous studies on ethical climate in terms of the perspectives of person centric paradigms and separation. The contribution of this work is that it can provide an explanation of the different relationships between kinds of ethical climate and outcomes. Consistent with Research Question 1, our findings reveal four profiles of ethical climate that varies in the level differences (high ethical climate, moderate ethical climate, and low ethical climate) and shape differences (high normative and low egoism).

Table 5. Outcome means and pairwise comparisons between profiles.

	Mean				Chi-square						
Variable	1	2	3	4	1 vs 2	1 vs 3	1 vs 4	2 vs 3	2 vs 4	3 vs 4	Overall test
SB	4.289	4.353	1.810	3.879	2.152	569.487***	80.232***	578.981***	92.796***	379.316***	659.601***
ISB	4.628	4.396	1.780	4.062	31.145***	772.452***	159.801***	622.457***	45.067***	464.162***	852.419***
ESB	3.724	4.280	1.860	3.573	54.787***	206.855***	4.199*	333.870***	83.642***	171.016***	347.153***

Positive values show that the higher the values on the antecedent, the more likely an individual possesses the first latent profile; $N = 871$; *$p < 0.05$, ***$p < 0.001$ (2-tailed); SB: Service behavior; ISB: In-role service behavior; ESB: Extra-role service behavior. 1–4: Profile 1–4.

Consistent with Research Question 2, our results reveal that these ethical climate profiles have various relationships with service behavior. For overall service behavior, clinical nurses under both high normative and low egoism and high ethical climate profiles display highest scores. However, when tested separately, clinical nurses under the high normative and low egoism profile present the highest level of in-role service behavior, while those under a high ethical climate profile exhibit the highest scores of extra-role service behavior.

Hospital ethical climate profiles

Usually, climate questionnaires capture an observer's description of the styles and forms of behavior in organizations. By using a person-centered approach,[27] the results of LPA showed that there are four latent profiles of hospital ethical climate perceived by clinical nurses: high normative and low egoism (high rules and law and code, medium caring, low instrumental and independence climate); high ethical climate (five dimensions are all at a high level); low ethical climate (all five dimensions are at a low level); and moderate ethical climate (all five dimensions are at a medium level).

Among the four latent profiles, the last three profiles show differences in the overall score level of ethical climate, and only the high normative and low egoism climate has great differences in scores from different dimensions—that is, shape differences. A similar pattern of results was obtained by Dalmolin et al.,[11] in which following legal and professional standards, institutional standards, rules, and procedures was highly important for safe and quality care. This result also adds to the existing literature of Victor and Cullen,[18] who argued that the instrumental climate is closely linked to egoistic structures and personal and local points of analysis. The high normative and low egoism profile accounts for the highest proportion of nurses (45.8%), and the hospital ethical climate it revealed is closer to reality. That is, the hospital has clear rules and regulations and work processes. As such, clinical nurses take laws and codes and hospital rules and regulations as the criteria for nursing practice and do everything in accordance with the law and rules, rather than taking personal moral standards as the basis or only considering the maximization of personal interests when making decisions.

The high ethical climate with the low ethical climate varied in the level differences. Specifically, the high ethical climate profile showed the highest levels of all five ethical climate dimensions, while the low ethical climate profile showed the lowest levels. The quantitative difference between these two profiles is an important theoretical contribution because it confirms our commonsense perception about the high or low level of the entire ethical climate. Furthermore, nursing ethics research is enriched deeply and effectively through the focus on the characteristics of the two profiles instead of deducing theoretically what kinds of behaviors would appear with diverging levels of ethical climate.[28]

In each latent profile, clinical nurses' perception of rules and law and code climates was higher than the scores for instrumental and independence climates, which is consistent with the research results of Fu et al.[14] These findings further proved that all kinds of decision-making and subsequent behavior among nurses in the hospital are mainly based on laws and professional codes, and they strictly follow the existing hospital rules in taking caring of and providing services for patients. Meanwhile, clinical nurses tend not to behave primarily according to their beliefs and interests, avoiding conflicts with the rules and ethical codes regulating organizations and the professional category. It was thus inferred that hospitals' strategies and interventions are reducing instrumental and independent climate and emphasize caring, rules and law and code climates.

Hospital ethical climate profiles and clinical nurses' service behavior

From a variable-centered perspective, the results of the correlation analysis showed that the hospital ethical climate is significantly and positively related to the two sub-dimensions of service behavior—in-role and

extra-role—which is consistent with the research results of Zhang et al.[1,12] It is noteworthy that our findings are consistent with Deshpande and Joseph,[47] who found that ethical behavior was positively associated with independence climate. In addition, the correlations found between extra-role service behavior and caring, law and code, and rules climates are similar in magnitude to those previously reported by Huang et al.,[48] which found that organizational citizenship behaviors were positively associated with caring, law and code, and rules climates. We found, however, less consistent evidence for the role of instrumental climate. Previous studies have reported negative effects of instrumental climate,[13] but the findings in our study indicated that instrumental climate is not associated with in-role service behavior, although it is positively related to overall and extra-role service behavior.

The present findings revealed that, when clinical nurses perceive a high level of all types of ethical climate in the hospital, it has a significant impact on both their in-role service behavior within their responsibilities and the extra-role service behavior actively provided, even exceeding their job responsibilities. It can be seen that a good ethical climate in the hospital helps clinical nurses to provide more quality nursing services and thoroughly implement patient-centered care.

From a person-centered perspective, this study also examined the relationship between the latent profiles of hospital ethical climate and clinical nurses' service behavior. Our results showed that the group differences for clinical nurses' overall, in-role, and extra-role service behaviors reached the level of significance. Specifically, under the high normative and low egoism climate profile, clinical nurses' in-role service behavior was the highest; clinical nurses displayed the highest extra-role service behavior when they were under the high ethical climate profile; and their overall, in-role, and extra-role service behaviors were the lowest in the low ethical climate.

Accordingly, it can be inferred that the climates of rules and law and code are both stably related to a high level of in-role service behavior. Therefore, when the climate of instrumental and independence are both high with rules, law, and code at the same time, clinical nurses' extra-role service behavior is the highest. Moreover, clinical nurses are more inclined to devote themselves to their professional responsibilities and provide more in-role service behaviors under the climate of rules and law and code. Additionally, in an environment where all five types of ethical climates are high, clinical nurses act according to a set of personal moral principles that they carefully considered and provide patients with more extra-role service behaviors beyond the formal job requirements, thereby improving the overall service quality and level.

Limitations and future directions

The first limitation of the current study is that we only adopted Chinese clinical nurses at public hospitals as participants, and the conclusions may not be generalizable to other countries and regions, especially considering the differences in hospital ownership. This implies potentially different resources, operation modes, and ethical climates. Future work could consider examining profiles in private hospitals or other cultures. Another limitation of our study is that we measured clinical nurses' service behavior subjectively, by asking clinical nurses to answer survey questions about their service behavior. As such, objectively measuring clinical nurses' service behavior would also be possible by asking the patients to evaluate nurses' service behavior. Finally, the current study only examined the relationship between hospital ethical climate and nurses' service behavior, but how or under which conditions hospital ethical climate generates a positive or negative influence on related outcomes for different ethical climate profiles remains unknown. Future research could examine the mechanisms or conditions by which ethical climate affects outcomes, such as whether the differences in ethical climate may be caused by differences in hospital ownership.

Conclusion

In this study, we used a person-centered approach and identified four different hospital ethical climate profiles. Furthermore, we assessed how these clusters differed in important work outcomes—that is, clinical nurses' service behavior. LPA reflected the level of each latent profile in different dimensions, focusing on a combination of both quality and quantity, which had practical value for an in-depth understanding of the current situation of hospital ethical climates. Our results revealed that hospitals should pay more attention to the specific dimensions and actual performance of their ethical climate, and be more strategic in how and where they allocate their resources to improve the clinical nurses' service behavior. The results could provide a new theoretical perspective and management strategy for hospitals to comprehensively improve the management of nursing ethics.

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Appendix

Nurses' service behavior measure

In-role service behavior:

1. I can provide nursing services according to the job responsibilities prescribed by the hospital.
2. I am familiar with the service procedures of different work shifts.
3. I can independently fulfill responsibilities to patients as specified in the nursing job description.
4. I can satisfy the needs of patients with pleasure in my duties.
5. I have the good manners as a nurse with neat and professional appearance.

Extra-role service behavior:

6. I can help patients to solve problems beyond what is expected or required of the nursing work contents.
7. When the patient is in need, I can provide additional services voluntarily.
8. Even beyond my job requirements, I take the initiative to meet the needs of the patients.