BMC Nursing

RESEARCH

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The relationship between compulsory citizenship behavior and nurses' silence: a cross-sectional study

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Abstract

Aim This study aimed to assess the relationship between compulsory citizenship behavior and nurses' silence.

Methods A descriptive cross-sectional online study was conducted in October 2023, targeting 402 nurses working in Yichang Central People's Hospital, Hubei Province, China. Data were collected through a structured questionnaire comprising demographic details, the Compulsory Citizenship Behavior Scale, and the Nurses' Silence Scale. Statistical analyses were conducted using SPSS 25.0, including descriptive statistics, t-tests, one-way ANOVA, Pearson correlation, and hierarchical regression analyses.

Results The study revealed that the overall mean score for nurses' compulsory citizenship behavior was 14.63 (3.99), while the overall mean score for nurses' silence was 32.78 (8.28). Significant differences in compulsory citizenship behavior scores were observed among nurses with varying levels of work experience ($P < 0.05$). Similarly, significant variations in silence scores were identified according to work experience and employment type ($P < 0.05$). After adjusting for work experience and employment type, a significant correlation was identified between compulsory citizenship behavior and nurses' silence ($P < 0.05$).

Conclusions Nurses exhibited moderate levels of compulsory citizenship behavior and silence. Additionally, a significant positive correlation was revealed between compulsory citizenship behavior and nurses' silence.

Recommendation Nursing administrators should implement targeted measures to lower compulsory citizenship behavior, thereby fostering a more open and communicative environment within the organization, and encouraging nurses to express their opinions more freely.

Keywords Compulsory citizenship behavior, Cross sectional study, Nurses, Silence

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Background

Compulsory citizenship behavior (CCB) refers to non-voluntary actions that employees are compelled to perform due to external pressures [1]. Traditionally, organizations advocate for "organizational citizenship behavior", where employees voluntarily take on additional responsibilities to boost organizational efficiency and competitiveness [2]. Recently, practices such as "mandatory overtime" and "additional work obligations" have become increasingly common, undermining the voluntary nature of these citizenship behaviors [3]. A study indicates that organizational citizenship behaviors can evolve into CCB when employees face exploitation from leaders, exclusion by colleagues, or a politicized work environment, leading to actions driven more by obligation than willingness [4].

In high-risk and high-demand healthcare environments, nurses, due to the power imbalance inherent in their professional roles and the intense work requirements, often become the primary bearers of CCB [5]. For instance, a nurse may initially volunteer for holiday overtime out of goodwill, but when managers start treating this as an expectation, it gradually shifts into a mandatory obligation. A study has shown that prolonged exposure to high levels of CCB significantly increases nurses' work-related stress [6]. Under stress, individuals often adopt avoidance behaviors, with silence being a typical example. Nurses may withhold critical feedback on organizational matters to prevent potential negative consequences [7].

Nurses' silence is a common phenomenon in healthcare settings [8]. A study by Yurdakul et al. [9] found that over 90% of nurses reported experiencing silence at work, with 61.6% choosing to remain silent even in critical situations. Such silence not only diminishes nurses' job satisfaction but also poses significant risks to care quality and patient safety [10–12]. Potential causes may include a lack of confidence in communication effectiveness and negative perceptions of organizational culture, such as the belief that voicing concerns will not result in meaningful change [13–15]. Although previous studies have examined factors influencing nurses' silence—such as demographic characteristics, psychological factors, and organizational culture—the role of CCB as a key antecedent remains insufficiently investigated [16–18].

Theoretical framework

The conservation of resources (COR) model offers a robust framework to investigate the relationship between nurses' CCB and silence. The core premise of the model is that individuals strive to acquire, retain, and protect their resources to meet basic psychological and physiological needs [19, 20]. Excessive CCB depletes these resources—such as time, energy, and emotional well-being—causing heightened stress [5]. Power imbalances between nursing leaders and nurses exacerbate resource depletion, leading nurses to adopt cautious behaviors aimed at conserving their remaining resources [21]. As a result, silence often becomes a self-protective coping strategy, helping nurses avoid further resource loss and potential conflicts [7].

Significance of the study

In public hospitals, nurses often face pressure from managers or colleagues to take on additional responsibilities, resulting in an involuntary burden known as CCB [6]. While studies revealed the negative effects of CCB on physical and mental health [21], its role in shaping silence among nurses—especially in high-stress healthcare settings—has not been sufficiently addressed. By applying the COR model, this study seeks to address this gap and provide actionable insights for healthcare leaders to reduce silence, and foster open communication.

Study aim

This study aimed to assess the relationship between CCB and nurses' silence.

Study questions

The questions of this study were as follows:

1. What is the level of CCB among nurses?
2. What is the level of silence among nurses?
3. What demographic factors are associated with nurses' CCB?
4. What demographic factors are associated with nurses' silence?
5. What's the relationship between CCB and nurses' silence?

Methods

Study design and setting

This descriptive cross-sectional study was conducted at Yichang Central People's Hospital located in Yichang City, Hubei Province, China. This facility is a comprehensive tertiary Grade-A healthcare institution integrating medical care, nursing, education, and scientific research. The institution employs over 5,000 staff members, including 3,018 nurses, and accommodates 3,880 beds.

Participants

Registered nurses from Yichang Central People's Hospital in Hubei Province of China were selected as the study participants using the convenient sampling method. Inclusion criteria: (a) possessing a valid nursing license from the People's Republic of China; (b) direct involvement in patient care; (c) having at least one year of work experience. Exclusion criteria included: (a) nurses in

management positions; (b) assistant nurses; and (c) nurses on leave, studying, or training.

We estimated the required sample size using two approaches: power analysis and regression modeling. Power analysis, aimed at better estimating the population parameters, was conducted assuming a standard deviation of 10, a precision level of 2, and a two-sided significance level of 0.05, the sample size was calculated using the following formula: $n = \left(\frac{Z1-\alpha/2\times\sigma}{\delta}\right)^2 = \left(\frac{1.96\times 10}{2}\right)^2 = 97$. After accounting for a 20% attrition rate, the adjusted sample size was 122. For the regression modeling approach, which aims to achieve higher statistical power, we followed the rule of thumb recommending 10–20 events per predictor variable. Anticipating 13 predictor variables, the required sample size was calculated as *N*=13*20=260. After adjusting for a 20% attrition rate, the final sample size was 325 [22]. To ensure sufficient statistical power and model reliability, we adopted the larger sample size of 325 participants. Ultimately, 402 eligible participants were recruited using a convenience sampling approach.

Instruments

Socio-demographic questionnaire

This questionnaire covered age, gender, work experience, educational level, marital status, professional title, employment mode, and average monthly income.

Compulsory citizenship behavior scale

The CCB scale, developed by Vigoda-Gadot [21], was used to assess nurses' CCB. The original English version of the scale demonstrated a Cronbach's alpha coefficient of 0.830. In a previous study, our team translated the scale into Chinese, conducted back-translation, followed by back-translation review and expert committee evaluation to ensure compatibility with the original version, and validated it for use with clinical nurses, achieving a Cronbach's alpha of 0.820 [23]. This scale comprises five items rated on a 5-point Likert scale (1=strongly disagree to 5=strongly agree), resulting in a total score range of 5 to 25 to indicate behavior intensity. For this study, mean scores were categorized into three levels: low (1–2), moderate (2.1-4), and high (4.1-5). The reliability of the scale in this study was assessed using Cronbach's alpha, which demonstrated excellent internal consistency, with a coefficient of 0.879.

Nurses' silence scale

The study utilized the scale developed by Zheng et al. [24], a well-established instrument with a Cronbach's alpha of 0.890, to assess silent behavior in Chinese nurses. It comprises three subscales: acquiescent silence, defensive silence, and disregardful silence, each with four items. The scoring is based on a five-point Likert scale (1 for "never" to 5 for "usually"). The total score ranges from 12 to 60, with higher scores indicating more severe instances of personal silence behavior. This behavior is categorized into low (>1.00–2.33), moderate (>2.33–3.66), or high (>3.66), based on mean scores. The reliability of this scale was evaluated using Cronbach's alpha to measure internal consistency, yielding a coefficient of 0.878 for the total scale. The three dimensions also demonstrated acceptable reliability, with acquiescent silence at 0.715, defensive silence at 0.695, and disregardful silence at 0.702, respectively.

Data collection

A pilot study was conducted to ensure the applicability and understandability of the instruments. Ten nurses participated in this pre-survey, which used an online questionnaire developed on the Wenjuanxing platform. Participants completed the questionnaire and evaluated the clarity of each item. Feedback from the pilot study confirmed that the questionnaire was straightforward, with clear items, simple options, and a manageable number of questions. No modifications were required based on this feedback.

The formal survey was conducted from October 10 to 17, 2023. The researcher initially contacted the nursing department director at the participating hospital, who facilitated recruitment by distributing the survey link to nurses via the hospital's enterprise WeChat group. An invitation message was shared in the group, explaining the purpose of the study, the voluntary nature of participation, eligibility criteria, and the steps for completing the survey.

Upon accessing the link, participants were first presented with an electronic informed consent form and were required to click the "Agree" button to provide consent before proceeding to the questionnaire. The questionnaire consisted of three sections: general information, a CCB scale, and a nurses' silence scale, each accompanied by specific instructions.

To support participants during the survey, the researcher provided contact information (email and phone) at the start of the survey and in the consent form, enabling participants to reach out with any questions. To ensure data accuracy and completeness, the system restricted submissions to one per IP address and required participants to complete the entire survey before submission.

Data analysis

Statistical analyses were conducted using IBM SPSS version 25.0. The demographic characteristics, nurses' CCB, and silence scores were described using frequencies, percentages, means, and standard deviations. T-tests

and ANOVA tests were used to analyze the relationships between general demographic characteristics and nurses' CCB and silence. Correlation analysis was used to determine the relationship between CCB and nurses' silence. Furthermore, linear regression analysis was used to investigate the effects of demographic characteristics and CCB on nurses' silence. Hierarchical regression analysis was used to investigate further the impact of CCB on nurses' silence.

Ethical considerations

This study was conducted strictly following ethical guidelines and was approved by the hospital's ethics committee, with ethical approval number 2023-126-01. All participants provided informed consent before completing the survey, ensuring they were fully aware of the study's purpose, procedures, and potential risks. To protect participants' privacy and ensure anonymity, no identifying information such as names, employee IDs, or contact details was collected. Participants also retained the right to withdraw from the study at any time.

Results

Socio-demographic characteristics and their association with nurses' CCB and silence

Out of 409 questionnaires collected online, data from 402 were included in the final analysis, with a response rate of 98.29%. Table 1 summarizes the socio-demographic characteristics of the participants. The majority were female (77.6%) and under 30 years old (42.3%). Most were married (61.7%) and held a bachelor's degree or higher (60.0%). Nearly half had ≤ 5 years of work experience (47.0%), with 58.0% at the nurse or junior nurse level. In terms of income, 47.8% earned < 5,000 CNY, and 53.7% were permanent staff.

No significant differences in CCB scores were found across groups based on gender, age, marital status, educational level, professional title, average monthly income, or employment mode ($P > 0.05$). However, significant

Table 1 Socio-demographic characteristics and association with nurses' CCB and silence ($n = 402$)

Socio-demographic characteristics	*n*	%	CCB Score	*P*	NS Score	*P*
Gender				0.879[a]		0.792[a]
Male	90	22.4	14.58(4.43)		32.58(8.46)	
Female	312	77.6	14.65(3.87)		32.84(8.24)	
Age(years)				0.219[b]		0.75[b]
<30	170	42.3	15.03(4.25)		33.06(8.43)	
31–39	88	21.9	14.48(3.84)		32.91(8.21)	
≥ 40	144	35.8	14.26(3.76)		32.37(8.19)	
Marital status				0.442[a]		0.362[a]
Unmarried	154	38.3	14.84(4.45)		33.26(8.58)	
Married	248	61.7	14.51(3.68)		32.48(8.09)	
Educational level				0.478[a]		0.949[a]
Associate degree	161	40	14.81(4.02)		32.81(8.38)	
Bachelor's degree or above	241	60	14.52(3.98)		32.76(8.23)	
Years of experience in nursing				<0.05[b]		<0.001[b]
<5	189	47	15.01(4.21)		34.40(8.88)	
6–9	128	31.8	14.76(4.02)		32.28(7.50)	
≥ 10	85	21.1	13.61(3.24)		29.93(7.17)	
Professional title				0.421[b]		0.357[b]
Senior nurse or below	233	58	14.82(4.15)		32.7(8.44)	
Supervisor nurse	103	25.6	14.54(4.04)		33.61(8.65)	
Deputy chief nurse or above	66	16.4	14.11(3.32)		31.76(6.99)	
Average monthly income (CNY)				0.31[b]		0.449[b]
<5,000	192	47.8	14.66(4.02)		32.44(8.44)	
5,000 ~ 10,000	124	30.8	14.96(4.18)		33.56(8.35)	
>10,000	86	21.4	14.10(3.64)		32.41(7.83)	
Employment mode				0.8[a]		0.002[a]
Permanent employment	216	53.7	14.31(3.69)		31.56(7.41)	
Contract employment	186	46.3	15.01(4.30)		34.20(9.00)	

Note: p, p-value (statistically significant ≤ 0.05) (statistically high significant ≤ 0.001)

Abbreviation: CCB, compulsory citizenship behavior; NS, nurses' silence; M, mean; SD, standard deviation

[a] t-test

[b] ANOVA test

Table 2 The levels of nurses' CCB and silence ($n=402$)

	Range	Overall score M(SD)	Mean score M(SD)	Low No.(%)	Moderate No.(%)	High No.(%)
CCB	6–25	14.63(3.99)	2.93(0.80)	88(21.9)	236(58.7)	78(19.4)
Nurses' silence	20–49	32.78(8.28)	2.73(0.69)	127(31.6)	192(47.8)	83(20.6)
Acquiescent silence	4–20	11.13(3.05)	2.78(0.76)	127(31.6)	200(49.8)	75(18.7)
Defensive silence	4–20	10.82(3.06)	2.70(0.77)	143(35.6)	192(47.8)	67(16.7)
Disregardful silence	4–19	10.84(3.08)	2.71(0.77)	148(36.8)	184(45.8)	70(17.4)

Note: The mean score of CCB scale: 1–2: low level; 2.1-4: moderate level; 4.1-5: high level

The mean score of nurses' silence scale: >1.00–2.33: low silence; >2.33–3.66: moderate silence; >3.66: high silence

Abbreviation: SD, standard deviation

Table 3 Correlation between nurses' CCB and silence ($n=402$)

		Nurses' silence			
CCB		Overall NS score	Acquiescent silence	Defensive silence	Disregardful silence
Overall CCB score	r	0.524	0.503	0.451	0.460
	p	<0.001	<0.001	<0.001	<0.001

Note: Correlation coefficient interpretation guidelines [25]: >0.00–0.30: weak correlation; >0.30–0.70: moderate correlation; >0.70–1.00: strong correlation

Abbreviation: CCB, compulsory citizenship behavior; NS, nurses' silence; SD, standard deviation

differences were observed among groups with different years of nursing experience ($P<0.05$). Similarly, no significant differences in nurses' silence scores were found across groups based on gender, age, marital status, educational level, professional title, or average monthly income ($P>0.05$). Nevertheless, significant differences in nurses' silence scores were identified based on years of nursing experience and employment mode ($P<0.05$).

The levels of nurses' CCB and silence

Table 2 details the prevalence of CCB and nurses' silence. The mean score for CCB was 2.93 (0.8), indicating a moderate level overall. Concerning nurses' silence, the mean score was 2.73 (0.69), indicating a moderate level. In this category, 47.8% of nurses demonstrated a moderate level, 31.6% a lower level, and 20.6% a higher level. Further analysis of the subscales for nurses' silence showed that 49.8% of nurses exhibited a moderate level of acquiescent silence, 47.8% of defensive silence, and 45.8% of disregardful silence.

Correlation analysis between nurses' CCB and silence

Table 3 presents the correlations between CCB and nurses' silence, including its three subscales. The results of the Pearson correlation analysis revealed that CCB had a moderate positive correlation with silence ($r=0.524$, $p<0.001$), which was statistically significant. Similarly, a significant positive correlation exists between CCB and nurses' silence subscales, with all correlations being statistically significant ($p<0.001$ for each).

Table 4 Regression analysis identifying predictors of CCB ($n=402$)

	CCB		
	B	SE	p
Constant	15.011	0.298	<0.001
Years of experience in nursing <5[a]			
6–9	-0.2.53	0.454	0.578
≥10	-1.399	0.518	0.007
F	3.736		
P	0.025		
R^2	0.018		

Note: B, regression coefficient; R^2, R-square; SE, standard error; [a]: dummy reference group

Regression model for CCB

Table 4 presents a regression analysis examining the socio-demographic characteristics as predictors of CCB among nurses. The model explained 1.8% of the variance in CCB, with a significance level of $\alpha=0.05$ ($F=3.736$, $P=0.025$), indicating statistical significance. The results revealed that years of nursing experience significantly predicted CCB ($P<0.05$), whereas other factors, including gender, age, marital status, education level, professional title, income, and employment type, were not significant predictors ($P>0.05$). Specifically, nurses with ≥10 years of experience demonstrated significantly lower levels of CCB compared to those with <5 years of experience (β = -1.399, SE=0.518, $P=0.007$). However, no significant differences were observed between nurses with 6–9 years of experience and those with <5 years (β = -0.253, SE=0.454, $P=0.578$).

Regression model for nurses' silence

Table 5 employs socio-demographic characteristics and CCB as predictors in a regression modeling of three sub-scales of nurses' silence. The models accounted for 22–27% of the variance at a significance level of $\alpha=0.05$ ($F=37.101$, 28.077, and 33.000, respectively, all $P<0.001$), indicating statistical significance. In the prediction of acquiescent silence, the regression analysis revealed that nurses with 6–9 years of working experience demonstrated significantly lower levels of acquiescent silence

Table 5 Regression analysis identifying predictors of acquiescent, defensive, and disregardful silence among nurses ($n=402$)

	Acquiescent silence			Defensive silence			Disregardful silence		
	B	SE	p	B	SE	p	B	SE	p
Constant	5.494	0.668	<0.001	5.552	0.697	<0.001	5.351	0.685	<0.001
Years of experience in nursing <5[a]									
6–9	-0.726	0.300	0.016	-0.563	0.313	0.073	-0.690	0.308	0.026
≥10	-0.698	0.362	0.055	-0.655	0.378	0.084	-1.029	0.372	0.006
Employment mode Permanent employment [a]									
Contract employment	0.394	0.281	1.62	0.472	0.294	0.109	0.697	0.289	0.016
CCB	0.372	0.033	<0.001	0.334	0.034	<0.001	0.335	0.034	<0.001
F	37.101			28.077			33.000		
P	<0.001			<0.001			<0.001		
R^2	0.272			0.221			0.250		

Note: B, regression coefficient; R^2, R-square; SE, standard error; [a]: dummy reference group

Table 6 The regression analysis showing predictors of nurses' silence ($n=402$)

	Model 1			Model 2		
	B	(SE)	p	B	(SE)	p
Constant	31.408	1.446	<0.001	16.397	1.775	<0.001
Years of experience in nursing <5[a]						
6–9	-2.274	0.927	0.015	-1.979	0.798	0.013
≥10	-3.675	1.112	0.001	-2.382	0.963	0.014
Employment mode Permanent employment [a]						
Contract employment	1.965	0.867	0.024	1.563	0.747	0.037
CCB				1.041	0.088	<0.001
F	7.949			43.236		
p	<0.001			<0.001		
R^2	0.057			0.303		

Abbreviations: B, regression coefficient; R^2, R-square; SE, standard error

[a]: dummy reference group

compared to their counterparts with 1–5 years of experience (β = -0.726, SE=0.300, $P<0.05$). Furthermore, CCB positively predicted acquiescent silence (β=0.372, SE=0.003, $P<0.001$). However, the mode of employment did not significantly predict acquiescent silence ($P>0.05$).

In predicting defensive silence, CCB emerged as a significant positive predictor (β=0.334, SE=0.034, $P<0.001$). Neither working experience nor mode of employment were significant predictors of defensive silence ($P>0.05$). Regarding disregardful silence, nurses with 6–9 years and over 10 years of working experience demonstrated significantly lower levels compared to those with 1–5 years of experience (β = -0.690, SE=0.308, $P<0.05$; β = -1.029, SE=0.372, $P<0.05$). Contract nurses showed higher levels than those with a permanent position (β=0.697, SE=0.034, $P<0.05$). Furthermore, CCB was positively associated with disregardful silence (β=0.335, SE=0.034, $P<0.001$).

Table 6 presents the multiple regression model results for clinical nurses' silence, using demographic data and CCB as predictors. R^2 was employed to quantify the percentage of variance explained by the models. Initially, Model 1 was developed with nurses' silence as the dependent variable, incorporating two significant demographic variables—working experience and employment mode—as independent variables. This model revealed that these variables predicted nurses' silence, accounting for 5.7% of the variance. Subsequently, Model 2, an extension of Model 1, included CCB in addition to the previous variables. The results of this extended analysis demonstrated that, after controlling for working experience and mode of employment, CCB was a significant and positive predictor of nurses' silence (β=1.041, SE=0.088, $P<0.05$). These three variables in Model 2 explained 30.3% of the variance in the model, marking an increase in R^2 of 24.6% from Model 1. This significant increase indicates that CCB accounts for an additional 24.6% of the variance in nurses' silence, beyond the general demographic information.

Discussion

This study aimed to assess the relationship between CCB and nurses' silence in a public hospital in Yichang City, China. The findings demonstrated that nurses exhibited moderate levels of both CCB and silence. Furthermore, a positive correlation was identified between CCB and silence, indicating that as nurses feel increasingly compelled to engage in behaviors beyond their formal job requirements, their tendency to remain silent also increases.

Moderate level of nurses' CCB

Nurses in this study demonstrated moderate levels of CCB. This can be attributed to the hierarchical structure of the healthcare system and the demanding nature of the profession. Resource constraints in public hospitals, such as shortages of personnel, equipment, and budgets, often compel nurses to take on excessive responsibilities. Additionally, the hierarchical nature of the system limits nurses' autonomy in decision-making, reinforcing a sense of obligation to comply with tasks beyond their formal roles. This lack of control, combined with intense job demands, fosters CCB as a coping mechanism or perceived professional duty.

Similar patterns have been observed in healthcare systems with similar organizational structures, such as Turkey [5, 6], where high job demands and limited autonomy are key factors driving CCB. Compared to non-healthcare sectors, such as education [21] and enterprises [26, 27], where moderate to high levels of CCB are also reported, the drivers in healthcare are distinct, shaped by specific job demands and systemic constraints inherent to the profession.

The CCB scale revealed notable differences in nurses' responses, highlighting contrasting views on job expectations and unpaid overtime. Item 3, "I feel that I am expected to invest more effort in this job than I want to and beyond my formal job requirements," scored the highest, suggesting that the demands of the public healthcare setting and complex patient needs create high expectations from superiors. Keykaleh et al. [28] observed that nurses are frequently called upon to deliver high-quality care, ensure patient safety, and manage emergencies, contributing to increased pressure and expectations regarding their dedication and responsibilities.

In contrast, item 2, "Working extra hours beyond the formal workload and without any formal rewards is common in our hospital," received the lowest score, reflecting a generally negative attitude toward uncompensated overtime. This reluctance may be due to two main factors. First, work-related stress is prevalent in healthcare, and compulsory overtime can intensify this stress, making nurses hesitant to work extra hours. Second, maintaining a work-life balance is vital for many nurses, and mandatory overtime disrupts this balance, leading to a preference to avoid additional shifts. Yang et al. [29] found that the cumulative impact of work stress and reduced work-life balance from compulsory overtime may ultimately reduce career satisfaction, prompting nurses to prioritize job sustainability and personal well-being.

Moderate level of nurses' silence

This study identified a moderate level of silence among nurses, aligning with findings from other studies conducted both within China and internationally. Two large-scale, multicenter surveys conducted in tertiary public hospitals in China also reported moderate levels of nurse silence [30, 31]. Globally, similar trends have been observed. For example, Farghaly Abdelaliem et al. [12] reported moderate silence levels among nurses in Saudi Arabia, while Sakr et al. [32] and Atalla et al. [33] found comparable levels in Egypt. In the Philippines, Labrague et al. [34] identified moderate levels of silence. The consistency of these findings across different settings highlights the widespread nature of this phenomenon among nurses, suggesting that silence may be a common response to workplace challenges in healthcare settings.

Among the three subscales of nurses' silence, acquiescent silence was the highest, followed by defensive and disregardful silence, contrasting with the findings of Wang's study [31]. Nurses' silence has become widespread for three main reasons: (1) Worries and Concerns – Nurses often remain silent to preserve relationships and avoid conflicts with leaders and colleagues. (2) Reverence and Compliance – Silence frequently reflects respect for leadership and commitment to team dynamics. Nurses view adherence to instructions and norms as core professional duties, which discourages them from challenging authority. (3) Harmony and Courtesy – To foster a collaborative environment, nurses often choose silence to maintain harmony and courtesy. While this approach strengthens teamwork and minimizes discomfort, it can also limit the expression of individual opinions and concerns [35].

Differences in CCB among nurses with different work experience

This study revealed notable differences in CCB among nurses with varying levels of work experience. Nurses with five years or less of work experience exhibited higher levels of CCB compared to those with ten or more years of experience. This finding contrasts with Baydin et al. [6], likely due to differences in respondent demographics, sample sizes, or other contextual factors. We infer that this pattern may be linked to the following factors: (1) Nurses new to the hospital or unit may feel heightened external pressures, prompting them to take

on additional responsibilities and informal tasks to prove their value, thereby exhibiting higher levels of CCB. (2) Nurses with shorter work experience may face greater challenges, such as resource scarcity, insufficient support, or inadequate training. Under these circumstances, they may feel compelled to undertake extra work to compensate for these deficits and ensure task completion, leading to higher levels of CCB.

Differences in silence levels among nurses with different work experience and employment types

Work experience was found to significantly impact levels of silence, particularly acquiescent and disregardful silence, with shorter work experience linked to higher levels of silence. This finding aligns with studies by Labrague et al. [34] and De Los Santos JAA et al. [36]. From the researchers' point of view, nurses with shorter tenures may lack the clinical experience and confidence needed for self-expression, leading them to choose silence to avoid mistakes or inappropriate actions. Additionally, new nurses may require time to adjust to work environments, team dynamics, and responsibilities. During this adaptation period, they often observe and learn rather than actively share opinions, as they are not yet fully familiar with the organizational culture.

Employment type also significantly affected nurses' silence, with contract nurses exhibiting higher levels of silence and disregardful silence. These results are consistent with those of Yin et al. [37]. Based on our analysis, we propose that the higher levels of silence observed among contract nurses may be attributed to the following three factors: (1) Job Stability and Security – Unlike permanent nurses, contract nurses face greater job instability and risk of unemployment, making them hesitant to voice concerns; (2) Employment Relationship Inequality – Contract nurses often feel less empowered than permanent staff, which discourages them from questioning decisions within the organizational hierarchy; and (3) Professional Identity – As temporary employees, contract nurses may feel a diminished sense of professional identity and integration within the organization, leading to reduced participation and vocalization.

CCB and nurses' silence were positively correlated

The findings of this study demonstrate that CCB significantly impacts nurses' silence, including acquiescent, defensive, and disregardful silence. Higher CCB was also positively correlated with increased nurse silence, consistent with He's findings [7]. Yam et al. [38] found that in nursing, CCB, typically involuntary, creates a gap between the effort invested by nurses and the recognition or compensation they receive. Often overlooked in formal compensation structures, this behavior can lead nurses to feel that their organizational contributions are undervalued, potentially fostering a sense of disempowerment and rationalizing counterproductive behaviors.

In public hospitals, where CCB is common, nurses frequently expend additional time and resources to maintain quality patient care. The healthcare setting's pronounced power imbalance, reinforced by a hierarchical structure, suggests that assertive actions may negatively affect nurses' career prospects. Consequently, nurses may adopt a more cautious, conservative approach, viewing silence as the safest option [7].

Limitations

Although this study provides valuable insights, it has some limitations that should be acknowledged: (1) Potential selection bias: The study's limited sample size and single-center design, combined with the voluntary involvement of participants and use of convenience sampling, may introduce selection bias. (2) Lack of causal inference: The cross-sectional design of this study, which involves observing and surveying participants at a single point in time, does not allow for the establishment of causal relationships. (3) Subjectivity and recall bias: Dependence on participants' subjective recollections and memories in this study could lead to subjectivity and recall bias. (4) Challenge in controlling confounding variables: There may be a challenge in sufficiently controlling for confounding variables that affect CCB and silence among nurses, such as individual characteristics, work environment, and organizational culture. Not adequately addressing these variables could lead to confounding and misinterpreting results.

Conclusions

The study revealed that nurses display moderate levels of CCB and silence, showing a significant positive correlation. Limited working experience and contract-based employment emerged as key predictors of heightened nurses' silence. Within the dimensions of nurses' silence, acquiescent silence was predominant, followed by defensive and disregardful silence.

Recommendations

Based on this study's findings, we propose the following strategies to address nurses' CCB and silence. First, future studies should adopt longitudinal designs and integrate qualitative methods, such as in-depth interviews and observations, to better understand the dynamics of these behaviors among nurses. Second, nursing managers should optimize workload and resource allocation, foster psychologically safe environments, and implement fair performance evaluation systems to alleviate external pressures associated with CCB. Strategies like adequate staffing, effective communication channels, and sufficient rest periods can effectively enhance nurses' autonomy

and participation. Finally, targeted training for newly hired and contract-based nurses, combined with monitoring and adjusting motivational strategies, can help mitigate silence and foster a more open and communicative organizational culture.

Acknowledgements
This research was supported by The First College of Clinical Medical Science, Three Gorges University/Yichang Central People's Hospital. Besides, we thank the nurses who participated in this study, as their contribution was essential for its completion.

Author contributions
LZF and YLH were responsible for the study's conception and design. The data were collected by LZF, XZY, YW, FYZ, and CCY. Analysis and interpretation of the results were conducted by LZF, LYH, XZY, YLH, and YW. The manuscript was drafted by LZF, CCY, FYZ, and YW, while YLH, LYH, and XZY provided critical revisions. The final manuscript was read and approved by all authors.

Funding
Not applicable.

Data availability
The data supporting this study's findings are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study received approval from the Ethics Committee of Yichang Central People's Hospital (Ethics No. 2023-126-01). All study participants provided informed consent.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 25 February 2024 / Accepted: 30 December 2024
Published online: 06 January 2025

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