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Gender differences in co-rumination and transition shock among nursing interns in China: a cross-sectional study

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Abstract

Background It has been reported that co-rumination and transition shocks significantly influence effective communication in clinical practice. However, previous research has not sufficiently explored the specific relationships between these two characteristics and their gender differences among nursing interns.

Objective The objective of this study was to evaluate the states of co-rumination and transition shock among current nursing interns during clinical placements, as well as to determine whether gender differences affect these two traits and how exploiting such differences can improve nurses' co-rumination.

Methods A cross-sectional study design was adopted. We gathered data from a convenient sample of 505 nursing interns from a grade A tertiary hospital in Anhui, China. This study included Data collected using the Co-Rumination Questionnaire (CRQ-9) and Transition Shock Scale for Undergraduate Nursing Students (UNSTS). The data were analyzed using an independent samples t-test, Pearson correlation, and hierarchical multiple linear regression.

Results There was no significant difference in UNSTS scores between male and female nursing interns, but male nursing interns had lower CRQ-9 scores ($P < 0.05$). This study found that Transition Shock was the most critical factor influencing Co-Rumination variation for male and female nursing interns during clinical practice through hierarchical multiple regression analysis.

Conclusions Gender differences are reflected not only in the level of co-rumination but also in the relationships between co-rumination and transition shock. Nursing educators should be aware of how gender differences can affect these two traits; this is particularly important for improving the mental health problems of nursing interns based on students' aptitudes.

Keywords Co-rumination, Transition shock, Nursing interns, Quantitative

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Background

In recent years, to cater to the needs of nursing talents at all levels of medical institutions, the number of nursing interns enrolled in medical colleges has increased year by year. Clinical practice, as a critical period for undergraduate nursing interns to combine theoretical knowledge with clinical practice, not only needs to deal with complex interpersonal relationships and repeated clinical operations but also face possible emotional events such as doctor-patient tension and occupational exposure during their first clinical practice [1, 2]. A systematic review and meta-analysis showed that bullying is reported by almost 60% of student nurses, and even more so that the main perpetrators are reportedly nurses [3]. Moreover, nursing interns tend to perceive a considerable gap between their expectations and actual experiences in the clinical environment. Studies have also reported that they experience a conflict between the theoretical content taught in nursing schools and actual clinical practice. Given this, a particular psychological experience, namely transition shock, can occur.

Kramer coined the term 'Reality shock' in 1974 to describe the dramatic difference between the values students develop on campus and the values of clinical work, forming the theory of reality shock [4]. Duchscher defines Transition Shock (TrS) as experiences and feelings of disorientation, confusion, doubt, and uncertainty in the physical, psychological, knowledge and skills, sociocultural, and developmental aspects of the individual's transition from the role of student to that of nurse, influenced by their knowledge, responsibilities, roles and interpersonal relationships [5, 6]. However, research has shown that transformational impact theory also applies to the nursing trainee population to describe the conflict between nursing interns' authentic clinical placement experience and their clinical expectations based on theoretical knowledge [7–10]. Nursing interns encounter many difficulties and challenges upon entering the clinical setting, leading many to opt out of the nursing profession following their clinical placement. A recent study revealed that up to 45.4% of newly graduated nurses in China have contemplated abstaining from entering the nursing profession [11]. Students identified clinical practice experiences as essential occasions for their personal and professional development [12]. Driven by transition shock, individuals may be inclined to share stressful events and engage in collective rumination excessively [13].

Co-rumination was a concept that Rose formally introduced and studied at the beginning of the 21st century. As a standard mode of interpersonal communication, co-rumination is not solely determined by individual psychological traits but rather emphasizes specific interaction patterns and the resulting psychological transformations. It refers to individuals' behavior of excessively discussing their own or others' problems in personal relationships, characterized by frequent problem-focused conversations, repetitive discussions on the same issues, speculation on the causes and effects of crises, mutual reinforcement of discussion behaviors, and concentration on negative emotions rather than problem-solving [14, 15]. Empirical evidence indicates that co-rumination is positively associated with elevated burnout, negative affectivity, and internalizing symptoms (e.g., anxiety and depression), with these associations demonstrated both cross-sectionally (across individuals and social groups) and longitudinally (over developmental trajectories) [16–18].

Sexual stereotypes are still found in the nursing professions in clinical settings. Approximately 90% of the global nursing workforce comprises women, while men constitute a minority in nursing [19]. The percentage of male nurses in China (less than 2%) is significantly lower compared to that in developed countries (over 10%) [20]. This study was based on the theory of gender differences [21, 22]. The investigation of gender disparities in personality commenced in the late 19th century. It continued into the 1930s, exploring the correlations between gender and behavior and the distinctions between male and female personality traits. Gender is fundamentally a sociocultural and psychological differentiation between males and females. Gender refers to the psychological condition in which an individual perceives a particular pattern of conduct deemed socio-culturally appropriate and identifies as male or female. In this way, individuals can form a behavioral system, basic attitudes, and feelings suitable for social cultures and psychological gender, that is, gender roles. Different gender roles have different specific behaviors. Several studies have demonstrated notable gender disparities in co-rumination [23, 24]. Regarding challenge and threat, the findings revealed that female disclosers in the co-rumination condition demonstrated physiological responses indicative of heightened psychological threat (i.e., increased total peripheral resistance) compared to those in the natural need [25]. The findings indicated that when adolescents reported higher levels of co-rumination than their typical level, they concurrently reported an increase in rumination. This correlation was more pronounced among male adolescents and became more robust over time [26]. A survey of 484 recent college students, comprising 126 males and 358 females, revealed no statistically significant difference between genders regarding co-rumination [27]. Consequently, gender differences in co-rumination between males and females remain unresolved, owing to contradictory evidence across empirical studies.

The theory of gender differences points out that men and women have different specific behaviors, basic

attitudes, and feelings in the same environment [22]. However, it remains unclear whether nursing interns exhibit gender differences in co-rumination and transition shock. With the increasing number of male nurses-for example, about a quarter of the Dutch nurses are male [28], it is crucial to pay attention to gender differences between male and female nursing interns in terms of co-rumination and transition shock. Examining the impact of these differences has significant implications for the future development of personalized clinical nursing education. However, to our knowledge, there is currently no national or international report on the correlation between co-rumination levels and transition shock among nursing interns. Therefore, this study aims to examine the levels of co-rumination and transition shock among nursing interns in China and to investigate gender differences between these two variables. To address these aims, we proposed the following three hypotheses:

Hypothesis 1 Nursing interns' co-rumination is positively correlated with their transition shock.

Hypothesis 2 Gender differences in co-rumination scores exist among nursing interns.

Hypothesis 3 Gender differences in transition shock scores exist among nursing interns.

Methods

Design

A cross-sectional, descriptive, and correlational study was conducted from June to August 2022. This study followed the STROBE (strengthening the reporting of observational studies in epidemiology) statement.

Participants

A total of 505 nursing interns from one tertiary-level public hospital in Anhui Province, China, were selected via convenience sampling. The inclusion criteria were as follows: (1) nursing interns who are currently practicing in the hospitals; (2) Clinical placement duration of at least two weeks; (3) Provision of informed consent and voluntary participation in this study. Exclusion criteria: Non-working nursing interns due to illness or approved leave.

Sample size

According to the sample size calculation formula N = [Max (number of dimensions)] × (15–20) × (1 + 15–20%) [29]. The scale used in this study had a maximum of six dimensions, and the sample size was calculated to be 144 at most. Therefore, the recruitment of 550 participants was sufficient to meet the sample size requirements of this cross-sectional survey. A total of 505 nursing interns participated in the study.

Instruments

Questionnaire for general information

Designed by the researcher to align with the study's objectives, this questionnaire primarily encompasses variables such as gender, age, only child or not, served as a class officer, and family address.

Transition shock scale for undergraduate nursing students (UNSTS)

The measurement tool was devised by Kim and Shin [30] and revised by Yuxuan Huang et al. [31]. There are 18 items in total, which can be categorized into six dimensions: conflict between theory and practice (3 items), overwhelming practicum workload (3 items), loss of social support (2 items), shrinking interpersonal relationship (3 items), ambiguity in professional nursing values (5 items), and contradiction between clinical practicum and personal life (2 items). The Cronbach's α coefficient for the total scale of UNSTS was found to be 0.912, indicating good internal consistency. The assessment was conducted using a refined 4-point Likert scale, where the range from 1 to 4 represents the spectrum from "strongly disagree" to "strongly agree." The overall score ranged from 18 to 108, with elevated scores signifying increased transition impact. Notably, Cronbach's alpha coefficient for this study yielded an impressive value of 0.872.

9-item co-rumination questionnaire(CRQ-9)

The questionnaire was devised by Rose [14], and a revised unidimensional scale by Yunxue Zhang et al. [32]. The scale comprises nine items, each rated on a 5-point Likert scale ranging from "not at all" to "completely. The Cronbach's α coefficient for the total scale of CRQ-9 was 0.875, indicating good internal consistency. The higher the score, the higher the level of co-rumination. The Cronbach's alpha coefficient for this study was 0.882.

Data collection

Wenjuanxing (https://www.wjx.cn/), a professional online questionnaire platform in China, was utilized to create the electronic questionnaire. A pilot study was administered to nursing interns ($n = 10$) before the formal data collection phase. Findings confirmed the absence of technical barriers in the web-based self-report questionnaire, with participants endorsing highly comprehensible items (these data were not included in this study). The researcher contacted the hospital internship manager to explain the purpose, significance, and method of completing the survey and asked them to send a link to the questionnaire to each student group. The questionnaire was sent to the student group with unified instruction

to inform the nursing interns of the content and the requirements for completing the questionnaire. The respondents ticked the box to agree to the questionnaire and then answered it on time. The mandatory questions could only be answered once for the same IP address. The investigated nursing interns were guaranteed anonymity of their responses, the confidentiality of their information, and the voluntary nature of their participation. A total of 511 questionnaires were returned. According to the pre-survey feedback, it took at least 5 min to complete the questionnaires, and six questionnaires that took less than 5 min to answer were excluded, resulting in 505 valid questionnaires with an effective recovery rate of 98.93%.

Data analysis

The data analysis was conducted using SPSS v. 22.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were utilized to depict the characteristics of the sample and the scores on the scales, including measures such as mean, standard deviation, and frequency. The normality of the distribution was assessed using the Skewness and kurtosis test. An independent samples t-test was employed to compare the scores of male and female nursing interns on transition shock and co-rumination. At the same time, Pearson correlation analysis was used to examine the associations between these variables among male and female nursing interns. Hierarchical multiple regression analyses were conducted to test the incremental variance of any given set of independent variables, using co-rumination as the dependent variable. In this study, the characteristics of nursing interns were added to the regression model in the first step, and transition shock in the second step. The relative importance of the variables retained in the final multiple regression model helps to explain the co-rumination, which is denoted as standardized beta. Preliminary analyses were conducted to ensure no violation of the assumption of multicollinearity and homoscedasticity. Adjusted R^2 values were used to assess model fit. A P value less than 0.05 indicated statistical significance.

Table 1 General information on nursing interns [$N=505$]

Variables	Total sample size	Male 64 (12.7%)	Female 441(87.3%)	χ^2	*P*-Value
Family address				5.196	0.023
Rural area	357(70.7%)	53(14.8%)	304(85.2%)		
Urban area	148(29.3%)	11(7.4%)	137(92.6%)		
Served as a class officer				5.671	0.017
YES	142(28.1%)	26(18.3%)	116(81.7%)		
No	363(71.9%)	38(10.5%)	325(89.5%)		
Only child or not				8.311	0.004
YES	74(14.7%)	17(23.0%)	57(77.0%)		
No	431(85.3%)	47(10.9%)	384(89.1%)		

Ethical considerations

This study was conducted following the ethical principles required in the Declaration of Helsinki and approved by the ethical committee of the First Affiliated Hospital of the University of Science and Technology of China (ethical approval number: 2023KY Ethics Review No. 027). All participants were informed of the research objective, volunteered to participate in this survey, and had the right to refuse participation at any time. Informed consent was obtained from all participants. All the data collected from the participants were kept anonymous and confidential to protect their privacy.

Results

General information on nursing interns

A total of 505 nursing interns were surveyed in this study, 64 (12.7%) males and 441 (87.3%) females; mean age ranged from 17 to 23 (20.66±0.97) years; 142 (28.1%) had served as class leaders; 74 (14.7%) were only children; family address: Rural area 357 (70.7%), Urban area 148(29.3%). See Table 1 for details.

Current status and gender differences in transition shock and co-rumination among nursing interns

As a result of the study, there was a statistically significant difference in the level of co-rumination between male nursing interns and their counterparts, with the former scoring lower ($P<0.05$). No significant gender-based differences were observed in the transition shock scale scores and most dimensions among nursing interns, except for shrinking interpersonal relationships ($P>0.05$). The results are shown in Table 2.

Comparison of UNSTS and CRQ-9 scores among male and female

Pearson's correlations in Fig. 1 show that the correlation between male nursing interns for the total score of co-rumination and transition shock scale for nursing interns was statistically significant ($r=0.662$, $P<0.001$), and there was a significant positive correlation between male nursing interns' co-rumination and transition shock for the dimensions of UNSTS1($r=0.690$, $P<0.001$) and UNSTS2 ($r=0.671$, $P<0.001$) and UNSTS3 ($r=0.456$, $P<0.001$) and UNSTS6 ($r=0.642$, $P<0.001$). The pearson correlation coefficients in Figs. 1 and 2 also show that female nursing interns' co-rumination was significantly correlated with transition shock.

Table 2 Current status and gender differences in transition shock and co-rumination among nursing interns

	Average M(SD)	Male M(SD)	Female M(SD)	t	*P*
UNITS					
Total score	2.41 ± 0.47	2.42 ± 0.60	2.41 ± 0.45	0.219	0.826
The conflict between theory and practice	2.84 ± 0.77	2.68 ± 0.82	2.87 ± 0.76	-1.787	0.074
Overwhelming practicum workload	2.76 ± 0.62	2.74 ± 0.70	2.76 ± 0.61	-0.234	0.815
Loss of social support	2.41 ± 0.86	2.35 ± 0.87	2.42 ± 0.86	-0.622	0.534
Shrinking interpersonal relationship	2.13 ± 0.69	2.38 ± 0.86	2.10 ± 0.66	2.556	0.013
Ambiguity in professional nursing values	2.16 ± 0.71	2.26 ± 0.80	2.15 ± 0.70	1.190	0.235
The incongruity between clinical practicum and personal life	2.29 ± 0.85	2.10 ± 0.87	2.31 ± 0.84	-1.854	0.064
CRQ-9	3.49 ± 0.68	3.20 ± 0.86	3.53 ± 0.64	-3.017	0.004

Abbreviation: UNSTS, Transition Shock Scale for Undergraduate Nursing Students; CRQ-9, Co-Rumination Questionnaire

The association of transition shock on co-rumination among nursing interns and its gender-based variations

Hierarchical regression analyses were conducted with co-rumination as the dependent variable. Demographic variables (e.g., family address, served as a class officer, one child) were entered as control variables in Model (1) The TSSUNS score was subsequently added to Model (2) As shown in Tables 3 and 4, transition shock was identified as a significant predictor of co-rumination in both male (ΔR^2 = 30.7%, $P < 0.001$) and female (ΔR^2 =6%, $P < 0.001$) nursing interns, independent of controls.

Discussion

This study observed that male and female nursing interns generally displayed similar levels of transition shock. However, it was noted that female nursing interns exhibited higher co-rumination than their male counterparts. Gender differences were also observed in the associations between co-rumination and transition shock ability among nursing interns.

Analysis of the current status of co-rumination and gender differences among nursing interns

The present study's findings indicate that gender is a significant predictor of co-rumination levels among nursing interns, with female nursing interns exhibiting higher levels of co-rumination than their male counterparts. These results are consistent with those reported in the meta-analysis of Lai Lizu et al. [33]. This may be due to traditional Chinese cultural expectations of gender roles, where boys are raised with an emphasis on 'masculinity' and encouraged to be more proactive and independent in problem-solving [22]. Moreover, it is related to women's social norms regarding emotional expression. Previous research has indicated that the cognitive style of women is typified by an inclination to internalize pain, engage in co-rumination on the subject, and prioritize the dynamics of their relationships. They often lack rational thinking when faced with adverse life events and prefer venting negative emotions rather than working towards solutions [34, 35]. Several studies have demonstrated that male nursing interns exhibit elevated levels of psychological resilience, enabling them to utilize positive psychological resources to cope with adversity and reduce negative emotions and inter-individual co-rumination behavior [36, 37]. This finding is inconsistent with the results of previous studies conducted in the USA. Whitton and Kuryluk surveyed 484 recent adult college students (126 males, 358 females) and found that the gender difference in co-rumination was not statistically significant [38]. According to the author, the conflicting results could be due to the low percentage of male nursing interns (12.7%) in this study, which has resulted in biased results. In light of conflicting evidence, we suggest future studies to investigate more about co-rumination and gender through phenomenological study design.

The findings of this study indicate that the average score for co-rumination among nursing interns was 3.49 ± 0.68, signifying a relatively elevated level of co-rumination. These findings are in alignment with those of Chinese scholars who conducted a survey of 1,354 students from nursing colleges in Shandong province. As individuals engage in greater levels of co-rumination with their peers, they are more likely to become involved in their peers' problems and experience the emotional distress associated with them [32]. First, the Chinese cultural values can partly explain this appearance. This may be attributed to the fact that, in contrast to the individualistic values espoused in the West, Chinese cultural values are grounded in social groups, which are more socially oriented. Additionally, learning about group culture, coupled with the tendency of Chinese individuals to form groups and focus on wholeness in a dualistic relationship to a greater extent than their Western counterparts, may also play a role. Second, the daily interaction

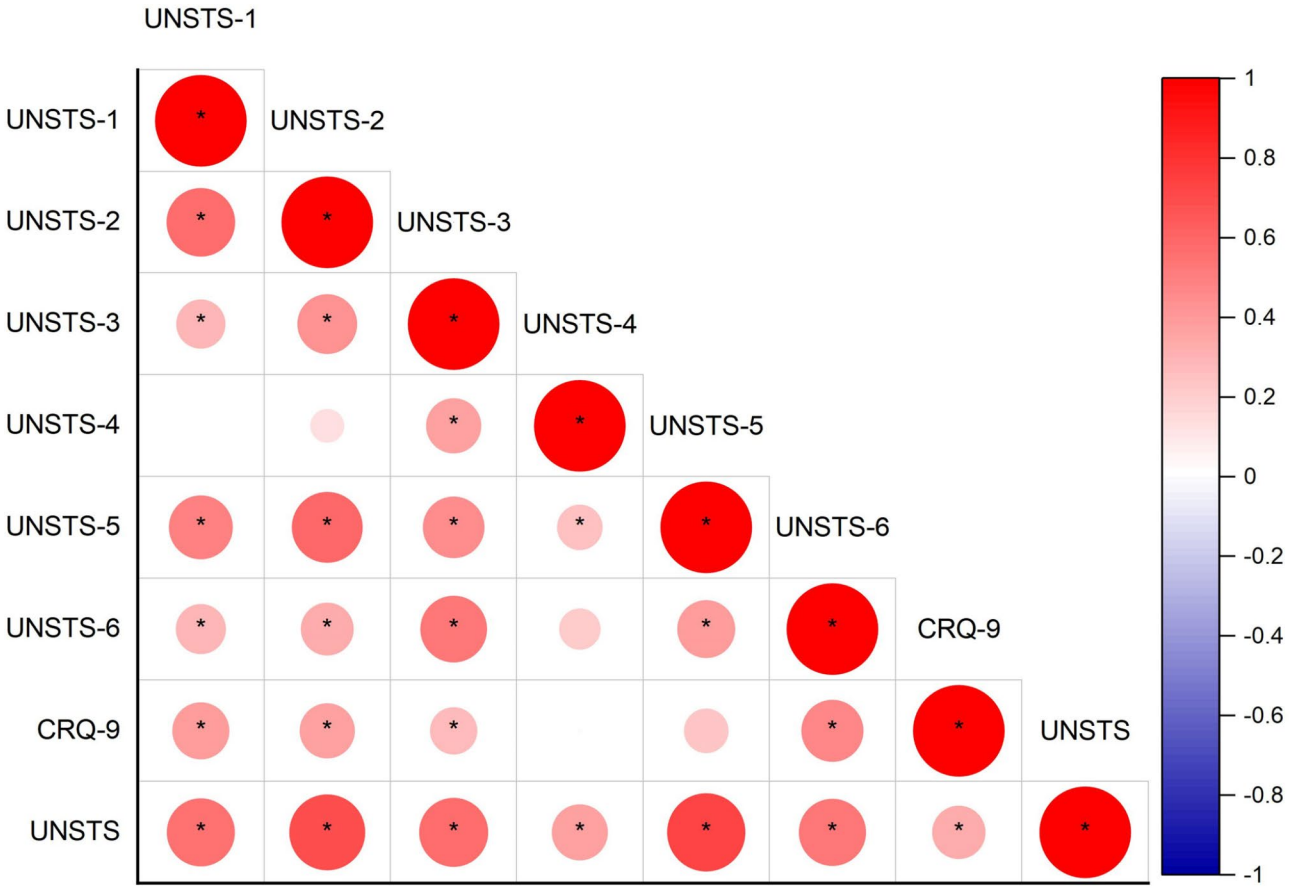

Fig. 1 Correlation thermodynamic diagram of UNSTS and CRQ-9 among male nursing interns

between nursing interns in work and personal life is characterized by a high degree of intimacy and interpersonal connection. The subjects of this study were exclusively drawn from tertiary hospitals, with the survey period coinciding with a resurgence of the COVID-19 pandemic. As such, intern nursing interns encountered various challenges, including intense nursing workloads, insufficient knowledge and skills, and exposure to infectious diseases. These difficulties have fostered mutual catharsis among nursing interns, leading to more frequent discussions regarding adverse problems. As negative emotions accumulate, they become more attentive and persistent in discussing adverse events. Third, Ali et al. [39] conducted a cross-sectional study involving 825 undergraduate nursing students. The findings demonstrated that 98.8% of students exhibited varying degrees of internet addiction. Notably, such pervasive internet engagement may exacerbate maladaptive coping behaviors—a concern further underscored by the role of digital platforms in facilitating co-rumination. Specifically, internet-based modes (e.g., social media messaging) provide nursing interns with continuous opportunities to engage in repetitive, problem-focused discussions, potentially amplifying emotional distress without resolution [40]. Several studies have demonstrated that co-rumination, as a maladaptive coping strategy, is ineffective in reducing negative experiences when individuals repeatedly share adverse events or emotions. Instead, it elicits emotional expressions such as anxiety and depression [23, 41].

A basic condition analysis of transition shock among nursing interns of diverse genders

We found no evidence of gender differences in transition shock, contrasting with studies from Egypt and Croatia [42, 43]. Previous research has shown that male nurses have slightly better physical strength and emergency skills than their female counterparts [44], so male nurses are often assigned to departments with high work demands and intensity, such as emergency care, intensive care units, and operating theatres. These areas typically experience a shortage of nursing staff, especially after the full implementation of China's two-child policy in 2016. The increased incidence of pregnancy and childbirth among female nurses has inevitably led to higher workloads for those on duty. As a result, managers tend to assign more demanding shifts and night duties to male nurses. Consequently, male nurses face an elevated workload and are frequently overwhelmed, leading to

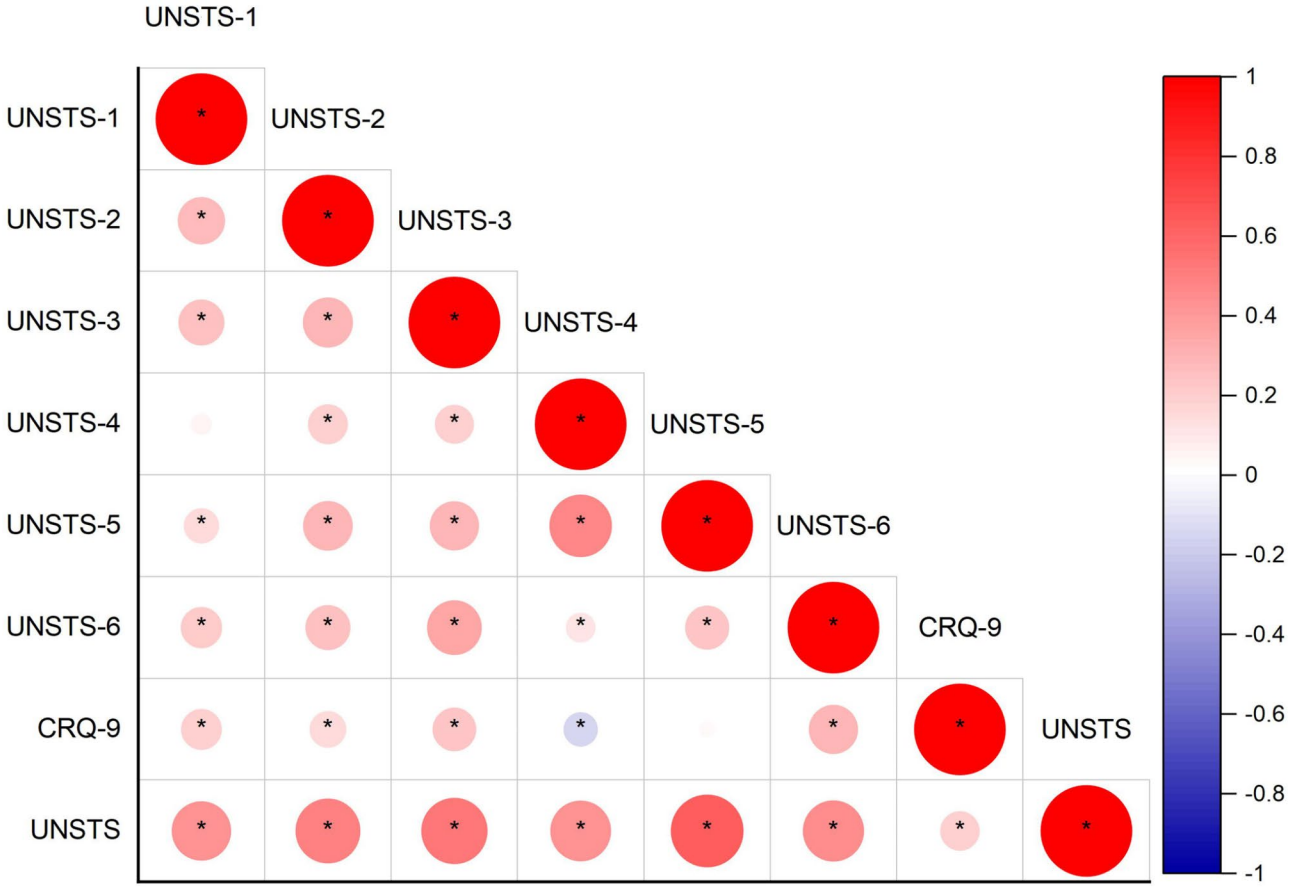

Fig. 2 Correlation thermodynamic diagram of UNSTS and CRQ-9 among female nursing interns. Abbreviation: UNSTS1, identify the conflict between theory and practice; UNSTS 2, overwhelming practicum workload; UNSTS 3, loss of social support; UNSTS 4, shrinking interpersonal relationship; UNSTS 5, ambiguity in professional nursing values; UNSTS6, incongruity between clinical practicum and personal life; UNSTS, Transition Shock Scale for Undergraduate Nursing Students; CRQ-9, Co-Rumination Questionnaire. Note: *$P < 0.05$

Table 3 The hierarchical linear regression analyses of CRQ-9 among male nursing interns

Variables	Step1			Step2		
	β	SE	t	β	SE	t
Family address	0.693	0.289	2.398*	0.519	0.226	2.298*
Served as a class officer	-0.137	0.195	-0.704	-0.189	0.152	-1.248
One child	-0.545	0.245	-2.227*	-0.330	0.193	-1.710
TSSUNS	-	-	-	0.819	0.128	6.381**
Adjusted R^2	0.229			0.536		
F	7.244**			19.210**		

Abbreviation: CHQ-9, 9-item Co-rumination Questionnaire; TSSUNS, Transition Shock Scale for Undergraduate Nursing Students

Note: *$P < 0.05$.**$P < 0.01$

heightened levels of transition shock compared to their female counterparts. In light of the considerations above, Chinese scholars have devised nursing safety training materials grounded in the transition shock theory [45]. With a greater emphasis on enhancing nursing interns' adaptive skills and learning abilities, they can transition more smoothly during their clinical placements, potentially reducing the disparity in transition shock levels between male and female nursing interns. This implies that nursing managers should pay equal attention to male nursing interns' needs and provide them with equitable understanding and support.

Clinical practice is an irreplaceable educational field in nursing education. The findings of this study revealed that the total score for transition shock among nursing interns (43.41±8.46) and the mean entry score (2.44±0.47) indicated a moderate to high level of overall transition shock experienced by nursing interns, which

Table 4 The hierarchical linear regression analyses of CRQ-9 among female nursing interns

Variables	Step1			Step2		
	β	SE	t	β	SE	t
Family address	0.393	0.063	6.206**	0.350	0.062	5.672**
Served as a class officer	-0.072	0.065	-1.096	-0.077	0.063	-1.214
One child	-0.206	0.087	-2.358*	-0.183	0.085	-2.166*
TSSUNS	-	-	-	0.356	0.063	5.683**
Adjusted R^2	0.102			0.162		
F	17.661**			22.269**		

Abbreviation: CHQ-9, 9-item Co-rumination Questionnaire; TSSUNS, Transition Shock Scale for Undergraduate Nursing Students

Note: *$P < 0.05$.**$P < 0.01$

were consistent with the previous studies in South Korea [46], suggesting that nursing interns encounter varying degrees of stress during clinical placement, related explicitly to transitional challenges. The findings of Zhang Panpan et al. [47], who conducted a study on new nurses with a bachelor's degree or higher, yielded higher results than nursing interns as learners. This may be attributed to the latter being exclusively comprised of newly graduated nurses with a bachelor's degree or higher. On the one hand, newly graduated nurses, as formally appointed clinical staff in healthcare institutions, face significantly higher clinical demands and professional accountability compared to nursing interns. On the contrary, new nurses with higher qualifications are subjected to greater expectations from their colleagues and leaders, imposing heightened psychological pressure upon them. The results of this study show that the dimension with the highest score is "conflict between theory and practice. "According to a survey, nursing interns demonstrated the highest proficiency in the domain of 'own knowledge and skills.' However, due to the rapid updates in clinical nursing knowledge, nursing interns may lack practical experience and possess relatively weak perceptions regarding patient safety. Consequently, they can be easily challenged by patients or their families, leading to feelings of failure and frustration during the transition from theory to practice. This ultimately results in a higher impact [48, 49]. The lowest score was observed in the "interpersonal tension" domain, likely attributed to the nursing etiquette and interpersonal communication courses provided at their educational institutions. These courses aid nursing interns in enhancing their professional image, emotional communication, communication skills, and physical and mental adjustment abilities. Consequently, they are better equipped to swiftly adapt to clinical work with greater proficiency [50]. It is recommended that schools and hospitals continue to innovate clinical teaching models for nursing student internships, focusing on institutional integration, on-campus practice, comprehensive training, pre-service preparation, and humanistic education, such interventions as the "survival" program summarized by Tseng et al., the guided learning interactive teaching model, and PBL combined with mind mapping are utilized to cultivate nursing interns' independent thinking abilities, enhance their comprehension of clinical problems, and facilitate a smooth transition period by ensuring the depth and solidity of their theoretical knowledge [51–53].

Association between co-rumination and transition shock

The findings of this study indicate that the level of co-rumination among nursing interns is significantly influenced by transition shock, with higher levels of transition shock associated with higher levels of co-rumination. This can be attributed to the inadequate social support process inherent in a dichotomous relationship known as co-rumination [54]. During the transition, nursing interns may experience negative emotions due to physical, psychological, sociocultural, and intellectual barriers, which may affect their perception of the work environment, making them fearful and avoidant of their supervisors or leaders [9, 56]. Nursing interns may also seek peer support during this time and are prone to experiencing "empathic distress" when learning about the difficulties faced by their friends. This can cause both parties to focus too much on adverse events and emotions, thus making the high level of transition shock a common cause of regurgitation among nursing interns [55]. In addition, nursing interns may face physical shocks such as sleep disorders and somatic fatigue due to the adjustment of work and rest schedules and increased physical demands after entering clinical practice; according to the theory of transformational shocks [56], when an individual is unable to adapt to environmental changes and changes in social roles, and the transformational shocks are severe, the nursing interns will have self-perception bias, which then induces or exacerbates the tendency of self-competence denial and even triggers persistent anxiety and other psychological shock [57]. Co-rumination is a typical pattern of interpersonal interaction characterized by excessive discussion of adverse events and focusing on negative emotions. It may result in internalization issues, like depression and anxiety, in individuals. Accordingly, a mix of psychological and physical shocks may cause

nursing interns to engage in more co-rumination, which lowers mental health. On the contrary, individuals exhibiting low levels of transition shock demonstrate effective strategies in resolving workplace challenges and adapting to intricate healthcare environments. Consequently, they experience higher levels of career satisfaction, leading to reduced co-rumination behavior within this cohort [58]. It is advisable for nursing managers to actively guide student interns in seeking assistance from more experienced supervisors or nursing managers rather than solely relying on peers when confronted with challenging issues. It is also recommended that cognitive behavioral therapy, positive stress reduction training, and peer support intervention counseling be employed to mitigate the impact of transition shock and minimize co-rumination among nursing interns [59].

Relevance to clinical practice

This study showed that nursing interns, who are predominantly female, are more likely to engage in co-rumination. To prevent nursing interns from exhibiting high levels of co-rumination during their placements, it is recommended that positive co-rumination training be conducted following the characteristics of nursing interns of different genders. First, nursing managers should be mindful of the detrimental effects of co-rumination on individual emotional adjustment and remain attentive to rumination patterns in the clinical practice of nursing trainee groups. It is recommended that the clinical teaching process should be carried out in the form of group counseling and that a program of eight group counseling activities should be designed with the theme of positive co-rumination, combined with positive regurgitation thinking training techniques [60] and supported by methods such as positive thinking meditation, ABC theory, attribution theory, the concretization of bad things, and problem-solving strategies [61]. These approaches aim to reduce nursing interns' preoccupation with negative emotions, thus facilitating the alleviation of internalization issues stemming from co-rumination (e.g., anxiety, depression, etc.) and improving their psychological well-being. Second, clinical instructors (nurses) ought to furnish nursing interns with supplementary coping experiences, foster a constructive work atmosphere within the department, and assist students in acknowledging their worth and assimilating into the new workplace. Third, the leaders should appropriately reduce the work intensity of nursing interns, reduce their work pressure, improve the psychological tolerance of nursing interns, and carry out counseling for positive psychological interventions within the department; there is also a need to reform the hospital teaching model and adopt more diverse teaching methods (e.g., using situational simulation [62], problem/context-based learning [63], etc.) to improve nursing interns' clinical practice skills and confidence in their clinical work, thereby reducing transition shock among such interns and reducing their level of co-rumination.

Limitations and future directions

Investigating gender differences in co-rumination levels among nursing interns necessitates a broad range of theoretical knowledge and practical considerations. However, there are several areas where this study falls short. Firstly, the data in this study were obtained from the self-reports of the nursing interns. Although the anonymity and confidentiality of the data were adequately explained to the respondents before the study began, it may not be possible to avoid the situation that some nursing interns had reservations about answering the questionnaire, especially when it comes to sensitive questions, which may result in some bias. Future studies may consider combining qualitative interviews to verify the results' reliability further. Second, in terms of the sampling method, due to budgetary constraints, using convenience sampling may limit the generalizability of the findings. To improve the representativeness of nursing interns for subsequent studies, random sampling, and large-scale surveys are recommended in future surveys. Future research could enhance the sampling methodology and broaden the scope of participants for further validation. Third, this study is limited in generalizability; our study's geographical size was limited to a single level 3 A hospital in Anhui Province, resulting in a narrow sample that fails to fully capture intern nurses' overall transition shock and co-rumination experiences. The current design prioritized testing core theoretical hypotheses over exploring demographic covariates, which warrants future dedicated studies. Therefore, these findings cannot be assumed to be generalizable to other regions. Future research should consider multi-center studies and longitudinal designs. The sample does not represent the entire population of nursing interns in China. Thus, any extrapolations to other nations must be approached with utmost prudence.

Despite advancements in the research on co-rumination and transition shock, further efforts are necessary. The processes of co-rumination and transition shock are complex and dynamic, occurring within and between systems of the individual, their work, and their wider social and cultural contexts. It is logical for future research to utilize longitudinal designs, such as latent transition analysis or growth mixture models, to investigate the fluctuations in co-rumination and transition shock over an extended period. Quantitative data may be integrated with qualitative data acquired through observations and interviews, enhancing the depth and realism of the results. Future studies could also create tailored interventions to propose ideas for minimizing the level of

co-rumination among nursing interns, decreasing their turnover intentions, and increasing the development of nursing practice.

Conclusions

This study reveals no significant gender disparity in transition shock levels among Chinese nursing interns yet identifies marked differences in co-rumination, with females exhibiting heightened co-rumination levels. Moreover, hierarchical regression analyses revealed transition shock as a robust predictor of co-rumination severity. Given the findings of gender-specific co-rumination patterns and the predictive role of transition shock, nursing education programs must prioritize addressing these dynamics through targeted pedagogical tactics, especially those tailored to students' characteristics. Nursing educators should integrate gender-aware curricula to address differential co-rumination tendencies. For female nursing interns: Implement cognitive-behavioral modules targeting co-rumination reduction (e.g., problem-solving vs. emotion-focused discussions). For male nursing interns: Foster peer mentoring roles to channel co-rumination tendencies into constructive peer support. In addition, considering the significant correlation between transition shock and co-rumination, pre-clinical training should emphasize cognitive evaluations of clinical transitions.

Abbreviations

UNSTS	Transition shock scale for undergraduate nursing students
UNSTS1	Identify the conflict between theory and practice
UNSTS 2	Overwhelming practicum workload
UNSTS 3	Loss of social support
UNSTS 4	Shrinking interpersonal relationship
UNSTS 5	Ambiguity in professional nursing values
UNSTS 6	Incongruity between clinical practicum and personal life
CRQ-9	Co-Rumination questionnaire
SPSS	Statistical package for the social sciences
PBL	Problem-based learning
ABC Theory	Activating event, belief, consequence theory

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Author contributions

The authors confirm contribution in to the paper as follows: W.J.G., Methodology, Investigation, Resources, Data curation, Writing–original draft. S.J.Z., Conceptualization, Methodology, Resources, Formal analysis, Investigation. X.Y.Z., Methodology, Resources, Software, Validation, Writing – review &editing. A.Q.C., Conceptualization, Methodology, Resources, Writing–review & editing, Visualization, Project administration, Funding acquisition.

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Data availability

The data that were generated and analyzed in this study are mostly included within the published article. However, source material and the raw datasets are available from the corresponding author upon request.

Declarations

Ethics approval and consent to participate

This study was conducted following the ethical principles required in the Declaration of Helsinki and approved by the ethical committee of the First Affiliated Hospital of the University of Science and Technology of China (ethical approval number: 2023KY Ethics Review No. 027). All participants were informed of the research objective and volunteered to participate in this survey, as well as having the right to refuse participation at any time. Informed consent was obtained from all participants. The written informed consent was not obtained from participants because of the anonymous survey approach.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

1. Ge WJ, Wei J, Wu ZW. Investigation on status quo of mental health among nursing interns during a period of prevention and control of COVID-19. Chin Nurs Res. 2022;36(22):4103–5.
2. Zhang GZ. Research status quo on needle stick injuries of nursing interns in China. Chin Nurs Res. 2021;35(11):1983–5.
3. Hallett N, Gayton A, Dickenson R, Franckel M, Dickens GL. Student nurses' experiences of workplace violence: A mixed methods systematic review and meta-analysis. Nurse Educ Today. 2023;128:105845.
4. Meier M. Der Wirklichkeitsschock Oder warum Verlassen die Schwestern die Pflege? [Reality shock or why do nurses leave nursing?]. Krankenpfl Soins Infirm. 1979;72(11):460–3.
5. Duchscher JE. Transition shock: the initial stage of role adaptation for newly graduated registered nurses. J Adv Nurs. 2009;65(5):1103–13.
6. Kim EY, Yeo JH. Transition shock and job satisfaction changes among newly graduated nurses in their first year of work: A prospective longitudinal study. J Nurs Manag. 2021;29(3):451–8.
7. Kaihlanen AM, Salminen L, Flinkman M, Haavisto E. Newly graduated nurses' perceptions of a final clinical practicum facilitating transition: A qualitative descriptive study. Collegian. 2019;26(1):55–61.
8. Salifu DA, Gross J, Salifu MA, Ninnoni JP. Experiences and perceptions of the theory-practice gap in nursing in a resource-constrained setting: A qualitative description study. Nurs Open. 2018;6(1):72–83.
9. Lian Y, Zhang CM. Correlation between nursing interns' transformation impact and feedback-seeking behavior. J Nurs Sci. 2020;35(14):68–71.
10. Wang L, Guo QX, Wang YF, Zhang Y. Current situation of the transition shock of nursing intern students and its correlation with professional identity. Chin J Mod Nurs. 2019;25(32):4251–4.
11. Lin Y, Hu Z, Danaee M, Alias H, Wong LP. The impact of the COVID-19 pandemic on future nursing career turnover intention among nursing students. Risk Manag Health Policy. 2021;14:3605–15.
12. Steven A, Rossi S, Dasso N, et al. A qualitative exploration of undergraduate nursing students' experience of emotional safety for learning during their clinical practice. Nurse Educ Today. 2023;121:105673.
13. Fan CY, Chu XW, Wang MZ, Zhou ZK. Co-rumination: conceptualization, measurements and theoretical explanation. Psychol Dev Educ. 2016;32(5):631–40.
14. Rose AJ. Co-rumination in the friendships of girls and boys. Child Dev. 2002;73(6):1830–43.
15. Rose AJ, Carlson W, Waller EM. Prospective associations of co-rumination with friendship and emotional adjustment: considering the socioemotional trade-offs of co-rumination. Dev Psychol. 2007;43(4):1019–31.
16. Boren JP. The relationships between Co-Rumination, social support, stress, and burnout among working adults (Article). Manage Communication Q. 2014;28(01):3–25.
17. Spendelow JS, Simonds LM, Avery RE. The relationship between Co-rumination and internalizing problems: A systematic review and Meta-analysis. Clin Psychol Psychother. 2017;24(2):512–27.

18. Stone LB, Mennies RJ, Waller JM, et al. Help me feel better! Ecological momentary assessment of anxious youths' emotion regulation with parents and peers. J Abnorm Child Psychol. 2019;47(2):313–24.
19. Punshon G, Maclaine K, Trevatt P, Radford M, Shanley O, Leary A. Nursing pay by gender distribution in the UK - does the glass escalator still exist? Int J Nurs Stud. 2019;93:21–9.
20. Hong Zhang JT. The working experiences of male nurses in China: implications for male nurse recruitment and retention. J Nurs Adm Manag. 2020;28(02):441–9.
21. Yin H, Qi SS. Gender differences theory and its implications for personality education of college students. J Inner Mongolia Normal Univ (Educational Science). 2015;28(02):60–6167.
22. Cao J, Sun H, Zhou Y, Yang A, Zhuang X, Liu J. Nursing students' experiences of workplace violence based on the perspective of gender differences: a phenomenological study. BMC Nurs. 2023;22(1):387.
23. Rnic K, Battaglini A, Jopling E, Tracy A, LeMoult J. Attentional biases and their push and pull with rumination and Co-Rumination is based on depressive symptoms: a prospective study of adolescents. Res Child Adolesc Psychopathol. 2023;51(3):399–411.
24. Miller-Slough RL, Dunsmore JC. Co-rumination with parents and friends: Gender-specific links to adolescent internalizing symptoms. J Appl Dev Psychol. 2021;77:101342.
25. Tudder A, Wilkinson M, Gresham AM, Peters BJ. The intrapersonal and interpersonal consequences of a new experimental manipulation of co-rumination. Emotion. 2023;23(4):1190–201.
26. DiGiovanni AM, Fagle T, Vannucci A, Ohannessian CM, Bolger N. Within-person changes in Co-rumination and rumination in adolescence: examining heterogeneity and the moderating roles of gender and time. J Youth Adolesc. 2022;51(10):1958–69.
27. Waller EM, Rose AJ. Brief report: adolescents' co-rumination with mothers, co-rumination with friends, and internalizing symptoms. J Adolesc. 2013;36(2):429–33.
28. Harding T, Jamieson I, Withington J, Hudson D, Dixon A. Attracting men to nursing: is graduate entry an answer? Nurse Educ Pract. 2018;28:257–63.
29. Gao YX, Zhang JX. Determination of sample size in logistic regression analysis. J Evidence-Based Med. 2018;18(2):122–4.
30. Sy K, Ys S. Validity and reliability of the transition shock scale for undergraduate nursing students. J Korean Acad Soc Nurs Educ. 2019;25(1):17–26.
31. Huang YX, Mu SY, Zhu L, Bi YP, Zhang QY. The reliability and validity of the Chinese version of the transition shock scale for undergraduate nursing students. Chin J Nurs Educ. 2021;18(8):727–32.
32. Zhang YX, Xie ZH, Lv GR, Sheng SY, Li P. Reliability evaluation of the Chinese short version of the Common Ruminant Questionnaire applied to 1354 nursing students. Journal of Shandong University (Medical Edition). 52021;9(07):85–90 + 96.
33. Lai LZ, Ren ZH, Tao R. A meta-analysis on Co-Rumination. Adv Psychol Sci. 2018;26(1):14.
34. Lewinsohn PM, Gotlib IH, Seeley JR. Depression-related psychosocial variables: are they specific to depression in adolescents? J Abnorm Psychol. 1997;106(3):365–75.
35. Hastings TL, Anderson SJ, Kelley ML. Gender differences in coping and daily stress in conduct-disorder and non-conduct-disordered adolescents. J Psychopathol Behav Assess. 1996;18(3):213–26.
36. Liu Y, Zhao J, Wu XJ, Wang W, Li Z, Xie LL, Cao J. Status of psychological resilience and its influencing factors among 5 582 nursing students. J Nurs Sci. 2020;35(20):76–7882.
37. Ruan JY, Zhou YX. Research progress on resilience of nursing students and its implications for Chinese relative research. Chin Nurs Res. 2018;32(16):2497–501.
38. Whitton SW, Kuryluk AD. Intrapersonal moderators of the association between relationship satisfaction and depressive symptoms: findings from emerging adults. J Soc Pers Relat. 2013;30(6):750–70.
39. Ali HFM, Mousa MA, Atta MHR, Morsy SR. Exploring the association between internet addiction and time management among undergraduate nursing students. BMC Nurs. 2024;23(1):632.
40. Battaglini AM, Rnic K, Tracy A, Jopling E, LeMoult J. Co-rumination across in-person and digital communication: associations with affect and relationship closeness in adolescents. J Adolesc. 2021;89:161–9.
41. Stone LB, Gibb BE. Brief report: preliminary evidence that co-rumination fosters adolescents' depression risk by increasing rumination. J Adolesc. 2015;38:1–4.
42. Abd Elfatah A, Adam S, Abrabu H et al. Assessing perception of role transition among nurse interns EBNR. 2021;3(4):7.
43. Nakić D, Gusar I, Franov I, Sarić MM, Ljubičić M. Relationship between transition shock, professional stressors, and intent to leave the nursing profession during the COVID-19 pandemic. Med (Kaunas). 2023;59(3):468.
44. Zhang H, Tu J. The working experiences of male nurses in China: implications for male nurse recruitment and retention. J Nurs Manag. 2020;28:441–9.
45. Tian T, Li CZ, Du FF, Zhu YY, Li WL, Wan FF. Construction of a nursing safety training system for new nurses based on transition shock theory. J Nursing(China). 2023;30(3):35–40.
46. Woo CH, Kim C. Impact of incivility and psychological capital on nursing students' transition shock. Collegian. 2022;29(5):621–7.
47. Zhang PP, Zhu SS, Li LM, Cheng QH, Zhang HM. Effect of working environment perception and person-organization fit on transition shock of newly recruited nurses with a bachelor's degree or above. Chin Nurs Res. 2021;35(06):941–6.
48. Yang JT, Zhu XM, Wang X, Bo QY, Zhang SX. Professional identity, professional coping self-efficacy and stressors among nursing interns correlation analysis. J Qilu Nurs. 2022;28(12):88–91.
49. Gu HL, Yao YQ, Zhang XQ, Zhang TS. The current situation of safety perception of trainee nurses and the influencing factors. Chin Gen Pract Nurs. 2022;20(22):3116–9.
50. Zhang SH, Liu LL, Liu CJ, Yang M, Chen XY. The relationship between structural empowerment and maladjustment in clinical practice among nursing students. J Nurs Sci. 2022;37(11):64–6573.
51. Tseng MY, Hwang SL. SURVIVAL intervention program effects on student nurses' transition to staff nurses: A quasi-experimental study. Nurse Educ Pract. 2021;56:103184.
52. Zhang RL, Han AR. Research on the construction and application of teaching programs for nursing students in primary hospitals based on BOPPPS. Chin Nurs Res. 2022;36(09):1687–9.
53. Chen D, Wu QH, Zhang Y, Zhu QM. The application of PBL combined with Mind mapping in teaching nursing students in cardiology practice. China High Med Educ. 2022;06:85–6.
54. Lechner C.L.D.M.G.B.-C.C.M.R.J.V. Psychometric properties of the co-rumination questionnaire. Personality and Individual Differences. 2014;70:171–175.
55. Wang S, Zhu N, Fang XJ, Wei Y, Ma JJ, Zhang LY. Transition shock and workplace adaptability in newly graduated nurses: multiple mediating roles of resilience and person-organization. Journal of Nursing Science. 2022;37(09):53–57.
56. Smith RL, Rose AJ. The cost of caring in youths' friendships: considering associations among social perspective taking, co-rumination, and empathetic distress. Dev Psychol. 2011;47(6):1792–803.
57. Duchscher JB. A process of becoming: the stages of new nursing graduate professional role transition. J Contin Educ Nurs. 2008;39(10):441–50.
58. Wenxia Z, Feifei C, Min H, et al. The status and associated factors of junior nurses' transition shock: A cross-sectional study. J Nurs Manag. 2022;30(3):716–23.
59. Li YH. Psychological capital in new nurses' transition shock and workplace mediating effects between adjustment. Chin Gen Pract Nurs. 2022;20(06):735–9.
60. Wang YY, Li LZ, Zhang XZ, Li N, Yang XW. Advances in research on the current status of transition and interventions for new nurses. Military Nurs. 2022;39(04):74–6.
61. Yang HF. A primary study of the theoretical basis and method of positive rumination training. Chin J Appl Psychol. 2019;25(3):272–80.
62. Fang Y. Research on the relationship and intervention between family-rearing style, self-disclosure,co-rumination and friendship quality of senior high school students. Sichuan Normal University. 2024.
63. Song C, Yao L, Chen H et al. Analysis of hot spots and frontiers of nursing scenario simulation teaching research at home and abroad. Educ Inf Technol (Dordr). 2023:1–11.
64. Zia T, Sabeghi H, Mahmoudirad G. Problem-based learning versus reflective practice on nursing students' moral sensitivity. BMC Nurs. 2023;22(1):215.

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