


# General Psychiatry Factors influencing ruminative thinking behaviours in nurses: a cross-sectional study of 858 subjects in a tertiary care hospital

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## To the editor:

Nurses play a vital role in healthcare by providing direct medical care to patients, and their mental well-being significantly impacts the quality of service and patient satisfaction.<sup>1</sup> Ruminative thinking involves repetitive thoughts about negative feelings, their causes and consequences. This common psychological behaviour in nurses can significantly impact their self-evaluation and result in feelings of worthlessness.<sup>2</sup> However, there is a knowledge gap regarding the risk factors influencing ruminative thinking in practising nurses. Ruminative thinking has been linked to psychological processes such as empathy, social support and feedback-seeking behaviours. Empathy is crucial for the quality of care, a positive nurse–patient relationship and reducing medical disputes.<sup>3</sup> Social support encompasses the psychological and material assistance that individuals receive from their social networks. Adequate social support contributes to bolstering an individual's self-esteem and maintaining psychological well-being. Feedback-seeking behaviour is an active psychological approach through which individuals seek valuable information to modify their behaviours and achieve personal and professional objectives.<sup>4</sup> We hypothesised that practising nurses have specific personal and professional risk factors that are integrally associated with these psychological processes and ruminative thinking. By examining the current state of ruminative thinking in practising nurses and its associated factors, we aimed to fill the knowledge gap and provide a foundation for potential interventions for this important psychological condition.

## METHODS

This study was conducted in a busy tertiary hospital with over 2000 beds and a nurse-to-patient ratio of approximately 1:10, in a city with a population of over 8 million. The survey was distributed using the Questionnaire Star application. The survey method was communicated to the head nurses of each nursing unit. The head nurses then explained these details to eligible nurses during focused learning or training sessions before distributing the Questionnaire Star QR code. All participants were made aware of the purpose and consented to the study. Inclusion criteria were nurses certified and working continuously for over a year in a tertiary care hospital. Exclusion criteria include (1) refusal to participate; (2) a diagnosis of major psychological conditions; (3) missing more than 30% of items on a surveyed scale; (4) responses that were completed within 5 min or exceeded 15 min. A pilot test was conducted with 40 participants, showing filling times ranging from 7 min and 32 s to 11 min and 36 s. To avoid rushed responses without proper consideration or overly edited responses that might not reflect genuine thoughts, or the possibility of nurses helping each other to fill out the questionnaire, the set time was between 5 and 15 min. Participants filled out the questionnaire, and data were collected in the background. To ensure the quality and integrity of the responses, the survey was anonymous, with each IP address allowed only one submission. The survey was conducted in March 2023. Collected responses included: (1) general demographic information: working department/unit, years of nursing practice, marital status, education and income level; (2) Ruminative Response Scale (RRS), which consists of

three dimensions that capture different aspects of rumination: reflection, brooding and depressive mood repair (the RRS has been successfully used in evaluating rumination response style in nurses); (3) the Interpersonal Reactivity Index (IRI), which consists of four dimensions that capture different aspects of empathy: perspective taking, fantasy, empathic concern and personal distress; (4) the Social Support Scale, which assesses three dimensions: subjective support, objective support and utilisation of support; (5) feedback seeking, which includes four dimensions: supervisor observational feedback seeking, supervisor interrogative feedback seeking, colleague observational feedback seeking and colleague interrogative feedback seeking. The primary outcome was the total RRS. The secondary outcomes included the association between ruminative thinking and sociodemographic factors, empathy, social support and feedback seeking.

Data entry was double-checked for accuracy by two independent researchers in a blinded fashion. Data were summarised via standard univariate summary statistics as mean (SD) or n (%), as appropriate. Multiple regression model was used to assess the relationship between sociodemographic factors and rumination (the primary outcome). Pearson's correlation tests were used to explore the associations between rumination and empathy, social support or feedback seeking.  $P < 0.05$  was considered statistically significant. Statistical analyses were performed by investigators who were blinded to the research subjects using SPSS V.26.0 software.

### ASSOCIATION OF NURSES' RUMINATIVE THINKING BEHAVIOURS WITH THEIR SOCIODEMOGRAPHIC PROFILES

Considering that this study involved 82 independent variables and a 10% potential loss of respondents, we decided a sample size ranging from 451 to 902 cases. We distributed 860 questionnaires and successfully collected 858 valid responses, resulting in a valid recovery rate of 99.8%. The two disqualified submissions were due to simple repetition of the same option. Descriptive statistics for all questionnaire measures including individual dimensions and the scale reliability (Cronbach's alpha) were summarised in online supplemental table 1. The rumination scores were analysed based on their demographic profiles. Statistically significant differences were observed in the total RRS and reflection dimension scores among nurses from different nursing units, years of nursing practice, education levels and income levels. Furthermore, significant differences were found in the reflection dimension scores among nurses with different marital statuses. There were statistically significant differences in the brooding and depressive mood repair dimensions among nurses with different years of practice (table 1).

### ASSOCIATION BETWEEN RUMINATIVE THINKING WITH EACH DIMENSION OF EMPATHY, SOCIAL SUPPORT AND FEEDBACK SEEKING

Correlation analysis revealed positive correlations between the total rumination score, its three individual dimensions (reflection, brooding and depressive mood repair) with total IRI score (empathy) and three of its four dimensions (perspective taking, fantasy and personal distress). Conversely, negative correlations were found between empathic concern and ruminative thinking. There were negative associations between ruminative thinking (all dimensions) and social support (all dimensions) or feedback seeking (all dimensions). Only the supervisor observational feedback seeking was significantly related to RRS total score and reflection. Reflection was also significantly related to total feedback seeking score in a negative manner (table 2).

### DISCUSSION

We studied ruminative thinking and its associated factors among nurses working in a busy tertiary hospital in China. We collected scores on ruminative thinking, empathy, social support and feedback thinking. All scores had a high Cronbach's alpha value (0.70 or above) (online supplemental table 1), suggesting that the instruments used in this study are reliable and likely to produce consistent results across different administrations under similar conditions. We found that nurse ruminative thinking was significantly associated with working place (nursing units), length (years) of nursing practice, level of education and income. There was a positive association between rumination and empathy except for the empathic concern dimension. There were negative associations between rumination and social support or supervisor observational feedback-seeking behaviours.

Ruminative thinking has been linked to increased levels of stress, anxiety, emotional exhaustion, depression, memory issues<sup>5</sup> and suicidal ideation.<sup>6</sup> Nurses who ruminate excessively may experience difficulties focusing on their tasks and may struggle to detach from work-related stressors, leading to reduced job satisfaction and increased burnout.<sup>7</sup> Several risk factors have been identified in relation to nurse ruminative thinking behaviour. Workload factors, such as high patient acuity and long working hours, have been associated with increased rumination.<sup>8</sup> Organisational factors, including lack of support from supervisors or colleagues and inadequate communication, can also contribute to rumination.<sup>9</sup> Additionally, personal characteristics, such as high levels of perfectionism, self-criticism and neuroticism, have been linked to higher levels of rumination.<sup>10</sup> In this study, we sought to further identify sociodemographic and psychological factors that are related to rumination in nurses. We found that nurse ruminative thinking is significantly related to the place of work (nursing units), length of practice (years working as a clinical nurse), level of education and income, and to some extent, the personal relationship

**Table 1** Association of nurses' ruminative thinking behaviours with their sociodemographic profiles

Sociodemographic factors	n (%)	Reflection	Brooding	Depressive mood repair	RRS total score
<b>Nursing unit</b>					
Internal medicine	330 (38.46)	22.04 (6.64)	9.18 (2.70)	9.65 (2.91)	40.87 (11.82)
Surgery	218 (25.41)	22.03 (6.70)	9.28 (2.77)	9.68 (2.94)	40.98 (11.83)
Obstetrics and gynaecology	36 (4.20)	19.92 (5.09)	8.39 (2.18)	8.89 (2.15)	37.19 (9.05)
Paediatrics	53 (6.18)	21.28 (7.07)	9.17 (2.75)	9.64 (2.96)	40.09 (12.40)
Intensive care unit	19 (2.21)	24.00 (4.64)	9.58 (1.35)	10.26 (1.56)	43.84 (7.24)
Operating room	57 (6.64)	19.96 (6.99)	8.37 (2.78)	8.68 (3.08)	37.02 (12.48)
Emergency room	145 (16.90)	23.04 (8.10)	9.50 (3.32)	9.93 (3.41)	42.48 (14.53)
F		2.30	1.70	1.73	2.12
p		0.033*	0.120	0.110	0.049*
<b>Years of nursing practice</b>					
<2	86 (10.02)	21.20 (5.78)	8.83 (2.23)	9.45 (2.64)	39.48 (10.14)
2–5	144 (16.78)	20.94 (6.62)	8.66 (2.76)	9.05 (3.12)	38.65 (12.12)
6–10	209 (24.36)	22.34 (7.41)	9.25 (3.03)	9.72 (3.07)	41.32 (13.11)
11–20	294 (34.27)	22.98 (7.06)	9.58 (2.89)	10.01 (3.05)	42.56 (12.55)
21–30	77 (8.97)	20.66 (5.60)	8.81 (2.28)	9.17 (2.36)	38.64 (9.81)
>30	48 (5.59)	20.85 (7.65)	9.19 (2.91)	9.60 (3.02)	39.65 (13.06)
F		3.06	2.79	2.51	2.97
p		0.010**	0.016*	0.029*	0.011*
<b>Education level</b>					
Vocational secondary school	5 (0.58)	15.00 (3.94)	7.00 (0.71)	7.20 (1.79)	29.20 (5.76)
Associate degree	149 (17.37)	21.01 (6.33)	8.85 (2.72)	9.22 (2.92)	39.08 (11.57)
Bachelor's degree	692 (80.65)	22.23 (7.03)	9.26 (2.83)	9.71 (3.00)	41.20 (12.42)
Master's degree	12 (1.40)	22.08 (6.39)	9.67 (2.67)	10.50 (2.68)	42.25 (11.38)
F		3.01	1.98	2.56	2.78
p		0.029*	0.120	0.050	0.040*
<b>Marital status</b>					
Single	264 (30.77)	22.30 (7.05)	9.17 (2.80)	9.64 (3.04)	41.10 (12.41)
Married	582 (67.83)	21.73 (6.75)	9.15 (2.79)	9.58 (2.94)	40.46 (12.06)
Others	12 (1.40)	26.83 (10.01)	10.67 (3.63)	11.42 (3.87)	48.92 (17.30)
F		3.63	1.71	2.25	2.94
p		0.027*	0.180	0.110	0.050
<b>Income level (CNY/month)</b>					
<3000	11 (1.28)	23.73 (6.28)	9.55 (2.02)	10.00 (3.13)	43.27 (11.15)
3000–5000	122 (14.22)	21.85 (6.26)	9.25 (2.71)	9.68 (2.86)	40.78 (11.33)
5000–10000	600 (69.93)	22.26 (7.27)	9.24 (2.92)	9.69 (3.07)	41.19 (12.85)
10000–15000	113 (13.17)	21.19 (5.51)	8.95 (2.36)	9.37 (2.64)	39.50 (9.99)
>15000	12 (1.40)	14.83 (2.69)	7.33 (2.31)	7.50 (2.11)	29.67 (6.40)
F		4.06	1.63	1.86	3.08
p		0.003**	0.170	0.120	0.016*

\* $p < 0.05$ ; \*\* $p < 0.01$

RRS, Ruminative Response Scale.

(marital status). Nurses working at intensive care units or emergency rooms showed significantly higher risk of rumination. These findings are consistent with other studies

demonstrating that longer working hours, increased stressors and greater burnout were associated with depression and risk of psychiatric morbidity in intensive care

**Table 2** The association between ruminative thinking and empathy, social support and feedback seeking (Spearman regression,  $n=858$ , values are the Spearman correlation coefficient,  $r_s$ )

	Reflection	Brooding	Depressive mood repair	RRS total score
<b>Empathy</b>				
Perspective taking	0.14**	0.21**	0.22**	0.18**
Fantasy	0.11**	0.17**	0.18**	0.14**
Empathic concern	-0.13**	-0.09*	-0.04	-0.11**
Personal distress	0.51**	0.47**	0.49**	0.51**
IRI total score	0.21**	0.26**	0.29**	0.24**
<b>Social support</b>				
Subjective support	-0.27**	-0.20**	-0.18**	-0.25**
Objective support	-0.28**	-0.23**	-0.19**	-0.26**
Utilisation of support	-0.26**	-0.19**	-0.17**	-0.24**
Social support total score	-0.29**	-0.21**	-0.19**	-0.26**
<b>Feedback seeking</b>				
Supervisor interrogative feedback	-0.04	-0.00	-0.03	-0.02
Supervisor observational feedback	-0.10**	-0.06	-0.03	-0.08*
Colleague interrogative feedback	-0.05	-0.00	0.00	-0.03
Colleague observational feedback	-0.06	-0.02	0.01	-0.04
Feedback seeking total score	-0.07*	-0.02	-0.01	-0.05

\* $p<0.05$ ; \*\* $p<0.01$ .  
IRI, Interpersonal Reactivity Index; RRS, Ruminative Response Scale.

unit nurses.<sup>8</sup> The coronavirus disease 2019 pandemic has caused extra stresses to healthcare providers.<sup>11</sup> We also found that nurses with working experience of 11–20 years appeared to be more likely to have rumination thinking. This may be due to increased personal and professional responsibilities during this career stage. A recent study of 335 Korean nurses found that the length of service is a significant contributor to anger rumination, though it did not specify which stage of practice was most significant.<sup>12</sup> Levels of education and income were also significant risk factors we found. Surprisingly, nurses with higher education (master's degree) showed a higher level of ruminative thinking. To the best of our knowledge, this is the first report on the association between education level and risk of rumination in nurses. Some may argue that individuals with higher levels of education are less prone to rumination due to improved problem-solving skills, better understanding of mental health and more adaptive coping strategies. However, the increased pressures and stress associated with higher-level job expectations and the cognitive capacity to engage in complex thought processes, including rumination, may explain the higher levels of rumination among highly educated nurses. Income level also showed a significant association

with ruminative thinking. Nurses with lower incomes (less than CN¥3000, roughly US\$400) were more likely to ruminate, with the RRS decreasing as income increased. This aligns with studies indicating that financial status impacts cognitive thinking, with lower-income individuals tending to ruminate more.<sup>13</sup>

In addition to sociodemographic factors, we found that all dimensions of ruminative thinking were positively associated with the IRI dimensions except empathic concern. The connection between empathy (as measured by the IRI) and rumination is complex. A study found that rumination had significant moderate effects on the relationship between emotional empathy and depression.<sup>14</sup> Another study demonstrated that self-reflectiveness has an almost linear relationship with anxiety and guilt feelings.<sup>15</sup> We found that higher perspective taking scores were associated with high ruminative thinking scores. Interestingly, we found a negative correlation between empathic concern and ruminative thinking. While concern for others is generally positive, it can also lead to increased rumination if the individual frequently worries about others' problems or internalises their distress. Correlation analysis revealed negative associations between ruminative thinking (all dimensions) and social support (all dimensions) among survey participants. High-quality social support can help buffer against stress, a common trigger for rumination. Social support can help individuals feel connected and understood, which can reduce the intensity and frequency of rumination. Finally, we found that nursing ruminative thinking (total score and all dimensions) was negatively associated with feedback seeking (all dimensions). We found supervisor observational feedback seeking was significantly related to RRS total score and reflection, suggesting its critical role in nursing rumination. The impact of feedback seeking on rumination can depend on the style of feedback seeking. Individuals who approach feedback seeking as a learning opportunity and are receptive to criticism may be less prone to ruminate compared with those who seek feedback due to high levels of anxiety or insecurity. Therefore, while feedback seeking can facilitate learning and growth, potentially mitigating uncertainty and rumination, it can also exacerbate rumination if not managed effectively, particularly in response to negative feedback.

There are several limitations of this study. First, this study was conducted on a single site, which could introduce bias as many participants may know the lead investigators. However, single-site studies can still offer valuable insights, particularly in preliminary research, specific case studies or when resources are limited. In our study, all investigators were blinded to the data entered, and the data analysis was performed by someone external to the hospital, reducing potential bias. Second, there might be limitations for generalising the findings here to other hospitals of different sizes. However, the relatively large sample size in this study may compensate for such limitations. Lastly, the vast majority of the participants in this study were females, which could introduce potential bias

as women are generally more prone to ruminate than men. Nevertheless, the findings in our study provide valuable insights into the major risk factors related to rumination in nurses.

In summary, we identified several sociodemographic risk factors for ruminative thinking in nurses, including their working unit, years of nursing practice, education level and income. We also found that nursing ruminative thinking was positively associated with empathy and negatively related to social support and feedback seeking. Understanding these relationships is crucial given nurses' crucial role in healthcare. Identifying risk factors is an essential step to develop interventions. Effective interventions such as targeting nurses in high-stress units (such as intensive care unit or emergency room), those in mid-career stages or those with lower levels of education or income can help manage negative rumination. Providing training in empathetic strategies, fostering effective social support and promoting positive feedback seeking may help nurses manage their negative rumination. Further research is needed to better understand the underlying mechanisms, to identify additional risk factors and to evaluate the effectiveness of interventions.

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#### REFERENCES

- Alonazi O, Alshowkan A, Shdaifat E. The relationship between psychological resilience and professional quality of life among mental health nurses: a cross-sectional study. *BMC Nurs* 2023;22:184.
- Sun L, Deng J, Xu J, *et al.* Rumination's role in second victim nurses' recovery from psychological trauma: a cross-sectional study in China. *Front Psychol* 2022;13:860902.
- Moudatsou M, Stavropoulou A, Philalithis A, *et al.* The role of empathy in health and social care professionals. *Healthcare (Basel)* 2020;8:26.
- Ashford SJ, De Stobbeleir K, Nujella M. To seek or not to seek: is that the only question? Recent developments in feedback-seeking literature. *Annu Rev Organ Psychol Organ Behav* 2016;3:213–39.
- Gao H, Xia Q, Zhang X, *et al.* Intermediary roles of prospective memory and retrospective memory in the comorbidity of depression and pain. *Gen Psychiatr* 2023;36:e100895.
- Li Y, Li P, Yuan M, *et al.* Social-ecological perspective on the suicidal behaviour factors of early adolescents in China: a network analysis. *Gen Psychiatr* 2024;37:e101317.
- Zarei S, Fooladvand K. Mediating effect of sleep disturbance and rumination on work-related burnout of nurses treating patients with coronavirus disease. *BMC Psychol* 2022;10:197.
- Vandevala T, Pavey L, Chelidoni O, *et al.* Psychological rumination and recovery from work in intensive care professionals: associations with stress, burnout, depression and health. *J Intensive Care* 2017;5:16.
- Song Y, Zhao Z. Social undermining and interpersonal rumination among employees: the mediating role of being the subject of envy and the moderating role of social support. *Int J Environ Res Public Health* 2022;19:8419.
- Dunn NA, Luchner AF. The emotional impact of self-criticism on self-reflection and rumination. *Psychol Psychother* 2022;95:1126–39.
- Zandy M, El Kurdi S, Samji H, *et al.* Mental health-related healthcare service utilisation and psychotropic drug dispensation trends in British Columbia during COVID-19 pandemic: a population-based study. *Gen Psychiatr* 2023;36:e100941.
- Ham EM, You MJ. Role of irrational beliefs and anger rumination on nurses' anger expression styles. *Workplace Health Saf* 2018;66:223–32.
- Mani A, Mullainathan S, Shafir E, *et al.* Poverty impedes cognitive function. *Science* 2013;341:976–80.
- Liu Q, Zhao X, Liu W, *et al.* Empathy and depression among a Chinese sample: the moderating role of rumination and attentional shift. *Front Psychol* 2022;13:1027298.
- Xu L, Cui H, Wei Y, *et al.* Relationships between self-reflectiveness and clinical symptoms in individuals during pre-morbid and early clinical stages of psychosis. *Gen Psychiatr* 2022;35:e100696.



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