Systematic Review and Meta-Analysis

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Effects of psychological nursing care on anxiety and depression in perioperative patients with lung cancer

A systematic review and meta-analysis

Ren-Ying Zhu, MB[a], Hong Chen, MB[b], Yue-Juan Gao, MM[c], Zhi-Han Pan, MM[d], Jiu-Ying Wang, MB[e,*]

Abstract

Background: This study aimed to investigate the effects of psychological nursing care (PNC) on anxiety relief in perioperative lung cancer (LC) patients.

Methods: We searched the Cochrane Library, PubMed, Embase, CNKI, CBM, and Wangfang electronic databases from inception to May 1, 2022. Eligible randomized controlled trials (RCTs) investigating the effects and safety of PNC on anxiety relief in perioperative LC patients. Anxiety was the primary outcome measure. The secondary outcomes were depression, length of hospital stay, and the occurrence of adverse events.

Results: Six eligible RCTs with 494 patients were included in this study. Compared with routine nursing care, PNC showed better outcomes in terms of anxiety relief (mean difference [MD] = –13.24; random 95% confidence interval (CI), –18.28 to –8.20; P<.001), depression decrease (MD = –11.84; random 95% CI, –18.67 to –5.01; P < .001), and length of hospital stay (MD = –2.6; fixed 95% CI, –3.13 to –2.07; P < .001). No data on adverse events were pooled because only 1 trial reported this outcome.

Conclusions: This study showed that PNC may benefit more than routine nursing care for patients with LC in anxiety, depression, and length of hospital stay. High-quality RCTs are needed to validate the current findings in the future.

Abbreviations: AE = adverse event, CI = confidence interval, HAMA = Hamilton Anxiety Scale, HAMD = Hamilton Depression Scale, LC = lung cancer, LHS = length of hospital stay, MD = mean difference, PNC = psychological nursing care, RCT = randomized controlled trial, RNC = routine nursing care, SAS = self-rating anxiety scale, SDS = self-rating depression scale.

Keywords: anxiety, depression, lung cancer, meta-analysis, psychological nursing care, systematic review

1. Introduction

Lung cancer (LC) is one of the most common cancers and a leading cause of cancer-related mortality in China and worldwide.[1–4] LC mainly consists of non–small cell lung cancer and small cell LC,[5–8] and non–small cell lung cancer accounts for over 83% of all LC cases.[9] Studies have reported that its incidence has increased significantly and is likely to show an upward trend over the next few decades.[10–15] There were 2,206,771 new LC patients and 1,796,144 LC mortality in 2020.[4] Of those, most patients with LC have a limited life span.

Various modalities have been reported to treat such disorders, including surgical resection, chemotherapy, radiotherapy, targeted management, and alternative therapy, especially surgery.[16–24] Although an increasing number of patients with LC benefit from surgery, they experience uncomfortable disorders such as physical function, quality of life, anxiety, depression, and adverse events (AEs).[25–29] Based on routine nursing care (RNC), including health education and guidance of medication and diet, psychological nursing care (PNC) refers to cognitive, emotional, and behavioral interventions. Cognitive intervention focused on improving patients' understanding of LC and cognitive level with detailed knowledge instruction of LC, such as their personalized situation and possible occurrence during the perioperative period. Emotional intervention aimed to instruct individual psychological guidance according to the specific

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[a] Infection Control Division, Hongqi Hospital Affiliated To Mudanjiang Medical University, Mudanjiang, China, [b] Department of Dermatology, Hongqi Hospital Affiliated To Mudanjiang Medical University, Mudanjiang, China, [c] Department of Pharmacy, Hongqi Hospital Affiliated To Mudanjiang Medical University, Mudanjiang, China, [d] Department of Nursing Care, Nursing Care College, Mudanjiang Medical University, Mudanjiang, China, [e] Department of Pre-examination and Triage Outpatient, Hongqi Hospital Affiliated To Mudanjiang Medical University, Mudanjiang, China.

**Correspondence: Corresponding address: Jiu-Ying Wang, Department of Preexamination and Triage Outpatient, Hongqi Hospital Affiliated To Mudanjiang Medical University, No.5 Tongxiang Street, Aimin District, Mudanjiang 157011, China, (e-mail: taywas7@21cn.com).*

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conditions of the patients. Behavioral intervention was to guide the patients to take positive actions to deal with the possible stress reaction caused by LC, such as guidance to patients on how to deal with emotions, progressive muscle relaxation, and deep breathing training.

Previous clinical studies have explored the effects of PNC on anxiety and depression relief in perioperative LC.[30–35] However, no systematic review and meta-analysis has addressed this issue. Thus, this systematic review and meta-analysis comprehensively investigated the effects and safety of PNC on anxiety and depression relief in LC patients during perioperative period.

2. Methods

2.1. Ethical approval

This systematic review and meta-analysis did not need ethical approval because it analyzed secondary data from patient records and did not involve any individual patient data.

2.2. Literature search

This study conducted a comprehensive literature search of the Cochrane Library, PubMed, Embase, CNKI, CBM, and Wangfang from inception to May 1, 2022. All potential randomized controlled trials (RCTs) focusing on the effects and safety of PNC on anxiety and depression relief in perioperative patients with LC were included in the analysis. In addition, we searched other literature sources, such as dissertations and reference lists of related reviews. We utilized the keywords of "lung cancer", "lung neoplasms", "pulmonary neoplasms", "pulmonary cancer", "anxiety", "depression", "emotion", "pressure", "psychological disorder", "surgery", "surgical resection", "nursing care", "psychological care", "randomized controlled trial", "clinical trial", and "controlled study".

2.3. Study selection

Two authors independently performed study selection in accordance with the eligibility criteria. First, duplicate literature was eliminated from all records. After removing duplicates, we identified titles/abstracts, and all irrelevant studies were excluded. Finally, the full text of potential articles was carefully read against the eligibility criteria. We resolved any divergence with the help of a third experienced author.

2.4. Eligibility criteria

2.4.1. Inclusion criteria. The inclusion criteria were as follow: only RCTs of PNC on anxiety relief in patients with LC during the perioperative period; all patients were diagnosed with LC and underwent surgery for anxiety; and patients in the experimental group underwent PNC, whereas those in the control group received RNC.

2.4.2. Exclusion criteria. The exclusion criteria were as follows: duplicate, irrelevant studies, such as reviews, case studies, and uncontrolled studies; and studies not involving PNC, not RCT, combined therapy, and insufficient data and information.

2.5. Outcome measurements

The primary outcome were anxiety and depression. Anxiety was measured using related scales, such as the self-rating anxiety scale (SAS) and Hamilton Anxiety Scale (HAMA).[36,37] Depression was assessed using any associated tool, such as the self-rating depression scale (SDS) and Hamilton Depression Scale (HAMD).[38,39] SAS consists of 20 items, and each one ranges from 1 to 4, with a higher score indicating more serious anxiety.[36] HAMA includes 14 subscale, and each subscale varies from 0 to 4, with a higher score suggesting more serious symptoms.[37] SDS also comprises 20 items.[38] Each item scores from 1 to 4, with a higher score signifying more serious anxiety.[38] HAMA has 17 items. Each one ranges from 0 to 4, with a higher score meaning more serious conditions.[39] Secondary outcomes were length of hospital stay (LHS) and the occurrence rate of AEs.

2.6. Data extraction

Two authors independently extracted data from all the included trials. It comprised the following information: title, first author, time of publication, age, sample size, types and details of experimental and control modalities, primary and secondary outcomes, and AEs. We resolved any conflicts between the 2 authors by a third experienced author through a discussion.

2.7. Risk-of-bias assessment

This study used the Cochrane risk-of-bias tool to assess methodological quality of each trial.[40] This tool covers 7 fields, each of which is rated as high, unclear, or low risk of bias. Any disagreement was resolved by a third experienced author through discussion.

2.8. Statistical analysis

This study performed all data analyses using RevMan 5.3 software. All continuous data were calculated using the mean difference (MD) and 95% confidence interval (CI), and all dichotomous data were presented as odds ratios and 95% CI. I^2 test was performed to investigate the heterogeneity of pooled data. We used a fixed-effects model to pool data when I^2 <50%. Otherwise, we utilized a random-effects model to synthesize the data if I^2 was ≥50%.

3. Results

3.1. Search results

After a comprehensive search, 597 records were identified after duplicates were removed (Fig. 1). We eliminated 552 irrelevant records, and 45 full-text articles were carefully read. We further excluded 39 articles because they did not involve PNC, incomplete data, combined therapy, and were not RCT. Finally, we included 6 studies for qualitative synthesis and 5 studies for quantitative synthesis (meta-analysis; Fig. 1).

3.2. Study characteristics

This study included 6 eligible trials with a total of 494 patients. All 6 eligible trials investigated the comparative outcomes between PNC and RNC. The general characteristics of the patients from all 6 studies are summarized in Table 1.

3.3. Study quality assessment

The methodological quality of the 6 included RCTs was assessed using the Cochrane risk-of-bias tool[30–35] (Fig. 2). All 6 studies reported random sequence generation, details of incomplete outcome data, selective reporting, and other bias.[30–35] However, all of them failed to clearly report the allocation concealment and blinding of participants, investigators, and outcome assessors.[30–35]

3.4. Pooled analysis of anxiety

Five studies with 414 patients investigated the effects of PNC vs RNC on anxiety relief using SAS. There were statistically significant differences in anxiety relief (MD = –13.24; random 95% CI, –18.28 to –8.20; P < .001; I^2 = 95%; Table 2, Fig. 3). Another study involving 80 patients explored the effects of PNC

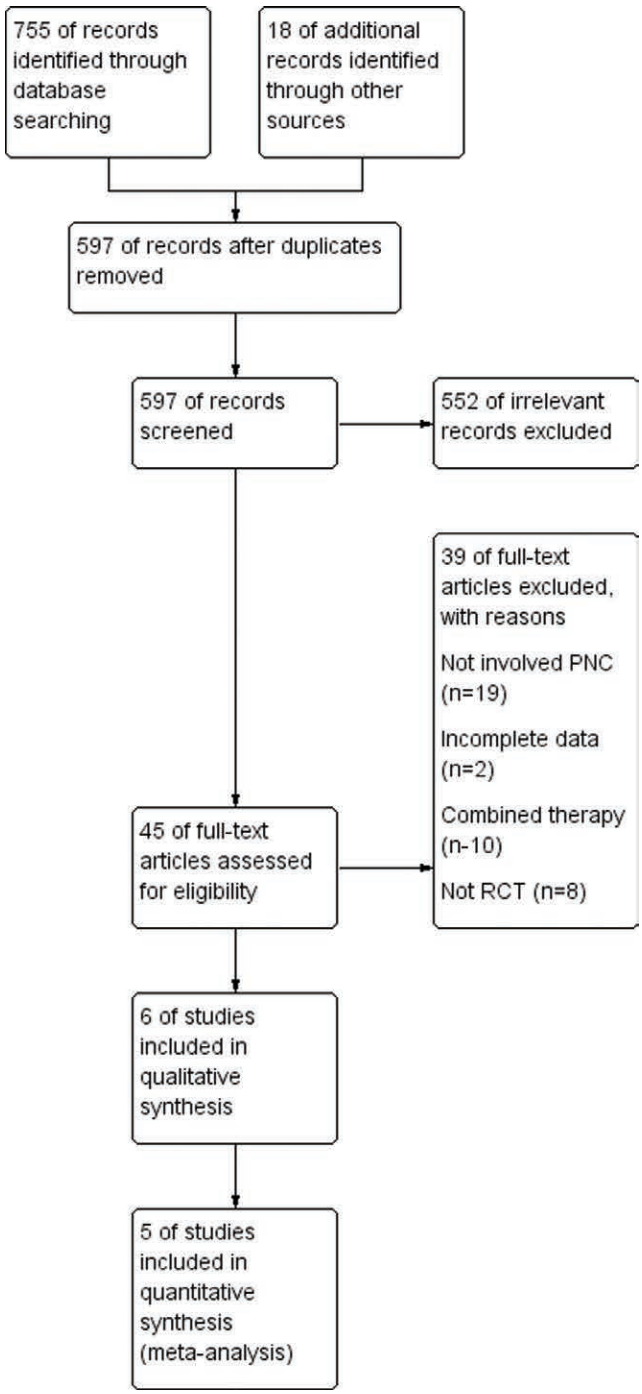

Figure 1. Flow diagram of study selection. RCT = randomized controlled trial.

vs RNC on anxiety relief using HAMA (MD = –4.4; fixed 95% CI, –5.4 to –3.4; Table 2).

3.5. Pooled analysis of depression

Three studies with 214 participants explored the effects of PNC vs RNC on depression. Statistically significant differences were identified between the 2 modalities of PNC and RNC for depression (MD = –11.84; random 95% CI, –18.67 to –5.01; $P < .001$; $I^2 = 95\%$; Table 2, Fig. 4). Another study of 80 patients investigated the effects of PNC vs RNC on depression using the HAMD (MD = –3.4; fixed 95% CI, –6.13 to –0.67; Table 2).

Table 1

General characteristics of included studies.

Study	No. of patients (T/C)	Age (yr, T/C)	Intervention	Control	Outcomes
Chen et al[30]	30/30	T: 59.9 ± 2.4 C: 59.7 ± 2.2	PNC	RNC	SAS; SDS; LHS
Chen et al[31]	40/40	T: 55.2 ± 10.7 C: 55.3 ± 10.7	PNC	RNC	HAMA; HAMD
Gao et al[32]	60/60	T: NR C: NR	PNC	RNC	SAS
Li et al[33]	33/33	T: 52.9 ± 1.5 C: 52.6 ± 1.4	PNC	RNC	SAS; SDS; AEs
Liu et al[34]	44/44	T: NR C: NR	PNC	RNC	SAS; SDS
Liu et al[35]	40/40	T: 60.2 ± 2.5 C: 60.2 ± 2.5	PNC	RNC	SAS; LHS

AE = adverse event, C = control group, HAMA = Hamilton Anxiety Scale, HAMD = Hamilton Depression Scale, LHS, = length of hospital stay, NR = not reported, PNC = psychological nursing care, RNC = routine nursing care, SAS = self-rating anxiety scale, SDS = self-rating depression scale, T = treatment group.

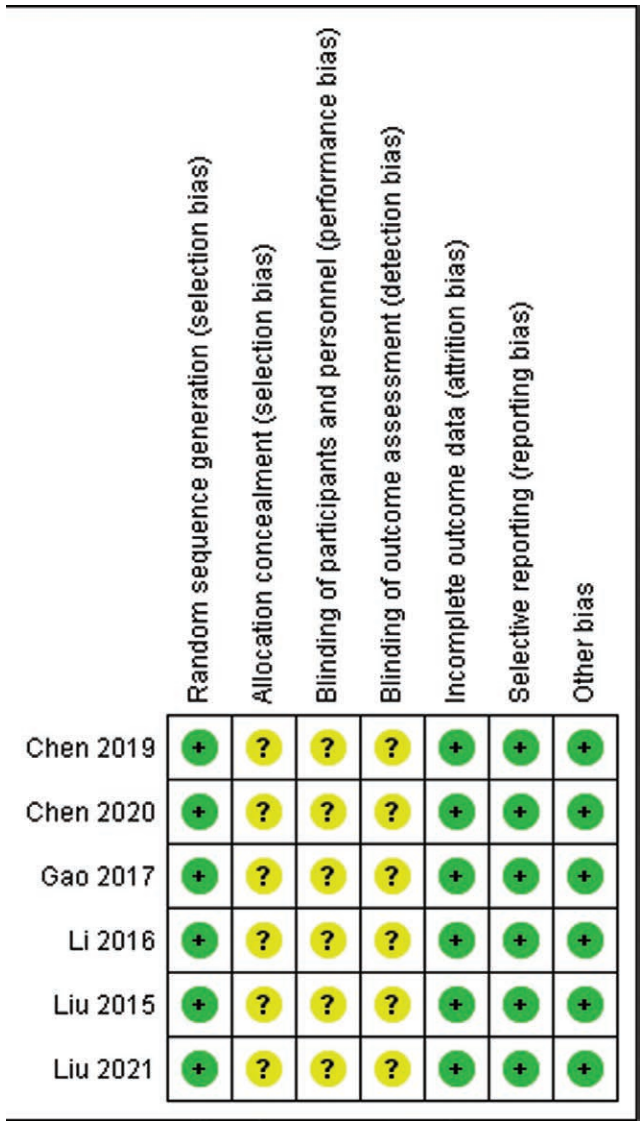

Figure 2. Risk-of-bias summary.

Table 2

Qualitative synthesis of included studies.

Outcome or subgroup	Studies	Participants	Statistical method	Effect estimate
1.1 SAS	5	414	Mean difference (IV, random, 95% CI)	–13.24 (–18.28 to –8.20)
1.2 SDS	3	214	Mean difference (IV, random, 95% CI)	–11.84 (–18.67 to –5.01)
1.3 LHS	2	140	Mean difference (IV, fixed, 95% CI)	–2.60 (–3.13 to –2.07)
1.4 HAMA	1	80	Mean difference (IV, fixed, 95% CI)	–4.40 (–5.40 to –3.40)
1.5 HAMD	1	80	Mean difference (IV, fixed, 95% CI)	–3.40 (–6.13 to –0.67)
1.6 AEs	1	66	Odds ratio (M-H, fixed, 95% CI)	0.14 (0.02–1.24)

AE = adverse events, CI = confidence interval, HAMA = Hamilton Anxiety Scale, HAMD, Hamilton Depression Scale, M-H = Mantel-Haenszel, LHS = length of hospital stay, SAS = self-rating anxiety scale, SDS = self-rating depression scale.

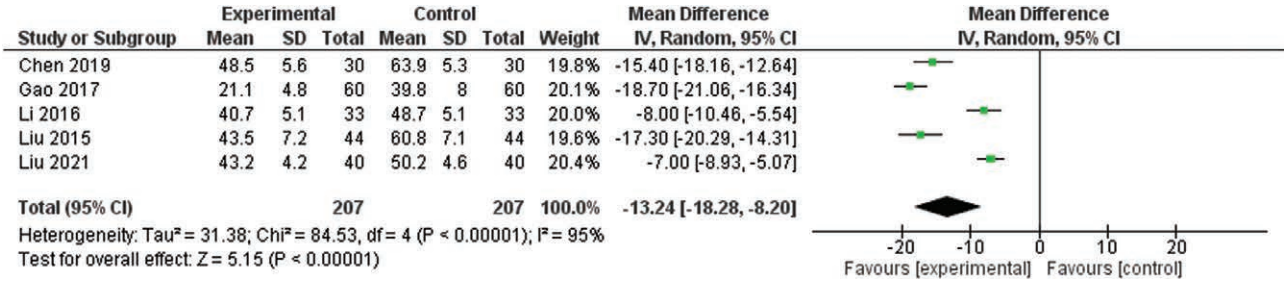

Figure 3. Meta-analysis of anxiety. CI = confidence interval, SD = standard deviation.

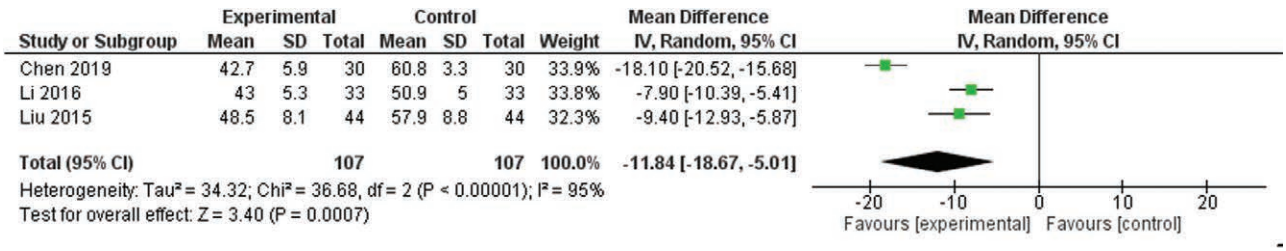

Figure 4. Meta-analysis of depression. CI = confidence interval, SD = standard deviation.

3.6. Pooled analysis of LHS

Two eligible trials with 140 subjects assessed the effects of PNC vs RNC on the LHS. There were significant differences in the LHS (MD = –2.6; fixed 95% CI, –3.13 to –2.07; $P < .001$; $I^2 = 0\%$; Table 2, Fig. 5).

3.7. AEs report

One study of 66 patients explored the effects of PNC vs RNC on AEs (MD = 0.14; fixed 95% CI, 0.02–1.24; Table 2).

4. Discussion

LC has become one of the most malignant neoplasms globally, with approximately 2.2 million new cases and 1.8 million cancer-related deaths annually. It also ranks as one of the highest morbidity rates worldwide for both males and females.[41,42] A previous study reported that it accounted for approximately 11.4% of all cancers in 2020.[42] Therefore, effective treatment modalities are very important for the management of this condition.

Surgical resection is the most effective treatment option. However, patients with LC who undergo surgery also have a variety of uncomfortable experiences, such as psychological disorders including anxiety, depression, and AEs.[25–29] Previous clinical studies reported that PNC was effective for the management of psychological disorders, including anxiety and depression, in patients with LC during the perioperative period.[30–35] However, no systematic review and meta-analysis focused on investigation of PNC comparing with RNC for the treatment of LC patients with depression and anxiety during the perioperative period. The present study comprehensively explored this topic.

In this study, a total of 597 studies were searched, and we finally included 6 studies involving 494 patients. We pooled

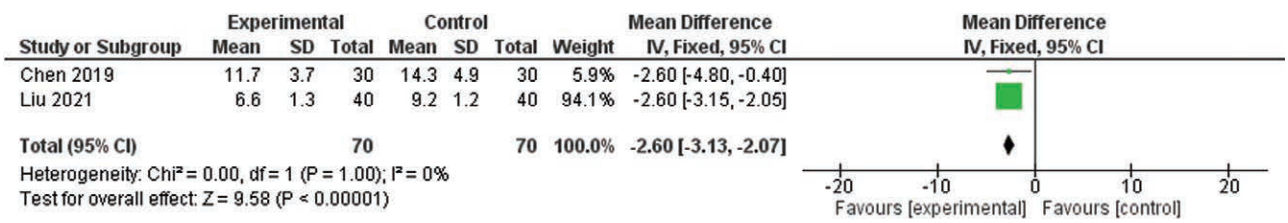

Figure 5. Meta-analysis of length of hospital stay. CI = confidence interval, SD = standard deviation.

the outcome data for anxiety, depression, and LHS. There were statistically significant differences between the PNC and RNC groups in anxiety, depression, and LHS. The findings show that the effects of PNC are superior to RNC in relieving anxiety and depression and LHS reduction. Regarding AEs, only 1 study reported this outcome; thus, no data on AEs were pooled in this study.

This systematic review and meta-analysis has several limitations. First, this study included only 6 eligible trials, which may affect the present findings. Second, all studies failed to clearly report the blinding details of patients, researchers, and outcome assessors, which may impact the risk of selection, performance, and detection bias. Third, the sample size of all included studies was quite small, which may affect the current results. Fourth, the overall methodological quality of all included studies is not high. Finally, all studies were conducted in China and they were published in Chinese academic journals. Thus, more high-quality eligible RCTs are required to validate the present findings.

5. Conclusion

This study showed that PNC was superior to RNC in relieving anxiety and depression, as well as reducing the LHS in patients with LC during the perioperative period. Future similar studies involving high-quality RCTs are needed to confirm the present findings.

Author contributions

Conceptualization: Ren-Ying Zhu and Jiu-Ying Wang.
Data curation: Ren-Ying Zhu and Hong Chen .
Formal analysis: Yue-Juan Gao.
Investigation: Jiu-Ying Wang.
Methodology: Yue-Juan Gao.
Supervision: Jiu-Ying Wang.
Validation: Zhi-Han Pan.
Writing–original draft: Ren-Ying Zhu.
Writing–review & editing: Jiu-Ying Wang.

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