



Meta-analysis of the traditional Chinese medicine care model in relieving postoperative pain in patients with anorectal diseases

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ABSTRACT

Objective: To explore the effect of traditional Chinese medicine (TCM) nursing on relieving postoperative pain in patients with anorectal diseases.

Method: Three English and three Chinese databases (PubMed, Embase, the Cochrane Library, the China National Knowledge Internet, Wanfang Data and the China Science and Technology Journal Database) were systematically searched for case-controlled or prospective studies evaluating the impact of TCM nursing on postoperative pain in patients with anorectal diseases from the date of library construction until June 20, 2022. The Newcastle–Ottawa Scale was adopted to evaluate the quality of the observational studies. The effect of TCM care on pain based on the Visual Analogue Scale (VAS), the effective pain relief rate, the wound healing time and the length of hospital stay were systematically analysed.

Result: After a systematic search and screening, a total of 15 documents were included in this study. The systematic evaluation showed that TCM care reduced the VAS score (mean difference (MD): 1.15 (95 % Confidence Interval (CI): 1.96, –1.06; $P < 0.00001$) compared with conventional postoperative care methods. As TCM nursing time increased, there was a trend towards decreased VAS scores. Furthermore, TCM care was effective in providing pain relief (OR: 4.78; 95 % CI: 2.93, 7.79; $P < 0.00001$) and reducing wound healing time (MD: 4.44; 95 % CI: 5.60, –3.27; $P < 0.00001$) and length of hospital stay (MD: 4.87; 95 % CI: 5.93, –3.82; $P < 0.00001$).

Conclusion: Traditional Chinese medicine nursing has a positive effect on the postoperative clinical results of patients with anorectal diseases, especially in relieving postoperative pain. The effect of traditional Chinese medicine nursing in relieving short-term postoperative pain in patients with anorectal diseases is obvious. However, there is no uniform standard for TCM nursing projects, which may lead to heterogeneity.

1. Introduction

Anorectal disease is common and refers to haemorrhoids, fistulas, fissures and other diseases around the anus, with surgery as the main treatment [1]. Surgical traction of local tissue, anal tissue injury and blocked blood and lymphatic fluid flow lead to postoperative pain, bleeding, too long wound healing time and other complications [2]. Due to the sensitivity of the perianal nerve, 65 % of patients experience moderate to severe pain after anorectal surgery, which affects their rehabilitation and quality of life [3]. Treatment in Western medicine generally involves using potassium permanganate solution sitz baths, oral antibiotics and anti-inflammatory

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painkillers, but the effect on pain relief is not ideal [4]. Postoperative pain relief in anorectal disease has always been a concern of scholars. The ideal postoperative pain relief method should not be addictive and should be non-traumatic, convenient and effective. Traditional Chinese medicine nursing has accumulated a rich experience in pain relief and has unique advantages.

According to traditional Chinese medicine (TCM), anorectal diseases are mostly related to wind, wet, dryness, fire, blood stasis and qi deficiency. The evil invasion, coupled with the viscera deficiency, leads to downward wind, dryness, wet and hot and stasis of the anus. In addition, surgery can easily damage the meridians, leading to anal stagnation, blood stasis, disharmony of the meridians and general pain [5]. At present, TCM nursing methods to relieve the postoperative pain of anorectal diseases include ear point seed embedding, Chinese medicine fumigation and sitz baths, dialectical meals, acupoint massage, scraping, acupoint application and TCM health education. Previous studies have shown that these TCM care methods achieve good efficacy in pain relief. However, relevant systematic evaluation studies are currently lacking. Therefore, this study aims to elucidate the effects of comprehensive TCM care and conventional postoperative care on postoperative anorectal pain.

2. Methods

2.1. Literature search strategy

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidance manual, three English databases, PubMed, Embase and the Cochrane Library, and three Chinese databases, the China National Knowledge Infrastructure, Wanfang Data and the China Science and Technology Journal Database, were systematically searched. The search time was from the library construction until June 30, 2022. The English database search strategy used the keywords: 'traditional Chinese medicine or TCM', 'nursing or nursing model', 'anal surgery, haemorrhoids surgery or anorectal surgery' and 'pain or pain nursing'. The Chinese database search strategy used the keywords 'traditional Chinese medicine', 'nursing', 'after anorectal surgery', 'after haemorrhoid' and 'pain'. Additionally, the target literature was obtained by reading the relevant systematic review.

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) Chinese and English studies published in peer-reviewed journals. Only the studies published in the core Chinese journals were included; (2) The study subjects were diagnosed with an anorectal disease and underwent surgery; (3) Conventional nursing was implemented for the control group, and the research group underwent comprehensive TCM nursing based on conventional TCM intervention, including ear point seed embedding, Chinese medicine fumigation and sitz baths, dialectical meals, acupoint massage, scraping, acupoint application and TCM health education; (4) The study type was a case-controlled or prospective study; (5) The main outcome indicator was the pain score [6,7] based on the Visual Analogue Scale (VAS). The full score on the VAS scale is 10 points (1–10 points). The higher the score, the greater the pain. Secondary indicators included response efficiency, wound healing time and length of hospital stay. The response efficiency was based on the clinical efficacy standard proposed in the Standard for the Efficacy and Diagnosis of Traditional Chinese Medicine [8] and the VAS score on days 3 and 7 after surgery. If there was a VAS score reduction of 4 points or more, the treatment was classified as highly effective. If the VAS score reduced by 2 or 3 points, it was effective, and if the reduction was less than 2 points, it was deemed as no significant change or invalid. $\text{Efficiency} = (\text{number of valid cases} + \text{number of effective cases}) / \text{number of evaluable cases} \times 100\%$.

Exclusion criteria: (1) Non-population studies; (2) Conference articles, case reports, systematic reviews and other research types; (3) Inadequate outcome information and no data analysis; (4) Repeated reports of literature studies; (5) Studies where complete articles were not available.

2.3. Literature screening and data extraction

Literature screening was performed by two researchers individually based on the inclusion and exclusion criteria. When there was a disagreement between the two researchers, the advice of a third researcher was sought, and a discussion was had to reach a unified opinion. After the literature screening, the two researchers respectively extracted the data according to the developed standard data extraction table, which included the literature information, demographic characteristics of the research subjects, TCM nursing methods and nursing time, VAS score after TCM comprehensive care, response efficiency, wound healing time and length of hospital stay.

2.4. Literature quality evaluation

The Newcastle–Ottawa Scale was adopted to evaluate the quality of the observational studies. The scale included eight aspects, including the representativeness of the study population, the comparability between the groups, the adequacy of the evaluation of the results, the adequacy of the follow-up time and the completeness of the follow-up. The total score was 9. A score of 7 and above indicated high-quality literature, and 5 and below low-quality literature.

2.5. Statistical analysis method

Statistical analysis was performed using the ReviewManager 5.3 software. The effect size of the measurement data was represented

by the weighted mean difference (MD) of relative risk, and the 95 % confidence interval (CI) was used to estimate the interval range of the effect size. The heterogeneity test was performed using the I^2 test. If $I^2 < 50\%$ or $P > 0.1$, the included literature was considered homogeneous and analysed using the fixed effects model (Mantel–Haenszel). If $I^2 > 50\%$ or $P \leq 0.1$, the homogeneity between the included studies was considered poor, and the random effects model (DerSimonian and Laird) was used. If the heterogeneity was large, the sources of heterogeneity were explored using subgroup or sensitivity analysis. $P \leq 0.05$ was considered to be statistically significant.

3. Results

3.1. Basic characteristics of the included studies and the literature quality evaluation results

After a systematic search and screening of the Chinese and English databases, 15 studies that met the inclusion and exclusion criteria were included in this study [9–23]. Fig. 1 shows the literature screening process. These 15 studies involved 2375 patients who underwent anorectal surgery due to anorectal diseases, including haemorrhoids, anal fissures, anal fistulas and perianal abscesses. Among them, 1207 study subjects received TCM nursing, including ear point seed embedding, Chinese medicine fumigation and sitz baths, dialectical meals, acupoint massage, scraping and acupoint application, with the nursing time lasting from one day to one month. The other 1168 study subjects underwent routine postoperative care. The literature quality evaluation results showed that the quality of the included studies was high (mean: 7.3; median: 8). (See the supplementary material.)

3.2. Effect of traditional Chinese medicine nursing on postoperative Visual Analogue Scale scores in patients with anorectal disease

There were 11 studies reporting VAS scores in anorectal patients after postoperative TCM care. The heterogeneity evaluation showed high heterogeneity in the included studies ($I^2 = 98\%$, $P < 0.00001$), which was analysed by the random effects model, and the subgroup analysis was performed according to the evaluation time of the VAS. The systematic evaluation showed that TCM nursing could effectively relieve postoperative pain in patients with anorectal diseases, with a combined effect size of -1.15 (95 % CI: 1.96, -1.06 ; $P < 0.00001$). The results of the subgroup analysis showed that 2, 7 and 14 days of TCM care had a positive effect on pain relief after anorectal surgery. As TCM nursing time increased, there was a trend for decreased postoperative pain in patients with anorectal diseases. The combined effect sizes were -2.60 (95 % CI: 4.38, -0.82 ; $P = 0.004$), -1.25 (95 % CI: 1.84, -0.66 ; $P < 0.0001$) and -0.73 (95 % CI: 0.84, -0.62 ; $P < 0.00001$) (Fig. 2).

3.3. Effect of traditional Chinese medicine nursing on postoperative efficiency in patients with anorectal diseases

Eight studies reported the effective rate of postoperative pain improvement in patients with anorectal diseases, with a total of 515 study subjects undergoing TCM care and 498 study subjects receiving routine postoperative care. The heterogeneity evaluation results

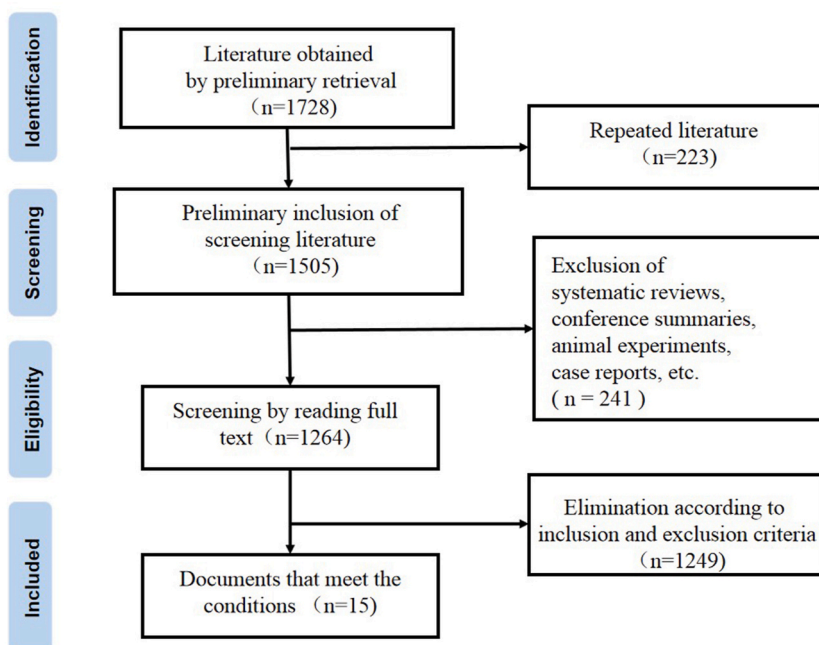


Fig. 1. Flow chart of the target literature screening.

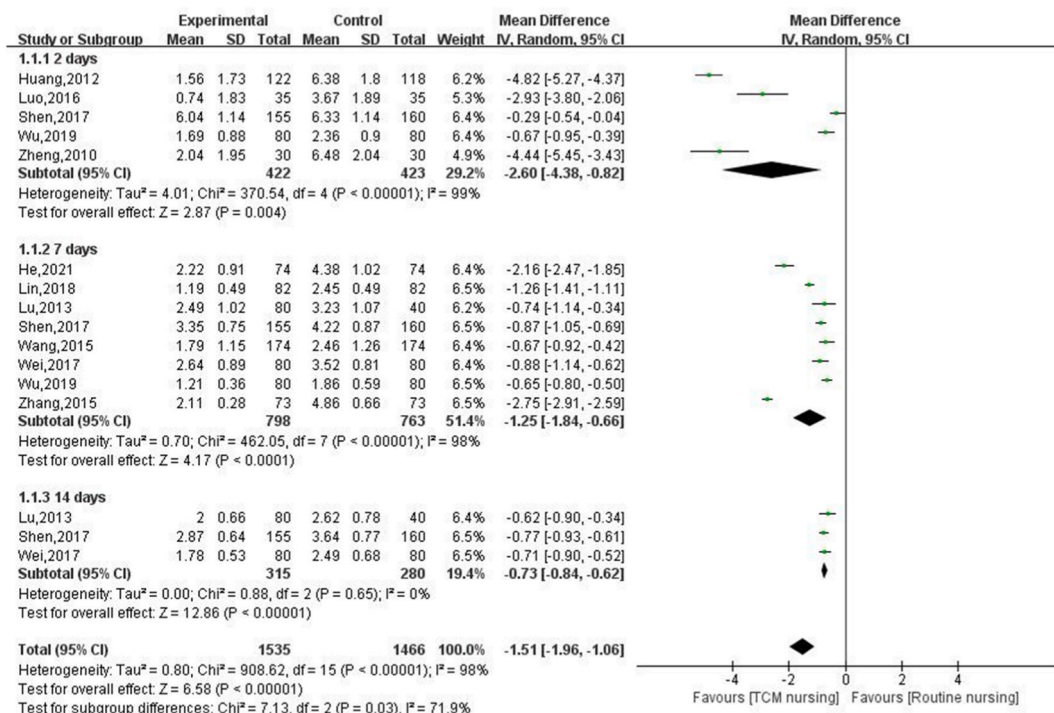


Fig. 2. Subgroup analysis of the effect of TCM care on postoperative VAS score in patients with anorectal disease.

showed a good homogeneity among the included studies ($I^2 = 20\%$, $P = 0.97$), which were systematically evaluated using a fixed effects model. The systematic evaluation results suggest that TCM care helps relieve postoperative pain in patients with anorectal diseases. In the TCM care group, the study subjects had pain relief 4.78 times more effective than in the group receiving routine care (95% CI: 2.93, 7.79; $P < 0.00001$) (Fig. 3).

3.4. Influence of traditional Chinese medicine nursing on postoperative wound healing time in patients with anorectal disease

Eight studies reported wound healing time after surgery in patients with anorectal diseases, with 682 study subjects receiving TCM care and 642 study subjects receiving routine postoperative care. The results of the heterogeneity evaluation showed some heterogeneity among the included studies ($I^2 = 95\%$, $P < 0.00001$), and the effect of TCM care on wound healing time was evaluated using a random effects model. The meta-analysis results showed that, compared with routine care, TCM care significantly shortened the wound healing time by about 4.44 days (95% CI: 5.60, -3.27; $P < 0.00001$) (Fig. 4).

3.5. Effect of traditional Chinese medicine nursing on postoperative length of hospital stay in patients with anorectal diseases

Four studies reported the effect of TCM care on postoperative length of hospital stay. The results of the heterogeneity evaluation showed some heterogeneity among the included studies ($I^2 = 63\%$, $P = 0.04$), and the random effects model was used for the

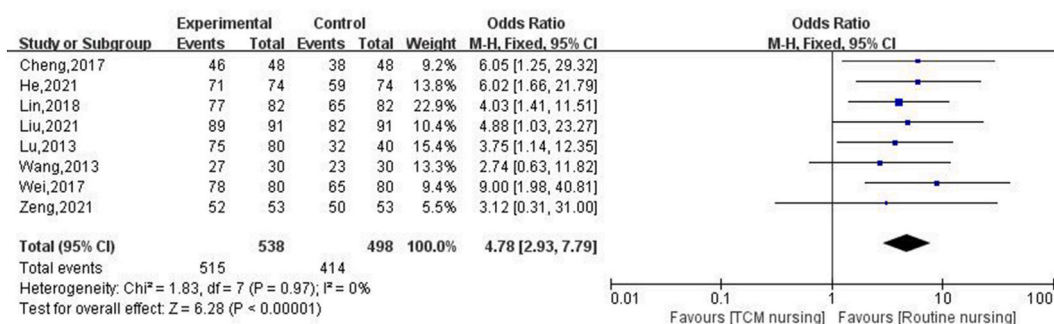


Fig. 3. A meta-analysis of TCM nursing for postoperative efficiency in patients with anorectal disease.

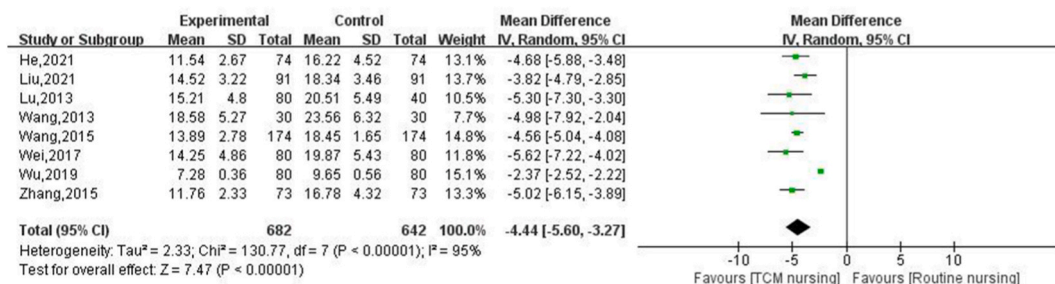


Fig. 4. A meta-analysis of the effect of TCM nursing on the postoperative wound healing time (d) in patients with anorectal disease.

evaluation analysis. The systematic evaluation results showed that after TCM care, the postoperative length of hospital stay of patients with anorectal diseases decreased by 4.87 (95 % CI: 5.93, -3.82; P < 0.00001) days (Fig. 5).

3.6. Sensitivity analysis

In this study, the heterogeneity evaluation using the VAS score, wound healing time and length of hospital stay as indicators suggested a large heterogeneity among the included studies, so a sensitivity analysis was performed by removing included studies one by one. The sensitivity analysis results of the VAS score studies found no obvious source of heterogeneity, suggesting that the heterogeneity among the included studies was relatively stable and that these results were reliable. The sensitivity analysis results of the wound healing time studies showed that the heterogeneity was significantly reduced after deleting the studies [9] (I² = 0 %, P = 0.52). For a systematic evaluation using a fixed effects model, the effect of TCM care on postoperative wound healing time in patients with anorectal diseases was MD = -4.60 (95 % CI: 4.96, -4.24; P < 0.00001; Fig. 6). The sensitivity analysis results of the length of hospital stay studies showed that the heterogeneity decreased to I² = 28 % (P = 0.25) after deleting the studies [13]. The meta-analysis using a fixed effects model showed that TCM care had positive effects on shortening the postoperative length of hospital stay in patients with anorectal diseases (MD: 5.35; 95 % CI: 6.36, -4.33; P < 0.00001) (Fig. 7).

4. Discussion

In this study, the 15 pieces of literature that met the inclusion and exclusion criteria were included in a systematic evaluation to determine the effect of comprehensive TCM care on postoperative pain relief in patients with anorectal diseases. The systematic evaluation results show that TCM nursing (including ear point seed embedding, Chinese medicine fumigation and sitz baths, dialectical meals, acupoint massage, scraping and acupoint application) could effectively reduce patients' VAS scores at 2 days (MD: 2.60; 95 % CI: 4.38, -0.82; P = 0.004), 7 days (MD: 1.25; 95 % CI: 1.84, -0.66; P < 0.0001) and 14 days (MD: 0.73; 95 % CI: 0.84, -0.62; P < 0.00001) after surgery, and that TCM nursing has a more significant impact on short-term VAS scores. Furthermore, TCM care was 4.78 times more effective in relieving pain compared with routine postoperative care (95 % CI: 2.93, 7.79; P < 0.00001). In addition to improving the degree of pain after anorectal surgery, TCM care also had significant positive effects on wound healing time and length of hospital stay, effectively shortening the wound healing time (MD: 4.44; 95 % CI: 5.60, -3.27; P < 0.00001) and length of hospital stay (MD: 4.87; 95 % CI: 5.93, -3.82; P < 0.00001).

Most included studies adopted TCM sitz baths or acupuncture as TCM nursing after surgery. Traditional Chinese medicine believes that the pain after anorectal surgery is mainly caused by surgery-related meridian damage, stagnation and blockage and stagnation of qi and blood. As the inflammatory reaction intensifies, stagnation of qi and blood may bring about pain. Traditional Chinese medicine fumigation directly acts on the affected locations. Through the curative and warm effect of drugs, it reduces nerve excitement, improves muscle spasm, promotes blood and lymphatic circulation, improves metabolism and reduces tissue oedema, reducing swelling and relieving pain. Hu and Liu et al. [24,25] used data mining technology to analyse the medication rule of TCM fumigation after haemorrhoid surgery. The study found that the top four most frequently used traditional Chinese medicines were yellow cypress, mirabilite, Chinese gall and radix sophorae flavescens. The medicines are mainly cold and warm. Most of the drugs taste bitter and

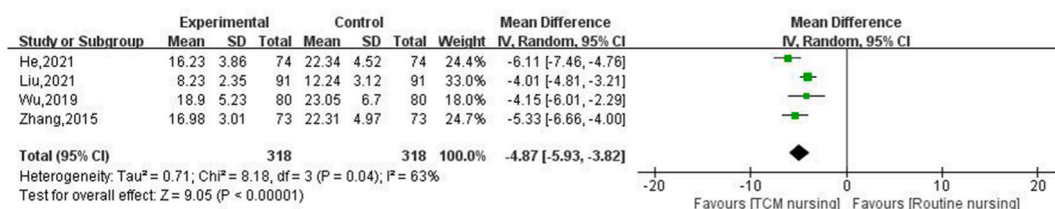


Fig. 5. A meta-analysis of the effect of TCM nursing on postoperative length of hospital stay in patients with anorectal disease.

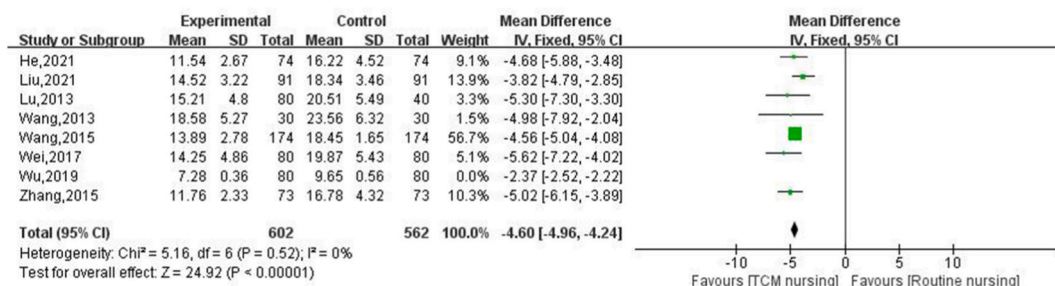


Fig. 6. Sensitivity Analysis of the effect of TCM nursing on the postoperative wound healing time in patients with anorectal disease.

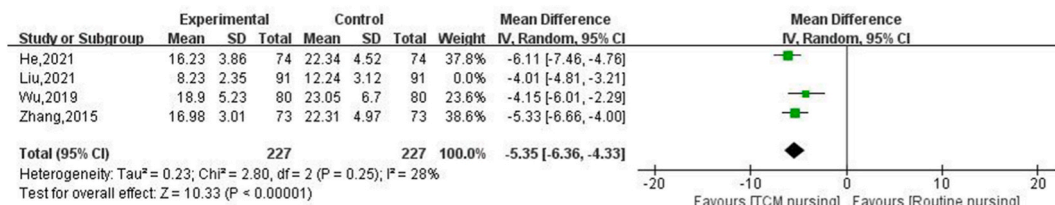


Fig. 7. Sensitivity Analysis of the effect of TCM nursing on postoperative length of hospital stay in patients with anorectal disease.

spicy, and the drug efficacy is mainly to clear heat and dry dampness, promote qi and blood circulation, and reduce swelling and relieve pain. Acupuncture has a long history in treating anorectal diseases, with the advantages of being simple and having quick effects and high safety. Moreover, Wu et al. [26] evaluated the effect of acupuncture treatment in relieving postoperative pain. The results showed that acupuncture was effective in relieving postoperative pain and reducing the amount of opioid analgesic drug usage. The study of Huang et al. showed that acupuncture to the Chengshan, Changqiang and Shenmen points effectively reduced pain after haemorrhoid surgery [12]. Studies have also shown that acupuncture effectively relieves pain after haemorrhoidectomy and reduces adverse events [27].

The present study has some limitations. Firstly, there is no uniform standard for TCM nursing programmes. Traditional Chinese medicine practitioners' treatments are mainly based on their own experience, which has a certain subjectivity, so there are differences in the postoperative TCM care plans of patients, which may lead to great heterogeneity. Secondly, the study population was of one ethnicity. Due to the particularity of care, all the included studies were from China, and the evaluation results of different ethnic groups are lacking. Third, the evaluation indicators need to be expanded. Only the effects of TCM care on pain relief, wound healing time and length of hospital stay were analysed due to the lack of sufficient data on different evaluation methods. Therefore, a more unified TCM nursing programme developed by TCM experts with more indicators and more ethnic groups needs to be studied in further research.

5. Conclusion

In conclusion, this study systematically evaluates the effects of comprehensive TCM care and routine care on postoperative pain in patients with anorectal diseases. The findings suggest that TCM care can improve clinical outcomes in patients undergoing anorectal surgery. Comprehensive TCM nursing in patients with anorectal diseases undergoing surgery can help relieve postoperative pain, improve the efficiency of pain relief and shorten wound healing time and length of hospital stay. However, due to the limitations of this study, more high-quality, multi-ethnic prospective studies should be conducted to provide more evidence for clinical decision-makers and patients on the benefits of adopting comprehensive TCM care in relieving postoperative pain in patients with anorectal diseases.

6. Ethics approval and consent to participate

An ethics statement was not required for this study type, no human or animal subjects or materials were used.

7. Consent for publication

Not applicable.

Data availability

The data used to support the findings of this research were available from major databases, including Embase, PubMed, Cochrane Library, CNKI, Wangfang, and Weipu databases.

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CRediT authorship contribution statement

Peiyao Li: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing. **Guoshuang Yu:** Data curation, Formal analysis, Writing – review & editing, Investigation. **Fuyan Liu:** Data curation, Investigation, Writing – review & editing, Formal analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Not applicable.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2023.e22310>.

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