

Meta Analysis of moxibustion in the Treatment of Functional Constipation based on Radar Plot Multivariate Evaluation of Literature Quality

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ABSTRACT

Objective: The multiple evaluation method of radar map was used to evaluate the literature quality of systematic evaluation /meta analysis of moxibustion therapy for functional constipation, providing clear and reliable evidence for the majority of users.

Methods: The retrieval strategy was developed and perfected, and the quality of literature was evaluated from six aspects: publication time, design type, AMSTAR score, PRISMA score, heterogeneity and publication bias.

Results: Finally, 5 literature that met the established requirements were included, and the publication years were concentrated from 2018 to 2021. Randomized controlled trials accounted for a large proportion of design types, AMSTAR scores ranged from 12 to 23, PRISMA scores ranged from 21 to 40, and the average rank score of 5 literature was 3.43. Among them, the literature quality of xuan Yichen and Wu Xinyu was relatively good, with balanced and stable scores in all dimensions, while the treatment of the rest was poor (mainly manifested in: the literature retrieval strategy was not comprehensive enough; The existence of heterogeneity was not satisfactorily explained and discussed; Lack of reporting on research funding and funding sources; Lack of literature search and screening flow chart reports in study selection; The characteristics of the literature are not fully reported). Most literature have low homogeneity and publication bias

Conclusion: Systematic evaluation/Meta Analysis of moxibustion therapy for functional constipation the quality of literature needs to be further improved, especially the quality of methodology and reportage. The radar chart shows the data in a concise, intuitive and clear way, which is worthy of wide application in various specialties of traditional Chinese medicine.

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INTRODUCTION

Functional Constipation (FC) refers to constipation after excluding metabolic, organic and systemic diseases. It is a common functional gastrointestinal disease of the digestive system and is characterized by persistent difficulty defecating, reduced frequency of defecation, or a sense of incompleteness. [1] FC is prevalent around the world. According to relevant statistics, the incidence of FC in China is about 8.4%, while the incidence of FC in people over 60 years old can be more than 12%, or even as high as 37.8%. [2] Studies have shown that FC is closely related to qi and blood status of the body, and its incidence increases significantly with age. [3] FC is a common cause of increased intracranial pressure, cardiovascular and cerebrovascular diseases and endocrine disorders. Long-term constipation may cause intestinal diseases such as anal fissure, hemorrhoids and colorectal cancer, as well as mental diseases such as anxiety and depression. [4] At present, the etiology and pathogenesis of FC is still not very clear, and there is no specific treatment in Western medicine. A large number of clinical studies have confirmed that acupuncture and moxibustion is safe and effective in the treatment of FC. In particular, moxibustion has been increasingly favored by FC patients with its advantages of comfort, painless and significant efficacy, and has become one of the important intervention measures. [5-6]

Systematic evaluation/meta-analysis belongs to the highest end of the "evidence tower" and is highly effective evidence to guide clinical practice [7]. However, only high-quality systematic evaluation/

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meta-analysis can provide reliable information to evidence users, while low quality will affect decision-making, lead to misdirection and many adverse consequences [8].Therefore, scientific evaluation of the literature quality of systematic evaluation/meta-analysis of moxibustion therapy for FC is an important issue which needs to be solved at present.

This study includes six aspects as follows: the publication time, design type, AMSTAR score (Assessment of Multiple Systematic Re-views2)[9], PRISMA score (Preferred Reporting Items for System-atic Reviews and Meta Analysis) [10] homogeneity and publication bias. Intuitive radar diagram analysis method was used to evaluate the multi-dimensional literature quality of moxibustion intervention FC system/meta-analysis, providing strong evidence for decision-making. Materials and Methods

MATERIALS AND METHODS

Literature scope

Design retrieval strategy, China Biomedical Journal Database (CBM disc, 1978-September 30, 2021), China Journal Knowledge Network (CNKI, 1978-September 30, 2021), Chongqing VIP Technology Chinese information (VIP,1989-September 30, 2021) and Beijing WF PharmaceuticalDatabase (WF, 1994-September 30, 2021).Pubmed News (1966-September 30, 2021), Embase Biomedicine (1980-September 30, 2021) and Cochrane Library (Issue 4, September 30, 2021). Select Key words combined with Title for Advanced Search. Retrieval type: (functional constipation” OR “habitual constipation” OR “simple constipation” OR “constipation” AND “systematic evaluation” OR “systematic review” OR “meta-analysis” OR “meta-analysis”),Andthen “moxibustion” OR “warmmoxibus-tion” OR “salt-separatedmoxibustion” asasecondaryretrieval.

Inclusion and Exclusion Criteria

Inclusion: All Chinese or English literature on systematic evaluation and meta-analysis of moxibustion intervention on FC. Exclusion: the same literature was detected in different databases and articles with the same content were published several times, the content and data of articles were missing, systematic evaluation related to etiology and pathogenesis, systematic evaluation methodology design, etc.

Literatures Election and Screening

The latest literature manager Note express 2.2.0.674 was adopted. According to the established retrieval method, liu Huilin, Wu Desheng and Zhou Xingchen imported the information of literature title, abstract, author, publication year and other information retrieved from these data bases are imported in to the manager, then read the full text, screened the literature according to the inclusion and standard criteria, and made a flowchart.

Information Extraction and Quality Evaluation

Use Excel 2021 to prepare the compilation table of Literature Quality Evaluation Information of Systematic Evaluation of Moxibustion Therapy for FC/ metaAnalysis, the content includes qualitative data such as publication year, literature source, data base source and sample size, as well as evaluation scales for all

items of AMSTAR 2 and PRISMA for all items. Data extraction was completed by Yang Yanan and Huang Guomin independently. Data extraction was performed after the evaluation results were consistent. In case of disagreement, a consensus was reached through discussion with the research leader. Before data extraction, the study leader trained all participants.

Statistical Methods

Clinical epidemiology and evidence-based medicine methods were used to conduct qualitative evaluation from four perspectives: publication year, design method, homogeneity and publication bias. AMSTAR score and PRISMA score were quantitatively evaluated and scored one by one with the scale. The item report was complete and sufficient, 2 points. Missing or partial report, score 1 point; For failure to report or misuse, 0 point.

Radar map drawing

Sukhmeet S et al.[11] were used to systematically evaluate the same intervention measures meta analysis literature quality evaluation method, diversified evaluation is conducted from six perspectives of this study, including publication time, design type, ect, and radar map is made by Excel 2021. The values of each article on the radar chart coordinate axis are derived from the rank of the six dimensions in the whole article. Ranking number transformation refers to grade data processing method of medical statistics,[12] in which the highest rank is the total number of references included in the study.

RESULT

Retrieval Process

According to the established retrieval strategy, 253 original bibliographies were preliminarily detected, including 58 CNKI, 21 WF, 18 VIP, 13 CBM, 12 PUBMED, 11 EM-base and 6 CL. Note express 2.2.0.674 were included in literature screening, title and abstract were browsed, and 5 qualified literature were included according to inclusion and exclusion criteria.[13-17] This specific process is shown in Figure 1.

Publication Status

From the analysis of the five literature, it can be concluded that 1 study was named “systematic evaluation”, 2 studies were named “systematic evaluation/meta analysis”, and 2 studies were named “meta analysis”. In terms of intervention

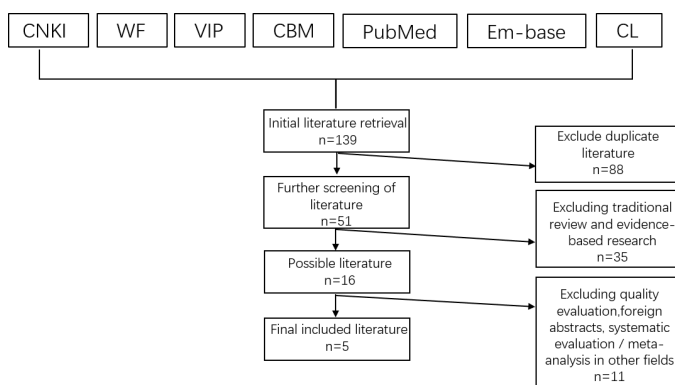


Figure-1 Document retrieval flow chart

Fig. 1: Document retrieval flow chart

Table 1: General overview of included literature

Literature source	Database source	Design method	Sample size	Intervention measures		Quality evaluation tool
				Test group	Control group	
Qian Chen 2019	CNKI, WF, VIP, PubMed, CL, Medline	RCT	1129	Moxibustion	Unlimited	CLEAR NPT
Xinyu Wu 2020	CNKI, WF, VIP, CBM, PubMed, CL, Medline, Em-base	RCT	695	Moxibustion + routine nursing	routine nursing	Cochrane
Qinyu Liu 2020	CNKI, WF, VIP, CBM, PubMed, CL, Wed of Science, Ovid	RCT+Q- RCT	963	Moxibustion	Unlimited	Cochrane
Yichen Xuan 2021	CNKI, WF, VIP, CBM, PubMed, CL, Em-base	RCT	666	Mainly moxibustion	Unlimited	Cochrane
Fushui Liu 2018	CNKI, WF, VIP, CBM, PubMed, CL	RCT+Q- RCT	880	Mainly Heat sensitive moxibustion	Unlimited	Cochrane

Note: RCT is a randomized controlled trial, Q-RCT is a randomized controlled trial

measures, moxibustion was the main method in most literature of the experimental group, and the selection of its therapy was based on subject of *Subject of Acupuncture moxibustion technique* as the selection standard. The coverage of the control group is relatively wide, there is no clear limit to the therapy, both western medicine intervention and acupuncture intervention. (See table 1).

Evaluation Overview

Publication Time

The wider the time span and the faster the update of a study, the higher the literature quality and the stronger the timeliness. In this study, the publication years are concentrated from 2018 to 2021, with 5 papers in 2018, 2019 and 2021 respectively, and 2 papers in 2020. It can be seen that systematic evaluation / meta analysis of moxibustion therapy for functional constipation has few studies before 2018, which is with a small time span.

Type of Design

Randomized controlled trial is the highest level of systematic evaluation / meta-analysis design, and it is internationally agreed that the most scientific and accurate method to evaluate the effectiveness of a treatment or drug. This study found that two of the five literature included semi-randomized controlled trials (Q-RCT) to varying degrees, and some literature only mentioned the word "random" without describing specific random methods, which led to the increase of the risk of bias.

AMSTAR Score

The scores of the five included references ranged from 12 to 23 points. The reasons for the low score of some literature are as follows: ① The literature retrieval strategy is not comprehensive enough. For the two literature, [13,17], relatively few databases were searched. Chen Qian's Chinese database was not included in CBM, and Liu Fushui's foreign language database was only or additional retrieval and grey literature, most of the included research literature was not described. As an important process in literature retrieval, grey retrieval is an important embodiment of literature retrieval, both are closely related to the quality of the final study presentation.

② The existing heterogeneity was not explained and discussed satisfactorily. Four studies [13-15,17] did not use random effect method in evaluating heterogeneity, and the discussion content was simple and insufficient. ③ Lack of reports to include research funding and funding sources. Two studies [14,15] did not state potential sources of funding in terms of related conflicts of interest.

PRISMA Score

The scores of the five included references ranged from 21 to 40 points. The reasons for the low score of some literature are as follows: □ The retrieval strategy is not systematic and comprehensive enough. A complete search strategy should present all databases, registered platforms, etc., and include the start and end time of search, the language included and other elements. Two studies [13,15] only described database retrieval, and the retrieval method was too simple. □ Reports of literature search and screening flow charts were missing in the study selection. The flow chart not only presents clear logical thinking to researchers and readers, but also is an important criterion to reflect the fairness and objectivity of research. One study [15] did not use flow charts, but only listed the process of literature inclusion in words. □ The reports on the characteristics of literature research are not comprehensive enough. To test the applicability and safety of the systematic evaluation / meta-analysis results, the investigator should specify and cite the characteristics of each included study, such as title, database, study type, intervention, sample size, duration of treatment, and outcome indicators. One study [15] elaborated the literature features too simple.

Homogeneity

Clinical trials can only be conducted if the disease, method design, and intervention are of the same nature. Two studies [15,17] included both randomized controlled trials and semi-randomized trials, resulting in methodological heterogeneity. The three [13,15,16] studies were not unified in terms of intervention methods, resulting in clinical heterogeneity. Studies with high homogeneity should be designed in strict accordance with the randomized controlled trial method, and only one single therapy is evaluated in the trial group. Only in this way can the final conclusion be deduced with higher reliability.

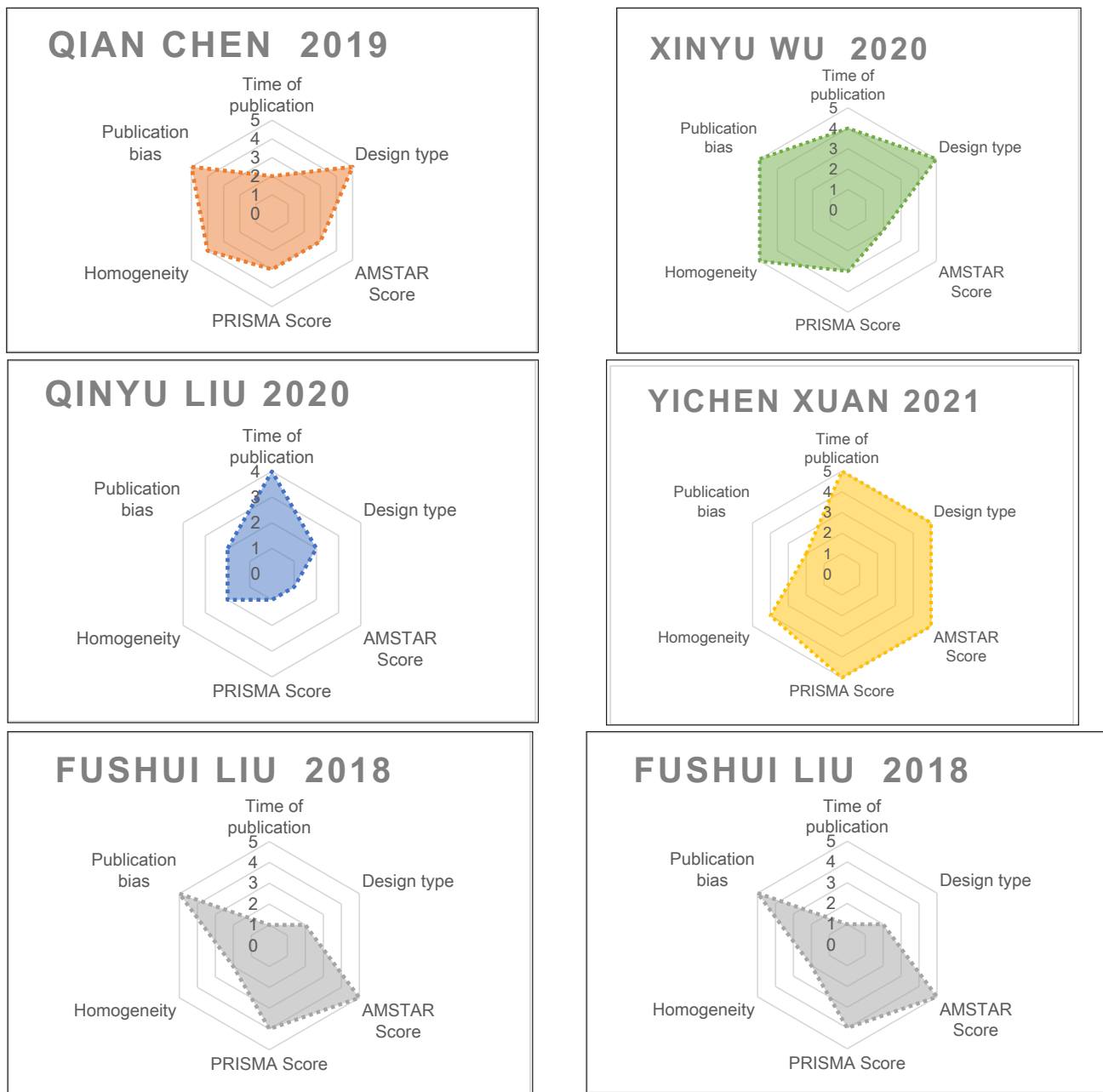


Fig. 2: Radar distribution map of 5 included documents

Publication Bias

Publication bias will greatly reduce the credibility of systematic evaluation/meta-analysis, resulting in repeated experiments and waste of research resources. Three studies^[13,14,17] used funnel plot for bias test, one^[15] did not give any description of publication bias, and one^[16] could not use funnel plot to analyze publication bias due to too few studies on relevant outcome indicators. Results in the publication bias of the paper. Table 2 shows the six dimension evaluation and rank evaluation of the five literature.

Multiple evaluation of Dado Radar map

Graphic Analysis

By drawing and presenting the radar map, it was analyzed that the studies of Li Xi [13], Wu Xinyu^[14] and Xuan Yichen [16] covered a larger area, while those of Liu Qinyu [15] and Liu Fushui.^[17] covered a smaller area. From the perspective of

surrounding shapes, four studies by Wu Xinyu,^[14] Liu Qinyu,^[15] Xuan Yichen^[16] and Liu Fushui^[17] presented convex polygons, while one study by Chen Qian^[13] presented concave polygons. See Figure 2 for details.

Comprehensive Summary

Combining the radar maps with the average rank scores of each study, the literature quality of xuan Yichen^[16] and Wu Xinyu^[14] is relatively good, with balanced and stable scores in all dimensions. However, the average rank score of the five literature included in this study is 3.43, indicating that the literature quality of systematic evaluation/meta-analysis of moxibustion treatment of FC needs to be further improved

DISCUSSION

This study adopts the multidimensional perspective of radar map, intuitively combines numbers and charts, and

Table 2: Evaluation of 6 dimensions and rank scores of 5 literatures

Literature author	Time of publication	Design type	AMSTAR Score	PRISMA Score	Homogeneity	Publication bias	Rank average
Qian Chen	2019 ^[2]	RCT ^[5]	20 ^[3]	25 ^[3]	medium ^[4]	Partial description ^[5]	3.67
Xinyu Wu	2020 ^[4]	RCT ^[5]	18 ^[2]	25 ^[3]	High ^[5]	Partial description ^[5]	4.00
Qinyu Liu	2020 ^[4]	RCT+Q-RCT ^[2]	12 ^[1]	21 ^[1]	low ^[2]	No description ^[2]	2.00
Yichen Xuan	2021 ^[5]	RCT ^[5]	23 ^[5]	40 ^[5]	medium ^[4]	No description ^[2]	4.33
Fushui Liu	2018 ^[1]	RCT+Q-RCT ^[2]	23 ^[5]	38 ^[4]	low ^[2]	Partial description ^[5]	3.17

Note: The number in brackets is the rank of each evaluation

carries out a comprehensive evaluation of the systematic evaluation/meta analysis of moxibustion therapy for FC. Among the 5 included studies, the quality of the literature is relatively good, which are Xuan Yichen and Wu Xinyu, and the rest of the literature needs to be improved. Through comprehensive analysis, there are two main reasons for the low quality of literature, one is the quality of methodology, the other is the quality of reportage.

As we all know, methodological quality and reportage quality are the key links of systematic evaluation/meta-analysis.^[18-19] Systematic review/meta-analysis is a combination analysis of several controversial small sample clinical randomized controlled trials using scientific methods to resolve disputes or provide guidance. If each step of systematic evaluation/meta-analysis is not accurately grasped, which will have different degrees of consequences on the quality of research and finally affect the authenticity and wide applicability of the conclusions.^[20-22] Therefore, only by mastering correct methodology and publishing high-quality systematic evaluation/meta-analysis can accurate and persuasive evidence information be formed to better guide practice.

In the future research work, we need to continuously improve the following aspects: ① ensure comprehensive literature retrieval, including grey literature retrieval and manual retrieval supplement for those that cannot be obtained; ② Elaborate on the research and the funding, sources and conflicts of interest of the included research; ③ Pay attention to the drawing of flow chart, which should include literature screening process, exclusion list and reasons; ④ The experiments should be designed strictly according to the principle of PICOS, and special attention should be paid to the type of report included in the study; ⑤ Summary of evidence in the complete report.

The shortcomings of this study are as follows: ① Only electronic retrieval was carried out in major databases at home and abroad, and grey literature and paper literature were not included, resulting in selective bias; ② Only Chinese and English literature were retrieved in this study, and the included studies were only Chinese, so there was a certain degree of reporting bias. ③ Systematic evaluation/meta-analysis of moxibustion therapy for functional constipation is limited, and the quality evaluation results may be biased.

To sum up, the literature quality of systematic evaluation/meta-analysis of moxibustion therapy for FC needs to be further improved. It is hoped that future researchers will pay attention to the study of evidence-based medicine method

ology, constantly optimize the design scheme, and standardize the experimental study strictly in accordance with AMSTAR2 and PRISMA items, so as to provide more high-quality evidence for the majority of researchers.^[23-24] In this study, a six-dimensional diversified evaluation was adopted, and the data were presented in a concise, intuitive and clear way by combining with the radar chart, so as to avoid the one-sided conclusion caused by single index in the past. It is hoped that radar map can be widely used in various specialties of TCM to promote the continuous development and progress of evidence-based medicine and traditional Chinese medicine in the integration.

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