

Reasons for the use of traditional bonesetter in fracture care: a systematic review and meta-analysis

I Gede Gawandhi Arrya^{a,1}, Luh Seri Ani^{b,2*}

^a Medical Study Program, Ganesha Education University, Singaraja, Bali

^b Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University

¹ degawandhi90@gmail.com; ² seriani@unud.ac.id*

* corresponding author

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ABSTRAK

Traditional bonesetter (TBS) is often the primary choice in the treatment of fractures by communities, especially in rural areas, even though modern medical services are readily available. Dependence on TBS is a determinant of treatment success because improper fracture management is associated with increased morbidity and patient mortality. Meanwhile, information about why people prefer TBS is still limited. This systematic literature review aims to identify the reasons why patients prefer TBS in fracture treatment to improve understanding of the use of TBS in fracture cases. This study was systematically compiled in this review based on a literature search using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method. A total of three electronic databases were used, namely PubMed, ScienceDirect, and Scopus. The article search is arranged with the range of 2014-2024. Four of the 1009 selected articles have met the inclusion and exclusion criteria. Funnel Plots were used to test effect size and heterogeneity with a p-value of less than 0.05 was considered statistically significant. The results of the analysis of 4 articles found that the reasons for choosing TBS in the case of fracture were dominated by economic factors, trust in TBS, religious beliefs, and advice from people closest to them. Therefore, it is recommended to increase educational efforts and integrate traditional medicine with modern medicine to reduce the incidence of morbidity and mortality.



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1. Introduction

Bone fractures are a global public health problem. The WHO reported there were 178 million new fractures globally in 2019 (WHO 2024). Meanwhile, based on the Global Burden of Disease (GBD) in 2021, the number of new cases of fractures was 172.79 million (Yan et al. 2025). Meanwhile, Indonesia does not have national data on fracture events. According to the Indonesian Ministry of Health, by 2025 the number of fractures will be 1.3 million, the largest in Southeast Asia (Kemenkes RI 2025). Most people choose Bone setter

first in the treatment of fracture cases. Overall, 45.2% of patients visited TBS before hospital presentation (Allen-Taylor et al. 2025). Traditional bonesetter (TBS) is a lay practitioner of joint manipulation (Agarwal and Agarwal 2010). It is estimated that between 10-40% of patients with fractures in the world are managed by traditional medicine (Setianingsih and Rusmiati 2023). In developing countries like India, it is believed that as much as 60% of trauma is handled by traditional healers and bonesetters (Agarwal and Agarwal 2010). A study in Indonesia reported that 52.2% of people choose bonesetter as the first choice in their treatment (Setianingsih and Rusmiati 2023). TBS is also an integral part of fracture treatment in Nigeria (Ezeanya-Esiobu 2019) As many as 22.3% of patients who use TBS services reported experiencing complications (Hamad et al. 2024). Types of complications reported include amputation, chronic pain disorders, infections, and permanent muscle and nerve damage (Girish et al. 2020). The use of non-sterile techniques by TBS may lead to infection and be the cause of high morbidity and mortality. Improper immobilization techniques may be the cause of permanent muscle and nerve damage. The existence of complications can increase the cost of treatment and delays in seeking treatment from an orthopedic doctor will reduce the recovery rate (Girish et al. 2020).

Various factors are suspected to influence patients' preference for TBS in fracture treatment, including limited access to orthopedic care, travel costs, medical procedures, and medicines that are less popular for some of the population (Aguzzi et al. 2024). Traditional bone-setters in West Africa are often chosen to manage traumatic injuries due to their perceived effectiveness (Deniz and Sevimli 2021). Another study found that lower cost factors drive the utilization of TBS in the Mecha district, Ethiopia. Treatment effectiveness, economics, and perception factors have also reportedly influenced preferences for Traditional Chinese Medicine in the treatment of orthopedic conditions.

Understanding the patient's reasons for preferring TBS in fracture care is important. Analyzing these factors is expected to help improve access to health services for communities that may be underserved. In addition, it helps to create synergies between traditional and modern medical services, thus providing a holistic approach to care for orthopedic patients. Various primary studies on the reasons why users choose TBS in fracture care are available with qualitative and quantitative methods. However, studies with systematic review and meta-analysis methods are still limited. Based on this, this study is aimed at analyzing the reasons for the use of TBS in fracture treatment by systematic review and meta-analysis methods.

2. Method

This study is a systematic literature review and a meta-analysis review on the use of TBS services in fracture cases. A systematic review is a review of primary studies that uses explicit and reproducible methods. Meta-analysis is a mathematical synthesis of the results of two or more primary studies that address the same hypothesis in the same way. While meta-analyses can improve the accuracy of results, it is important to ensure that the methods used for such reviews are valid and reliable. In addition, a systematic literature review provides a structured approach to evaluating a wide range of studies, aiding in evidence-based decision-making in areas such as treatment services. The study was conducted following the 2020 Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) statement.

The question of this study is what are the reasons for users of traditional medicine in orthopedic cases, systematic studies and meta-analysis? The research questions were prepared using the PICO (Population, Phenomena of Interest, and Context) method. I = people with fractures, and bone setters. E = reasons for choosing traditional bonesetter, Co = fracture care.

The inclusion criteria used to select articles consist of (1) A study examining the reasons for TBS in fractures cases, (2) the article is full text, and (3) articles written in English. Studies are excluded if the article is a systematic literature review and meta-analysis, case studies, reviews, reports, a commentary/perspective piece and incomplete data available. This research uses three electronic databases, namely PubMed, ScienceDirect, and Scopus. The conjunction words, using Boolean logic "OR " and " AND " are used to connect phrases or keywords. The keyword combination with Boolean is shown in more detail in Table 1.

The selection process begins with determining the research question, namely, what are the reasons for the use of TBS in fracture cases? Furthermore, a web-based search for relevant articles was conducted on the scientific journal databases PubMed, Science Direct and Scopus using a combination of keywords as seen in Table 1. In the search process, 1009 documents were found. The selection process consists of 3 stages. In the first stage, the article selection process is carried out on multiple documents and non-research articles. This process leaves 92 articles that enter the next selection stage. The selection process in stage 2 was carried out to issue research articles using the systematic literature review and meta-analysis method, case studies, reviews, reports, and a commentary/perspective piece and the subject of the study is not human. The screening process in stage 2 left 17 articles to proceed

to stage 3. The 3rd stage selection process was carried out to assess the suitability of the available manuscripts for the research, namely, to find out the reasons for using TBS in fracture cases. The final selection results left 7 articles that met the requirements to enter the data extraction stage and 4 articles that were eligible to be meta-analyzed. The selection process is shown in Figure 1.

Table 1. Keyword combination with Boolean logic

No	Data Based	Keyword Combination
1	PubMed	("complementary therapies"[MeSH Terms] AND "medicine*"[MeSH Terms]) OR "traditional*"[MeSH Terms] OR "complementary medicine"[Title/Abstract] OR "traditional therapy"[Title/Abstract] OR "traditional treatment"[Title/Abstract] OR "traditional healer*"[Title/Abstract]) AND ("reason"[All Fields] OR "reasonable"[All Fields] OR "reasonably"[All Fields] OR "preference"[All Fields] OR "preferences"[All Fields] OR "prefers"[All Fields])) AND ("orthopedics"[MeSH Terms] OR "orthopedic*"[MeSH Terms] OR "fractures, bone"[MeSH Terms] OR ("bone and bones"[MeSH Terms] OR AND "fracture*"[MeSH Terms]) OR "orthopedics"[Title/Abstract] OR "orthopedic*"[Title/Abstract] OR "fractures"[Title/Abstract] OR "fracture*"[Title/Abstract] OR "bone fractures"[Title/Abstract] OR "bone fracture*"[Title/Abstract])
2	Science Direct	complementary OR traditional OR complementary medicine OR traditional therapy OR traditional treatment OR healers OR traditional healers AND orthopedics OR fractures OR bone OR bone fracture OR bone setter.
3	Scopus	complementary OR traditional medicine OR complementary medicine OR traditional therapy OR traditional treatment OR traditional healer AND orthopedics OR fractures OR bone OR bone fracture OR bone setter.

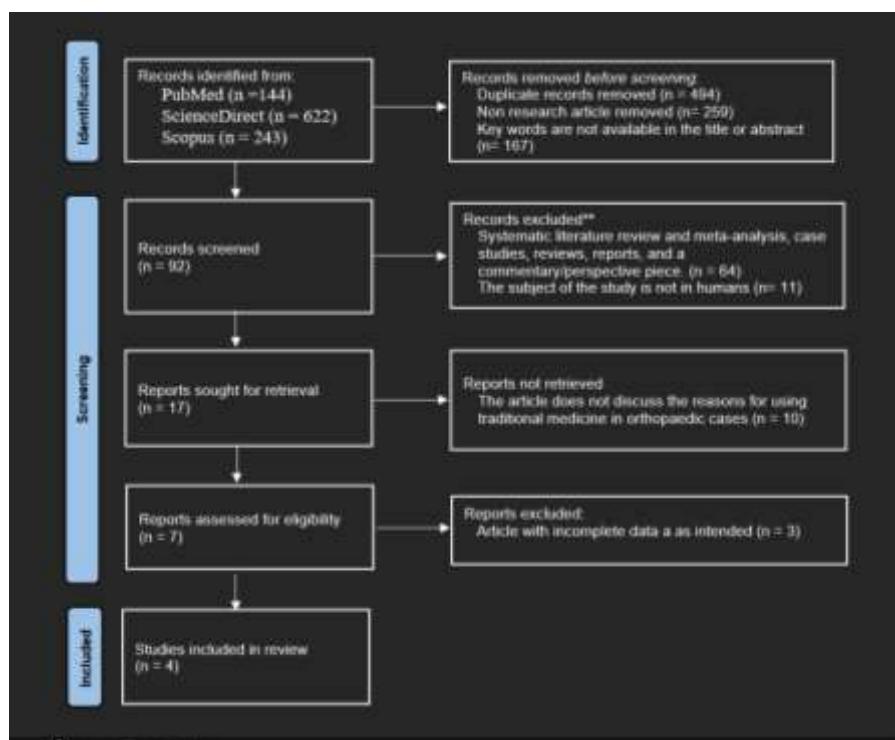


Figure 1. Identification of studies via databases using the PRISMA diagram

The data collection process for a literature review and meta-analysis on the reasons for the use of TBS services in fracture cases with the determination of the topic and purpose of the study. The topic of the research studied is TBS, while the purpose of the analysis is to identify and analyze the reasons for the use of traditional services in fracture cases. Articles are collected from scientific article databases such as PubMed, Science Direct and Scopus. The word conjunction, using the Boolean logic "AND" and "OR," is used to connect phrases or keywords. Articles obtained are subject to the article selection and evaluation process. Articles that do not meet the inclusion criteria are excluded from the analysis process. Screening is carried out in 3 stages, namely the selection of duplicate articles, selection based on titles and abstracts, and suitability with the criteria of the journal sought. The process continues with extracting and synthesizing data.

The data collected consisted of data on authors, year of publication, place of study, title, objectives, research methods, results and recommendations. A total of 4 articles were continued for review, and 4 articles were eligible to continue using meta-analysis. Important data items identified in this study are the reasons for the use of TBS in fracture cases, such as trust factors, economics, advice from others and others.

The quality evaluation of the articles used was based on the Newcastle-Ottawa Scale for observational studies (BMJ Open, 2023). In this study, articles with a small number of sources were used in connection with the limited number of publications, so that there may be bias in the information obtained.

The following data are taken from eligible studies: author data, year of publication, place of study, title, objectives, research methods, results and recommendations. The data extracted is data on the reasons for the use of TBS in fracture cases. A shared spreadsheet was used to enter the data, which was extracted independently by 2 authors for analysis (A.LS and A.IGG.). The third reviewer (D.KS.) solves differences in data extraction and reaches consensus in case of disagreement. The quality assessment was carried out by the author (A.LS), who independently assessed the reasons for the use of traditional bonesetter. The results of the data extraction are displayed in the Table 2. This study only reported results from the number of articles that met the criteria, so there is a possibility that there are important results from articles that were omitted that were not reported.

Meta-analysis data processing is carried out using Review Manager 5 software (version 5.4). Meta-analysis was carried out to calculate the effect size and heterogeneity of the factors that are the reason for the use of TBS in fracture cases. We performed a randomized effect meta-analysis where appropriate. We used funnel plots to assess

publication bias in meta-analyses with I2 values and heterogeneity. Evidence quality checks were performed by Review Manager 5 software (version 5.4) using a risk bias tool that describes included studies at high, low, or moderate risk. In all analyses, a p-value of less than 0.05 was considered statistically significant.

Table 2. Coding the reason for TBS utilization

A.IGG	A.LS	D.KS	Reason	Koding
x	x	x	Advice from relatives and friends,	Advice from others
	x	x	Family influence	
x	x	x	Low patient income	Economic Factors
x	x		Low cost	
x	x	x	lower costs of treatment	
x	x	x	Sociocultural trust	
x	x		Quick attention to treatment	
x	x		Availability of services	Belief in TBS
x	x	x	Use of natural remedies	
x	x		Easy accessibility	

3. Results and Discussion

This study reviews 4 articles that discuss the reasons for choosing TBS in fracture cases. In Table 1, it is shown that 2 out of 4 studies reviewed used quantitative methods, 1 study used a mixed method and 1 study used a qualitative method. All articles reported that African as the study site. The sample size varies between 34 and 245 respondents. More complete study characteristics are shown in Table 3.

Based on the results of the literature research, it was found that the reasons for choosing traditional bonesetter in fracture cases were dominated by economic factors, belief in TBS, religious beliefs and advice from those closest to them. The reasons for economic factors are obtained from 3 articles, belief reasons and religious factors were reported from 3 articles and advice from the closest people was also obtained from 3 articles. The factors of ease of accessing services, fear of amputation and surgery were conveyed by research conducted in Cameroon (Araújo et al. 2014). Other experts report that the reasons for choosing traditional bonesetter services include quick attention to treatment, close to the accident site, use of natural remedies, and quick recovery.

Meta-analysis was carried out on the grounds obtained by more than 1 study. In this study, three reasons were found that met the criteria for meta-analysis, namely factor belief in TBS, economics and advice from others. The forest plot depicting the meta-analysis results for the belief score in TBS is shown in Figure 1. Three studies comparing the

proportion of reasons for belief in TBS versus non-belief in TBS showed a significant difference in the proportion of the use of traditional bonesetter in fracture cases (MH=0.47, 95% CI=0.39-0.56, I²= 75%, P = 0.02).

Table 3. Characteristics of the study

Characteristics	Description
Number	1
Study	Alegbeleye, B.J., et al., 2019
Country	Northwest Region of Cameroon
Title	Traditional bonesetting practices in the Northwest Region of Cameroon
Objective	This study aimed to highlight the practice and dangers inherent in the practice of traditional bone setting in North- Western, Cameroon, by traditional bone setters (TBS)
Sample	245
Study design	Questionnaires were administered/retrospective and qualitative review.
Method analysis	Descriptive
Finding	Advice from relatives and friends, as seen in 75 (30.6%) patients, was the most common reason for FFB protection. Other reasons were lower costs (figure [n] = 60; 24.5%), sociocultural trust (n = 35; 14.3%), easy accessibility (n=30; 12.4%), fear of amputation (n=25; 10.2%), and fear of surgery (n=20; 8.2%).
Recommendation	There is an urgent need for collaboration and integration of traditional and biomedical medicine practices as advocated by the World Health Organization; to take advantage of the benefits for everyone and assorted. Patients who are led astray by false beliefs can be better educated by public enlightenment.
Number	2
study	Camara et al., 2023
Country	Guinea
Title	Complications of the Traditional Treatment of Limb Fractures: Frequency and Management in the Orthopedics-Traumatology Department of the CHU Ignace Deen
Objective	The objective was to report on our service's experience in managing complications related to the traditional treatment of limb fractures.
Sample	67
Study design	a prospective descriptive
Finding	Low patient income is the reason for choosing traditional medicine. In 34.32%. The application of poultice plus immobilization with a stick held by a bandage is a traditional treatment used at 40.30%. Pseudarthroses (28.36%) and malunion (20.90%) are the main complications after traditional treatment. Surgical treatment was performed at 95.52%. According to Souna BS criteria, our functional results were good at 52.08%, on average at 29.17% and bad in 18.75% of cases.
Recommendation	NA
Number	3
Study	Asa, S.S., et al., 2014
Country	Southwest Nigeria
Title	Healthcare Delivery among Yoruba Bonesetters in Southwest Nigeria and the Need for Collaboration with Orthodox Orthopedic Healthcare Services: A Mixed Method Study
Objective	NA
Sample	69
Study design	A mixed-study approach
Finding	Reasons for FFB preference (dual response): Quick attention to treatment 51 (78.5%), Close to accident point 3 (4.6%), Low cost of treatment 29 (44.6%), Use of natural remedies 48 (73.8%), Quick recovery 42 (64.6%)
Recommendation	NA

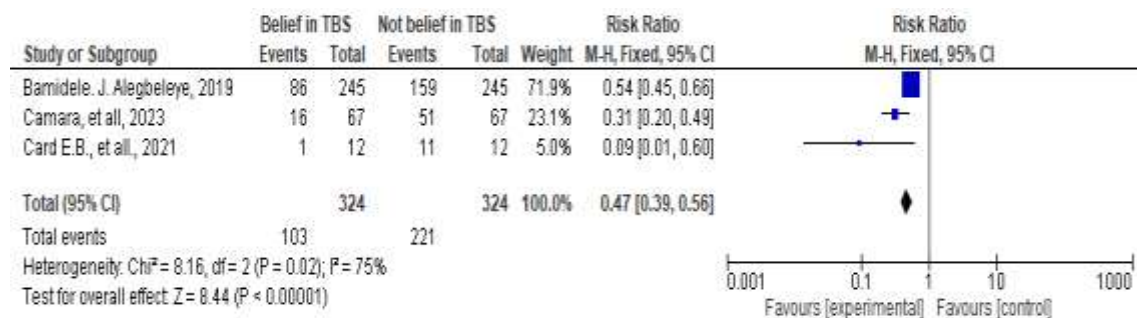
Table 3. Characteristics of the study (continue)

Characteristics	Description
Number	4
Study	Mekonnen. E. K., et al., 2024
Country	Addis Ababa Ethiopia
Title	Traditional Bone Setting Practice in Addis Ababa, Ethiopia: Perspectives of TBS and Orthopedic Surgeons
Objective	The aim of this study was therefore to explore the perception of TBS and orthopedic surgeons towards TBS practice in Addis Aba
Sample	34 informants
Study design	A qualitative descriptive study design
Finding	The community prefers to use TBS services rather than allopathic orthopedic treatment based on the nature of the condition to be treated, previous experience, family influence, and availability of services
Recommendation	This requires more collaboration between TBS practitioners and orthopedic surgeons, as well as policy interventions to ensure that people access safe and effective orthopedic primary health services

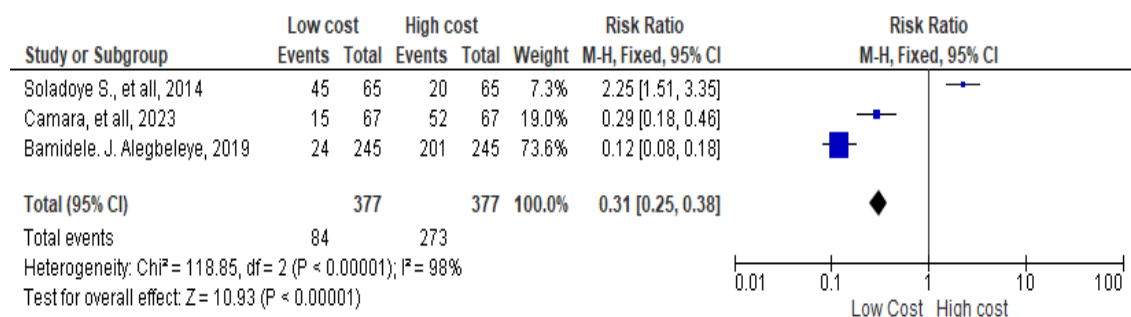
Based on the funnel plot to have a qualitative analysis of publication bias, it was found that asymmetrically distributed studies indicate that there may be publication bias in our study that affects the results of our analysis, as shown in Figure 2. Based on the results of the meta-analysis, Trust in traditional bonesetter was found that patients who had not trust in traditional bonesetter were 0.47 times more likely to choose to use patient treatment services in orthopedic cases. Patients prefer traditional bonesetters, also found in Nigeria. As many as 85% of fracture patients in Nigeria are mainly in rural areas, seeking treatment from traditional bonesetters as a first choice (Ru et al. 2014). The use of TBS for bone disease is no longer an alternative but the first and foremost choice (Andarini, Arif, and Rasyid 2019). Trust in traditional bonesetter for fracture cases stems from a high cure rate. Patients also prefer it because of its lower cost and the nature of the treatment, which is free of side effects (Zuska 2022).

Traditional bonesetter encompasses knowledge, skills, and practices rooted in the beliefs and experiences of various cultures (Chali, Hasho, and Koricha 2021). The most influential factors in the use of traditional bonesetter are knowledge, trust and distance of health facilities, with a probability value of 90.93%. This preference is particularly strong in choosing traditional bonesetter for primary health care needs based on a level of trust in history and culture. The use of traditional bonesetter is prevalent in regions where traditional systems, such as those of China, India, and Africa, are prevalent. The most widely used

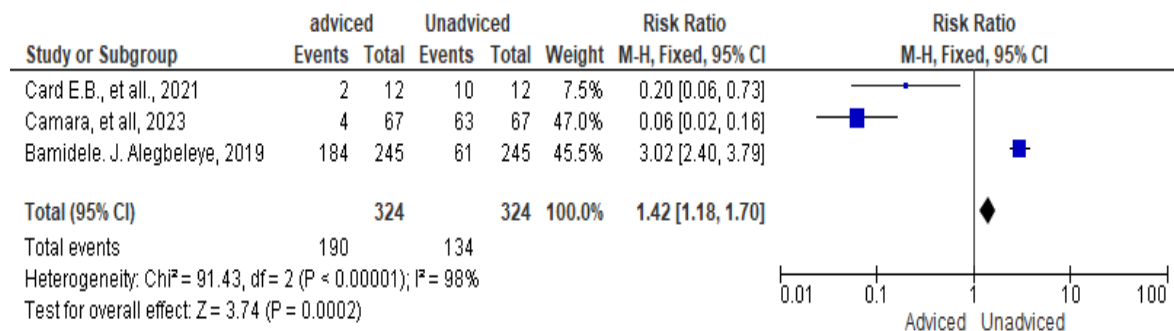
traditional bonesetter uses are manual skills 65.3%, finished herbs 48%, homemade herbs 31.8%, energy skills 2.1% and thought skills 1.9% (Araújo et al. 2014).



(a)



(b)



(c)

Figure 2. The forest plot of (a) belief in BTS, (b) economic and (c) advice factor

Forest plots depicting the results of the meta-analysis for economic factor scores are shown in Figure 2. The proportion of low versus high economic reasons showed a significant difference in proportion to the use of TBS in fracture cases (MH=0.31, 95% CI=0.25-0.38, $I^2 = 98\%$, $P < 0.00001$). Based on the funnel plot to have a qualitative analysis of publication

bias, it was found that asymmetrically distributed studies indicate that there may be publication bias in our study that affects the results of our analysis, as shown in Figure 2.

Economic factors were obtained as a reason to prioritize the use of TBS in fracture cases. Based on the meta-analysis, it was found that patients with low economic levels were 0.31 times more likely to use TBS compared to patients with high economic levels. The role of economic factors in the selection of TBS in fracture cases is also obtained from the results of a study conducted in the Katikekile Moroto Sub- County, Karamoja region of Uganda. Residents in this region use TBS as a first-line treatment (Logiel et al. 2021).

Socioeconomic and health sector factors are associated with the use of traditional bonesetters, especially in people with low economic status (James et al. 2018). Individuals with lower income levels or those from rural areas are more likely to rely on traditional bonesetter due to financial constraints and limited access to modern healthcare services. This is possible because orthopedic doctors tend to use technology that is relatively expensive and unaffordable for underprivileged populations (Twea et al. 2024). Therefore, a comprehensive cost analysis needs to be carried out in the provision of orthopedic services in low-income settings so that the gap in service costs can be addressed.

The forest plot depicting the results of the meta-analysis for the advice from others' scores is shown in Figure 3. The proportion of reasons for advice from others versus without advice showed a significant difference in proportion to the use of TBS in fracture cases (MH=1.42, 95% CI=1.18-1.70, I²= 98%, P < 0.00001).

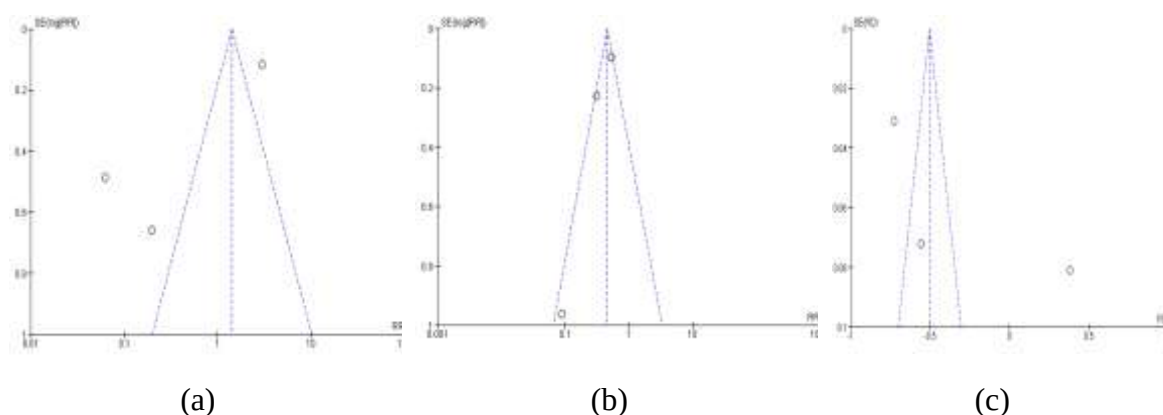


Figure 3. Funnel plot of (a) advice from each other, (b) belief in TBS and (c) economic factor

Based on the funnel plot to have a qualitative analysis of publication bias, it was found that asymmetrically distributed studies indicate that there may be publication bias in our study that affects the results of our analysis, as shown in Figure 3. The choice of the use of TBS in handling fracture cases is also informed by suggestions from the surrounding environment, such as the patient's family and closest people. The results of the meta-analysis found that patients who received advice from others were 1.42 times more likely to use traditional versus without advice. These results are supported by other researchers who found that pressure from friends and relatives influences the decision-making process for the use of TBS in fracture cases. In fact, as many as 58.3% of patients cited suggestions from friends and relatives as the main determinant of choosing a traditional bone determiner. Advice to use traditional orthopedic services most often comes from family members and former patients (Hamad et al. 2024).

Advice from family members or communities plays an important role in guiding patients towards traditional bonesetter, as these are seen as culturally appropriate and holistic. Family members usually influence the selection of TBS in fracture cases, as they trust their relatives' expertise and reputation in healing practices (James et al. 2018). The patient satisfaction rate with TBS reaches 96%, especially in rural areas. This suggests that advice from experienced people significantly influences the selection and reliance on traditional bonesetter for fracture cases.

Family involvement in joint medical decision-making can help improve health outcomes (Suswardany et al. 2015). Conversely, the high demand for treatment of the original bone determinant increases the likelihood of malunion, nonunion, delayed union, compression wounds, chronic osteomyelitis, neglected dislocation, compartment syndrome, Volkmann's ischemic contractures and gangrene. Unsupervised advice from the seller of the herb leads consumers to choose irrational combinations based on the misconception that natural products are inherently safe, despite the potential for complications (Appiah et al. 2018). 40.8% of traditional bone-defining complications observed were non-union fractures of various bones, followed by malunion in 24.5% of cases (Ossai EN et al. 2018).

The widespread use of TBS highlights the need to integrate traditional practices into formal healthcare systems to improve outcomes while preserving cultural heritage. TBS practitioners are often trusted for their ability to provide symptomatic relief for simple fractures and sprains, especially when modern healthcare is inaccessible (Ossai EN et al. 2018). Acceptance in the community despite the high rate of treatment failure associated

with it. So, there is a need to monitor traditional bone determinant activities to improve competence and encourage referrals.

Based on the funnel plot graph, it was found that the graph of factor belief in traditional medicine is symmetrical. While the other 2 graphs show asymmetrical. This illustrates the publication bias on economic factors and suggestions from people close to them. Some of the limitations of this systematic review and meta-analysis are as follows: the limitations of the number of articles analyzed allow for publication bias. Most of the articles analyzed came from 1 country, so these results may be less representative if applied to other regions

4. Conclusion

Factors of ease of accessing services, fear of amputation and surgery, quick attention to treatment, proximity to the point of accident, use of natural remedies, and quick recovery are the reasons that encourage patients to use traditional medicine. Economic factors, belief in traditional medicine, religious beliefs and advice from close people are proven to increase the tendency to choose TBS compared to orthopedic. This discovery contributes to the public's understanding of fracture hazards, a quick referral route from bone setter to a healthcare facility, and communication of complication risk to patients' families. Based on this, it is recommended to increase educational efforts as well as integrate traditional bonesetter services with modern treatment in fracture care to lower morbidity and mortality.

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