WRIST-ANKLE ACUPUNCTURE AND ITS PROCEDURAL VARIATIONS: A SCOPING REVIEW

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Doctor of Acupuncture and Oriental Medicine

by

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I'd like to thank all the little people I stepped on as I rose to the top of my profession.

ABSTRACT

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Introduction

Wrist-ankle acupuncture is a modern style of acupuncture that uses superficial needling at specified points on the wrists and ankles. It is characterized by a diagnostic process that relates symptoms on the body to a zone that is treated using the corresponding acupuncture point. Researchers are using this style of acupuncture; however their procedural methodology is varied and poorly documented.

Method

This scoping review examined the procedure of wrist-ankle acupuncture from 43 sources available for free in English on PubMed as of 8/15/2025.

Results

Variations were found in every aspect of the procedure including diagnosis, point location, needle characteristics, needle insertion, and the use of devices for stimulation of wrist-ankle acupuncture points.

Discussion

The diversity of procedural variations in studies claiming to be wrist-ankle acupuncture dilutes the evidence of the effectiveness of this style of acupuncture. A clear standard needs to be available and utilized for English-language researchers.

INTRODUCTION

As a modality of traditional medicine, acupuncture has been chronicled in at least 1547 Chinese- and Japanese-language modern and classical treatises over more than 2000 years (Birch & Tsutani, 1996). The procedure involves inserting a thin sterile solid needle into the body at specific points to instigate change in the body's physiological state (Smith et al., 2024).

Acupuncture theory is built on many classical texts from ancient China including the *Nei Jing* (Inner Classic) which is comprised of the *Su Wen* (Simple Questions) and *Ling Shu* (Spiritual Pivot) (O'Connor et al., 1981). These set up a framework that makes up a complete system of medicine that allows for diagnosis and treatment.

The transliteration of Chinese characters into an English alphabet set called pinyin is common to identify the Chinese names of acupuncture points. A term in pinyin often doesn't have an equivalent in English and so the Chinese term is retained. For this reason, it is left in italics to note this specific untranslated term. In addition, a standardized naming convention developed by the World Health Organization is used to identify point names and their abbreviations (*WHO Standard Acupuncture Point Locations in the Western Pacific Region*, 2008). This study will follow both of these standardized conventions. Additionally, Acupuncture and Herbal Medicine (AHM) uses terms that are based on the modality such as Lung or Pericardium (Smith et al., 2024). These terms are capitalized to indicate the AHM terms and concepts rather than the Western biomedical concepts of anatomy and associated processes. A complete list of conventions, definitions and abbreviations used in this study are located in Appendix XX.

Acupuncture relies on an individualized approach to point location because of the differences in a person's height and body shape (*WHO Standard Acupuncture Point Locations in*

the Western Pacific Region, 2008). A proportional measurement called a *cun* is used because the same measurement can be applied to people of different sizes when looking at a ratio of the whole. Historically, a human was described as being 75 *cun* tall using the bone *cun* (B-*cun*) measurement (*WHO Standard Acupuncture Point Locations in the Western Pacific Region*, 2008). This is differentiated from the finger *cun* (F-*cun*) measurement in which 3 F-*cun* is the measurement of the four fingers at the proximal interphalangeal joint of the middle finger (*WHO Standard Acupuncture Point Locations in the Western Pacific Region*, 2008). These measures are not identical (Casey, 2020) but they are both used when locating acupuncture points. The word cun is also sometimes translated as "inch" which can add confusion when compared to an absolute measure like the inch or millimeter.

Motivation

One style of acupuncture of interest to the researcher is Wrist-Ankle Acupuncture. During previous searches the researcher noted that the accessibility of peer-reviewed literature on this topic is hampered by language barriers and pay walls. For an average practitioner of acupuncture in the United States, these are likely to be barriers as well.

For the style of WAA specifically, Han et al. (2023) noted that much of the literature is based in China and is presented in Chinese. Trials are being registered in English on clinicaltrials.gov, but some protocols are vague or challenging to understand perhaps due to translation from Chinese. In order to understand where the research is lacking, the current state of the literature needs to be mapped. Once we know what research is available on WAA, a plan can be made to translate or do more research. This will make WAA more widely known and can provide an option for treatment of many conditions in addition to Western biomedicine.

However, practices that are evidence-based require current research that is applicable to a chosen patient population.

Background

There are many styles of AHM that have been developed and have research supporting the use of each specific style. However, there is some lack of clarity when studies refer to "acupuncture" as the modality, without further definition of which specific style. TCM is a common style of acupuncture used in the United States that was recently developed in China as a way of standardizing the medicine. Much of the research is based on TCM, but many other styles of acupuncture exist and are being used in research as well. Examples of these styles include Five Elements, Japanese, Korean-style hand acupuncture, and auricular acupuncture (Smith et al., 2024). It is important to distinguish the evidence that supports each style of acupuncture and the associated populations and conditions.

WAA Background

Wrist-Ankle Acupuncture (WAA) is a modern style of acupuncture developed by Professor Zhang Xinshu of the Department of Neuropsychiatry at Changhai Hospital of the Second Military University. The research was done in the 1960s and published in the 1970s (Lao, 1999; Zhou et al., 2002). The initial publication of this method was later translated by Hwang in 1977 which made it accessible to English-language audiences. Since then, several books have been published in English that are either centered on WAA or include it as one among many styles. English texts on WAA known to the researcher are listed in Appendix XX.

The information published in 2002 by the original creator Professor Zhang Xinshu and his colleagues is the standard that is used as the basis for this research (Zhou et al., 2002). This

study uses the convention followed by Zhou et al. (2002) in that specific points or zones are capitalized and general references are lowercase.

In their book, Zhou et al. (2002) detail the history of wrist-ankle acupuncture. WAA evolved in the treatment of neurological conditions. An early prototype of WAA used perpendicular, deep needles which were heavily stimulated through a short burst electrical current (Zhou et al., 2002). As the style evolved, each of these elements changed:

- Perpendicular needle placement became transverse
- Deep needling became superficial
- Electrical stimulation became no manipulation

In the development of WAA, the treatments used electrical stimulation, but the stimulation was eliminated to increase patient comfort and compliance with the treatment. Ultimately, electrical stimulation was found to not be needed for the effectiveness of the treatment (Hwang, 1977; Zhou et al., 2002).

Wrist-Ankle Acupuncture has been shown to be effective for various conditions including postoperative multimodal analgesia after orthopedic surgery, increasing pain thresholds, and decreasing cancer pain (Bi et al., 2017; L.-P. Xu et al., 2020; N. Xu et al., 2022).

Fundamentals of Wrist-Ankle Acupuncture

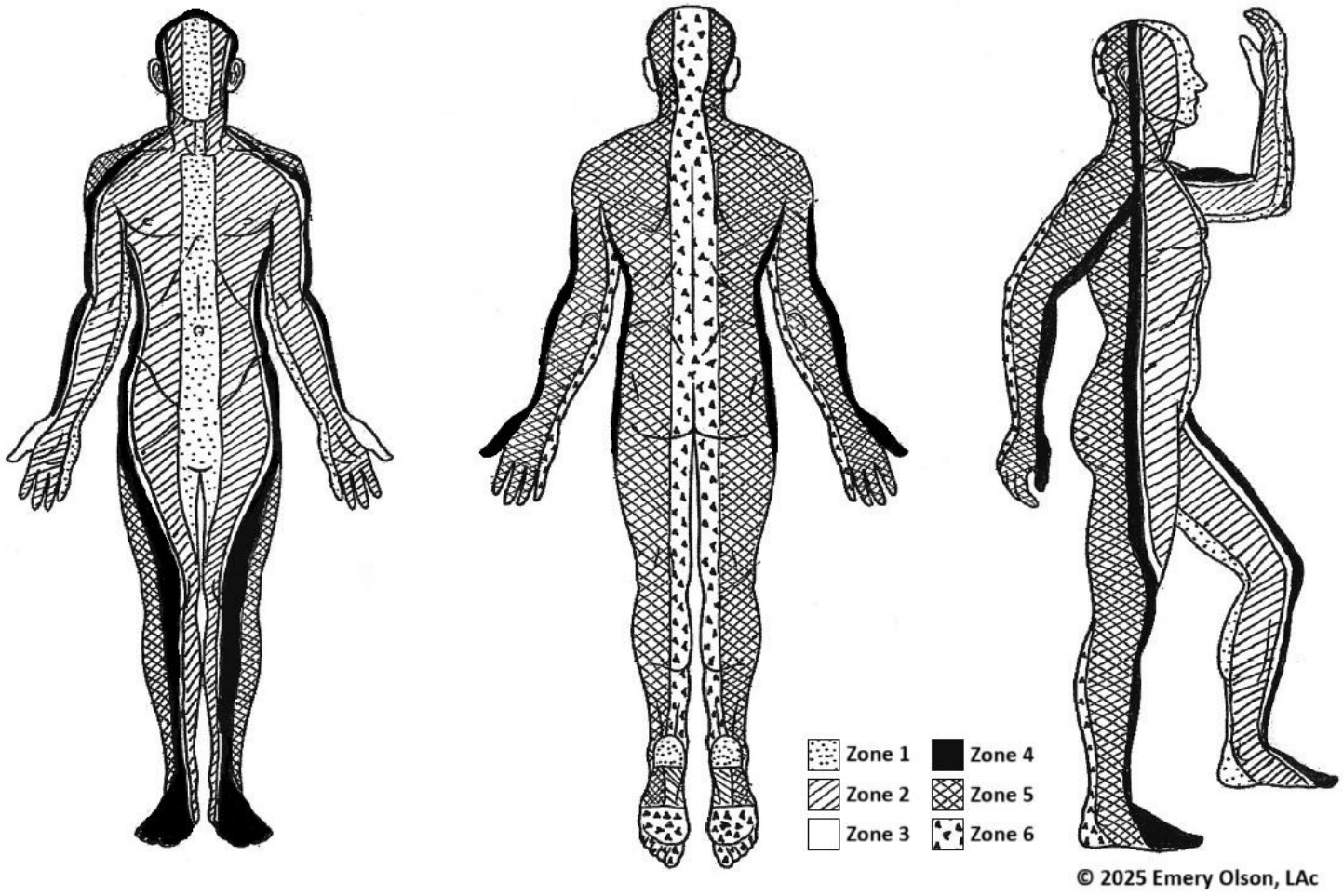
The text authored by Lao (1999) is aimed at teaching acupuncture students WAA. In this text, the author notes a few tenets of this style of acupuncture that support its simplicity:

- There are few points to treat – six on the wrist and six on the ankle.
- The fewer needles used, the better the effect.
- The point used treats symptoms within the corresponding zone.

- Multiple systems can be combined, such as using the point that contains the zone where the tremor line on the scalp is located.
- The style does not require and is more effective when there is no stimulation to the needle and no deqi obtained.
- WAA can be combined with other modalities such as cupping and bloodletting.
- All points are needled with the same technique.

Zones of WAA.WAA relies on a system of body mapping which divides the body into six bilateral longitudinal zones (Figure 1) (Zhou et al., 2002). The zones are numbered 1 through 6 from the anterior midline around the sides of the body toward the posterior midline. Zone 1 is the anterior midline of the body and includes the area approximately 3 cun to either side. Zone 6 is the posterior midline of the body and approximately 3 cun to either side. Zone 4 is the lateral aspect of the body. Zones 2 and 5 make up the majority of the anterior and posterior areas of the body with Zone 3 being a very narrow area between Zones 2 and 4. Each of the WAA zones is then divided at the level of the diaphragm into upper and lower sections. These zones are named for their location within each longitudinal zone and their placement above or below the diaphragm. Examples include “Upper 1” and “Lower 4”, though other terms have been used in the literature, such as “Shuangxia 1” (B. Z. Song & Wang, 1985) and “inferior No. 4” (Chu & Bai, 1997).

Figure 1
Zones of Wrist Ankle Acupuncture.



The limbs are divided in a method not unlike those used for channel-based acupuncture with the upper zones 1 through 6 roughly corresponding to the HT, PC, LU, LI, TB, and SI channels (Lao, 1999). The lower zones 1-6 are similar to the KD, LR, SP, ST, GB, and BL channels respectively (Lao, 1999). The upper and lower zone descriptions are detailed in Appendix XX.

Diagnosis. Diagnosis is based on the symptoms as located on the body (Zhou et al., 2002). The symptom location is located within a particular zone and the associated point will be chosen to treat that area (Lao, 1999). Some complaints may be associated with more than one zone - for example, a medial knee complaint can be associated with Lower 3 and Lower 4 (Zhou et al., 2002).

When the area of the symptom is the entire body or cannot be located - for example, insomnia or night sweating - then Upper 1 is needled bilaterally (Zhou et al., 2002). When the symptoms are one sided, then the point on the same side of the disease is needled (Lao, 1999). If the disease is on the midline either anterior or posterior, then Zone 1 or 6 are to be needled bilaterally (Hwang, 1977). Appendix XX details the common indications for each zone.

Needling Locations. In order to treat conditions using the WAA system, the points associated with the zone must be needled. The needling locations for each zone are located just proximally to the wrist or ankle within the zone they treat. According to Lao (1999), the insertion points for the wrist (Figure 2) are located approximately two finger breadths or 1.5 cun proximal to the wrist crease. Upper 1, 2, and 3 are located on the palmar aspect of the wrist; Upper 4 is located on the radial side of the wrist between the dorsal and palmar aspects of the wrist; and Upper 5 and 6 are located on the dorsal aspect of the wrist (Zhou et al., 2002).

Figure 2
Insertion points of the wrist.

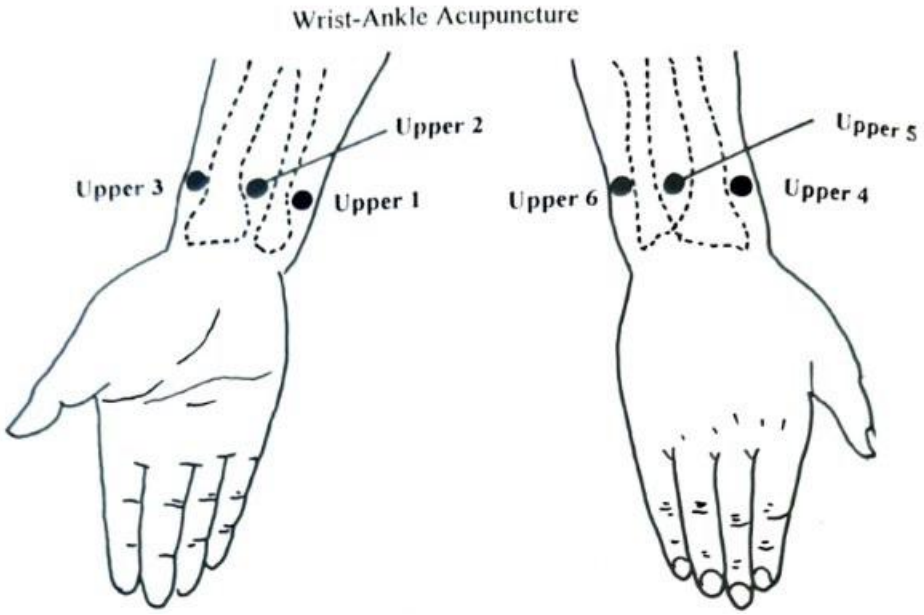
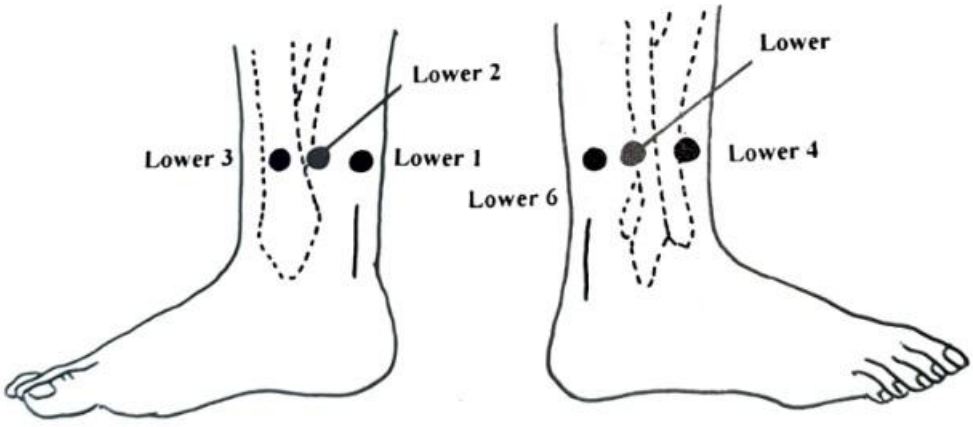


Figure 3 shows the ankle insertion points which are located approximately three finger breadths or 2 cun proximal to the high point of the malleoli (Lao, 1999). Lower 1, 2, and 3 are all located on the medial aspect of the ankle; Lower 4 is on the anterior ankle between the medial and lateral aspects; and Lower 5 and 6 are on the lateral aspect of the ankle (Zhou et al., 2002).

Figure 3
Insertion points of the ankle.

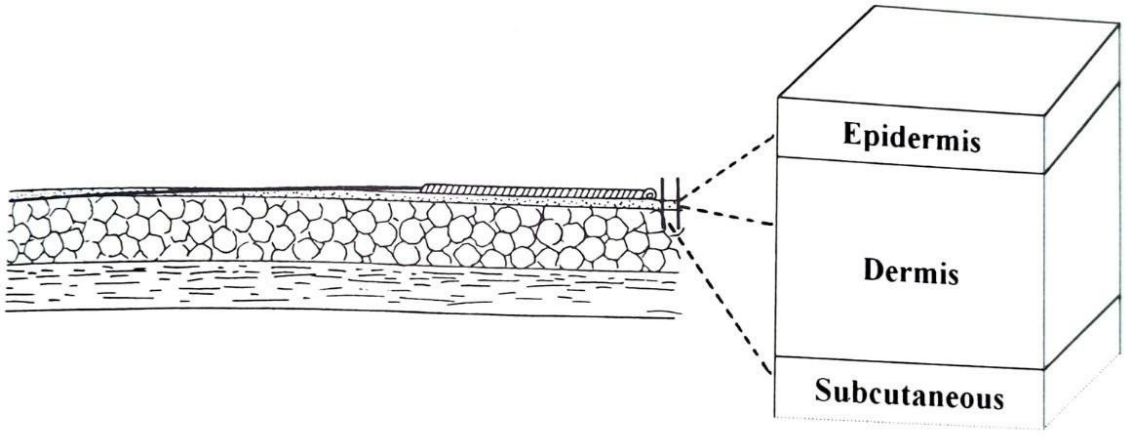


The needle is inserted with the tip of the needle directed toward the area of complaint proximally or distally within the zone (Zhou et al., 2002). For example, the fingers could be treated by Upper 5 directed distally, and the shoulder when directed proximally. Since the needle is threaded under the skin, the location of insertion is what is commonly identified as the point rather than the therapeutic area which is found along the path of insertion (Lao, 1999). When the complaint is distal to the point, the insertion point is often shifted proximally to avoid impeding the joints (Zhou et al., 2002). Additionally, as long as the needle is parallel to the zone, the point of insertion can be shifted a short distance distally or proximally along the zone line to avoid visible vasculature or scars (Hwang, 1977). More research is needed to determine how far a point may be shifted and still be effective.

Several scholars have noted that many of the points used in this system are near the luo points of the 12 primary channels (N. Xu et al., 2022). The Luo channels are complementary channels that affect the body and are related to their similarly named main channel (O'Connor et al., 1981). The Luo channels branch from one channel and move toward another channel and affect the balance between them (Cecil-Sterman, 2012). The Luo point locations as defined by *WHO Standard Acupuncture Point Locations in the Western Pacific Region* (2008) are shown in Appendix XX in comparison to the insertion points of WAA.

Needling Method. The needling method for WAA differs from many other acupuncture styles, as the needles are inserted very superficially, threaded just under the dermis as shown in Figure 4 (Lao, 1999). Originally, superficial needling was used for treating pain caused by Cold Excess (O'Connor et al., 1981).

Figure 4
Needle position under the skin after insertion.



According to Zhou et al., the method of insertion involves stretching and pinning the skin with the thumb of one hand and swiftly puncturing the dermis at a 30 degree angle so just the tip is inserted (2002). With the tip still inserted, the angle of the needle is then changed to lie close to the surface, often 10-15 degrees and is advanced under the skin for the length of the needle less approximately 1 mm (Zhou et al., 2002). The needle should be just visible underneath the skin (Lao, 1999). The practitioner should feel no resistance as the needle is advanced (Hwang, 1977). If sensation is felt by the patient, the needle is likely too deep and it needs to be re-positioned to a shallower depth (Lao, 1999).

Point locations of WAA insertion points are noted to vary by source (Lao, 1999; Zhou et al., 2002). The terminology regarding measurement varies including terms such as “cun”, “finger-breadth”, “inch”, and “centimeter” (Lao, 1999; B. Z. Song & Wang, 1985; Wu et al., 2023). These variations can lead to differences in the point location. Inch and centimeter are both absolute measurements and are the same everywhere. Cun is a proportional measurement that has different absolute measurements based on the size of a body (*WHO Standard*

Acupuncture Point Locations in the Western Pacific Region, 2008). However, the Chinese term *cun* can be translated into English as "inch" which complicates the understanding because it conflates a proportional measurement with one that is absolute.

In many systems of acupuncture, a sensation (*deqi*) is expected and desirable, however in WAA, sensations at the site of the needle are said to hinder results (Lao, 1999). *Deqi* is a subjective feeling by the patient that can be described as heavy, sore, numb, and/or distending (O'Connor et al., 1981).

Needles are frequently left for about 30 minutes (Hwang, 1977), though more severe conditions often utilize longer retention times (Lao, 1999; Zhou et al., 2002) by taping the needle in place, sometimes up to multiple days (Marra et al., 2011). When the needle is correctly inserted, the patient can't feel the needle and they can move freely (Lao, 1999). The needle handle can be taped to the skin to ensure it does not shift during the treatment (Zhou et al., 2002). When needles are placed appropriately, they will elicit no sensation even during movement which can be beneficial during sessions of physical therapy (N. Xu et al., 2022).

A treatment course of WAA is often recognized as 10 treatments (Zhou et al., 2002). Treatments are often administered daily for acute and every other day for chronic concerns (Lao, 1999). More than one course may be needed based on the condition response to treatment (Hwang, 1977).

Zhou et al. describe their understanding of the mechanism of action of WAA, "Subcutaneous needling relieves the spasm from the affected area by the conduction of nerve ending, the improvement of blood circulation, remission or elimination of symptoms" (2002). Recent studies hypothesize that neurotransmitters could also be involved (C. Zhang et al., 2020).

Proponents of WAA note that it is simple to learn and execute, and is both painless and effective (He et al., 2022). One translator (Hwang, 1977) went as far as to report that practitioners of this style do not need to practice medicine because of its simplicity. Given the simplicity of this style of acupuncture, and the potential benefit for a variety of conditions, it is deserving of further study.

Weaknesses of the Current Literature

There are several weaknesses in the current literature. One of these weaknesses is the presence of variations in the protocols associated with WAA. Among the differences in the protocols that seem to differ from the standard are differences in point location, duration of needle retention, manipulation / stimulation, and naming conventions of points. A second weakness is the lack of literature in English. A third weakness is the lack of literature requiring no payment to access.

At this point, it is not known what matters in the effectiveness of WAA treatments. With literature that is so heterogeneous, it is difficult to draw conclusions. It may therefore be beneficial to establish a standard of WAA such that research can be done from a common foundation and in the future establish the effectiveness of a standard WAA treatment.

Much of the literature on WAA is not available in the English language (Han et al., 2023) which limits the evidence base from which future research can be based by English-language research teams.

Variations of Wrist-Ankle Acupuncture

Given how this style of acupuncture came into existence, there is some clarity needed around what exactly constitutes a WAA treatment and what variations exist. There is a need for a determination of what is within the scope of the style and what is not.

Despite this lack of cohesion, many studies use the term Wrist-Ankle Acupuncture as a basis for research and treatment, even when referring to different techniques (Correa et al., 2020)

This poorly defined divide between WAA variations and their effectiveness weakens the research base by failing to account for the context in which each variation is applicable. The resulting lack of clarity limits the generalizability of findings and hinders the development of standardized treatment protocols. However, some effort at standardization of this style has occurred, as demonstrated by the existence of a text in Chinese detailing a 2009 standard created by the State Bureau of Quality and Technical Supervision (GB/T 21709.19-2009). Unfortunately, the text was not available to the author.

Objective of the Study

The objective of this study is to map the English-language literature of Wrist-Ankle Acupuncture (WAA). The aim is to compare the major characteristics of documented procedures to a common standard. This study will contribute to the body of evidence by mapping existing literature, identifying gaps, and providing direction for future research to enhance clinical application. The underlying research question for this study is "What is known about the evidence base of literature for the procedure of Wrist Ankle Acupuncture (WAA) and its related variations?"

Due to the mapping nature of the research question, a scoping review was selected. Through the well-known frameworks of scoping reviews (Arksey & O'Malley, 2005; Levac et al., 2010), this study will provide a comprehensive overview of the existing research landscape on various procedures of WAA, laying the groundwork for future studies on the effectiveness of each variation.

By addressing the variations in WAA, this project delineates the boundaries of a specific named style of acupuncture. Filling that research gap advances the understanding of WAA by identifying the components of a WAA treatment. These advancements improve our understanding of what makes a successful acupuncture treatment. That improved understanding helps to inform clinical guidelines, which contributes to improved patient care and reduced disease burden.

METHODS

Methods Overview

The research questions this study aimed to answer are based on a single conceptual question with two sub-questions.

What is known about the evidence base of literature for the procedure of Wrist-Ankle Acupuncture (WAA) and its related variations?

RQ1: What variations exist in diagnosis, point selection methods and point location?

RQ2: What tools are being used to perform WAA and how are they used?

In order to answer these research questions, qualitative data were collected. Specifically, details about the utilized protocols were extracted. Data from the articles located were noted and analyzed for commonalities and gaps. The breadth of information sought led the author to choose a scoping review to answer the research questions.

Arksey and O'Malley (2005) note that when multiple study designs address the field of interest, a scoping review can be used to map the topics present. The authors set out a methodological framework that outlined the stages in a scoping review. That framework was updated by Levac et al. in 2010. Below is a summary of each stage of the process.

Overview of the Scoping Review Process

The steps outlined by Arksey and O'Malley (2005) and later updated by Levac (2010) were followed in this scoping review.

Stage 1: identifying the research question: Using a broad survey of literature, a topic of interest was selected which informed the research questions.

Stage 2: identifying relevant studies: Several representative articles were identified and used to craft a search strategy including terms and inclusion / exclusion criteria. Databases were selected for the search for relevant literature. Reference lists were also used to locate studies.

Stage 3: study selection: A date for the final search was set and a deadline was created for the final collection of articles. The screening process was outlined prior to screening the articles.

Stage 4: charting the data: Information about the study characteristics was collected using a data extraction tool. This was used to capture details about the study protocol and conditions. This was an iterative process as themes in the literature were noted.

Stage 5: collating, summarizing and reporting the results: Information was charted into tables and figures using a process of thematic analysis. Gaps in the evidence base were identified.

Stage 6: consultation: Interaction with stakeholders can be used to inform the review. Consultation was not used due to limitations of time and resources.

Limitations of the Study Design. This study was conducted by a single author which inherently introduces bias. Time and resources were limited which led to choices that limited the breadth and scope of the research question and subsequent analysis. Despite these limitations, this scoping review addressed the research questions using the methodological process outlined here.

Stage 1: Identify the Research Question

The first stage involved identifying the research question using a broad survey of the literature. From this a topic of interest was selected which in turn informed the research questions.

Wrist-Ankle Acupuncture was identified as an initial area of interest. A broad survey of the literature was undertaken and the author found discrepancies in descriptions of how this style of acupuncture was performed. To examine these differences, this study aimed to map all literature in English that is on a type of acupuncture that could be either Wrist-Ankle Acupuncture or a related adjacent type of WAA.

A research question was developed to describe the current available literature: What is known about the evidence base of literature for the procedure of Wrist Ankle Acupuncture and its related variations?

Additionally, sub-questions were crafted to clearly define the scope of the study.

RQ1: What variations exist in diagnosis, point selection methods, and point location?

RQ2: What tools are being used to perform WAA and how are they used?

The research question was used to identify relevant studies.

Stage 2: Identify Relevant Studies

The second stage is identifying relevant studies. This process entailed locating representative articles and using them to craft search terms for selected databases. The search was performed with limiters as outlined in the inclusion and exclusion criteria. Finally, reference lists were scanned for additional literature inclusion.

During the initial survey of literature, several articles were identified as representative articles of variations of WAA. Some detailed specific point locations, needle sizes, depths and angles of insertion, and types of acupuncture that were similar or identified by the study author as being based on WAA. These sources were used to identify search terms that were used locate articles that could answer the research questions.

In order to locate relevant studies, an initial set of search terms were developed using a combination of keywords, Medical Subject Headings (MeSH) terms, and index terms that encompassed the location and depth of the needling; the types of points selected; type of stimulation; and known styles of acupuncture that are similar to WAA. As data was charted in Stage 4, the search strategy was updated. The final list of search terms and the complete search strategy for PubMed are located in Appendix XX and XX.

Though a wide range of databases were considered to capture as many studies as possible on the topic, ultimately only PubMed was utilized due to time and resource limitations.

Inclusion and exclusion criteria were developed to answer the research question. The primary inclusion criterion was that studies must be about the topic of WAA or a similar style of acupuncture. The nature of a scoping review means that "a similar style of acupuncture" is both the search scope as well as the delineating factor between styles. The variations were iteratively categorized in stages 4 and 5 which in turn informed stages 2 and 3.

Exclusion criteria were adapted during the study as an exploratory process was utilized. The exclusion criteria were applied in the order noted. A source could have been excluded for multiple reasons; however, the first exclusion criteria met was noted in the PRISMA diagram and no further evaluation of exclusion criteria was applied. The final inclusion and exclusion criteria are noted below.

Inclusion:

- Wrist ankle acupuncture or similar variation using search terms such as outlined in search terms.

Exclusion:

- Studies that do not clearly meet the inclusion criteria

- Not available in English
- Not WAA
- Only body acupuncture or microsystem
- Intervention is WAA plus other modality (herbs, etc.)
- Poor quality literature reports
- Incomplete information
- Only abstract
- Opinion piece

The search was limited to English-language sources. No limitations were placed on the year or location of publication. The records were limited by free full-text access or those easily obtained through relationships with colleagues. Once the initial group of studies were identified, study selection was undertaken.

Stage 3: Study Selection

Stage three is the study selection process. Deadlines for the final literature search (8/15/2025) and collection (9/1/2025) were set to allow time for analysis and writing. The screening process was outlined prior to screening the articles and includes 1) deduplication, 2) screening the title and abstract of each source, and 3) screening the full text of sources.

After the records were located, they were uploaded to an online app for systematic reviews called Rayyan (Ouzzani et al., 2016) for deduplication, screening, and data extraction. All articles flagged for deduplication were verified by the author and AI was not used except as an auto-highlighting tool for visual comparison. The fields that were compared were the title, author(s), year of publication, journal of publication, and DOI. Where doubt of record duplication existed, further investigation was done at the title and abstract level or through full

text, depending on what was available. When records were found to be similar in concept as determined by the title and abstract, further verification was justified, including the comparison of Chinese names and comparison of the results in the abstracts. This was done due to the infrequent misidentification of authors' given and family names.

The process of screening articles was an iterative process that took place at two primary levels: title and abstract, and the full text. This fed into the identification of relevant studies in stage two.

Title and Abstract Screening. The title and abstracts were screened against the inclusion criteria into three categories using the question, "Does it meet the inclusion criteria?" Possible answers were "No", "Yes", "Unclear" and "Abstract Unavailable".

Those that did not meet the inclusion criteria (a "No" answer) were excluded at the title and abstract level with no specific reasons noted in the PRISMA flowchart.

Those that met the inclusion criteria at the title and abstract level (a "Yes" answer) were then screened at the full text.

Sources where it was unclear if the article met the inclusion criteria were marked as "Unclear". When a source did not have an abstract available, the title was investigated for possible inclusion using the hand search criteria below. It was excluded if it did not meet either criterion and labeled "Abstract Unavailable" if it met at least one criteria and was to be evaluated at the full text level.

- The title of the reference must contain the word "acupuncture" or a related concept as outlined in the search terms (Appendix XX)
- Any review article was flagged for further evaluation (as indicated by words such as "meta-analysis", "scoping review", "review", etc.) if is was not a clearly

irrelevant article (as indicated by extreme topic difference: tobacco, veterinary science, apheresis, etc.)

Both "Unclear" and "Abstract Unavailable" sources were screened at the full text level.

Full Text Screening. Sources were screened at the full text level if one of three conditions were met: the title and abstract clearly indicated a source fit the inclusion criteria ("Yes"); if it was unclear through the title and abstract if the inclusion criteria were met ("Unclear"); or if there was no available abstract to screen ("Abstract Unavailable").

For "Unclear" and "Abstract Unavailable" sources, the full text was screened for the inclusion criteria. If the inclusion criteria were not met, then the source was noted as excluded with the reason of "inclusion criteria not met".

If either the full text or title and abstract indicated that the inclusion criteria were met, then the full text was evaluated for the exclusion criteria. If the exclusion criteria were met, then the reasons were noted in the PRISMA flowchart (Figure 5) and the sources were excluded. All articles not excluded were included in the review.

Selected studies were then charted based on identified themes.

Stage 4: Charting the Data

Stage four is charting the data. Data from each study was collected using a data extraction tool. It was used to capture data about the study characteristics, protocols, and results. This data was used to identify common themes in the literature. As the study progressed, the tool and the themes were updated iteratively based on previous results.

Data Extraction Process. Data was collected through using questions developed by the author under the guidance of the review committee. A list of the extraction questions is located in Appendix XX.

The data extraction tool was updated iteratively during extraction. Once five sources were noted to have a common theme, the tool was updated and previously charted articles were reviewed for that theme. A final review was completed after all themes were noted to check for any that may have been missed.

Data Extracted. Study characteristics include author, title, year published, institutions of affiliation for each author, country of publication, and study type. The data extracted from each study are qualitative elements that are located in Appendix XX.

Qualitative Data Extracted. The qualitative data extracted related to the "PICO framework" of each study.

The population / patient / problem / procedure section included:

- Conditions treated

The intervention included the details of each treatment protocol:

- Name of style of acupuncture per the study
- Points named
- Diagnostic method and relationship to points chosen
- Location of needle insertion site - unilateral or bilateral
- Angle of needle insertion
- Depth of needle after placement
- Length of needle in the body vs. what was left not inserted
- Dimensions and characteristics of the needle including length, diameter, brand, and material
- Retention of needles / duration of session
- Frequency of treatment (number of sessions per week, etc.)

- Treatment course (number of sessions under research conditions)
- Stimulation of points (manual, electroacupuncture settings)
- Use of non-needle techniques (pressure, laser)
- Type of device (electronic vs pressure)
- Device details
- Definition of sham treatment

Comparison and concurrent treatments were also noted using the intervention data categories when they were related to WAA or a variant.

Outcome data was not collected as it did not pertain to the procedure of WAA.

Additionally, the study-author identified areas of further research needed and the strengths and limitations of the source were noted.

Quantitative Data Extracted. Quantitative data was not extracted.

Charting the data informs the next stage which entails collating, summarizing and reporting the results.

Stage 5: Collating, Summarizing and Reporting the Results

Stage five is collating, summarizing, and reporting the results. As the data in the extraction process were charted and collated, themes emerged which iteratively informed earlier stages. This allowed for the breadth of the literature to be examined. The data were summarized to report on themes noted.

Themes were noted in an iterative process during source review and data extraction. These themes closely aligned with the elements defined in Zhou et al.'s standard for the procedure of WAA (2002). Results were reported around the central themes.

Collating, summarizing and reporting the results informs the next stage which entails consulting those for whom the scoping review will benefit.

Stage 6: Consultation

Consultation is a step that can be undertaken when the review will be used to inform policy or future directions. It was not utilized in this scoping review due to project constraints.

Limitations

This study has several limitations relating to the design. First, a single author conceptualized, designed, and performed the experiment. Additionally, the same author extracted and interpreted the data. Further, time and resources limitations interfered with the gathering of some sources. Finally, the project was completed on a short timeline which led to the prioritization of more apparent themes.

This study was completed by a single author, though external guidance was received. As such, bias was introduced through assumptions and choices made. The data extraction tool was populated with questions and validated for this study through self-referential processes. Defining what was and was not Wrist-Ankle Acupuncture as a single author was a difficult task as other researchers could not weigh in on the explicit definitions.

Time and monetary resource limitations were many. Hand searching of selected journals was considered, but ultimately was not undertaken. Literature was often inaccessible due to subscription and institutional affiliation requirements. Secondary themes were not examined in depth and translations from languages other than English were not made. Results and effectiveness were not evaluated.

Despite these limitations, the experiment produced data that began to map the field as it relates to wrist-ankle acupuncture and related variations.

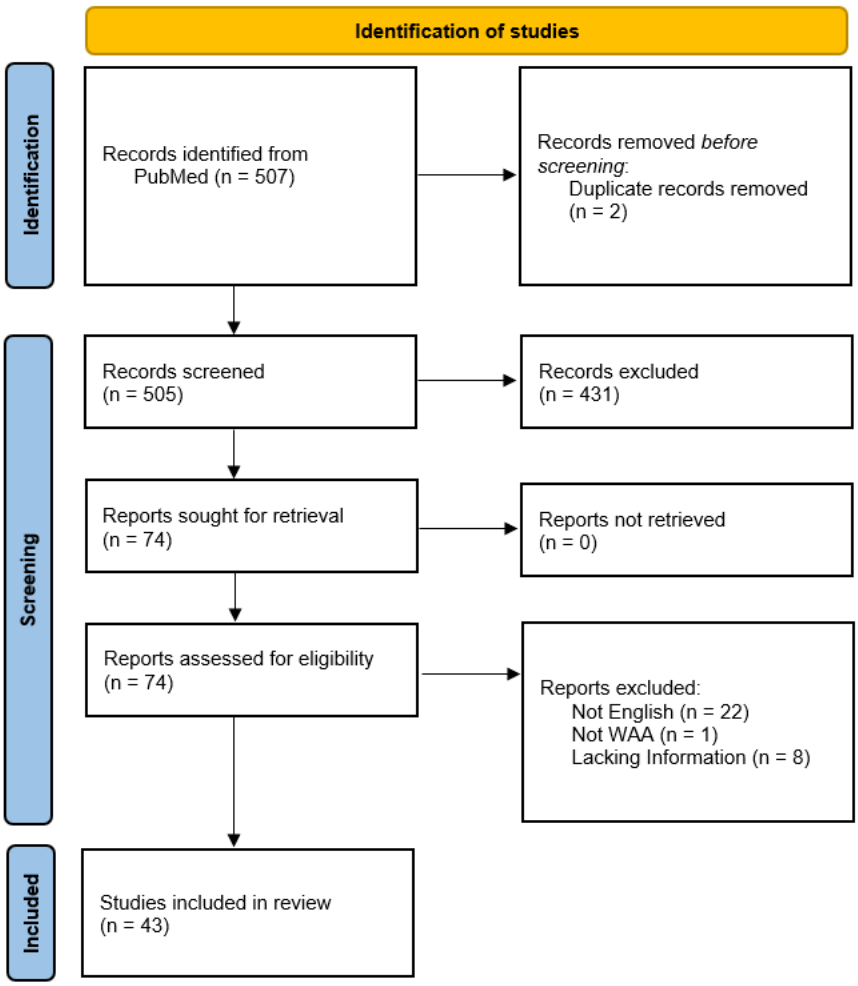
This scoping review follows the framework developed by Arksey and O'Malley (2005) and updated by Levac et al.(2010). Stage one focused on defining the purpose of the study through the development of a research question. The research sub-questions inform the landscape of literature on the procedure of wrist-ankle acupuncture - what is the essence of the style versus a variation on the core style. Stages two and three outlined the process of identifying and selecting relevant studies that would help answer the research question. Stage four focused on charting the data through data extraction and theme identification. Stage five looked at the data and themes identified and summarized what was found, noting gaps in the current evidence base. The methods used enabled the collection and characterization of the data presented.

RESULTS

This scoping review extracted data from 43 studies across six primary categories to address the research questions. As an overview of the available evidence on the topic, the study characteristics are charted in section 1, Study Characteristics. In Section 2, Diagnosis and section 3, Point Location, the data answer Research Question 1: What variations exist in diagnosis, point selection methods and point location? The final three sections - Section 4, Needle Characteristics; section 5, Needle Insertion; and section 6, Device Characteristics - answer Research Question 2: What tools are being used to perform WAA and how are they used?

To answer these questions, 507 records were identified through PubMed. After de-duplication, 505 records were screened and 431 were found to be irrelevant. 74 reports were sought for retrieval and assessed for eligibility. 31 were excluded for various reasons including not in English (22), not WAA (1) and Lacking Information (8). There were 43 studies included in this scoping review. This information is documented in Figure 5 PRISMA Flowchart.

Figure 5
PRISMA Flowchart



Study Characteristics

This scoping review cataloged study characteristics including the year of publication, study authors, and location of study. Study design details were captured. The publication patterns by study type and year were analyzed and broken down into four author-defined periods of publication patterns.

As shown in Table 1, of the 43 studies that were included in the analysis, 4 were meta-analyses, 28 were randomized control trials (RCT), 4 were case reports, and the remaining 7 did not clearly define their study design.

Table 1
Study Characteristics: Authors, Year, and Reported Design (N=43)

Author (Year)	**Reported Design**			
	Meta-analysis	**RCT**	**Case Report**	**Unclear**
Song and Wang (1985)			**X**	
Chu and Bai (1997)			**X**	
Zhu et al. (1998)				**X**
Jiang et al. (2006)		**X**		
Chan et al. (2009)		**X**		
Marra et al. (2011)				**X**
Zeng et al. (2014)*		**X**		
Zhu et al. (2014)	**X**			
Liu et al. (2015)		**X**		
Shu et al. (2015)		**X**		
Bi et al. (2017)				**X**
Chen et al. (2017)		**X**		
Lu et al. (2020)			**X**	
Shi et al. (2020)				**X**
Xu et al. (2020)*		**X**		
You et al. (2020)		**X**		
Zhai et al. (2020)^		**X**		
Zhang et al. (2020)		**X**		
Dong et al. (2021)**	**X**			
Li, J. et al. (2021)		**X**		
Li, W. et al. (2021)		**X**		
Song et al. (2021)		**X**		
Yuan et al. (2021)		**X**		
Dong et al. (2022)		**X**		
Du et al. (2022)		**X**		
He et al. (2022)		**X**		
Hou et al. (2022)		**X**		

Author (Year)	Reported Design			
	Meta-analysis	**RCT**	**Case Report**	**Unclear**
Shi et al. (2022)		**X**		
Xu, N. et al. (2022)	**X**			
Xu, Z. et al. (2022)		**X**		
Cao et al. (2023)		**X**		
Chen et al. (2023)	**X**			
Du et al. (2023)				**X**
Han et al. (2023)		**X**		
Kong et al. (2023)		**X**		
Wu et al. (2023)				**X**
Zheng et al. (2023)				**X**
Chen et al. (2024)		**X**		
Huang et al. (2025)		**X**		
Zhai et al. (2024)^^		**X**		
Liu et al. (2025)			**X**	
Pu et al. (2025)		**X**		
Zhang et al. (2025)		**X**		
TOTALS (N=43)	**4**	**28**	**4**	**7**

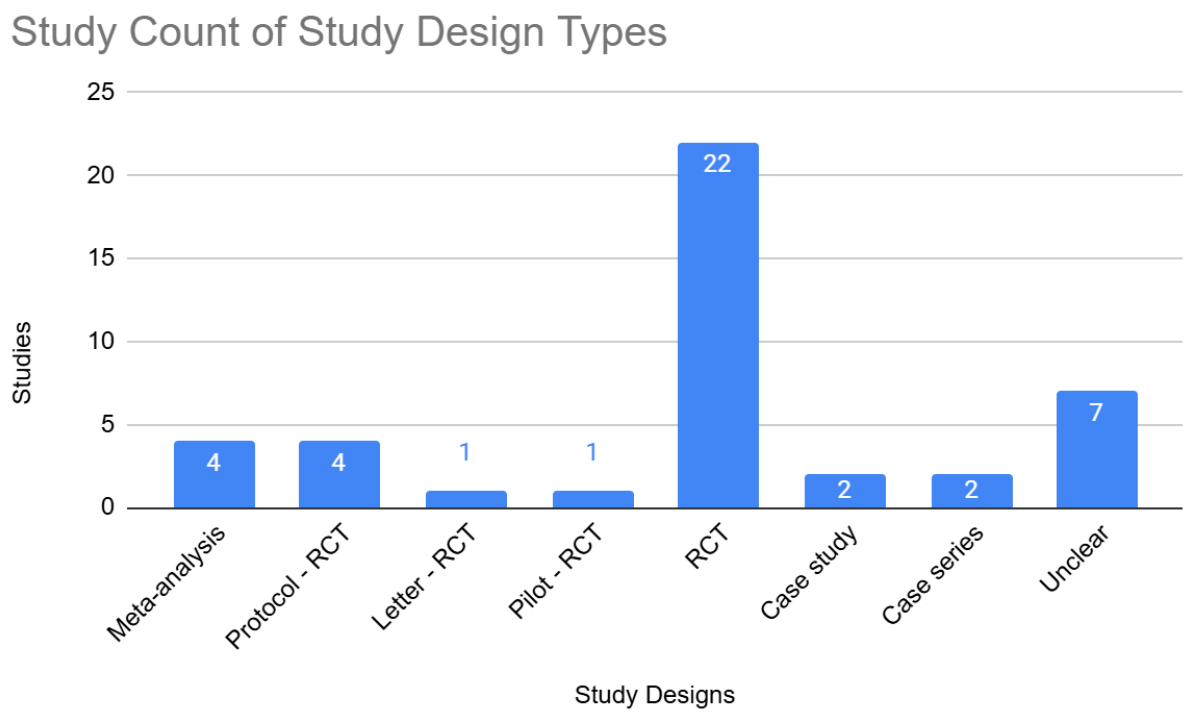
Note. RCT includes protocols and pilot studies; Case Report includes case studies and case series; Unclear includes studies with ambiguous methodological descriptions.

* Zeng et al., 2014 and Xu et al., 2020 were both part of the meta-analysis by ** Dong et al., 2021

^ Zhai et al., 2020 was the protocol for the later study ^^ Zhai et al., 2024

Of the four meta-analyses, only one (*Dong et al. 2021) referenced other studies (**Zeng et al. 2014, **Xu et al. 2020) that were also included in this scoping review. Of the 28 RCTs, four were protocols, one was a pilot study, and one was published as a letter to the editor. The remaining 22 were standard RCTs. One protocol (^Zhai et al. 2020) was used to perform a later RCT by the same team (^^ Zhai et al. 2024).

Figure 6
Study Count of study design types



Note. RCT = randomized controlled trial

Figure 6 shows the frequency for the study designs with two of the larger study design categories broken down into the specifics. For the randomized controlled studies, there were four protocols for RCTs, one letter to the editor that detailed an RCT, one pilot study, and 22 standard RCTs. The case report category contained two case studies and two case series. Neither the meta-analysis (N=4) nor the unclear (N=7) groups were further broken down.

Figure 7 demonstrates the chronological development and research interest in WAA with an increasing trend in publication on WAA since 2020.

Figure 7
Publication Timeline of WAA Studies (1985-2025)

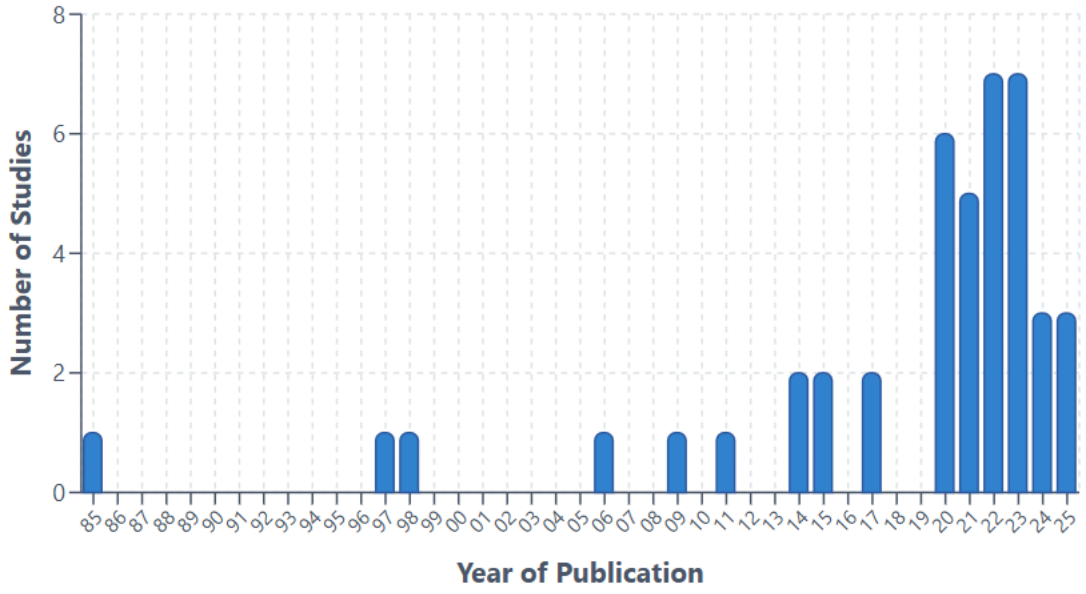


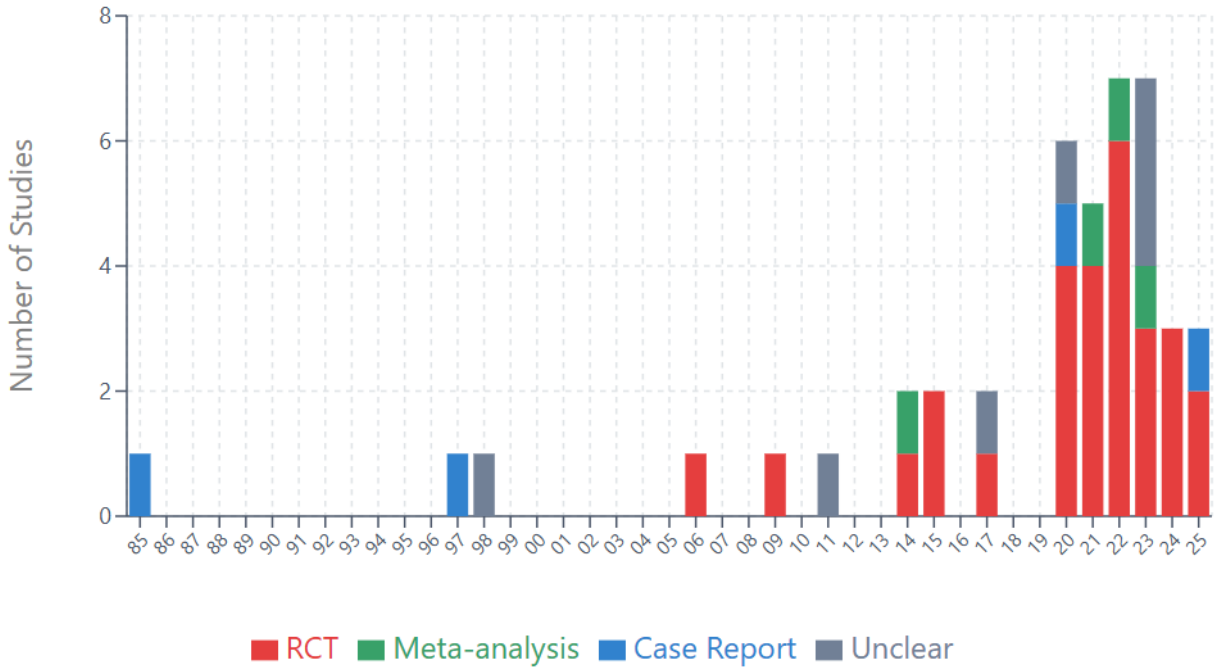
Figure 8 breaks down the timeline in Figure 7 and shows the progression of research through four author-defined periods. The upper left quadrant shows the Pioneer Studies (N=3) from 1985 to 1998 with an average of 0.3 studies being published over those 14 years. After a gap of seven years, the first RCT was published. The upper right quadrant shows the Early Modern Research (N=3) phase from 2006 to 2011. There was another gap from 2012 to 2013, after which the Established Research (N=6) phase began with the publication of the first meta-analysis. This is shown in the lower left quadrant. The lower right quadrant shows the current Peak Period (N=31) beginning in 2020 and continuing until 2025. This period has the highest average of studies per year (5.3) - a large gain from the previous two at 0.5 and 1.3 studies published per year.

Figure 8
Research Periods

Pioneer Studies (1985-1998) **3 studies across 14 years** **Average: 0.2 studies/year**			**Early Modern Research (2006-2011)** **3 studies in 6 years** **Average: 0.5 studies/year**		
Year	**Studies**	**Period**	**Year**	**Studies**	**Period**
1985	1	Pioneer	2006	1	Early Modern
1986-1996	0	Pioneer	2007-2008	0	Early Modern
1997	1	Pioneer	2009	1	Early Modern
1998	1	Pioneer	2010	0	Early Modern
1999-2005	0	Gap	2011	1	Early Modern
Established Research (2014-2017) **6 studies in 4 years** **Average: 1.5 studies/year**			**Peak Period (2020-2025)** **31 studies in 6 years** **Average: 5.2 studies/year**		
Year	**Studies**	**Period**	**Year**	**Studies**	**Period**
2012-2013	0	Gap	2020	6	Peak
2014	2	Established	2021	5	Peak
2015	2	Established	2022	7	Peak
2016	0	Established	2023	7	Peak
2017	2	Established	2024	3	Peak
2018-2019	0	Gap	2025	3	Peak

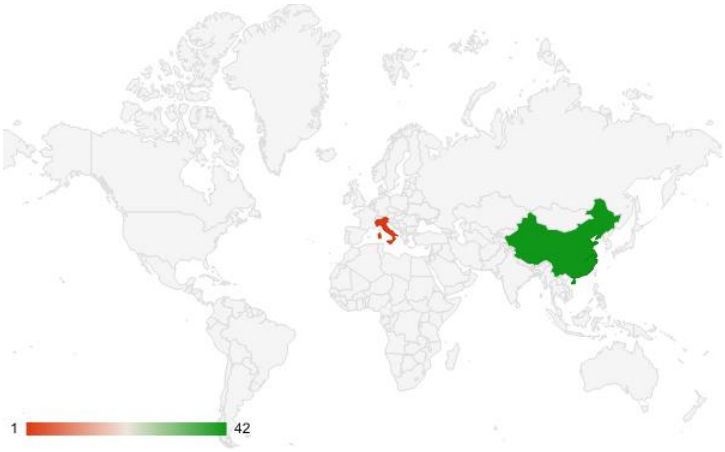
Figure 9 shows the change in methodological reporting over time. Early studies were case reports. It was only in the last 20 years that RCTs began to be published, and the first meta-analysis wasn't published until 2014. In the last five years however, several meta-analyses have been published.

Figure 9
Study Design Distribution in WAA Literature



The research on WAA is heavily concentrated in China and nearly all the studies were performed in China (Figure 10). Only one study was performed in Italy (Marra et al., 2011).

Figure 10
Geographic Distribution of WAA Research



There is an increasing trend of publication on the topic of WAA within China in the English language. Primarily RCTs are being published, but more meta-analyses have been performed over the last 5 years. However, the studies upon which the analyses were done are generally not available in English. Though based on a single style of acupuncture, these 43 studies differ in their application of the style's main tenets, including the diagnostic principles.

Diagnosis

The diagnostic principle of WAA is based on a correspondence of symptoms mapped to a zone of the body. Based on the zone of the symptoms, a particular point is chosen. Systemic symptoms and conditions that cannot be specifically located are exceptions. In that case, one would select Upper 1 as the point to treat. The included studies mostly did not clearly state their diagnostic principles and point selection methods.

To review the diagnostic principles, data was extracted. First, the studies are outlined in their diagnostic approach, standardization of the point protocol of the study, and the use of single or multiple points. Then the diagnostic approaches are examined. Second, the anatomical distribution of the conditions treated across studies are outlined and the application categories are broken down by different regions of the body. Third, the points chosen to treat various conditions are examined with a focus on whether the study point protocol was standardized or personalized. Finally, the points used are tabulated individually and in combination.

Table 2 shows the study characteristics for diagnostic approaches, standardization of point selection for the study or personalization for the patient, and the point selection pattern - whether a single or multiple points.

The Point-Zone correspondence uses the terminology of the relationship between the points chosen and the zone of the condition, whereas the Theory category is vague and may only

report that diagnosis is based on WAA theory or principles. The Specific Standard uses a standardized diagnosis process that is referred to as a person's standard (Zheng et al., 2023), or an institution's standard (W. Liu et al., 2025; B. Z. Song & Wang, 1985). Other was a category that encompassed less explicit diagnostic processes: manufacturer's instruction leaflet for a device study (Chan et al., 2009), clinical experience (Shi et al., 2020), mechanism of WAA in traditional Chinese medicine (Du et al., 2023), and as designated in a previous protocol (Zhai et al., 2024). Not Noted meant the diagnostic approach was not specified in the study. There were 17 studies (39.5%) that did not specify their diagnostic approach. The approaches are displayed relatively in Figure 11.

Table 2 also notes whether the points chosen are standardized for the study or personalized for the patient and if the points chosen for the study are a single point or multiple points.

Table 2
WAA Study Characteristics: Point Selection, Standardization, and Diagnostic Approaches (N=43)

Author (Year)	**Diagnostic Approach (N=43)**					**Standardization (N=37)**		**Point Selection (N=36)**	
	Point/Zone	**Theory**	**Specific**	**Other**	**Not Noted**	**Standard**	**Personal**	**Single**	**Multiple**
Song and Wang (1985)			**X**			**X**		**X**	
Chu and Dong (1997)					**X**	**X**			**X**
Zhu et al. (1998)	**X**								

Author (Year)	Diagnostic Approach (N=43)					Standardization (N=37)		Point Selection (N=36)	
	Point/Zone	Theory	Specific	Other	Not Noted	Standard	Personal	Single	Multiple
Jiang et al. (2006)					X		X		X
Chan et al. (2009)				X		X			X
Marra et al. (2011)					X	X		X	
Zeng et al. (2014)	X					X			X
Zhu et al. (2014)					X				
Liu et al. (2015)					X	X		X	
Shu et al. (2015)	X					X		X	
Bi et al. (2017)	X					X		X	
Chen et al. (2017)	X					X		X	
Lu et al. (2020)					X		X		X
Shi et al. (2020)				X		X			X
Xu et al. (2020)	X						X		

Author (Year)	Diagnostic Approach (N=43)					Standardization (N=37)		Point Selection (N=36)	
	Point/Zone	Theory	Specific	Other	Not Noted	Standard	Personal	Single	Multiple
You et al. (2020)					X	X		X	
Zhai et al. (2020)	X					X			X
Zhang et al. (2020)					X	X		X	
Dong et al. (2021)					X				
Li, J. et al. (2021)					X	X			X
Li, W. et al. (2021)					X	X			X
Song et al. (2021)	X						X	X	
Yuan et al. (2021)	X					X		X	
Dong et al. (2022)					X	X			X
Du et al. (2022)					X	X		X	
He et al. (2022)		X				X			X
Hou et al. (2022)		X				X			X

Author (Year)	Diagnostic Approach (N=43)					Standardization (N=37)		Point Selection (N=36)	
	Point/Zone	Theory	Specific	Other	Not Noted	Standard	Personal	Single	Multiple
Shi et al. (2022)		X				X		X	
Xu, N. et al. (2022)					X				
Xu, Z. et al. (2022)		X				X			X
Cao et al. (2023)		X				X			X
Chen et al. (2023)					X	X			X
Du et al. (2023)				X		X		X	
Han et al. (2023)		X				X		X	
Kong et al. (2023)	X					X			X
Wu et al. (2023)					X	X			X
Zheng et al. (2023)			X						
Chen et al. (2024)		X				X			X
Huang et al. (2025)		X				X			X

Author (Year)	Diagnostic Approach (N=43)					Standardization (N=37)		Point Selection (N=36)	
	Point/Zone	Theory	Specific	Other	Not Noted	Standard	Personal	Single	Multiple
Zhai et al. (2024)				X		X			X
Liu et al. (2025)			X				X		X
Pu et al. (2025)	X						X		
Zhang et al. (2025)					X	X			X
TOTALS (N=43)	**11**	**8**	**3**	**4**	**17**	**32**	**6**	**14**	**22**

Note. Standardization: Diagnostic Approach: Specific Standard = standardized diagnosis process, Point/Zone = point-zone correspondence, Theory = based on WAA theory/principles, Other = alternative approaches, Not Noted = approach not specified; Standard fixed protocols vs. Personalized individualized approaches; Point Selection: Single vs. Multiple point protocols.

Figure 11
Diagnostic Approaches Used in WAA Studies

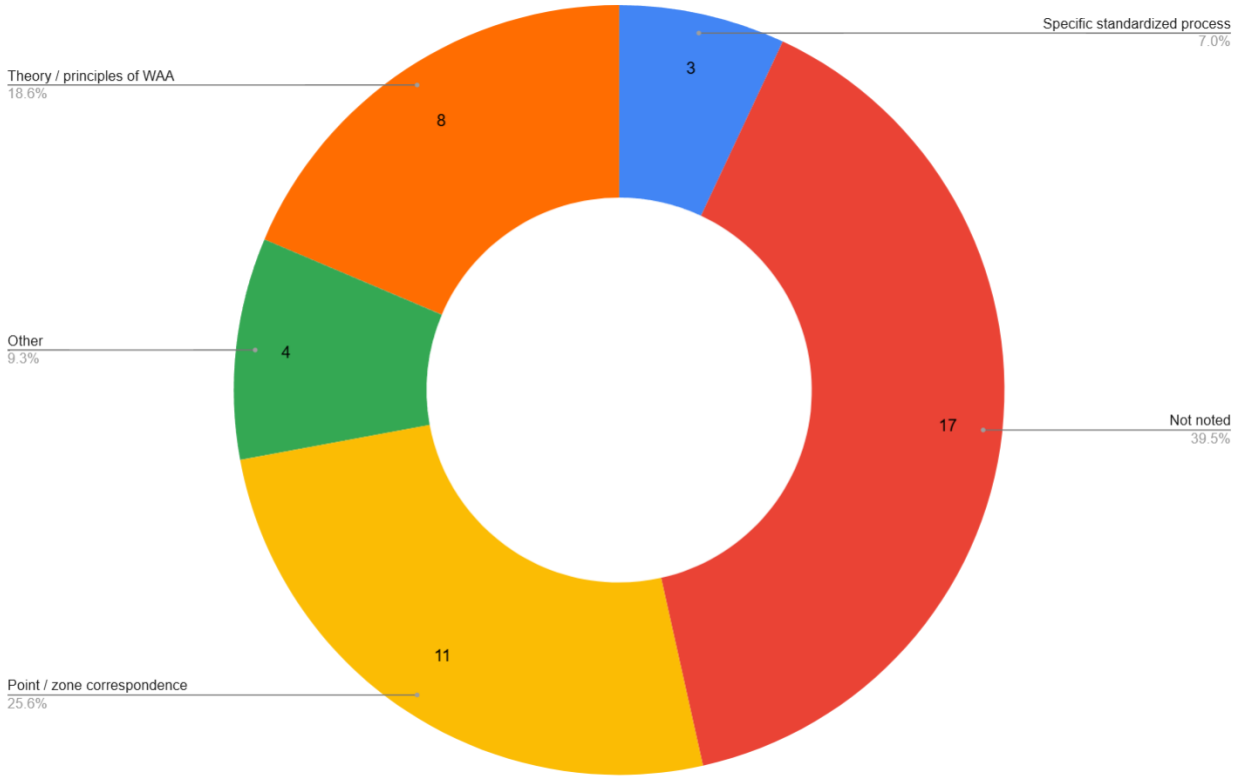


Table 3 shows the breakdown of conditions treated with WAA by anatomical region. Using five specific region (lower abdomen, abdomen, leg, throat, and the neck / shoulder region), one systemic and one various category, all 43 studies were divided. The two largest specific regions being treated were the lower abdomen (20.9%) and the neck / shoulder region (18.6%). The systemic category had the largest percentage overall at 23.3% and the various category (20.9%) rounded out the top four categories. These four categories encompassed more than 85% of the study regions.

Table 3
Anatomical Distribution of Conditions Treated with WAA

Anatomical Region	Studies (n)	Percentage	Clinical Focus
Systemic	**10**	23.3%	Whole-body effects, anesthesia, mental health
Lower Abdomen	**9**	20.9%	Pelvic pain, dysmenorrhea, urological
Various	**9**	20.9%	Multiple regions, analyses involving multiple conditions
Neck / Shoulder	**8**	18.6%	Cervical spine, shoulder pain conditions, healthy volunteer pain threshold testing
Abdomen	**3**	7.0%	Chemotherapy complications
Leg	**2**	4.7%	Lower extremity pain and surgery
Throat	**2**	4.7%	ENT surgical procedures
Total	**43**	**100.0%**	

Note. ENT = ear, nose, throat

Table 4 divides the studies into categories by their application. Of the five categories, pain (44.2%), surgical application (32.6%) and cancer-related (11.6%) made up the bulk of the studies. Mental-emotional and other conditions together included just 11.6% of the total studies. Two of the neck and shoulder studies (Bi et al., 2017 and Shi et al., 2020) used this area for experimental pain testing on healthy volunteers.

Table 4
Condition Categories in WAA Literature

Major Category	Subcategory	Studies	Clinical Examples
Pain Conditions 19 studies (44.2%)	Neck/Shoulder	**8**	Chronic neck pain, shoulder injury, experimental pain testing
	Lower Abdomen	**6**	Primary dysmenorrhea, pelvic pain
	Various	**4**	Neuropathy, various pain types
	Lower Extremity	**1**	Sciatica
Surgical Applications 14 studies (32.6%)	Anesthesia	**7**	Propofol dosing, post-operative nausea and vomiting
	ENT Surgery	**2**	Uvulopalatopharyngoplasty, throat procedures
	Lower abdominal Surgery	**2**	Bladder, perineum
	Orthopedic Surgery	**3**	Various surgical types, knee arthroplasty
Cancer-Related 5 studies (11.6%)	Chemotherapy Effects	**2**	GI reactions, post-TACE
	Cancer Pain	**3**	Various cancer pain
Mental-Emotional 3 studies (7%)	Psychological Conditions	**3**	Anxiety, depression
Other Conditions 2 studies (4.7%)	Pediatric/Urological	**1**	Enuresis
	Miscellaneous	**1**	Spastic cerebral palsy

Note. ENT = ear, nose, throat

TACE = transcatheter arterial chemoembolization

Table 5 displays the characteristics of the included studies as relating to diagnosis and point selection: conditions, diagnostic process, standardization or personalization of treatment, and points chosen for treatment. 32 studies (74.4%) used standardized protocols, 6 studies (14.0%) used personalized approaches, and 5 studies (11.6%) did not provide point information.

When a single side of the body was chosen based on the location of concern, this was not noted as personalization because it was the same point. Two of the personalized approaches (Lu et al., 2020 and Liu et al. 2025) were case reports from a single individual and necessarily personalized treatments. The remaining four personalized treatments were based on the location of symptoms for diabetic neuropathy (Jiang et al., 2006), cancer pain (Xu et al., 2020), rotator cuff injury (Song et al., 2021), and the acute phase of herpes zoster (Pu et al., 2025).

Table 5
Point Selection Standardization Patterns

Author (Year)	Condition Detail	Approach	Points Used
Song and Wang (1985)	Enuresis	Standardized	Lower 1 (named Shuangxia 1)
Chu and Dong (1997)	Pain: Sciatica	Standardized	Lower 4, Lower 6
Zhu et al. (1998)	Pain: Various	Points not provided	Points not provided – case series
Jiang et al. (2006)	Pain: Diabetic neuropathy	Personalized	Upper 2 and Lower 2 plus points based on symptoms
Chan et al. (2009)	Pain: Chronic neck pain	Standardized	Upper 4, Upper 5, Upper 6 - not named
Marra et al. (2011)	Post-surgical pain: Perineal pain after episiotomy	Standardized	Lower 1
Zeng et al. (2014)	Chemotherapy: Post-TACE pain	Standardized	Lower 1, Lower 2
Zhu et al. (2014)	Pain: Various	Points not provided	Points not provided – meta-analysis

Author (Year)	Condition Detail	Approach	Points Used
Liu et al. (2015)	Chemotherapy: Gastrointestinal reactions	Standardized	Upper 1
Shu et al. (2015)	Precompetition anxiety	Standardized	Upper 1
Bi et al. (2017)	Healthy adult - pressure-induced pain	Standardized	Upper 2
Chen et al. (2017)	Pain: Primary dysmenorrhea	Standardized	Lower 1
Lu et al. (2020)	Propofol dosage: Awake craniotomy	Personalized	Upper 1, Upper 2, Upper 3, Upper 4, Upper 5, Upper 6
Shi et al. (2020)	Healthy adult - ice water and pressure pain	Standardized	Upper 2, Upper 5
Xu et al. (2020)	Cancer pain: Various cancers	Personalized	Varies by affected area
You et al. (2020)	Post-stroke depression	Standardized	Upper 1
Zhai et al. (2020)	Pain: Primary dysmenorrhea	Standardized	Lower 1, Lower 2
Zhang et al. (2020)	Cancer pain: Cancer-induced bone pain	Standardized	Lower 5
Dong et al. (2021)	Cancer pain: Various cancers	Points not provided	Points not provided – meta-analysis
Li, J. et al. (2021)	Spastic cerebral palsy	Standardized	Upper 4, Upper 5, Lower 1, Lower 4
Li, W. et al. (2021)	Pain: Cervical radiculopathy	Standardized	Upper 4, Upper 5, Upper 6 - not named

Author (Year)	Condition Detail	Approach	Points Used
Song et al. (2021)	Pain: Rotator cuff injury	Personalized	Upper 4 OR Upper 5
Yuan et al. (2021)	Mild insomnia with anxiety	Standardized	Upper 1
Dong et al. (2022)	Propofol dosage: Gastroscopy	Standardized	Upper 1, Upper 2, Lower 1
Du et al. (2022)	Pain: Myofascial pain syndrome	Standardized	Upper 5
He et al. (2022)	Propofol dosage: Colonoscopy	Standardized	Lower 1, Lower 2, Lower 3
Hou et al. (2022)	Post-surgical: Catheter bladder discomfort	Standardized	Lower 1, Lower 2, Lower 3
Shi et al. (2022)	Pain: Trapezius myofascial pain	Standardized	Upper 5
Xu, N. et al. (2022)	Post-surgical pain: Orthopedic	Points not provided	Points not provided – meta-analysis
Xu, Z. et al. (2022)	Propofol: Hypertension after intubation	Standardized	Upper 1, Upper 2, Upper 3
Cao et al. (2023)	Post-surgical pain: Knee	Standardized	Lower 3, Lower 4
Chen et al. (2023)	Post-surgical pain: Orthopedic	Standardized	Lower 1-6 – meta-analysis: varies based on study protocol
Du et al. (2023)	Pain: Cervical-shoulder syndrome	Standardized	Upper 5
Han et al. (2023)	Post-surgical pain: Thyroidectomy	Standardized	Upper 2

Author (Year)	Condition Detail	Approach	Points Used
Kong et al. (2023)	Propofol dosage: Urologic	Standardized	Lower 1, Lower 2, Lower 3
Wu et al. (2023)	Pain: Urinary calculi	Standardized	Lower 2, Lower 5
Zheng et al. (2023)	Propofol dosage: Gastroscopy	Points not provided	Points not provided
Chen et al. (2024)	Post-surgical pain: Throat	Standardized	Upper 1, Upper 2
Huang et al. (2025)	Procedure pain: Colonoscopy	Standardized	Lower 1, Lower 2
Zhai et al. (2024)	Pain: Primary dysmenorrhea	Standardized	Lower 1, Lower 2
Liu et al. (2025)	Pain: Spastic Pelvic Floor Syndrome	Personalized	Upper 1, Upper 2, Lower 1, Lower 6
Pu et al. (2025)	Pain: Acute phase of herpes zoster	Personalized	Varies by affected area
Zhang et al. (2025)	Post-surgical nausea/vomiting: Orthopedic	Standardized	Upper 1, Lower 1

Table 6 shows the number of studies that used a particular point. The percentage is calculated based on the 36 studies that provided a named or described WAA point. Some studies used more than one point in the protocol, so the number of points used exceeds the number of studies. Table 7 shows the point combinations across studies. The combination of Lower 1 and Lower 2 was the most common, followed by Lower 1, Lower 2, and Lower 3. A total of 22 studies used point combinations. Half of the combination point studies used a mix of only Lower

points. The other half of the studies were nearly equally either only Upper points, or cross-extremity studies using both Upper and Lower points.

Table 6
Individual WAA Point Usage Frequency

WAA Point	Number of Studies	Percentage of Studies with Point Data*
Upper 1	**10**	27.8%
Upper 2	**9**	25.0%
Upper 3	**2**	5.6%
Upper 4	**5**	13.9%
Upper 5	**9**	25.0%
Upper 6	**3**	8.3%
Lower 1	**15**	41.7%
Lower 2	**10**	27.8%
Lower 3	**5**	13.9%
Lower 4	**4**	11.1%
Lower 5	**3**	8.3%
Lower 6	**3**	8.3%
Total point usages	**78**	**Across 36 studies with point data**

* Percentages calculated based on 36 studies that provided specific point information (83.7% of total 43 studies)

Note: Some studies used multiple points, so total point usages exceed number of studies

Table 7
Point Combinations

Point Combination	Number of Studies	Points Used	Pattern Type
Lower 1, Lower 2	**4**	2	Lower only
Lower 1, Lower 2, Lower 3	**3**	3	Lower only
Upper 4, Upper 5, Upper 6	**2**	3	Upper only
Lower 4, Lower 6	**1**	2	Lower only
Lower 3, Lower 4	**1**	2	Lower only
Lower 2, Lower 5	**1**	2	Lower only
Upper 1, Upper 2, Lower 1, Lower 6	**1**	4	Cross-extremity
Upper 2, Upper 5	**1**	2	Upper only
Upper 1, Upper 2, Upper 3, Upper 4, Upper 5, Upper 6	**1**	6	Upper only
Upper 1, Lower 1	**1**	2	Cross-extremity
Upper 1, Upper 2, Lower 1	**1**	3	Cross-extremity
Upper 1, Upper 2, Upper 3	**1**	3	Upper only
Upper 1, Upper 2	**1**	2	Upper only
Upper 4, Upper 5, Lower 1, Lower 4	**1**	4	Cross-extremity
Upper 2, Lower 2	**1**	2	Cross-extremity
Lower 1, Lower 2, Lower 3, Lower 4, Lower 5, Lower 6	**1**	6	Lower only
Total studies using combinations	**22**	**2-6**	**61.1% of studies with point data**

Exclusions: Single point protocols and Song 2021 (either/or selection) excluded. Based on 36 studies with specific point data (83.7% of total studies).

The principle of the diagnostic process of zone and symptom correspondence leads directly to the selection of points. However, even though the points chosen by these studies may be referenced by the same name, not all use the same anatomical location.

Point Location

Wrist-ankle acupuncture is a style of acupuncture that uses 12 specific points located on the wrists and ankles. Each point location is defined according to the standard used in this review and the deviations are noted. The studies are charted as to their inclusion of details that relate to the standard location definition of a particular point. The specific errors and omissions for each study are noted. The points used by the included studies are analyzed by the body regions they are used to treat.

Table 8 shows the point usage pattern by the body region treated. Table 9 shows the most common points used by body region. There is a strong relationship between the points Lower 1 and Lower 2 and the region of the lower abdomen. Similarly Upper 5 is frequently selected in conditions relating to the neck and shoulder. A majority of systemic condition treatments chose Upper 1. Both of the two throat studies used Upper 2 in their treatment protocol.

Table 8
Point Usage Patterns by Body Region Treated (N=43)

WAA Point	Abdomen	Leg	Lower Abdomen	Neck/Shoulder	Systemic	Throat	Various	Total
Upper 1	2		1		6	1		10
Upper 2			1	2	3	2	1	9
Upper 3					2			2
Upper 4				3	1		1	5
Upper 5				7	1		1	9
Upper 6				2	1			3
Lower 1	2		8		3		2	15
Lower 2	1		5		2		2	10
Lower 3		1	1		2		1	5
Lower 4		2					2	4
Lower 5			1		1		1	3
Lower 6		1	1				1	3
No Points					1		6	7
Total	3	2	9	8	10	2	9	

Table 9
Regional Point Usage Analysis

Body Region	Total Point Usages	Studies	Most Used Points
Systemic	**22**	10	Upper 1 (6), Upper 2 (3), Lower 1 (3)
Throat	**3**	2	Upper 2 (2), Upper 1 (1)
Neck / Shoulder	**14**	8	Upper 5 (7), Upper 4 (3)
Abdomen	**5**	3	Upper 1 (2), Lower 1 (2), Lower 2 (1)
Lower Abdomen	**18**	9	Lower 1 (8), Lower 2 (5)
Leg	**4**	2	Lower 4 (2), Lower 3 (1), Lower 6 (1)
Various	**12**	9	Lower 1(2), Lower 2 (2), Lower 4 (2)

Note. The number of studies using a point is listed in parentheses.

Table 10 reviews the completeness of data reported for the point locations reported in all 43 included studies. Each study's treatment points are named, along with whether they provided a location, and if that location contained both a circumferential anatomical reference and a measurement indicating the point along the length of the extremity. 86.0% (37/43) of studies lack sufficient location detail for accurate replication. Among these, there were typographical errors that in one case (Liu et al., 2015) caused confusion about the meaning of a phrase: "2 in wrist stripes". Kong et al. (2023) misspelled the measurement "3 inces from medial malleolus".

5 of the 43 studies (11.6%) contained reporting errors in location descriptions that referenced incorrect anatomy and described different points. Zhai et al. (2020) used "humerus" instead of tibia for Lower 2. Du et al. (2022) and Du et al. (2023) both described Upper 2 instead of Upper 5. Wu et al. (2023) used the term "tibia" instead of fibula when describing Lower 5. The final study by Zhang et al. (2020) is a rat study and the point needled was described as

"Lower Point 5 (the same location as BL60)". They located this point "at the depression posterior to the lateral malleolus of tibiofibula". A further 17 studies (39.5%) did not provide any point location description.

Table 10
Study-by-Study Point Location Reporting Status (N=43)

Study	Treatment Points	Location Description Provided	Description Detail Level
Song and Wang (1985)	Lower 1 – unclear naming	Yes	Full
Chu and Dong (1997)	Lower 4, Lower 6	Yes	Full
Zhu et al. (1998)	Not Reported	Yes	Partial
Jiang et al. (2006)	Upper 2, Lower 2 plus points based on symptoms	No	Absent
Chan et al. (2009)	Upper 4, Upper 5, Upper 6 - not named	Yes	Partial
Marra et al. (2011)	Lower 1	Yes	Full
Zeng et al. (2014)	Lower 1, Lower 2	No	Absent
Zhu et al. (2014)	Not Reported	No	Absent
Liu et al. (2015)	Upper 1	Typo	Partial
Shu et al. (2015)	Upper 1	Yes	Partial
Bi et al. (2017)	Upper 2	Yes	Full
Chen et al. (2017)	Lower 1	Yes	Partial
Lu et al. (2020)	Upper 1, Upper 2, Upper 3, Upper 4, Upper 5, Upper 6	No	Absent
Shi et al. (2020)	Upper 2, Upper 5	Yes	Partial
Xu et al. (2020)	Varies by affected area	No	Absent
You et al. (2020)	Upper 1	Yes	Partial
Zhai et al. (2020)	Lower 1, Lower 2	Typo	Full
Zhang et al. (2020)	Lower 5	Typo/Alternate*	Full
Dong et al. (2021)	Not Reported	No	Absent
Li, J. et al. (2021)	Upper 4, Upper 5, Lower 1, Lower 4	No	Absent
Li, W. et al. (2021)	Upper 4, Upper 5, Upper 6 - not named	Yes	Partial
Song et al. (2021)	Upper 4, Upper 5	Yes	Partial

Study	Treatment Points	Location Description Provided	Description Detail Level
Yuan et al. (2021)	Upper 1	Yes	Full
Dong et al. (2022)	Upper 1, Upper 2, Lower 1	Yes	Partial
Du et al. (2022)	Upper 5	Typo	Partial
He et al. (2022)	Lower 1, Lower 2, Lower 3	Yes	Partial
Hou et al. (2022)	Lower 1, Lower 2, Lower 3	Yes	Full
Shi et al. (2022)	Upper 5	No	Absent
Xu, N. et al. (2022)	Not Reported	No	Absent
Xu, Z. et al. (2022)	Upper 1, Upper 2, Upper 3	No	Absent
Cao et al. (2023)	Lower 3, Lower 4	No	Absent
Chen et al. (2023)	Lower 1, Lower 2, Lower 3, Lower 4, Lower 5, Lower 6	No	Absent
Du et al. (2023)	Upper 5	Typo	Partial
Han et al. (2023)	Upper 2	Yes	Partial
Kong et al. (2023)	Lower 1, Lower 2, Lower 3	Typo	Partial
Wu et al. (2023)	Lower 2, Lower 5	Typo	Full
Zheng et al. (2023)	Not Reported	No	Absent
Chen et al. (2024)	Upper 1, Upper 2	No	Absent
Huang et al. (2025)	Lower 1, Lower 2	Yes	Partial
Zhai et al. (2024)	Lower 1, Lower 2	No	Absent
Liu et al. (2025)	Upper 1, Upper 2, Lower 1, Lower 6	No	Absent
Pu et al. (2025)	Varies by affected area	No	Absent
Zhang et al. (2025)	Upper 1, Lower 1	Yes	Partial

Legend: Location Description Provided: Yes (present and accurate), No (absent), Typo (contains errors). Detail Level: Full (measurement + anatomy), Partial (measurement or anatomy only), Absent (no description).

* Zhang et al. (2020) is a rat study and the point was described “Lower Point 5 (the same location of BL60 - Kunlun (located at the depression posterior to the lateral malleolus of tibiofibula))”

These typographical and reporting errors are differentiated from WAA point location deviations which may use other descriptors such as an alternate unit of measure or lack an anatomical description. These differences are added to the typographical and reporting errors in Table 11. There were 11 deviations from the standard based on anatomical description and 20 deviations based on measurement. Of the 26 studies that described the point location, only four studies used point location descriptions that were true to the standard.

Individual point location description analyses are located in Appendix XX.

Table 11
WAA Point Location Deviations - Consolidated Analysis (N=26)

Author (Year)	**Point Location Description**	**Deviation Type**		
		Anatomy	**Measurement**	**Typo**
Song and Wang (1985)	located near the internal fringe of the Achilles tendon 4.5 cm above the highest point of the medial ankle	—	**X**	—
Chu and Dong (1997)	The inferior No. 4 region is located 3 cun above the external malleolus and at the midpoint between the anterior borders...	—	—	—
Zhu et al. (1998)	The upper 6 points are located along the line 2 finger-width above the transverse crease of the wrist, while the lower 6...	**X**	—	—
Chan et al. (2009)	dorsal aspect of the wrist, about 3 inches above the crease of the wrist	**X**	**X**	—
Marra et al. (2011)	Lower 1 point is on the interior border of the Achilles tendon, three transverse fingers above the medial malleolus	—	—	—

Author (Year)	Point Location Description	Deviation Type		
		Anatomy	Measurement	Typo
Liu et al. (2015)	indentations between the ulna near the little finger and the tendon of the ulnar flexor carpi, with *2 in wrist stripes*	—	X	X
Shu et al. (2015)	Point upper 1 is located on the pit between the medial border of the ulnar and the tendon of musculus flexor carpi ulnaris	—	X	—
Bi et al. (2017)	2 cun from the wrist crease and between the 2 prominent tendons	X	—	—
Chen et al. (2017)	close to the medial border of tendo calcaneus	—	X	—
Shi et al. (2020)	located in the middle of the palm surface between the two most prominent palmar longus tendons and the flexor carpi radialis tendons…	—	X	—
You et al. (2020)	the front of the ulnar edge near the little finger where people can touch a sag	X	X	—
Zhai et al. (2020)	TYPO: The lower 1 point is located at the medial border of the calcaneus tendon, while the lower 2 point is located at the posterior border of the *humerus*, both at the level 3 inches above the tip of the medial malleolus.	X	X	X
Zhang et al. (2020)	Lower Point 5 (the same location of BL60 - Kunlun, located at the depression posterior to the lateral malleolus of tibiofibula)	X	X	X
Li, W. et al. (2021)	wrist-ankle acupuncture was carried out to the three points of wrists, involving the lateral edge of the radius, Waiguan (the midpoint of	X	X	—

Author (Year)	Point Location Description	Deviation Type		
		Anatomy	Measurement	Typo
	the forearm back), and back of the medial margin of the ulna			
Song et al. (2021)	upper area 4, which is between the inner and outer edges of the radius on the thumb side, upper area 5, which is at the center of the wrist between the radius and the ulna	—	X	—
Yuan et al. (2021)	upper 1 is located at the depression between medial border of the ulnar and the tendon of musculus flexor carpi ulnaris, the level of about two fingers above the transverse crease of the wrist	—	—	—
Dong et al. (2022)	The upper 1 zone is located in the depression between the ulnar margin of the little finger and ulnar flexor tendon of the wrist, and the Hand Shaoyin Heart Meridian passes through this region…	—	X	—
Du et al. (2022)	TYPO: upper 5 is located in the middle of the *palm surface between the two most prominent palmar longus tendons and the flexor carpi radialis tendons*	X	X	X
He et al. (2022)	Inferior 1: In the inner edge of the Achilles tendon; Inferior 2: In the medial side adjacent to the posterior border of tibia; Inferior 3: At the site one transverse finger inward from the front of tibia	—	X	—
Hou et al. (2022)	approximately three transverse fingers above the inner malleolus and one loop around the ankle area. The lower 1 area is located near the medial border of the Achilles tendon, the lower 2 area is located near the medial border	—	—	—

Author (Year)	Point Location Description	Deviation Type		
		Anatomy	Measurement	Typo
	of the tibia, and the lower 3 area is located 1 cm medially from the anterior crest tibia			
Du et al. (2023)	TYPO: The upper 5 area is located in the middle of the *palm surface between the two most prominent long palmar tendons and the radial carpal flexor tendon*	**X**	**X**	**X**
Han et al. (2023)	Upper 2 is at the middle of the palmar side of the forearm, between the palmaris longus and flexor carpi radialis	—	**X**	—
Kong et al. (2023)	TYPO: 3 *inces* from medial malleolus	**X**	**X**	**X**
Wu et al. (2023)	TYPO: lower 5 acupoint was located 3 in above the lateral malleolus, near the posterior edge of the *tibia*; lower 2 acupoint was located 3 in above the medial malleolus, near the posterior edge of the tibia	**X**	**X**	**X**
Huang et al. (2025)	L1 is located between the medial Achilles tendon and the inner ankle, and L2 is along the inner edge of the ankle near the posterior tibia.	—	**X**	—
Zhang et al. (2025)	In the upper zone 1 (between the ulnar border on the little finger side and the flexor carpal tendon on the ulnar side, the most concave point pressed with the thumb end); The lower zone 1 (near the inner edge of the Achilles tendon)	—	**X**	—
	Total deviations and errors reported	**11**	**20**	**7**

Legend: X = Error present in this category. — = No error in this category.
Anatomy: Wrong/incomplete anatomical landmarks, major deviations from standard

Measurement: Wrong units, missing distances, incorrect measurements
Typo: Spelling errors, obvious transcription mistakes
Other: Traditional acupoint references, unclear descriptions

Studies with No Descriptions (17)

There is a great deal of inconsistency among the reported locations of the points used in wrist-ankle acupuncture. This discrepancy of both reporting and usage of particular needle characteristics continues in the next section.

Needle Characteristics

Since 1995, the needles used in wrist-ankle acupuncture have been recommended to be stainless steel needles 0.25 mm in diameter and 25 mm in length. The data charts the adherence to or variance from the Zhou et al. (2002) standard.

Table 12 shows the reporting completeness for needle characteristics of the 33 studies that used needles as an intervention. The reporting completeness for length and diameter were 84.8% and 81.8% respectively. 63.6% of the studies reported a brand or place of manufacture, and 48.5% specified a country of origin for the needle. However, only 6.1% reported the material of the needle.

Table 12
Needle Specification Reporting Matrix (N=33 needle-using studies)

Study (Author, Year)	Length	Diameter	Brand	Material	Country
Song and Wang (1985)	**X**	**X**			
Chu and Dong (1997)	**X**				
Zhu et al. (1998)	**X**	**X**			
Jiang et al. (2006)					
Marra et al. (2011)	**X**	**X**			

Study (Author, Year)	Length	Diameter	Brand	Material	Country
Zeng et al. (2014)	X	X	X		X
Zhu et al. (2014)					
Liu et al. (2015)	X	X	X		
Shu et al. (2015)	X	X	X		X
Bi et al. (2017)	X	X			
Chen et al. (2017)	X	X	X		X
Lu et al. (2020)					
Xu et al. (2020)	X	X	X		X
You et al. (2020)	X	X	X	X	X
Zhang et al. (2020)	X	X	X		X
Dong et al. (2021)	X	X			
Li, J. et al. (2021)	X	X	X		
Li, W. et al. (2021)	X	X	X		X
Dong et al. (2022)					
He et al. (2022)	X	X	X		X
Hou et al. (2022)	X	X	X		
Xu, N. et al. (2022)	X	X	X		X
Xu, Z. et al. (2022)	X	X	X		
Cao et al. (2023)	X	X	X		X
Chen et al. (2023)					
Han et al. (2023)	X	X	X		X
Kong et al. (2023)	X	X	X		X
Wu et al. (2023)	X	X	X		X

Study (Author, Year)	Length	Diameter	Brand	Material	Country
Zheng et al. (2023)	**X**	**X**	**X**		**X**
Chen et al. (2024)	**X**	**X**	**X**		
Liu et al. (2025)	**X**	**X**	**X**		**X**
Pu et al. (2025)	**X**	**X**	**X**	**X**	**X**
Zhang et al. (2025)	**X**	**X**			
TOTALS	**28/33** **84.8%**	**27/33** **81.8%**	**21/33** **63.6%**	**2/33** **6.1%**	**16/33** **48.5%**

Zhou et al. (2002) reports the historical needles used in WAA. All were stainless steel filiform needles.

(1) Gauge 32 and 1.5 cun (inch) in length (Ø0.25mm x 40mm)

(2) Gauge 32 and 1.0 cun (inch) in length (Ø0.25mm x 25mm)

(3) Intradermal needle (Ø0.22mm x 5mm)

From 1972 to 1995, the common needles to use for WAA were 0.25 mm x 40 mm - the first type. In 1995, the needles used began to shift to shorter needles - the second type - 0.25 mm x 40 mm. (Zhou et al., 2002) Both of these measurements are represented in the included studies. Intradermal needles were not represented.

Historically, acupuncture points were located on the body using a proportional measure known as cun. (WHO standard acupuncture point locations in the Western Pacific Region, 2008) The word cun is also sometimes translated as “inch” which adds confusion when compared to an absolute measure like the inch or millimeter. These studies provided needle measurements in a variety of units including inch, millimeter, cun and gauge. Table 13 documents the reported

needle lengths and table 14 notes the diameter. Across both tables, there are inconsistencies in the original authors' studies that indicate lengths and diameters that are unreasonable. One meta-analysis (Dong et al., 2021) reported other studies' needle lengths at 250 mm. Given that 40 mm needles were found to be too long, it is likely the author made a typo and intended 25 mm rather than 250 mm. Another author (Xu, N. et al., 2022) indicated a length of 0.25 mm instead of 25 mm - another likely typo. For the diameter, a third author (Kong et al., 2023) indicated a diameter of 25 mm.

One study (Zhang et al., 2023) used rats and the 0.16 mm x 7 mm needle. One study (You et al., 2020) examined the difference between different needle diameters.

Table 13
Needle Length Distribution (N=28 studies reporting)

Needle Length	Frequency (n)	Percentage (%)
25 mm	**18**	**64.3%**
40 mm / 1.5 inch	**4**	**14.3%**
2 *cun*	**2**	**7.1%**
1.5 *cun*	**1**	**3.6%**
7 mm	**1**	**3.6%**
Data Entry Errors	**2**	**7.1%**
TOTAL	**28**	**100.0%**

Table 14
Needle Diameter Usage Patterns (n=27 studies reporting diameter)

Needle Diameter	Frequency (n)	Percentage (%)
0.25mm / 32 gauge	**17**	63.0%
0.30mm / 30 gauge	**5**	18.5%
0.35mm / 28 gauge	**1**	3.7%
0.16mm	**1**	3.7%
Variable / Under Study	**2**	7.4%
Data Entry Errors	**1**	3.7%
TOTAL	**27**	**100.0%**

Half of the studies (48.5%) reported needle measurements consistent with the standard of 0.25 mm x 25 mm (Table 15). Nearly one fifth of the studies failed to report any needle characteristic. You et al. (2020) studied the effect of needle diameter on the treatment and the entry was considered compliant with the standard because one of the diameters was consistent with the standard of 0.25 mm.

Table 15
Needle Specifications: Compliance with Standard Protocol

Study (Author, Year)	Length Only (25mm)	Diameter Only (0.25mm)	Both Length & Diameter (Full Standard)
Song and Wang (1985)			
Chu and Dong (1997)			
Zhu et al. (1998)			
Jiang et al. (2006)			

Study (Author, Year)	Length Only (25mm)	Diameter Only (0.25mm)	Both Length & Diameter (Full Standard)
Marra et al. (2011)			X
Zeng et al. (2014)			X
Zhu et al. (2014)			
Liu et al. (2015)			X
Shu et al. (2015)			X
Bi et al. (2017)			X
Chen et al. (2017)			X
Lu et al. (2020)			
Xu et al. (2020)	X		
You et al. (2020)*			X
Zhang et al. (2020)			
Dong et al. (2021)*			
Li, J. et al. (2021)			
Li, W. et al. (2021)			
Dong et al. (2022)			
He et al. (2022)			X
Hou et al. (2022)			X
Xu, Z. et al. (2022)*		X	
Xu, N. et al. (2022)			X
Cao et al. (2023)			X
Chen et al. (2023)			
Han et al. (2023)			X

Study (Author, Year)	Length Only (25mm)	Diameter Only (0.25mm)	Both Length & Diameter (Full Standard)
Kong et al. (2023)*	**X**		
Wu et al. (2023)			**X**
Zheng et al. (2023)			**X**
Chen et al. (2024)			**X**
Liu et al. (2025)			
Pu et al. (2025)			**X**
Zhang et al. (2025)		**X**	
TOTALS (n=33)	**2** **6.1%**	**2** **6.1%**	**16** **48.5%**

Standard: WAA Standard (Zhou 2002) specifies 0.25mm × 25mm needles used since 1995

10 N/A studies excluded as they did not use needles

Special cases: ; "Under study" = compliant (You et al., 2020)

"TYPO" entries = non-compliant (Dong et al., 2021, Xu, Z. et al., 2022, Kong et al., 2023)

"varies" = non-compliant

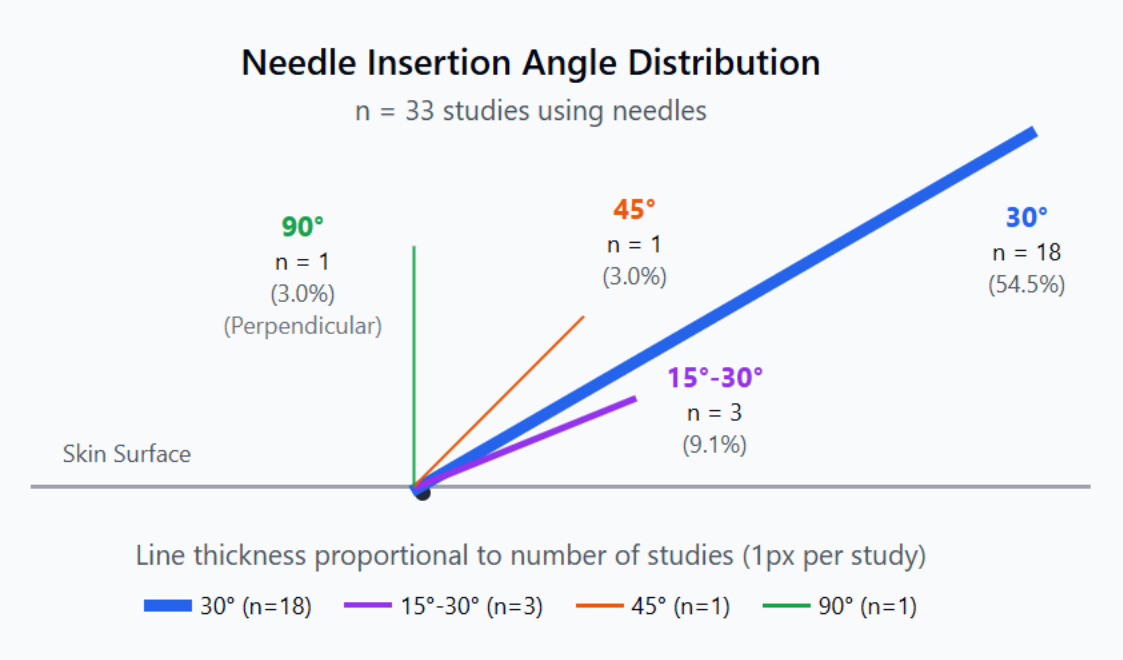
Along with the specified needle characteristics, the standard set forth by Zhou et al. (2002) also details information about the insertion procedure of the needle into the body.

Needle Insertion

The needle insertion description by Zhou et al. (2002) is characterized by several elements. These elements are the holding of the needle (using particular fingers), penetration of the skin (the angle of insertion, skin tightness, sensation passing through the tissues, angle of needle handle to the skin), and the needle manipulation (advancement without rotation).

Figure 12 shows a visual distribution of the angles of insertion using proportionally thick lines at the angle reported in the study. Ten studies did not note the angle of insertion and were not visualized. The 33 studies were grouped into categories of 90° (1 study), 45° (1 study), 30° (18 studies) and 15 - 30° (3 studies). Studies reporting 15° - 30° are shown as a separate line at approximately 22° visual angle to distinguish from pure 30° studies. One of the studies (Dong et al., 2021) represented in the 30° category was a meta-analysis that reported the angles of needling insertion from 13 studies. The angles reported varied among 15°, 20-30°, and 30°. Because most of the studies in that analysis used 30°, that study was visualized with the other 30° studies.

Figure 12
Insertion Angle Consistency Across Studies



Ten device-only studies have been excluded from this analysis as they do not use needle insertion techniques. Table 16 represents only the 33 studies that employed needle-based WAA

interventions. Needle insertion technique reporting was divided into five primary elements: needle holding, insertion angle, initial depth, insertion manipulation, and tip direction.

Needle holding looked at the presence or absence of language around which fingers held the needle and if any manipulation of the skin was used to assist in the penetration of the skin. 39.4% (13/33) of the studies reported some methodology regarding holding the needle. The insertion angle was reported by 69.7% (23/33) of the studies. Only 15.2% (5/33) of the studies reported the depth to which the needle was initially inserted before the lowering of the needle handle to be parallel to the skin. Two thirds (22/33) of the studies reported language around insertion manipulation. This was defined as the lowering of the needle handle to the skin and the advancement of the needle under the skin. The final category of tip direction includes any notes made about which way the tip is directed in its advancement, whether proximally or distally. Less than one quarter (8/33) of the studies included this information. Only two studies (6.1%) included all five elements of the needle insertion technique reporting. Two studies (Kong et al., 2023 and Wu et al., 2023) reported needle insertion depths greater than the length of the needle.

Table 16
Insertion Technique Reporting Completeness

Authors (Year)	Needle Holding	Insertion Angle	Initial Depth	Insertion Manipulation	Tip Direction
Song and Wang (1985)	X	X		X	
Chu and Dong (1997)		X	X		X
Zhu et al. (1998)		X		X	X
Jiang et al. (2006)				X	X
Marra et al. (2011)		X	X	X	X

Authors (Year)	Needle Holding	Insertion Angle	Initial Depth	Insertion Manipulation	Tip Direction
Zeng et al. (2014)	X	X		X	
Zhu et al. (2014)					
Liu et al. (2015)	X	X		X	
Shu et al. (2015)	X	X		X	
Bi et al. (2017)		X		X	
Chen et al. (2017)	X	X		X	
Lu et al. (2020)					
Xu et al. (2020)					
You et al. (2020)	X	X		X	
Zhang et al. (2020)				X	X
Dong et al. (2021)		X			
Li, J. et al. (2021)	X	X		X	
Li, W. et al. (2021)	X	X		X	
Dong et al. (2022)					
He et al. (2022)					
Hou et al. (2022)	X	X	X	X	X
Xu, N. et al. (2022)		X			
Xu, Z. et al. (2022)					
Cao et al. (2023)	X	X		X	
Chen et al. (2023)					
Han et al. (2023)		X		X	
Kong et al. (2023)		X		X	X

Authors (Year)	Needle Holding	Insertion Angle	Initial Depth	Insertion Manipulation	Tip Direction
Wu et al. (2023)	**X**	**X**		**X**	
Zheng et al. (2023)					
Chen et al. (2024)	**X**	**X**	**X**	**X**	**X**
Liu et al. (2025)		**X**		**X**	
Pu et al. (2025)		**X**	**X**	**X**	
Zhang et al. (2025)	**X**	**X**		**X**	
	13/33 (39.4%)	**23/33 (69.7%)**	**5/33 (15.2%)**	**22/33 (66.7%)**	**8/33 (24.2%)**

The process of needle insertion is well documented in the standard. However, the use of devices to stimulate WAA points is not included.

Device Characteristics

Electrical stimulation of WAA points is part of the history of how the style of acupuncture came to be developed. However, the Zhou et al. (2002) standard does not use electrical stimulation. The use of electrical and pressure based devices to perform WAA is not consistent with the known standard.

Of the 43 studies included in this scoping review, 10 (23.3%) use devices as shown in Table 17. Seven studies (16.3%) employ devices using transcutaneous electrical nerve stimulation (TENS) devices and three (7%) of the study devices use pressure.

Since 2020, there have been 9 device studies which represents 29.0% of the studies on WAA. One study team completed four of the electrical device studies (Du, Shi, Fang, et al., 2023; Du, Shi, Liu, et al., 2023; Shi et al., 2020, 2022). All four of the studies share authors Ping

Shi, Fanfu Fang, Hongliu Yu, and three studies each also have Junwen Liu and Jiahao Du as authors.

Table 17
Device Characteristics - All Studies Using Devices

Author (Year)	Device Type	Device Description	Device Application	Device Location
Chan et al. (2009)	Electrical	Wrist-ankle acustimulator device (Model WA-Relief 310, VCare International Medical Ltd, Hong Kong SAR, China)	Ipsilateral wrist was used for pain with predominance on one side of the neck and the wrist of the nondominant hand for bilateral neck pain	Dorsal aspect of the wrist, about 3 inches above the crease of the wrist
Shi et al. (2020)	Electrical	Flexible band with gold electrodes and an intelligent electronic terminal (device created for the study)	Subjects placed the two gold fingers of the bracelet in the corresponding area and then turned on the bracelet by pressing the button	Corresponding area
Song et al. (2021)	Electrical	Wearable electrical stimulation device jointly (Changhai Hospital & University of Shanghai for Science and Technology - China National Invention Patent: No. 201610928117.5)	Participants should wear the device during rehabilitation training; two electrical stimulation electrodes were placed on the upper area 4 or 5 with the skin of the treatment area exposed	Upper area 4 or 5
Du et al. (2022)	Electrical	Electrical stimulation device combined with wrist-ankle acupuncture (WAA-TENS, USST, China)	Applied in the upper 5th area above the participant's left wrist	Upper 5th area above wrist
Shi et al. (2022)	Electrical	E-WAA stimulator (not specified)	E-WAA was applied to the upper fifth area on the left hand	Upper 5th area

Author (Year)	Device Type	Device Description	Device Application	Device Location
Du et al. (2023)	Electrical	Transcutaneous electrical nerve stimulation analgesic bracelet based on Chinese medicine wrist and ankle acupuncture (not specified)	Small portable non-invasive electrical stimulation device that can be worn on the wrist or ankle with Velcro	Unspecified
Huang et al. (2025)	Electrical	TENS device (MicroPort Scientific Co., Ltd, Shanghai, China)	The trial group received low-frequency, high-intensity TENS-WAA adjusted to the maximum tolerable current, while the control group received minimal current	Unspecified
Zhai et al. (2020)	Pressure	Acupressure wrist-ankle strap (not specified)	Removable compression parts that exert pressure and stimulate the corresponding WAA points	According to individual need
Yuan et al. (2021)	Pressure	Acupressure wrist-ankle strap (China patent ZL201420475426.8)	Wear it on their wrists or ankles like wearing watches; compression component is installed inside the wrist-ankle strap and worn on both wrists	Upper 1 compression point
Zhai et al. (2024)	Pressure	Acupressure wrist-ankle strap (not specified)	Two compression parts were installed inside the wrist-ankle strap and patients wore a wrist-ankle strap on each ankle for 30 min, so that both the Lower 1 and Lower 2 compression points were simultaneously pressed	Lower 1 and Lower 2

The frequency and pulse widths used by the electrical devices varied as shown in Table 18. Contrary to the standard, those studies that specified the subjective intensity of the stimulation identified the target stimulation level as being the maximum intensity without feeling pain. The reporting clarity around the frequency, pulse width, and stimulation intensity were lacking in information and inconsistent in terminology.

Table 18
Electrical Devices - Frequency and Stimulation Intensity

Author (Year)	**Frequency**	**Stimulation Intensity**
Chan et al. (2009)	2/100 Hz; every 3 seconds	Strong but nonpainful sensation beneath the electrodes with no visible muscle contractions
Shi et al. (2020)	2/100 Hz; unspecified	Maximum intensity without feeling pain
Song et al. (2021)	70 Hz; pulse duration of 200 μs	Unspecified
Du et al. (2022)	2/100 Hz; every 1 minute	Maximum intensity without feeling pain
Shi et al. (2022)	self-adjusted: 0-100 Hz; pulse width of 0-5 ms	Unspecified
Du et al. (2023)	self-adjusted: 0-100 Hz; unspecified	Unspecified
Huang et al. (2025)	2 Hz; continuous wave	Treatment group - maximum tolerable level without causing pain; control group - the current was raised above the sensory threshold for only the first few seconds before being reduced to the lowest level.

The use of electrical and pressure based devices to stimulate WAA points at the wrists and ankles is contrary to the standard Zhou et al. published in 2002. In the more than two decades since that publication, many deviations have been noted.

The studies this scoping review analyzed were charted according to their study characteristics to explore publication patterns by year and study design. The diagnostic principle of each study was tabulated to clarify the relationship between the diagnostic patterns and the standard.

The conditions, anatomical regions, and distribution of points utilized by the included studies were cross referenced to show relationships among them. Point location differences between the standard and the descriptions from the studies were noted in terms of anatomical and measurement.

The needle characteristics and needle insertion processes were compared to the standard and the use of devices to perform WAA were noted.

The results found by this scoping review demonstrate significant deviation from the standard set forth by Zhou et al. in 2002. The deviations noted by the data collected clearly document differences in how WAA is performed.

DISCUSSION

Wrist-ankle acupuncture is a modern style of acupuncture that is being used in research. During this scoping review, it was found that the acupuncture procedure is poorly documented and inconsistent across studies.

The number of studies on WAA in English has increased dramatically since 2020. This peak period (see figure 8) averaged more than 5 studies per year, including the articles published through the final search on 8/15/2025. Even though the studies are being published in English, with one exception (Marra et al., 2011), all the studies were completed in China. It is unknown whether a similar increase in publication trends is also occurring in Chinese language literature.

Within the diagnostic system of WAA, diagnosis is directly related to locating the symptom. This zone correspondence with the point of treatment results in a one-to-one relationship of symptoms and treatment. This should have provided a set of data that was highly consistent. Though not specifically analyzed in this scoping review, two specific inconsistencies were noted from the Zhou et al. (2002) standard. Catheter related bladder discomfort was treated with Lower 3 with no explanation (Hou et al., 2022). Lower 3 is a very narrow zone that is on the side of the torso just anterior to the axilla (see figure 1) that is clinically used rarely because of the size of the zone (Lao, 1999). Jiang et al. (2006) used Lower 2 in every point protocol for diabetic neuropathy, though there is no mention of this indication of Lower 2 in Zhou et al.'s standard (2002).

Tenet of the style is to personalize based on the exact location of the symptom, yet only six of the 43 studies personalized the treatments based on the patient's exact symptoms. It is possible that the selection of participants was such that their inclusion resulted from a clear

definition of the symptom location, but there was no indication of this found in the studies that used a standardized approach.

Only one study (Han et al., 2023) described the region the chosen point treated and referenced the WAA principle of "fewer points but better ones" (Zhou et al., 2002). This principle indicates fewer points are more effective than many, which is contrary to the approach taken by several authors. Lu et al. (2020) used all six Upper points during an awake craniotomy, and Liu et al. (2025) used Upper 1, Upper 2, Lower 1, and Lower 6 to treat spastic pelvic floor syndrome. Twenty-two studies used point combinations and just 14 used a single point in the treatment.

According to Lao (1999), Upper 1 is the most frequently used point, however this review found that Lower 1 was the most frequently reported point (41.7%) which was well above the usage reported for Upper 1 (27.8%). Lao (1999) also discusses the location of points using a combination measure of cun and finger-breadths. Upper points are said to be 1.5 cun or 2 finger-breadths proximal to the wrist crease, and Lower points are 2 cun or 3 finger-breadths proximal from the tip of the malleoli. This differs from the Zhou et al. (2002) standard that indicates a one-to-one cun to finger-breadth measurement. However, given that the insertion point can be shifted along the zone, the measurement difference may be irrelevant altogether.

Based on the standard put forth by Zhou et al. in 2002, there are many deviations. However, there is another standard available in Chinese that newer studies in China are referencing. Zheng et al. (2023) reference a standard, however the DOI of their source was incorrect and could not be consulted. Liu et al. (2025) referenced a 2009 standard created by the State Bureau of Quality and Technical Supervision (GB/T 21709.19-2009). This source was not available in English and could not be consulted. However, the needle used by Liu et al. (2025)

was 0.30 mm x 40 mm, which was the same standard as pre-1995 (Zhou et al., 2002). And yet, the needle used by Zheng et al. (2023) was 0.25 mm x 25 mm. The two studies were either referencing different standards, or the standard outlines multiple acceptable tools.

Needle insertion procedures were particularly poorly documented, especially the method of needle holding (39.4%), initial insertion depth (15.2%), and needle tip direction (24.2%). Most of the studies reported angle of insertion (69.7%) and insertion manipulation (66.7%). All five of these elements are crucial to the correct implementation of WAA. Holding the needle and pinning the skin allows for accurate angle of insertion and initial depth of needle penetration. If the needle is inserted too deeply initially, then the needle will pass into the muscle layer and cause pain. The missing element that was most notable was the needle tip direction. Because the insertion points are located on a longitudinal line along the length of the extremity, the needle can be pointed either proximally or distally, yet less than one quarter of the studies reported this information. In addition, adjustments to the needles were not reported by these studies. Zhou et al. (2002) note that to get good results, the needle needs to be placed appropriately and adjusted if needed. Adjustment is needed if there is any pain or sensation at the site of the needle or the needle is deviated from the longitudinal axis (Lao, 1999).

One peculiarity of reporting in these studies were two instances where the authors Kong et al. (2023) and Wu et al. (2023) reported insertion lengths greater than the needle length. These and other errors were common across studies included in this review. It is unknown whether the incidence of errors can be attributed to translation discrepancies or if the quality of the studies selected are poor.

In the development of WAA, electricity was used to stimulate points, however this was abandoned in February of 1972 (Zhou et al., 2002). Shi et al. (2022) noted “WAA is an invasive

treatment that is not easy for patients to accept." However, the Zhou et al. (2002) standard contradicts this, "No needling sensation is required." Lao (1999) asserts this more strongly, "Subcutaneous insertion must not have any DeQi sensation." Yet Lao also goes on to say that electro-acupuncture is another technique of WAA, but that the needles should conduct the current (1999). Use of experimental methods that involve strong or maximum tolerable stimulation (Chan et al., 2009; Du et al., 2022; Huang et al., 2025) is not consistent with the standard. The return to electrical stimulation seems to be a style divergence. Similarly, the use of pressure-based devices (Yuan et al., 2021; Zhai et al., 2024) is new to the style of WAA.

The strengths of this study were that the same author extracted all the data which led to consistent reporting and interpretation of the data. The methods were clearly outlined (see Appendix XX) which allowed for adherence to the unpublished protocol.

There were several limitations of this scoping review. Since this review was completed by a single author with limited financial and time resources, the scope of the review was necessarily narrow. Choices the author made to limit the scope included using only English-language studies to preclude translation needs; limiting the records to those locatable through PubMed; and avoiding in-depth statistical analysis. In addition, the data that were analyzed was that which was easily identified and of most interest to the author. Though a valuable step in many scoping reviews, this study did not include the consultation stage as recommended by Levac et al. (2010). In addition, bias is inherent in any study and without additional authors, assumptions may have been overlooked and left unstated. Despite the limitations noted, the research questions were answered and the protocol differences around the procedure of WAA are well-documented.

Wrist-ankle acupuncture is a style of acupuncture that is simple, convenient, and painless. Hwang claims the creator of this method noted that it was so simple that it could be performed after two hours of training by a non-medical professional (1977). Because the only places that are accessed for treatment are the wrists and ankles, WAA is well suited for community acupuncture clinics where disrobing is not done. Similarly, in the context of routine surgery, WAA is useful for reducing the amount of anesthesia needed (Lu et al., 2020; Dong et al., 2022; He et al., 2022; Xu, Z. et al., 2022) and can help reduce post-operative pain and complications (Marra et al., 2011; Hou et al., 2022; Xu, N. et al, 2022; Zhang et al., 2025). Since the needle placement in this style of acupuncture does not limit movement, it is especially appropriate for situations where movement may be beneficial such as physical therapy (Cao et al., 2023), or for children and people with disorders of movement who need to be able to move without displacing the needles or causing discomfort. WAA has the potential of being very effective in widespread use; however, the research available to an English-language audience is minimal. Though clearly beneficial for pain, cancer, and surgical application, WAA can treat a wide array of conditions and deserves further study.

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APPENDIX A

Appendices forthcoming per communication with Dr Robyn.