



Review Article

Warm Needling Treatment in Korea: A Literature Review

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ABSTRACT

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Although there have been studies investigating the clinical effects of warm needling (WN) for specific diseases, a comprehensive review of WN is needed. Four Korean internet databases were used in the review of WN treatment performed in Korea. The search terms used to retrieve articles were “warm needling (in Korean; 온침),” “warm acupuncture,” and “warm needle.” A total of 29 articles were reviewed. The following aspects of WN were investigated: language and terminology, study design, use of Standards for Reporting Interventions in Clinical Trials of Acupuncture, research ethics, moxibustion types, number of moxa used, moxa combustion time, needle retention time, treatment time and frequency, acupoints, meridians, acupuncture size and depth, disease classification, pattern identification, outcome measures, and adverse effect. More sophisticated and precise studies on WN are required.

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Introduction

Acupuncture and moxibustion medicine is defined as a department of Korean Medicine, which prevents, palliates, and treats disease, through the practice of various acupuncture and moxibustion interventions. Acupuncture is where a mechanical stimulus is applied using acupuncture needles of varying types, and moxibustion is the use of a thermal stimulus using moxa or a drug to warm a particular area of the body [1].

Acupuncture harmonizes qi and the blood, and regulates the spirit. Moxibustion protects the body from pathogenic qi, and warming yang [2].

Warm needling (WN) is a combined treatment using acupuncture and moxibustion. WN treats diseases caused by wind-dampness and cold pathogens by using the warmth of moxa which is attached on the handle of the needles used for acupuncture and lit. The moxa can be either massed moxa floss, or pre-made moxa sticks [3]. In the clinic, pre-made mini moxa sticks are often used for convenience.

Since 2000, clinical cases where WN treatment has been used,

have been reported in Korea and analyses has been published. Chung et al [4] reviewed randomized controlled trials (RCT) that used WN treatment for musculoskeletal pain disease. Hwang et al [5] investigated WN treatment used for various conditions and diseases that were published in China. Recently, Ko et al [6] and Kim et al [7] reviewed treatment effects of WN on ankle sprains and lumbar herniated intervertebral discs in 2020 and 2018, respectively.

Although there have been a few studies reviewing the clinical aspects of WN treatment, there has not been a comprehensive investigation of studies (without restriction of disease types) that has been conducted in Korea; thus, the efficacy of WN treatment was reviewed in this study.

Materials and Methods

The databases of the National Discovery for Science Leaders (NDSL; www.ndsl.kr), Research Information Sharing Service (RISS; www.riss.kr), Korea Studies Information Service System (KISS; kiss.ksudy.com), and Oriental Medicine Advanced Searching Integrated

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System (OASIS; oasis.kiom.re.kr) were used to retrieve articles. The search terms were “warm needling (in Korean; 온침),” “warm acupuncture,” and “warm needle.” The process was performed on November 12, 2019.

A total of 386 articles were searched and selection was based on their titles and abstracts. Articles published outside Korea ($n = 1$), on an unrelated subject ($n = 205$), and processed in vivo or in vitro ($n = 37$) were first excluded. Translation articles on foreign studies ($n = 4$), and review articles ($n = 26$) were eliminated. Finally, 29 articles were included except for duplicated articles ($n = 84$). The process was performed by licensed Korean Medicine doctors (Fig. 1).

General aspects

Language and terminology

This review focused on articles published in Korean journals; 4 studies were written in English, and the other studies were written in Korean.

Various English and Korean terms of “warm needling” (in Korean; 온침) were used including “hot acupuncture” [8], “warm acupuncture” [9,10], “warming acupuncture” [11-18], “warming-acupuncture” [19], “warm needle” [20-22], “warm needling” [23-32], “warming needle” [33], “warm-needle” [34], “warm-needling” [35], and “warm needling acupuncture” [36].

Through the similarity of the terminology used, studies in this review were categorized into “hot acupuncture,” “warm acupuncture,” “warm needling,” and “warm needling acupuncture.” Only 1 article used the term “hot acupuncture” and 1 used the term “warm needling acupuncture,” accounting for 3.45% of the studies. Eleven studies used “warm acupuncture,” accounting for almost 38% of all articles. The last 16 articles used “warm needling,” accounting for almost 55% of the total number of studies (Table 1).

Study design

Most of the articles ($n = 24$) were written as case reports (CR), and a few were controlled clinical trials (CCT; $n = 3$) or randomized controlled trials (RCT; $n = 2$) were WN was used as treatment for a disease or illness. However, 1 CCT performed by Zhang et al [33], studied WN treatment for temporary leg edemas

(neither disease nor illness). In another study by Jung et al [16], the clinical effects and aspects of various treatment methods were roughly reviewed and compared, therefore, the study design could not be defined.

Standards for reporting interventions in clinical trials of acupuncture

Only 5 of 29 studies specified their use of Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA), and in 1 study [19] which was published in 2000, STRICTA had not been developed.

Research ethics

Sixteen studies revealed their ethical relevance, whereas 13 studies did not. Four of the 16 studies underwent supervision by an ethical organization including an institutional review board (IRB) and an ethical committee. The other 12 obtained consent from their patients.

Aspects of acupuncture and moxibustion

Moxibustion

In this review, 18 studies used pre-made moxa sticks for WN, and 7 used moxa cones or sticks made by the practitioner. Six of the 7 studies attached moxa cones for the treatment, and 1 used moxa sticks.

Most of the articles investigated in this review, did not specify the size of the moxa used. There was 1 study that used the “proper amount” of moxa floss, 8 studies stated the size of moxa used, however 1 of these 8 studies denoted the diameter of the moxa stick as “φ”, not an SI unit (Table 1).

Fourteen of the 29 studies did not mention the combustion time of moxa attached. One study combusted moxa for 5 minutes and another for 6-7 minutes. Three studies combusted moxa for 7-8 minutes and 10 minutes. Seven studies combusted moxas until they were burnt out.

Ten studies did not mention the number of moxa used per acupoint. The numbers of studies that used 1, 2, and 3 moxas per acupoint were 6, 7, and 6 studies, respectively.

One study retained acupuncture needles for 5, 10-12, 20-30, or 30 minutes, and “until warmth was not felt,” respectively. Two retained needles for 10 minutes. Three retained needles for 15 minutes. The most frequently used retention time was 20 minutes, which was used in 7 studies. Twelve studies did not mention needle retention time.

Treatment time and frequency

Most of the participants in the review ($n = 16$) had less than 2 weeks of treatment. Thirteen participants had long-term treatment of over 8 weeks. For 1 patient, the treatment period was not mentioned [33]. Since the studies by An et al [21], Jung et al [16], Cho et al [20], and Kweon et al [31] had more than 1 participant, the total number of participants reviewed was 48, excluding 1 patient of Cho et al [20] who did not receive acupuncture treatment (Table 2).

In most of the studies ($n = 12$) in this review, treatment was conducted daily. In 1 study, treatment was conducted once every 2 days, and in another study, treatment was performed 1 to 2 times per week. Two of the 29 studies had treatment frequencies of once per week. There were 2 studies with treatments twice per week, and the other 11 studies did not mention the treatment frequency.

Acupoints

Most of the studies specified their basic theory for their acupoint

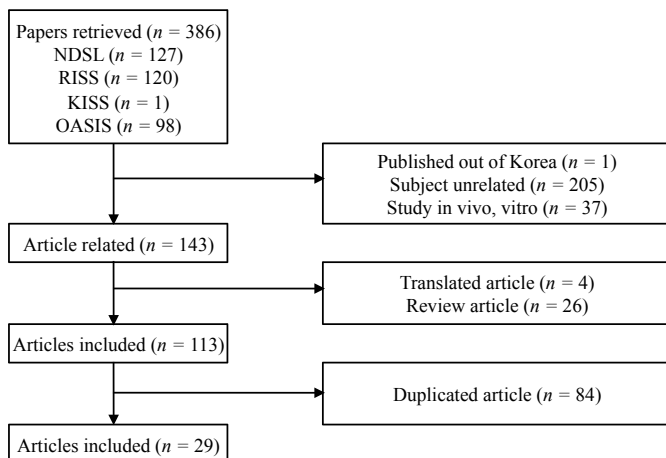


Fig. 1. Flow chart of the trial selection process.

NDSL, National Discovery for Science Leaders; RISS, Research Information Sharing Service; KISS, Korea Studies Information Service System; OASIS, Oriental Medicine Advanced Searching Integrated System.

Table 1. Terminologies and Moxa Sizes Used.

	Categorialized terminology	Terminology used	Moxa size
Jung et al [8]	Hot acupuncture	Hot acupuncture	Not shown
Son et al [9]	Warm acupuncture	Warm acupuncture	Not shown
Shin et al [10]			Not shown
Park et al [11]		Not shown	
Kwon et al [12]		5 mm × 25 mm	
Park et al [13]		Not shown	
Lee et al [14]		Warming acupuncture	5 mm × 20 mm
Park et al [15]			2 cm × 2 cm
Jung et al [16]			“Proper amount”
Kang et al [17]			5 mm × 20 mm
Lee et al [18]			2 cm × 2 cm
Kim et al [19]		Warming-acupuncture	Not shown
Cho et al [20]	Warm needling	Warm needle	Not shown
An et al [21]			Not shown
Hwang et al [22]		Not shown	
Park et al [23]		Not shown	
Han et al [24]		2 cm × 2 cm	
An et al [25]		Not shown	
Lee et al [26]		Not shown	
Park et al [27]		Warm needling	Not shown
Jo et al [28]			Not shown
Min et al [29]			Not shown
Yang et al [30]		Not shown	
Kweon et al [31]		Not shown	
Lee et al [32]		Not shown	
Zhang et al [33]		Warming needle	12 φ × 15 mm
Jun et al [34]		Warm-needle	Not shown
Lim et al [35]		Warm-needling	Not shown
You et al [36]	Warm needling acupuncture	Warm needling acupuncture	5 mm × 25 mm

*x × y=diameter × height.

choice. Traditional theory was the most frequently used base theory. Other theories, such as commonly used acupoints, early studies, modern and classic texts, ouch points (a-shi points), and anatomical consideration were not used much. Since some studies were based on more than 1 theory, the total number of treatments was 32 (Table 3).

The number of acupoints used for WN treatment varied from 1 to 9. There were 3 studies that did not mention the number of acupoints used. Two studies did not specify the precise number

of acupoints used (Table 4). In the article by Lim et al [35], LI11, LI15, ST36, and GB39 were used for central post-stroke pain, and LI11, LI15, LI16, and GB21 were used for impingement syndrome of the right shoulder; thus, a total of 6 acupoints were used.

A total of 64 acupoints were used, including 3 of conception vessel, 2 of governor vessel, 5 of extra points, and ouch points. The most commonly used meridian was the gallbladder meridian, of which 10 acupoints were used (Table 5).

In the 12 main meridians, LU1, LU6, LI4, LI5, LI11, LI14, LI15,

Table 2. Treatment Time.

Treatment time (wk)	<i>n</i>
< 2	16
< 4	6
< 6	5
< 8	7
≥ 8	13
Not shown	1
Total	48

Table 3. Base Theory of Acupoint Choice.

Classification	<i>n</i>	%
Commonly used acupoints	3	9.38
Early studies	4	12.50
Modern and classic texts	3	9.38
Traditional theory	10	31.25
Ouch points	5	15.63
Anatomical consideration	3	9.38
Not shown	4	12.50
Total	32	100

Table 4. The Number of Acupoints Used for Warm Needling Treatment.

No. of acupoints used	<i>n</i>
1	5
2	5
3	2
4	5
5	3
6	1
8	2
9	1
4-6	1
5-6	1
Not shown	3

Table 5. The Number of Acupoints Used per Meridian Lines.

Meridian lines	<i>n</i>
Lung	2
Large intestine	6
Stomach	6
Spleen	6
Heart	1
Small intestine	4
Bladder	8
Kidney	4
Pericardium	1
Triple energizer	3
Gallbladder	10
Liver	2
Conception vessel	3
Governor vessel	2
Extra points	5
Ouch points	1
Total	64

LI16, ST15, ST16, ST34, ST35, ST36, ST41, SP4, SP5, SP6, SP8, SP9, SP10, HT8, SI11, SI14, SI15, SI19, BL23, BL24, BL25, BL26, BL31, BL33, BL40, BL56 KI6, KI10, KI11, KI12, PC7, TE14, TE17, TE21, GB12, GB20, GB21, GB27, GB30, GB31, GB32, GB33, GB34, GB39, LR7, and LR8 were used. CV2, CV3, CV4, GV13, and GV14 were used in the governor vessel and conception vessel. As extra points, Ex-B2, Ex-LE2, Ex-LE3, Ex-LE4, and a point below C6 spinous process were used. Hwatahyeopcheok, used by Jo et al [28], was regarded as Ex-B2.

While most of the acupoints were used in 1 study, there were some acupoints used in more than 1 study. LI4, LI14, LI16, ST34, ST41, SP6, SP9, BL23, BL40, KI10, GB21, GB33, GB34, GB39, CV4, and Ex-LE4 were used in 2 studies. LI11, ST36, GB20, and Ex-B2 were used in 3 studies. LI15 was used in 4 studies. Ouch point was used in 7 studies.

Acupuncture

Acupuncture needles with a diameter of 0.25 mm and length of 40 mm (0.25 × 40 mm) were most frequently used in 12 articles. Three articles did not specify the size of the acupuncture needle used. Park et al [11] and Park et al [15] used 2 types of acupuncture needles, 0.35 × 40 mm and 0.35 × 60 mm, and 0.50 × 50 mm and 0.70 × 120 mm each (Table 6).

More than half, 18 of the articles mentioned the depth of acupuncture needling. Twelve did not mention the depth, and 1 mentioned the depth as “cun,” not in SI units. Since Park et al [23] acupunctured 0.5 cm in LI5, and 3.0-4.0 cm in LI14, LI15, and

Table 6. The Size of Acupuncture Needle.

Size (mm) *	n
0.18 × 48	1
0.20 × 30	2
0.25 × 30	2
0.25 × 40	12
0.30 × 40	3
0.30 × 50	1
0.35 × 40	1 [†]
0.35 × 60	1 [†]
0.40 × 40	2
0.40 × 60	1
0.50 × 50	1 [‡]
0.70 × 120	1 [‡]
Not shown	3
Total	31

*Diameter × length, [†]duplication by Park et al [15], [‡]duplication by Part et al [11].

Table 7. Needling Depth.

Depth	n
0.5-1 cun	1
≤ 10 mm	6*
≤ 15 mm	3
≤ 20 mm	6
> 20 mm	2*
Not shown	12
Total	30

*Duplication by Part et al [23].

Table 8. Disease Classification.

System	n	%
Musculoskeletal	17*	56.67
Nervous	9*	30.00
Reproductive	2	6.67
Etc.	2	6.67
Total	30	100

*Duplication from Lim et al [35].

Table 9. Pattern Identification by Cold-heat and Deficiency-excess.

	Cold	NC	Heat	n	%
Deficiency	4	8		12	37.50
NC	5			5	15.63
Excess	6	8	1	15	46.88
n	15	16	1	32	100
%	46.88	50.00	3.13	100	

NC, not classified.

LI16, duplicating the count, the total number of studies became 30, not 29 (Table 7).

Only 1 of 29 articles by Zhang et al [33] used manipulation, while 8 did not. In the other 20 articles, use of manipulation was not mentioned.

Other aspects

Disease classification

To investigate the usage of WN, diseases of searched studies were classified as diseases of the circulatory, digestive, endocrine, exocrine, lymphatic, musculoskeletal, nervous, urinary, reproductive, and respiratory systems. Seventeen studies had concerned for musculoskeletal disease, 9 for nervous disease, and 2 for reproductive disease. Lim et al [35] treated a patient with central post-stroke pain and right shoulder impingement syndrome, thus classifying in both musculoskeletal and nervous disease. Refractory levator ani syndrome described by Son et al [9] and edema described by Zhang et al [33] were sorted to as "etc.," due to the unclear aspects of the diseases for classification (Table 8).

Pattern identification

Except for 13 of 29 studies that did not identify patterns of their participants, a total of 22 pattern identification types were observed. All the types were reclassified according to a 2-dimensional table of cold-heat and deficiency-excess. There were 15 participants who were classified as showing a cold pattern, and only 1 a heat pattern. Twelve were classified as showing a deficiency pattern, while 15 showed an excess pattern. Most of the excess patterns were similar to static blood patterns (Table 9).

Regarding the 5 qi of wind, heat, dampness, dryness, and cold, 18 of the 22 patterns could be classified. In the study by An et al [21], there was 1 participant with heat pattern, 3 with dampness, and 14 with cold. Two participants had a deficiency in cold with static blood and blood stasis due to qi stagnation with cold, and these were classified separately to deficiency, cold, and excess pattern, and excess and cold pattern, respectively.

Outcome measures

Most of the studies tried to present treatment result as objective values. The American Orthopaedic Foot and Ankle Society (AOFAS) score, the EuroQol-5 dimension (EQ-5D), the Insomnia Severity Index (ISI), the Japanese Orthopedic Association (JOA) score, the Oswestry Disability Index (ODI), the Modified ODI, the Patient Global Assessment (PGA), the Shoulder Disability Questionnaire (SDQ), the 36-Item Short-Form Health Survey

Table 10. Outcome Measurements.

Index	16
Physical Examination	12
Physical measurement	2
Radiology	2
Scale	20
Special Inspection (PTI)	1
Symptom	9

PTI, pure tone audiometry.

(SF-36), the Short-form McGill Pain Questionnaire (SF-MPQ), the Shoulder Pain And Disability Index (SPADI), the Tinnitus Handicap Inventory (THI), and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) were used as indices in 16 articles.

The Cold Sensitivity Severity (CSS) scale, the Cold Intolerance Symptom Severity (CISS) scale, the Numeral Rating Scale (NRS), the Visual Analog Scale (VAS), the Pain Rating Scale (PRS), the Quality of Sleep (QSP), the Unite Rhumatologique des Affections de la Main (URAM), the lower back pain score, the pain grade, and the grade for clinical symptoms were used as scales in 20 articles.

Physical examinations were used in 12 articles. They included pain threshold test, range of motor (ROM) test, manual muscle testing grading system (MMT), grip strength of hand test, reflex test, grip and release test, finger escape sign test, straight leg raise test (SLRT), Milgram test, Apley scratch test, and 2-point discrimination test.

As radiological assessments, Digital Infrared Thermal Imaging (DITI), and sonography were used in 2 articles. One study presented a pure tone audiometry (PTI) result. Physical measurement, including size of cyst, skin temperature, and the boundary length of the lower legs were used by 2 articles. Nine used symptoms of the participants for treatment result assessment, including history taking, urinary output, bleeding amount, clinical manifestation, patient symptom diary, and pain drawing (Table 10).

Adverse effects

Only 3 articles reported no adverse effects. First-degree burn was reported by Park et al [23]. Mild bleeding of the treatment region was reported by Jun et al [34]. In the other 24 studies, the evaluation of adverse effects was not mentioned.

Discussion

Although Standardized Terminology of Korean Medicine (in Korean) [37] was published by the Society of Korean Medicine in 2015, English terminology of “warm needling” (in Korean; 온침) is not suggested. World Health Organization suggests “warm needling” as the standardized terminology of “warm needling” (in Chinese; 温鍼) [38].

Most of the articles investigated were CR. This suggests that more studies with higher evidence should be conducted and that stronger verification of the clinical effect of WN is needed.

STRICTA was first published in 2001, and the revised version was translated into Korean in 2010, and was intended to improve

the reproducibility and clarity of acupuncture studies [39]. Although it was expected that STRICTA would be used following its publication, most of the studies investigated did not mention their use of STRICTA. It is expected that a more active use of STRICTA will produce more standardized and reproducible study.

In the literature of Korean Medicine, ethical guidelines are not considered sufficient for the safety of participants [40]. Only 16 of 29 articles reviewed showed a level of ethical consideration, which included the consent of participants or supervision of an institutional review board or ethical committee. Regarding the dignity and human rights of participants, more precise and strict ethical administration should be performed in all clinical studies.

In 2008, the first RCT on WN in Korea was published by Yang et al [30]. Supervised by an ethics committee, WN was performed to a total of 15 participants, using pre-made moxa sticks. The sticks were burnt for 7-8 minutes. Acupuncture needles were retained for 20 minutes. Treatment was performed for 8 weeks, twice per week. Acupoints were selected based on traditional theory including meridian diagnosis, commonly used points, and ouch points. A total of 4 to 6 acupoints were selected according to the symptoms of the participants. ST15, ST16, Ex-LE3, and Ex-LE4 were used for standard acupoints. SP9 and SP10, LR8, GB33 and GB34, BL40, ST34, and KI10 were used according to the pain area. One to 4 ouch points were used on regions of tenderness. Although acupoints were selected by pain area, pattern identification was not conducted. The needling depth was 2-10 mm. Manipulation was not done. Treatment effect was assessed by WOMAC, SF-36, and PGA, which were categorized into indices. STRICTA adherence, and the sizes of acupuncture needles and moxa sticks were unclear.

The second RCT was published in 2013 by Min et al [29]. The aspects of the study were generally similar to those of Yang et al [30]. It was also supervised by an ethics committee. A total of 38 of 76 participants underwent WN treatment for 8 weeks, twice per week. Pre-made moxa sticks were burnt for 7-8 minutes, while acupuncture needles were retained for 20 minutes. Five to 6 acupoints, including commonly used acupoints, were selected based on traditional theory of meridian diagnosis. However, pattern identification was not conducted. ST35, ST36, Ex-LE2, and Ex-LE4 were used for standard acupoints. GB33 and GB34, BL40, ST34, and KI10 were used according to meridian diagnosis. Needles were inserted to a depth of 2-10 mm without manipulation. WOMAC, SF-36, and PGA were used for result assessment. STRICTA adherence, and the sizes of acupuncture needles and moxa sticks were unclear.

Lee et al [18] treated 3 of 6 patients with lumbago with WN treatment in a CCT in 2009. Moxa floss was massed into moxa cones 2 cm in diameter and 2.5 cm in high. The moxa cone was lit until natural combustion was finished. BL23, which was selected according to early studies and traditional theory, was used, and WN was performed only once per single treatment. Daily treatment was done for 7 days. Needles with 0.30 mm diameter and 50 mm length were inserted to a depth of 15-20 mm. The pain threshold was checked by physical examination. The VAS and the lower back pain score used in the hospital of the writer were also used for result assessment. Needle retention time, manipulation usage, and pattern identification were unknown.

Zhang et al [33] in 2017 published a study of 7 participants to assess the effect of WN on leg edema. The article was categorized as a CCT, since clinical interventions for certain symptom were conducted to an experimental group and a control group. Supervised by an ethics committee, pre-made moxa sticks were prepared with 12-φ diameter and 15 mm length, on needles of 0.18 mm diameter and 48 mm length. The needles were inserted to a depth of 1-1.5 cm, and reinforcing-reducing manipulation was

performed for 1 minute. Needles were retained for 20 minutes. ST36 and SP6 were selected based on traditional theory, patterning indicated edema as spleen yang deficiency and kidney yang deficiency. Skin temperature check and sonography were performed to assess the effect of treatment. Number and combustion time of moxa, and treatment time were not mentioned.

Park et al [11] assessed the clinical effect of WN on lower back pain in 2005 in the form of a CCT. WN was performed to a group of 22 participants, and a comparison was made with a control group of 20 participants. Moxa sticks, made by researchers from moxa floss, were attached to needles of 0.50 mm diameter and 50 mm length. The moxa combustion time was not mentioned. The needles were removed when warmth was felt. GB30 and points between the lumbar spinal processes were selected as ouch points. Treatment was done for 4 weeks, once every 2 days. ODI, VAS, and SLRT were performed for result assessment. The effects were summarized using statistics. The size and number of moxa used, pattern identification, and manipulation usage were not mentioned.

In an article by Jung et al [16], the relationships of thoracolumbar spine compression fracture severity with admission period, symptom grade, and improvement grade were investigated. The relationships of admission period and improvement grade with symptom grade were also investigated. The admission period of patients who were treated with both pharmacopuncture and WN, pharmacopuncture only, without pharmacopuncture nor WN was compared. Every relationship and comparison did not have statistical significance. Since the clinical effects and aspects of various treatment methods were roughly reviewed and compared, it was unable to define the study design.

From 2000 to 2018, 24 CR were published. The first CR was published by Kim et al [19] in 2000. A vertebral compression fracture patient was treated with WN. Treatment was performed to ouch points for 22 days. Moxibustion was performed twice per treatment period. The patient was identified as having static blood, deficiency, cold, and qi-blood deficiency. The result was assessed by symptoms of the patient and the Milgram test. Size, type, and combustion time of moxa, needle size and depth, and use of manipulation were not mentioned.

Cauda equina syndrome with voiding bladder incontinence patient was treated with WN in 2003 by Park et al [15]. Moxa cones of 2 cm diameter and 2.5 cm length were made from moxa floss. Two types of acupuncture needles were used: 0.35 mm diameter and 60 mm length, and 0.35 mm diameter and 40 mm length. The needles were inserted in KI11, KI12, CV2, and CV3, which were selected by traditional theory and anatomical area of symptom. Although treatment was performed during a period of 47 days, treatment frequency was not mentioned. The patient was identified as showing a cold pattern. The treatment results were assessed in terms of clinical manifestation, reflex, and urine output. Other aspects of moxa and acupuncture were not mentioned.

Park et al [13] applied WN treatment to a patient with chronic olecranon bursitis in 2007. Pre-made moxa sticks were attached on handles of acupuncture needles of 0.25 mm diameter and 40 mm length. Nine ouch points were used. The treatment was performed 6 times over a period of 13 days. The patient was identified as suffering from fatigue due to trauma and dampness of joints syndrome. Bursa size and symptoms were checked for result assessment. Characteristically, patient follow-up was performed by telephone and no recurrence was reported. Moxa size, combustion time, number of moxa, acupuncture depth, and use of manipulation were not mentioned.

Kwon et al [12] evaluated the clinical effect of WN on a neck pain in a patient in 2009. Pre-made moxa sticks with a 5 mm diameter

and 25 mm length were attached 3 times per treatment period on acupuncture needles with a diameter of 0.30 mm and a length of 10 mm, which were inserted to a depth of 10 mm. Manipulation was not used. Moxa sticks were combusted until naturally burnt to 15 mm, and acupuncture needles were retained for 30 minutes. GV13, GV14, both SI14, both SI15, and an ouch point below the C6 spinal process were used. The results were assessed by VAS, SF-MPQ, and PRS. Treatment was performed for 7 days. The patient was identified as showing a cold-dampness pattern. Other aspects of moxa and acupuncture were not mentioned.

In 2010, 2 CR were published. Jung et al [8] treated 5 carpal tunnel syndrome patients with WN for 4 weeks, 3 times a week. Needles with a diameter of 0.25 mm and a length of 40 mm were used. The results were assessed by VAS and the subjective symptoms of the patients. Moxa type, size, combustion time, number of moxa, needling depth, use of manipulation, and pattern identification were not mentioned.

Lee et al [14] treated an osteoarthritis-induced ankle pain patient, who was identified as showing a dampness pattern. Pre-made moxa sticks with a diameter of 5 mm and a length of 20 mm were attached 3 times per treatment period. Acupuncture needles with a diameter of 25 mm and a length of 40 mm were inserted to a depth of 10 mm. Manipulation was not used. Moxa sticks were retained until naturally burnt. GB39, SP6, and ST41 were used based on early studies, texts, and ouch point theory. Treatment was performed once a day for 7 days. The result was assessed with VAS, SF-MPQ, and PRS. Needle retention time was not mentioned.

Hwang et al [22] treated a chronic tinnitus patient in 2011. Pre-made moxa sticks for WN were attached on needles with a diameter of 0.25 mm and a length of 40 mm, inserted to a depth of 20 mm. SI19 was selected based on early studies. Treatment was performed daily for 2 weeks. VAS of tinnitus and THI were used for result assessment. Size and number of moxa, and pattern identification were not shown. They clarified that patient consent was obtained before the study was conducted.

A case of a rotator cuff tear patient was published by Yoo et al [36] in 2012. WN with pre-made moxa sticks with a diameter of 5 mm and a length of 25 mm was performed for 5 days, once a day. LI14, LI15, TE14, GB21, and SI11 were chosen based on early studies. Needles with a diameter of 0.25 mm and a length of 40 mm were inserted to a depth of 2 cm. The moxa sticks were burnt for 10 minutes, and then the needles were removed. The procedure was performed according to STRICTA. Result assessment was performed by VAS, ROM, and SDQ. Pattern identification and use of manipulation was not mentioned. Patient consent was obtained before the study was conducted.

Kang et al [17] treated a patient with lumbago due to post-hysterectomy syndrome. Pre-made moxa sticks with a diameter of 5 mm and a length of 20 mm were attached until naturally burnt. Three sticks were used per acupoint. Right and left BL23, BL24, BL25, and BL26, which are commonly used and traditional theoretically selected points, were used. Acupuncture needles with a 0.25 mm diameter and 40 mm length were inserted to a depth of 15-20 mm. Manipulation was not used. The treatment was performed once a day for 7 days. The treatment results were assessed through VAS, modified ODI, and SF-MPQ. The patient was identified as having kidney deficiency lumbago.

Han et al [24] treated a patient with hand hypersensitivity after cervical spine compression myelopathy. Moxa floss were made into moxa cones with a 2 cm diameter and a 2 cm length. Only 1 moxa cone was used for acupoint. LI4 and LI11 were used based on traditional theory and early studies. Needles with a 0.25 mm diameter and a 40 mm length were inserted to depth of 1.5-2 cm. Acupuncture was performed according to STRICTA. Combustion

was performed for 6-7 minutes. The needles were removed after 20 minutes. Treatment was performed once a day for 8 days. The DITI, the NRS, the CSS scale, and the CISS scale were checked, and a symptom diary was written by the patient himself for result assessment. Use of manipulation and pattern identification were not mentioned. Patient consent was obtained before the study was conducted.

A patient with myelopathy by ossification of the posterior longitudinal ligament was treated by Lee et al [32] in 2014. Pre-made moxa sticks were used twice per acupoint. Natural combustion was performed. Acupuncture needles with a 0.40 mm diameter and a 40 mm length were inserted to a depth of 30 mm on Ex-B2 and GB20, according to results from earlier studies. Treatment was performed once a day for 21 days. The VAS, the grip and release test, the finger escape sign test, and the JOA score were checked for result assessment. Characteristically, patient satisfaction was checked by a 5-point Likert scale. Use of manipulation, needle retention time, and pattern identification were not mentioned. Patient consent was obtained before the study was conducted.

Park et al [23] managed a supraspinatus tendinitis patient in 2014. Pre-made moxa-sticks were attached on the handles of acupuncture needles inserted a depth of 0.5 cm and 3-4 cm at LI5, LI14, LI15 and LI16. The acupoints were selected based on traditional theory and ouch point theory. Moxa sticks were burnt for 7-8 minutes, and needles were retained for 20 minutes. Manipulation was not used. VAS, SPADI, ROM, and Apley scratch test were performed for result assessment. Treatment was performed for 7 days once a day. The patient was identified as having cold, fatigue due to overexertion, static blood, and a phlegm-retained fluid pattern. Patient consent was obtained before the study was conducted. Grade 1 burn, which is estimated to be a grade 1 event by common terminology criteria for adverse events, was reported [41].

Jo et al [28] treated a patient with traumatic brachial plexus injury in 2015. Pre-made moxa sticks were used twice per acupoint. Needles with a 0.25 mm diameter and a 40 mm length were inserted and retained for 10-12 minutes at LU1, LU6, LI4, TE17, GB20, and Ex-B2, at a depth of 0.5-1 cun. Points predicted to be injured and ouch points were selected. Treatment was performed for 67 days once a day. ROM, MMT, and grip strength test were checked for result assessment. Tactile and pain sensitivity of the hand was also checked as NRS. Satisfaction rate was checked via patient interview. Moxa combustion time and pattern identification were not mentioned. Patient consent was obtained before the study was conducted.

In 2016, 4 CR were published. Improvement in the condition of 8 dysmenorrhea patients was reported by An et al [21]. Moxa floss was made into moxa cones. Acupuncture needles with a 0.25 mm diameter and a 40 mm length were inserted, and 3 moxa cones were lit on CV4. The needles were retained for 20 minutes. The patients were asked about their symptoms, and pain grade was checked for result assessment. Treatment periods varied: 49 days, 50 days, 54 days, 60 days, 62 days, 63 days, 80 days, and 90 days. Five patients were identified as having cold-static blood, 1 cold, 1 deficiency cold with static blood, and 1 blood stasis due to qi stagnation with cold syndrome. Depth of acupuncture, size of moxa, combustion time, use of manipulation, acupoint selection theory, and treatment frequency were not mentioned. After all treatment, patient follow-up was performed via the outpatient department.

An et al [25] treated a relapsing sudden hearing loss patient. WN was performed at TE21 and GB12, which were chosen by text and traditional theory. Acupuncture needles with a 0.20 mm diameter

and a 30 mm length were used. THI and NRS were checked for result assessment. The patient was identified as having deafness due to deficiency. Treatment was performed for 68 days once or twice per week. Type, size, number, and combustion time of moxa; use of manipulation; acupuncture depth; and needle retention time were not mentioned. Patient consent was obtained before the study was conducted.

Lee et al [26] published a CR of a patient with left leg pain due to myofascial dysfunction after fasciotomy at gastrocnemius muscle. The procedure was performed according to STRICTA. Pre-made moxa sticks were used twice per treatment period. Acupuncture needles with a 0.25 mm diameter and a 40 mm length were inserted to a depth of 1.5 cm at SP8, SP9, LR7, and BL56. The acupoints were selected by traditional theory. Moxa sticks were burnt until naturally combusted. Needles were retained for 10 minutes. Treatment was performed for 5 days once a day. The patient was identified as having cold syndrome. VAS, EQ-5D, and ISI were used for result assessment. No side effect was reported. Satisfaction was checked via a 5-point Likert scale. Use of manipulation and size of moxa sticks were not mentioned. Patient consent was obtained before the study was conducted.

Park et al [27] treated a patient with ankle sprain induced by talus osteochondral lesions. Pre-made moxa sticks were used. Moxibustion was performed twice per treatment period, and moxa were removed after fully burnt. Acupuncture needles with a 0.25 mm diameter and a 40 mm length were inserted to a depth of 15 mm at acupoints near lesions: ST41, SP4, SP5, and KI6. Treatment was performed 8 times for 8 days. AOFAS, VAS, and ROM were checked for assessment. Size of moxa sticks, needle retention time, use of manipulation, and pattern identification were not mentioned. Patient consent was obtained before the study was conducted.

There were few articles published in 2017. Cho et al [20] treated 6 patients with abnormal uterine bleeding. Because 1 patient did not take any type of acupuncture treatment, a total of 5 patients underwent WN. Moxa cones were made from moxa floss. Needles with a 0.25-diameter and 40 mm length were inserted at CV4, and moxa cones were burnt on the needle 3 times. The acupoint was selected based on early studies. The needles were removed after 15 minutes. Treatment time varied by patients: 4 times for 43 days, 5 times for 36 days, 7 times for 126 days, 21 times for 75 days, and 2 times for 68 days. The treatment result was assessed according to the amount of bleeding. The patients were identified as having dual deficiency of qi and blood. Size of moxa cones, combustion time, use of manipulation, and depth of acupuncture were not mentioned.

Son et al [9] published a CR on a patient with refractory levator ani syndrome. The patient was identified as having a lesser yang heat stagnation pattern. Acupuncture needles with a size of 0.25 mm diameter and a 30 mm length were used. BL31 and BL33 were used based on early studies. Needles were retained for 20 minutes. Treatment was performed for 25 days. The result was evaluated by NRS of pain and patient symptoms. Size, number, frequency, and combustion time of moxa, and use of manipulation were not mentioned. After treatment, patient follow-up was performed via telephone, and the patient claimed to be healthy in general.

Lim et al [35] treated a patient with post-stroke central pain with right shoulder impingement syndrome. Pre-made moxa sticks and acupuncture needles with a 0.20 mm diameter and a 30 mm length were used. Combustion was performed once per treatment period. The needles were retained for 15 minutes. For post-stroke pain, LI11, LI15, ST36, and GB39 were selected. LI11, LI15, LI16, and GB21 were used for impingement syndrome. The acupoints were selected based on former texts. Treatment was performed for 42 days. Treatment results were checked by ROM, MMT, NRS,

and patient symptoms. The patient was identified as having blood stasis due to qi stagnation and a cold impediment pattern. Size and combustion time of moxa, use of manipulation, and treatment frequency were not mentioned. After discharge, patient follow-up was done via out-patient department, and no aggravation of the patient's conditions was reported. In this study, treatment of 2 different diseases were not precisely identified; thus, it was difficult to analyze the aspects and effects of the interventions used.

Shin et al [10] reported a case of a patient with thigh hypoesthesia and pain with meralgia paresthetica. The procedure was performed according to STRICTA. GB27, GB31, and GB32 were selected based on traditional theory and ouch point theory. Pre-made moxa sticks were attached on the handles of acupuncture needles with a 0.30 mm diameter and a 40 mm length inserted to a depth of 1.5-2 cm. Moxibustion was performed 2 times for 5 minutes each. Needles were removed after combustion was finished. The treatment was performed once per day for 5 days. For result assessment, 2-point discrimination test, pain drawing, and VAS were used. The patient was identified as having cold pattern. Size of moxa sticks and use of manipulation were not mentioned.

In 2018, 2 CR were published. Kweon et al [31] treated 5 postherpetic neuralgia patients. Pre-made moxa sticks were used. Acupuncture needles with a 0.30 mm diameter and a 40 mm length were used. Five ouch points were used. Warming was performed for 10 minutes, and needles were retained for 15 minutes. Treatment was performed 14 times for 30 days, 19 times for 22 days, 9 times for 10 days, 25 times for 10 days, and 12 times for 10 days. VAS, PRS, and QSP were checked for result assessment. Size and number of moxa sticks, acupuncture depth, use of manipulation, and pattern identification were not mentioned.

Jun et al [34] treated a Dupuytren's contracture patient. Pre-made moxa sticks were used. Acupuncture needles with a 0.25 mm diameter and a 30 mm length were inserted to a depth of 5-7 mm. Combustion was performed twice, for 10 minutes each. Ouch points were used. One ouch point corresponded with HT8. Treatment was performed for 6 days once per day. Treatment result was assessed via VAS, grip and release test, and the URAM scale. The patient was identified as having cold syndrome. Use of manipulation, size of moxa sticks, and needle retention time were not mentioned. Satisfaction investigation was performed in the form of a 5-point Likert scale. Slight bleeding at the treatment site was reported as an adverse effect.

According to the literature review summarized here, many of the studies about WN have points that could be improved in terms of quality and evidence of the studies. More sophisticated and precise study processes are required.

Conclusions

1. Terminology for WN was not unified. Only a small number of articles had a high evidence grade. Research ethics were not appropriately considered in most of the studies.

2. There were several articles that did not specify the precise aspects of acupuncture and moxibustion methods used. All 12 main meridians, conception vessels, governor vessel and ouch points were used. A total of 65 acupoints were used.

3. Most of the articles studied musculoskeletal diseases. Most of the patients were identified as having a cold pattern. For outcome measures, 16 studies used indices, 12 physical examinations, 2 physical measurements, 2 radiological examinations, 20 scales, 1 special inspection, and 9 patients' symptoms. Most of the studies did not monitor adverse effects of the treatment.

4. More sophisticated and precise studies on WN should be performed.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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