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Review / Derleme

The Effect of Acupressure on Uremic Pruritus in Hemodialysis Patients: A Meta-Analysis Study

Hemodiyaliz Hastalarında Akupresürün Kaşıntı Üzerine Etkisi: Bir Meta Analiz Çalışması

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ABSTRACT

Introduction: The purpose of this study was to conduct a meta-analysis to investigate the efficacy of acupressure on uremic pruritus in hemodialysis patients.
Methods: The literature was searched between September and December 2022. A literature search was carried out in the PubMed, Cochrane Library, Google Scholar, Scopus, ScienceDirect, Ovid and EBSCO databases using the keywords "Hemodialysis", "acupressure", "pruritus", and their combinations. The Joanna Briggs Institute's (JBI) quality assessment scale was employed in the study. Statistical package program for meta-analysis, Comprehensive Meta-Analysis was used. The standardized mean difference (SMD) with a 95% confidence interval (CI) was calculated. The I^2 value(I^2=84.7) was utilized to determine the heterogeneity between the studies. The random effects model was adopted in the study due to the significant level of heterogeneity.
Results: According to the meta-analysis results, acupressure intervention to prevent pruritus in hemodialysis patients was significantly higher in the experimental group than in the control group (SMD=1.400, 95%CI:0.829-1.984, p=0.00). The meta-analysis findings based on the session revealed a very large mean effect size (Q between) of 1.152(95%CI=0.894–1.411, p=0.000).
Conclusion: Acupressure was found to be effective in reducing pruritus in hemodialysis patients.

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ÖZET

Giriş: Hemodiyaliz hastalarında akupresürün üremik kaşıntı üzerine etkisini belirlemek amacıyla bir meta analiz çalışması yapılmıştır.
Yöntem: Literatür taraması Ekim-Aralık 2022 tarihleri arasında yapılmıştır. PubMed, Cochrane Library, Google Scholar, Scopus, ScienceDirect, Ovid ve EBSCO veri tabanlarında "Hemodiyaliz", "akupresür" ve "üremik kaşıntı'' anahtar kelimeleri ve bunların kombinasyonları kullanılarak literatür taraması yapılmıştır. Araştırmada Joanna Briggs Enstitüsü (JBI) tarafından hazırlanan kalite değerlendirme ölçeği kullanılmıştır. Meta-analiz için istatistiksel paket program Comprehensive Meta-Analysis kullanıldı. %95 güven aralığı (CI) ile standartlaştırılmış ortalama fark (SMD) hesaplanmıştır. Çalışmalar arasındaki heterojenliği belirlemek için I^2 değeri kullanılmıştır (I^2=84.7). Araştırmada yüksek düzeyde heterojenite nedeniyle rastgele etkiler modeli kullanılmıştır.
Bulgular: Meta-analiz sonuçlarına göre hemodiyaliz tedavisi gören hastalarda kaşıntıyı önlemek için akupresür müdahale grubunda kontrol grubuna göre anlamlı bulunmuştur (SMD=1.407, 95% CI:0.829-1.984, p=0.00). Akupresür seansına göre yapılan alt grup meta-analizin sonucunun çok güçlü ve 1,152 (%95 CI=0.894 – 1.411, p=0.000) olduğu saptanmıştır.
Sonuç: Hemodiyaliz hastalarında, akupresür üremik kaşıntıyı azaltmaktadır.

1. Introduction

Uremic pruritus associated with chronic renal failure is a common and bothersome symptom in individuals with chronic kidney disease (1). Uremic pruritus is an irritating condition that causes itching in patients and affects the protective barrier of the skin (2). Uremic pruritus usually begins before hemodialysis but progresses with treatment. Uremic pruritus can be widespread,although it can also be localized (3). According to Dialysis Outcomes and Practice Patterns Study (DOPPS), approximately 80% of hemodialysis patients reports pruritus, with 40% having significant pruritus (1). Pruritus lasts all day but is said to be worse at night. As a result, patients with uremic pruritus experience insomnia, degradation in social life, and

changes in physical appearance. Therefore, it lowers the quality of life of hemodialysis patients (4,5).

Treatments such as oral antihistamines, gabapentin, and naltrexone are used for uremic pruritus in hemodialysis patients (6). In addition to medical treatments, alternative remedies for uremic pruritus have been researched in recent years. Aromatherapy, yoga, acupuncture, and acupressure are among the treatments being researched (7-11). One of the methods used to reduce uremic pruritus is acupressure. Acupressure is the intervention of pressure to variour body areas that transport energies with fingertips, palms, or a specific intrument. According to this strategy, pressure stimulates energy flow in the body, blood circulation raises, and neurotransmitter chemical release increases. homeostatic balance is achieved in this manner (12,13). Acupressure is utilized to treat a variety of disorders and symptoms (14,15). Uremic pruritus is a feeling mediated by peripheral unmyelinated C nerve fibers in the skin. By activating the acupressure sites, it produces endogenous opioids (endorphin, enkephalin). These chemicals are secreted by the brain to alleviate unpleasent feelings, such as pain and itching (12,14).

These released compounds inhibit impulses in the spinal cord, preventing sensations such as itching from the somatosensory cortex. Endorphins, it is claimed, relieve pressure on nerves and vessels in all tissues and speed the elemination of chemicals that cause itching by improving better blood circulation. Because of these effects, it has been stated that when acupressure is used conjunction with or instead of pharmaceutical techniques , it lowers the severity of itching as well as the amount of frequency of antihistamine medicines administered to the patient (3,5,13).

Several studies have been conducted to investigate the effect of acupressure on uremic pruritus in hemodialysis patients. Therefore, the meta-analysis approach was utilized in this study to investigate the effect of acupressure intervention on uremic pruritus in hemodialysis patients. The research was carried out by conducting a systematic retrospective review of previous studies on the subject, as well as data acquisition, analysis, and interpretation.

2. Methods

In this study, a systematic review meta-analysis was carried out to investigate the effecicacy of acupressure on uremic pruritus in hemodialysis patients. PROSPERO Number: CRD4202 4146158.

2.1. Search strategy

A literature search was undertaken in PubMed, Cochrane Library, Google Scholar, Scopus, ScienceDirect, Ovid and EBSCO databases. The search method used the phrases “Hemodialysis” OR “Dialysis” OR “Hemodialysis Patients” AND “Acupressure” AND “Pruritus” OR “Itching.” The studies were assessed in terms of inclusion criteria to select which studies to include in the meta-analysis. the literature review wasconducted between September and December of 2022. The literature review was conducted independently by two scholars. fter the scans, the researchers evaluated the number of scans using the prisma flow diagram.

The researchers reviewed the discrepancies in the scanning phase before making the final decision. After scanning, the data were transferred to the Endnote program and duplicates were removed. In the final phase, two researchers assessed the full-text articles to determine which should be included in this meta-analysis. Finally, the studies that met the inclusion criteria for the meta-analysis were identified. Disagreements and inconsistencies were discussed and resolved with an independent reviewer at each stage until a consensus was reached.

2.2. Inclusion and exclusion criteria

Studies that met the following inclusion criteria were included in the meta-analysis: (1) studies in which patients received hemodialysis, (2) studies conducted with patients older than 18 years, (3) studies in which acupressure was used, (4) studies with full texts available, (6) studies in English were included.

The exclusion criteria for studies include: (1) studies that do not provide specific information about the result and method, (2) case reports, study protocols, reviews, or systematic reviews, (3) studies carried out with children, (4) interventions other than acupressure (such as acupuncture), (5) studies that are unsuitable for the research, (6) studies published in languages other than English (Figure 1).Two researchers conducted the literature review according to the inclusion and exclusion criteria. In the event of disagreement, the researchers solved it by discussion.

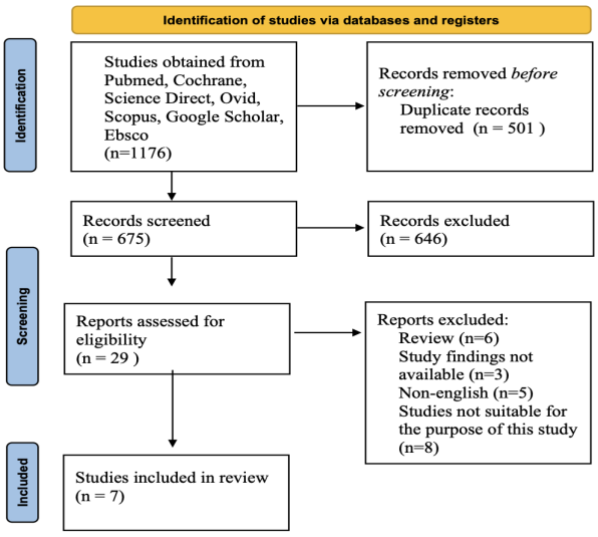

Figure 1. Prisma flow diagram (16)

2.3. Literature quality evaluation

The JBI checklist was used for quasi-experimental studies and randomized controlled trials (17). The bias risk of the randomized controlled trials was evaluated in thirteen categories. The bias risk of the quasi-experimental studies was assessed in nine different types. The risk of bias was graded as unclear, low, and high (17). Two authors independently evaluated the risk of bias for each study. According to JBI, the highest score for randomized controlled studies is 13, and 9 for quasi-experimental studies. Yan et al. (2015), Akca and Tasci (2016) and Karjalian et al. (2020) received 13 points from the scale while Akca et al. (2013) received 10 points from the scale according to the JBI's quality assessment scale used randomized control studies (3,11,18,19). Panma et al. (2021) received 8 points, Kang et al. (2017), and Bang et al. (2020) received 9 points from the scale according to the JBI's quality assessment scale used for quasi-experimental studies (20-22). The studies were evaluated as low-risk (Table 1,2).

Table 1. JBI Quality Rating Scale for randomized controlled studies

Checklist	Akca et al.2013	Yan et. al., 2015	Karjalian et al., 2020	Akca and Tasci 2016
Was true randomization used for the assignment of participants to treatment groups?	+	+	+	+
Was allocation to treatment groups concealed?	+	+	+	+
Were treatment groups similar at the baseline?	+	+	+	+
Were participants blind to treatment assignment?	-	+	+	+
Were those delivering treatment blind to treatment assignment?	?	+	+	+
Were outcomes assessors blind to treatment assignment?	?	+	+	+
Were treatment groups treated identically other than the intervention of interest?	+	+	+	+
Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analysed?	+	+	+	+
Were participants analysed in the groups to which they were randomized?	+	+	+	+
Were outcomes measured in the same way for treatment groups?	+	+	+	+
Were outcomes measured in a reliable way?	+	+	+	+
Was appropriate statistical analysis used?	+	+	+	+
Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?	+	+	+	+

("+" = "Yes"; "-" = "No"; "?" = "Unclear")

Table 2. JBI Quality Rating Scale for quasi-experimental studies

Checklist	Panma et al. 2021	Kang et al. 2017	Bang et al. 2020
Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	+	+	+
Were the participants included in any comparisons similar?	+	+	+
Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	+	+	+
Was there a control group?	-	+	+
Were there multiple measurements of the outcome both pre and post the intervention/exposure?	+	+	+
Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analysed?	+	+	+
Were the outcomes of participants included in any comparisons measured in the same way?	+	+	+
Were outcomes measured in a reliable way?	+	+	+
Was appropriate statistical analysis used?	+	+	+

("+" = "Yes"; "-" = "No"; "?" = "Unclear")

2.4. Data analysis method

Comprehensive Meta-Analysis (CMA), a statistical package program software, was utilized for meta-analysis. Endnote X9 software was used to preserve the studies obtained after review and to separate duplicates and Microsoft Office Excel was used to protect and transfer the data from studies to CMA.

When calculating the effect sizes of each study, the standardized effect size developed by Cohen (1988) was used (23). The 95% confidence interval (lower and upper limit) was used to determine the standardized mean difference. I^2, p and Q values were calculated to determine the level of heterogeneity. An I^2 value higher than 75% indicates marked heterogeneity between studies (24). The meta-analysis results revealed significant heterogeneity (I_2=84.7). As a consequence, the random effects model was employed to interpret the meta-analysis results.

2.5. Effect size interpretation

The classification of Cohen, Manion, and Marrison (2007) was used in interpreting effect size values. Accordingly: the values were interpreted as follows.

Between 0,.00-0.10, very small effect;
Between 0.10-0.30, small effect,
Between 0.30-0.50, medium effect,
Between 0.50-0.80, a large effect,
0,80 and very large effect (25).

3. Results

A total of 1176 studies were yielded. 501 studies were eliminated due to duplication. 646 studies were excluded because their titles and abstracts were not suitable for the study's ,nclusion criterias. 22 additional studies were excluded from the meta-analysis because they did not meet the inclusion criteria (review, study findings not available, non-English, studies not suitable for the purpose of this study). As a result, 7 studies were included in the meta-analysis (Figure 1). The characteristics of the included studies are detailed in Table 3.

Table 3. Characteristics of studies included in meta-analysis

Author (Year) Country	Design	Sample Size	Area	Intervention	Frequency and duration	Risk of Bias Assessments
Yan et. al., 2015 (China)	Randomized controlled	E:32 C:30	Auricular Acupressure CO10, CO14, CO15, CO18, TF4,AT4	E: UC+Acupressure C: UC	3 times/weeks 6-12 minutes/time Total weeks: 6 Total session:18	JBI:13 point Low Risk
Panma et al., 2021 (Indonesia)	Quasi-experimental studies	OG: 19	LI11	One Group: UC+Acupressure	2 times/weeks 6-10minutes/time Total weeks: 4 Total session:8	JBI:8 point Low Risk
Karjalian et al., 2020 (Iran)	Randomised controlled	E:30 C:30	LI11 SP10 SP6 ST36	E: UC+Acupressure C: UC	3 times/weeks 12 minutes/time Total weeks: 4 Total session:12	JBI:13 point Low Risk
Kang et al., 2017 (Korea)	Quasi-experimental research	E:20 C:22	LI11 SP10 SP6 ST36	E: UC+Acupressure C: UC	3 times/weeks 6-10 minutes/time Total weeks:12 Total session:36	JBI:9 point Low Risk
Bang et al., 2020 (Korea)	Quasi-experimental research	E:21 C:21	Auricular Acupressure	E: UC+Acupressure C: UC	1 time/weeks 6minutes/time Total weeks:8 Total session:8	JBI:9 point Low Risk
Akça et al., 2013 (Turkey)	Randomized controlled	E:38 C:40	LI11 SP10 SP6 ST36	E: UC+Acupressure C: UC	3 times/weeks 12 minutes/time Total weeks:6 Total session:18	JBI:9 point Low Risk
Akca and Tasci, 2016 (Turkey)	Randomized controlled	E:25 C:25	LI11	E: UC+Acupressure C: UC	3 times/weeks 6-10 minutes/time Total weeks:4 Total session:12	JBI:13 point Low Risk

E: Experimental Group, C: Control Group, UC: Usual Care, OG: One Group (Pre-Post Test).

According to the meta-analysis results, there is a high level of heterogeneity between studies (I^2=84.748 p=0.00). In addition, a *p-value* of 0.000 indicated that the Q-statistics value was statistically significant (p<0.005) (Table 4).

Table 4. Heterogeneity Level of Studies Included in Meta-Analysis

Heterogeneity				
N	**Q**	**df [Q]**	**p**	**I^2**
6	39.340	5	0.000	84.7

I^2:I-squared

According to the meta-analysis results, acupressure intervention to prevent pruritus in hemodialysis patients was significantly higher in the experimental group than in the control group (SMD=1.407, 95%CI:0.829-1.984,p=0.00). The impact size in all studies was positive (intervention favoured the experimental group). According to the random effects model, there was a significant difference between the studies (p<0.05) as a consequence of meta-analysis. The study conducted by Kang et al. (2017) discovered a very strong mean effect size of 4.300 (95%CI=3.199–5.401 p=0.000) (Table 5).

Table 5. Meta-analysis Results of acupressure interventions on pruritus

Study Name	Standard Mean Effect (d)	Standard Error	95% CI		Z	p
			Lower Limit	Upper Limit		
Akca et. al. 2013	1.708	0.265	1.190	2.227	6.456	0.000
Akca and Tasci 2016	0.819	0.294	0.242	1.396	2.781	0.005
Yan et. al. 2015	0.937	0.268	0.413	1.462	3.501	0.000
Kang et. al. 2017	4.300	0.562	3.199	5.401	7.655	0.000
Panma et. al. 2021	0.900	0.272	0.367	1.433	3.309	0.001
Bang et. al. 2020	1.112	0.336	0.454	1.770	3.312	0.001
Karjalian et. al. 2020	0.895	0.271	0.364	1.426	3.305	0.001
Q between*	1.407	0.295	0.829	1.984	4.774	0.000

*Total mean size between scales, d: Cohen d.

Since the results of the basic meta-analysis were significant, subgroup analysis was performed for acupressure intervention areas, the number of intervention sessions and intervention durations.

A significant difference was found between the intervention area used to determine the effect of acupressure on pruritus according to the results of the subgroup analysis conducted according to the area used in the studies included in the meta-analysis (p=0.000). The result of the meta-analysis based on the area showed a very strong mean effect size (Q between) of 0.979 (95%CI=0.698–1.254, p=0.000).

The mean effect size of the auricular acupressure area was very strong and SMD 1.005, 95%CI=0.595–1.415, p=0.00

The mean effect size of the L11 area was very strong and SMD 0.863, 95%CI=0.471–1.254, p=0.00

The mean effect size of the L11,SP6,SP10,ST36 area was very strong and SMD 2.210, 95%CI=0.741–3.679, p=0.003.

A significant difference was found between the sessions used to determine the effect of acupressure on pruritus according to the results of the subgroup analysis conducted according to the session used in the studies included in the meta-analysis (p=0.000). The result of the meta-analysis based on the session showed a very strong mean effect size ($Q_{between}$) of 1.152 (95%CI=0.894–1.411, p=0.000).

The mean effect size of the 12 sessions was very strong and SMD 0.860, 95%CI=0.496–1.251, p=0.000

The mean effect size of the 18 sessions was very strong and SMD 1.324, 95%CI=0.568–2.079, p=0.001.

The mean effect size of the 36 sessions was very strong and SMD 4.300, 95%CI= 3.199–5.401, p=0.000

The mean effect size of the 8 sessions was very strong and SMD 0.984, 95%CI=0.570–1.398, p=0.000

A significant difference was found between the practice time (minute) used to determine the effect of acupressure on pruritus according to the results of the subgroup analysis conducted according to the practice time (minute) used in the studies which were included in the meta-analysis (p=0.000). The result of the meta-analysis based on the practice time (minute) showed a very strong mean effect size (Q between) which was 0.835 (95% CI=0.559–1.110, p=0.000

The mean effect size of the 12 minutes was very strong and SMD 0.627, 95%CI=0.243–1.010, p = 0.001

The mean effect size of the 6 minutes was very strong and SMD 1.096, 95%CI=0.447–1.745, p=0.001

The mean effect size of the 6-10 minutes was very strong and SMD 1.921, 95%CI=0.310–3.533, p=0.019

The mean effect size of the 6-12 minutes was very strong, and SMD 0.937, 95%CI=0.413–1.462, p=0.000 (Table 6).

Table 6. Subgroup analysis

	Study Number	Standard Mean Effect (d)	Standard Error	95% CI		Z	p
				Lower Limit	Upper Limit		
Area							
Auricular	2	1.005	0.209	0.595	1.415	4.802	0.000
LI11	2	0.863	0.200	0.471	1.254	4.318	0.000
LI11, SP6, SP10, ST36	3	2.210	0.749	0.741	3.679	2.949	0.003
Q between*	7	0.979	0.142	0.698	1.254	6.881	0.000
Session							
12	2	0.860	0.199	0.469	1.251	4.315	0.000
18	2	1.324	0.386	0.568	2.079	3.434	0.001
36	1	4.300	0.562	3.199	5.401	7.655	0.000
8	2	0.984	0.211	0.570	1.398	4.656	0.000
Q between*	7	1.152	0.132	0.894	1.411	8.735	0.000

Table 6. Subgroup analysis (continued)

	Study Number	Standard Mean Effect (d)	Standard Error	95% CI		Z	p
				Lower Limit	Upper Limit		
Practice Time (Minute)							
12	2	0.627	0.196	0.243	1.010	3.204	0.001
6	1	1.096	0.331	0.447	1.745	3.311	0.001
6-10	3	1.921	0.822	0.310	3.533	2.336	0.019
6-12	1	0.937	0.268	0.413	1.462	3.501	0.000
Q between*	7	0.835	0.140	0.559	1.110	5.942	0.000

*Total mean size between scales, d: Cohen d.

Classic fail-safe N test was used to determine publication bias. For an alpha value of 0.05, the number of studies was 158 based on the relevant calculation. This result indicated that the study did not have publication bias and was reliable. The insignificance of the p-value-2-tailed value in the Begg and Mazumdar Rank Correlation analysis, another indicator of publication bias, points to no publication bias. There was no publication bias in the present study since p-value-2-tailed=0.133>0.05. A funnel plot was used for the risk of bias (Figure 2).

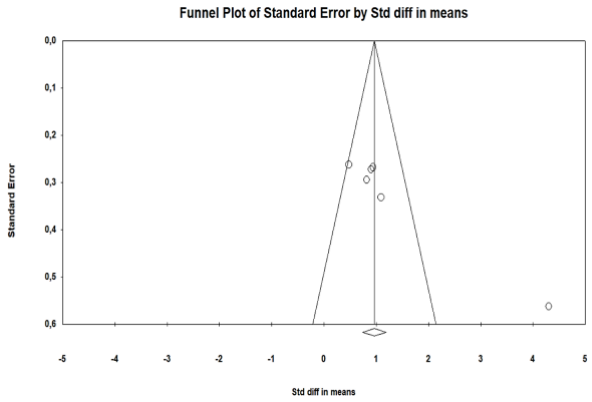

Figure 2. Funnel plot for risk of bias

4. Discussion

Seven studies examining the effect of acupressure on pruritus in hemodialysis patients were included in the meta-analysis.Four of these studies were conducted with a randomized controlled design and 3 used a quasi-experimental approach. The total number of patients in the meta-analysis was 185 patients for the experimental group and 187 for the control group. It was found that the studies were conducted using a small sample group (n<50). The number of samples is essential to generalize a study result and make high-powered judgements about the outcomes of prospective meta-analysis studies is critical. As the number of samples increases, so does the magnitude of the meta-analysis effect (26). It may be claimed that the study group comprised of patients receiving continuous hemodialysis, which affected the sample size owing to refusal or withdrawal from the therapy, resulting in a smaller sample group being analyzed.

Kang et al. (2017) found that the study's average impact size was quite large. Acupressure was applied to patients with varying session counts in the trials. In their study the patients received 36 sessions of acupressure. Kang et al. is the study having the most sessions among others. Kang's study may have the largest impact size due to the large number of sessions administered to hemodialysis patients (21). Akca et al. (2013) found that the study's average impact size was quite large. In their study the patients received 18 sessions of acupressure (19).

The results of Kang et al. (2017) and Akca et al. (2013) studies were positive and significant in favour of the experimental group. Since the effect size was strong and significant according to the meta-analysis results in two studies, it may be recommended to apply 18 sessions of acupressure to patients instead of 36 sessions. Using long acupressure sessions to patients can be tiring for patients, and they may want to stop the treatment. For this reason, we can recommend 18 sessions of acupressure instead of 36 sessions, as they have the same effect.

A subgroup analysis was made for the regions where acupressure was applied. According to the results of the subgroup analysis, it was found that there was a significant difference between the intervention areas (p=0.00). It was found that the effect size of the intervention results in the LI11, SP6, SP10, and ST36 regions was very strong and there was a significant positive result in favour of the experimental group (3,19,21). For this reason, we recommend applying primarily to the LI11, SP6, SP10 and ST36 regions to reduce itching in hemodialysis patients.

Subgroup analyses of acupressure intervention sessions were made. According to the subgroup analysis, it is seen that there is a significant positive difference between the acupressure intervention sessions in favour of the experimental group. It was determined that the most significant effect size among the sessions was 36 sessions of intervention (3). However, applying acupressure during long sessions in hemodialysis patients may be difficult, or patients may

want to stop the intervention over time. In their study, Akca et al. (2013) 18 sessions of acupressure were applied to the patients (19). For this reason, 18 sessions can be applied, which is second in the effect size. In addition, it was determined that 12 sessions of acupressure were significant and had a strong effect. For this reason, we can say that the number of sessions can be determined according to the conditions of the patients, and the intervention can be made since all of the 12, 18, and 36 sessions of acupressure sessions are positively significant in favour of the experimental group and have a strong effect.

Subgroup analyses were performed for the acupressure intervention times (minutes) applied to the patients. According to the results of the subgroup analysis, a significant difference was found between the intervention times. According to the subgroup analysis results, the intervention time with the largest effect size was 6-10 minutes. For this reason, applying acupressure for 6-10 minutes to hemodialysis patients reduces itching. At the same time, other acupressure times used in the studies were found to be significant in themselves. Therefore, according to the effect size, 6-10 minutes, 6 minutes, 6-12 minutes, and 12 minutes can be applied to the patients, respectively.

Most studies provided clear information on the blinding and randomized status. This situation increases the reliability of the results (3,11,15,19,20). However, some studies need detailed information on randomization and blinding (21,22). The lack of randomization and blinding information in the studies included in the meta-analysis may cause bias in patient selection and evaluation of the study results. Since the results of meta-analysis constitute the level of evidence, making it of the most reliable studies will increase the reliability and usability of the evidence level.

The total number of studies included in the meta-analysis was seven. In particular, including publications in languages other than English in the meta-analysis may affect the results. For this reason, even if the studies are published in different languages, it can be recommended to give essential findings that can be used for meta-analysis in the abstract. Including all studies on the subject in the meta-analysis will increase the level of evidence for the meta-analysis results.

Detailed information about the side effects or negative results after acupressure intervention should have been given in the studies included in the meta-analysis. In this case, according to our meta-analysis results, we can reassure the patients by saying that acupressure intervention reduces itching in hemodialysis patients. However, it is essential to provide detailed information on this issue in studies to prepare patients and health personnel for adverse situations that may develop with this practice.

5. Conclusion

According to the results of the meta-analysis, it was determined that acupressure intervention reduced itching in hemodialysis patients. Among the acupressure intervention areas, LI11, SP6, SP10, and ST36 had the most significant effect size and power of 6-10 minutes and 36 acupressure intervention sessions. According to the meta-analysis results, the strongest effect size was found in 18 sessions after 36 sessions. For this reason, in cases where long-term acupressure intervention is difficult, 18 sessions can be applied. In the studies included in the meta-analysis, adverse effects after acupressure intervention were not specified. It is essential to provide detailed information about the negative impact of acupressure in future studies.

Conflict of Interest: The authors declare that there were no potential conflicts of interest with regard to the research, authorship and/or publication of this article.

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Authorship Contribution:

SS: The idea/scope, data collection, literature review, manuscript writing.

SG: The idea/scope, data collection, literature review, manuscript writing

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