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Review Article

Is Acupressure Effective To Treat Pruritus In Hemodialysis Patients? A Literatur Review

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Abstract

Aims: Chronic kidney diseases effects make the pruritus prevalence in hemodialysis patients relatively high. Several studies have been conducted to determine the effect of acupressure on complaints of uremic pruritus. However, it is still debatable how acupressure relief pruritus complains regarding the duration of acupressure. This study aims to identify the effectiveness of acupressure against pruritus based on previous studies.
Materials and Methods: An electronic literature search was conducted to identify studies that matched the inclusion criteria. The electronic databases used in this research are Wiley online library, Clinical key, ProQuest, EBSCO, and Google Scholar. The keyword used was "acupressure", "pruritus", "itch", and "hemodialysis".
Results: We found 1,983 articles based on keywords, and five articles met the inclusion criteria after conducting the article selection process. Three of the four experimental studies measured pruritus using a visual analog scale, and one used a numerical scale. One study applied auricular acupressure, and four studies used acupressure. Four studies have shown that acupressure effectively reduces the scale of pruritus. One study showed no significant difference between acupressure, sham control, and negative control groups in two weeks of intervention in the severity of pruritus (p=0.66).
Conclusion: Acupressure is effective in treating uremic pruritus and nurse can applied acupressure as a non-pharmacological intervention for pruritus in hemodialysis patients.

Keywords:
Acupressure, hemodialysis, pruritus, review

INTRODUCTION

Pruritus is a problem that is often experienced by CKD patients undergoing hemodialysis. The effects of end-stage renal disease make hemodialysis patients have a high prevalence of pruritus. The prevalence of pruritus in HD patients is 83.4% (1). In 2018, the incidence of pruritus in hemodialysis patients in Indonesia increased to 10,807 after only reaching 9,448 cases in 2017(2). It has been reported that more than 70% of patients experience especially uremic, 25.9% of patients with pruritus develop pruritus only at night, and another 25.9% reported worsening at night, with more than 50% reporting problems primarily at night (3).

It is still controversial and not explicit about the cause of pruritus itself. Many factors are also believed to be the cause of pruritus. Research conducted by Gobo-Oliveira et al. (4) showed a higher pruritus intensity occurred in patients with high creatinine, low hemoglobin, dyslipidemia, high CRP levels, and black race. In contrast, lower pruritus intensity was associated with high

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dialyzer use. Nearly 90% of dialysis patients are affected by pruritus. Pruritus in hemodialysis patients is associated with increased morbidity and mortality, depression, low quality of life, and sleep disturbances (5,6). Pruritus can also cause sleep disturbances and difficulty getting to sleep, cause emotional disturbances such as anxiety and depression, and also interfere with social relationships (7–9). Although there have been many studies about the quality of life of hemodialysis patients and the impact of pruritus on it, the management of pruritus is still not optimal because the etiology is still unclear.

Acupressure is a non-pharmacological treatment option to treat pruritic complaints experienced by patients. A quasi-experimental study by Akca & Tasci (10) showed that applying acupressure and Transcutaneous Electric Acupuncture Point Stimulation (TEAS) at the LI-11 point effectively reduced uremic pruritus in hemodialysis patients. Similar results were obtained by Aval (10) showed that the frequency and severity of pruritus can be reduced or decreased with acupressure. Acupressure is widely known as one of the treatments to relieve pruritus. However, it is still debatable how acupressure relief pruritus complains regarding the duration of acupressure. This study aims to identify the effectiveness of acupressure against pruritus based on previous studies and reviewed experimental studies focused on acupressure to reduce uremic pruritus complaints.

METHODS

Searching strategies

This literature review is based on five electronic databases: Wiley online library, clinical key, ProQuest, EBSCO, and google scholar. The keyword used was acupressure, pruritus, itch and hemodialysis.

Eligibility Criteria

All articles must meet the inclusion criteria: (1) Free full-text papers from 2012 until 2022, (2) Research about acupressure in hemodialysis patients, (3) experimental design, (4) content of relevant articles, and

(5) original research (6) used the English language. The following items were excluded from this study: (1) research on inpatient hemodialysis; (2) systematic or literature review research.

Data Extraction

The search for articles was performed from July until August 2022. PICO was used as a strategy for searching the article from the journal. The population is hemodialysis patients with uremic pruritus. The intervention is acupressure, and the comparison is the usual treatment for pruritus, like the administration drug for pruritus. The outcome is reduced pruritus scale. The keywords used in this study are pruritus, itch, hemodialysis, and acupressure.

To increase the scope of the database, the word 'and' is used. The initial selection of articles was carried out by looking at the suitability of the title and abstract with the research objectives. Articles not containing a combination of keywords are excluded from the selected article results. The next step is to review the relevant articles according to the inclusion criteria starting from the introduction, methods, and results to determine suitability with the research topic and do the quality appraisal. Articles that do not meet the criteria are excluded, while the relevant articles are retained.

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RESULTS

After selecting the articles, 1,983 articles were obtained based on keywords. A total of 1,588 articles were excluded because they did not meet the inclusion criteria, and 390 were excluded because they did not meet the objective research. As a final result, five articles met the inclusion criteria.

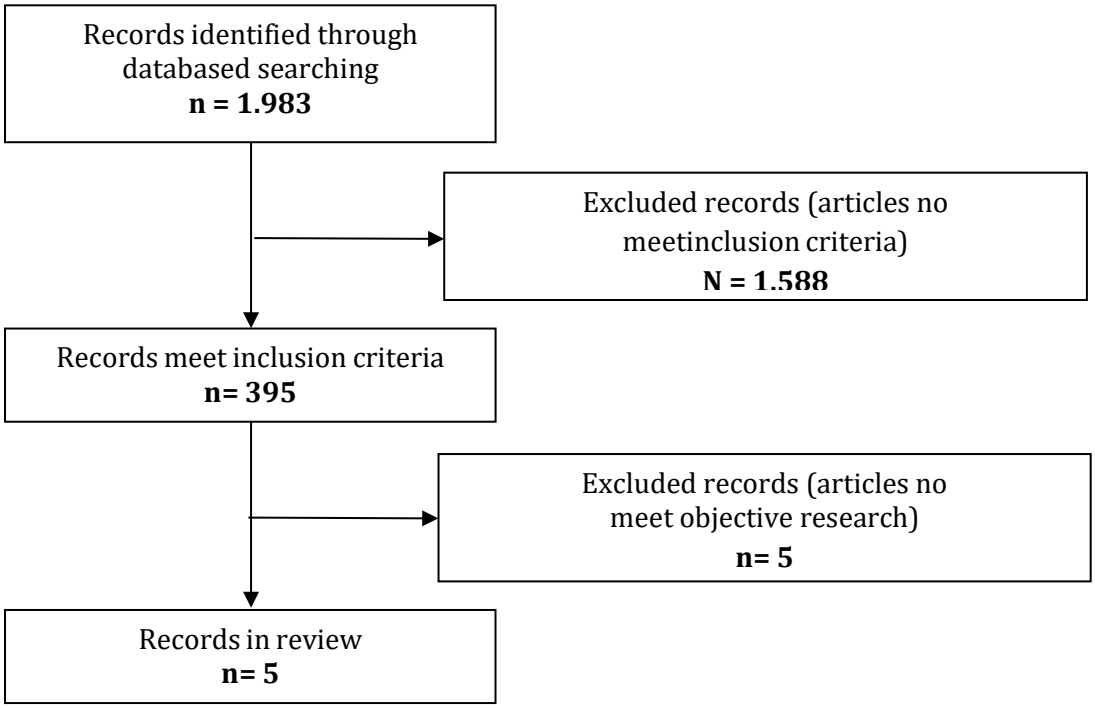

Figure 1.
The process of selecting articles included in the literature review

Table 1.
Effectiveness of acupressure on pruritus in hemodialysis patient articles

No	Author	Participant and location	Design	Intervention and instrument	Result
1.	Akca et al. (11)	Total of 78 participants: 38 in the intervention group and 40 in the control group in Turkey	Nonrandomized, controlled trial.	Acupressure in SP6, ST36, SP10, and LI11, a total of 18 sessions (3x/week for six weeks)	At week 6, the mean VAS score of participants in the intervention group decreased significantly ($p < .001$) compared to the control group. The decrease in the rate of pruritus remained stable at weeks 12 and 18 ($p > 0.05$)
2.	Yan et al. (12)	A total of 62 participants:32 participants were in the intervention	Randomized controlled trial	Auricular acupressure in the "kidney" (CO10), the "heart" (CO15), the "lung" (CO14), the	There was a significant difference between the mean VAS scores of participants before and after intervention in the

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		group and 30 participants in the control groups in Shanghai, China		"subcortical" (AT4), the "endocrine" (CO18), and the "Shenmen" (TF4) 5–8 times a day for total 18 sessions (3x/week for 6 weeks)	intervention group (5.750 ± 2.032 become 3.844 ± 1.687). There is a significant difference between VAS scores in the intervention group and the control group after the intervention (p<0.000)
3.	Akca & Tasci (13)	25 participants in the acupressure group, 25 participants in the TEAS Group and 25 participants in the control group in Turkey	Randomized controlled trial	Acupressure and TEAS in Li-11, 12 sessions (3x/week for 4 weeks)	The difference in the mean score between the acupressure groupand the control group after the intervention was -1.72 (p = 0.013), and the difference in the mean score between the TEAS group and the controlgroup was -1.95 (p = 0.004).
4.	Karjalian et al. (14)	90 participants in the south of Iran were dividedan into intervention group, sham control group, and negative control group	Randomized, double-blind, before-after clinical trial	Acupressure in SP6, SP10, ST36, and LI11, total of 12 sessions (3x/week for 4 weeks)	There was no significant difference between the three groups after two weeksof intervention in the severity of pruritus (p=0.66). However, the severity of pruritus decreased after one week of intervention.
5.	Panma et al. (15)	Indonesia, 19 respondents in a hemodialysis unit in Central Jakarta, Indonesia	Pre-experimental	LI-11 point two times per week for four weeks for a total of eight sessions, in the first hour of hemodialysis	Acupressure has a significant effect in reducing of pruritus scale (*p*-value 0,000).

There are 395 articles relevant to the research objectives. A total of 390 articles were excluded after reviewing the titles and abstracts because they did not meet the inclusion criteria. As a final result, five experimental studies met the inclusion criteria. The articles are described below:

A study conducted in Turkey by Akca (11) shown acupressure had an effect on uremic pruritus. A nonrandomized controlled trial design was performed with two groups, 38 respondents in the Intervention Group (IG), and 40 respondents in the Control Group (CG), for six weeks (18 sessions). The respondents are similar in the intervention and control groups in sociodemographic characteristics, pruritus scores, and duration of hemodialysis. The intervention group performed acupressure using a Transcutaneous Electrical Nerve

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Stimulation (TENS) in SP6, ST36, SP10, and LI11 points 3 minutes for each point. The control group (CG) did not perform acupressure, they only had a standard treatment like antihistamine tablets and lotions. The pruritus score was follow-up three times, at week 6, week 12, and week 18. At week 6, the mean VAS score of participants in the intervention group decreased significantly ($p < .001$) compared to the control group. The baseline VAS score for IG is 7.58 ± 1.57; it becomes 2.00 ± 1.36 in week 6. It decreases by 5.58 points in week 6. The decrease in the rate of pruritus remained stable at weeks 12 and 18 ($p > 0.05$), 2.21 ± 1.82 at week 12, and 2.66 ± 1.96 at week 18. The baseline VAS score for CG is 6.78 ± 1.46, it becomes 5.68 ± 1.37 at week 6, 1.65 ± 1.85 at week 12, and 4.98 ± 1.69 at week 18. This study also identified there is no significant difference between the IG dan CG in the biochemical parameter (Hb, Ht, K, Na, Ca, P, BUN, cr) and dialysis adequacy related to pruritus.

Yan et al. (12) conducted a study about auricular acupressure at six points: "kidney" (CO10), "lung" (CO14), "heart" (CO15), "Shenmen" (TF4), "endocrine" (CO18), and "subcortical" (AT4) on uremic pruritus in Shanghai, China, in 2014. This study used randomized block methods to allocate the participant. Everyone who was involved in this study was blinded to the participant, except the practitioner. Participants were divided into 32 participants in the intervention group and 30 in the control group. Both groups will be placed with tape at six points. The tape in the intervention group contained Vaccaria seeds. In contrast, the tape in the control group did not contain Vaccaria seeds, but the patients were told that the tape contained a traditional Chinese medicine that can reduce pruritus. The tape is changed daily and removed every Sunday as a rest day. The intervention group received auricular acupressure 5–8 times a day for 18 sessions (3x/week for 6 weeks). Auricular acupressure is performed by disinfection of the ear, identifying the acupressure points, then pressing to mark the skin, attaching the Vaccaria seed and applying pressure to each ear acupressure point for 1-2 minutes until patients feel numbness, heat, and tolerable pain. The control group did not receive auricular acupressure. For the result, after six weeks (18 sessions) there was a significant difference between the VAS scores in baseline and week 6 in the intervention group (5.750 ± 2.032 become 3.844 ± 1.687), the score decreased by 1.95 points in week 6. In contrast, there was no significant difference in VAS scores in the control group in baseline and week 6 (5.600 ± 2.127 become 5.567 ± 2.285). A significant difference was showed between VAS scores in the IG and the CG after six week ($p<0.000$). This study also identified that the biochemical parameters (phosphorus, calcium, PTH, substance P, PAR-2 and tryptase) do not significantly differ between CG and IG related to pruritus. However, histamine serum reduced significantly after six weeks in IG compared in CG.

Akca & Tasci (13) conducted a study to determine the effectiveness and the differences of acupressure and Transcutaneous Electrical Acupoint Stimulation (TEAS) in Li-11 point for relief pruritus. A randomized controlled trial was performed and participants randomly divided into three groups (each group consisted 25 participants): the acupressure group, the TEAS group, and the control group. The intervention was performed in the first half of the dialysis session in 12 sessions (3 x/week for 4 weeks). In the acupressure group, acupressure performed pressure with two rotations/second for 6 10 minutes/session. The force maintains between 3 and 5 kg. In TEAS group, acupressure was performed for three minutes/session in the first half hemodialysis. While the control group did not received acupressure, only standart treatment, and they received free acupressure course after completed the study. In the acupressure group, the

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baseline VAS score was 6.84 ± 1.70; at week 4, it dropped significantly to 3.36 ± 2.37 (p <.001). In the TEAS group, the baseline VAS score was 7.37 ± 1.31; at week 4, it dropped significantly to 3.12 ± 2.15 (p < 0.001). The mean score decreased in the acupressure group by 3.48 points; in the TEAS group, the score decreased by 4.25. The control group baseline VAS score was 6.92 ± 1.41. After week 4, it also decreased but not significantly by 5.08 ± 1.55 (p < .05). The difference in the mean score between the acupressure group and the control group after four weeks was -1.72 (p=0.013) between the TEAS group and the control group was -1.95 (p=0.004), and between the TEAS group and the control group was 0.23(p=1.000).

Research on acupressure was also conducted by Karjalian et al. (14) in Southern Iran. This randomized clinical trial of 90 hemodialysis patients was divided into an intervention, sham control, and negative control group. The intervention group received acupressure at SP6, SP10, ST36, and LI11 points. In comparison, the sham control group received acupressure at another point 2-cun away from the main point. Symmetric pressure is applied with the thumb for one minute with 4 kg pressure, followed by three intermittent pressures at each point. The intervention in both groups was carried out for 12 sessions (3x/week for 4 weeks) right before the dialysis time. The pruritus scores were follow-up two times, in week 2 and week 5. There was no significant difference between the three groups in week 2 of intervention in the severity of pruritus (p=0.66). Significant differences were observed in week 5 (p<0.001). The baseline NRS score in the intervention group is 8.37±1.22, which significantly decreased by 5.50 points in week 5 to 2.87±0.90. The three groups had no significant differences in biochemical parameters (Na, K, BUN, Hb, Ht, ca, cr).

Panma et al. (15) conducted a similar study in Indonesia. This study was a pre-experimental study with pre and post-tests without control. This study consisted of one group of 19 participants. The intervention was performed pressure in LI-11 point for 6-10 minutes/session for 8 sessions (2x/week for 4 weeks). The severity of pruritus assess use The Visual Analog Scale (VAS). The baseline VAS score was 7.95 ±1.90 (min-max: 4-10). The VAS score in week 4 decreased significantly to 4.00 ±2.00 (min-max: 0-8) with a p-value of 0.000. As much as 89.5% of respondents experienced a decreased score of pruritus ≥ 25%.

DISCUSSION

Five articles met the inclusion criteria; three were Randomized Controlled Trial (RCT) studies, one non-RCT study, and one pre-experimental study. The number of respondents in the study also varied, with the minimum number being 19 (15) to 90 (14). One study was conducted with only one group (intervention group without a control group) (15), two studies consisting of two groups (control group and the intervention group (11,12), and two studies consisting of three groups (acupressure, TEAS, and control groups; intervention, sham control, and negative control groups) (13,14). Both studies with two or three groups showed a significant difference between intervention and control groups.

Four articles showed that acupressure was effective in significantly reducing uremic pruritus. The decrease in pruritus score was in the range of 1.95-5.58. The decrease in pruritus VAS score was highest in the TENS group with 18 sessions (6 weeks) (11). Moreover, the group with auricular acupressure intervention was the lowest score reduction at six points during 18 sessions (12). The TENS intervention was performed for three minutes in each acupressure point with a frequency of 1000-10.000 Hz for 18 sessions. This intervention performs in the first two hours of dialysis. It can decrease pruritus significantly because the pulsed electric

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sent can activate the underlying nerves and perform during dialysis time. Similar to other studies that perform acupressure in dialysis time, it effectively reduces pruritus (13,15). While in auricular acupressure, use a finger to apply pressure in the acupressure point for 1-2 minutes, but the pressure force is not mentioned. This intervention performs 5-8 times/day, with one pressure must be done before sleep. The duration of acupressure was different between the TENS group and the auricular acupressure group. The duration of acupressure in the TENS group is longer than the auricular acupressure group, and the force produced by the TENS device is more stable than the force using a finger.

One article shows no significant difference in pruritus VAS scores after 12 sessions of acupressure (week 4), but pruritus decreased significantly at week 5. This shows that the length of time (number of sessions) in doing acupressure (more than one month) affects the effectiveness of acupressure therapy against pruritus (14). Jedras (20) also found that pruritus decreased significantly at 6, 12, and 18 weeks after baseline in the acupressure group, compared to a control group.

There are two studies that not only use acupressure by finger but also use Transcutaneous Electrical Stimulation (TENS) and Transcutaneous Acupoint Stimulation (TEAS). The time for applying acupressure with a finger (6-10 minutes) is longer than acupressure with TEAS or TENS (3 minutes at each point). Based on research by Akca & Tasci (10), The mean reduction in VAS pruritus scores was higher in the TEAS group than in the acupressure group. In TEAS, peripheral nerves can be activated by electric currents sent through the skin (16). Electrical impulses sent to the spinal cord and brain can help relieve pain and relax muscles. It can also stimulate the production of endorphins, the body's natural painkillers (16).

One article describes the study use of auricular acupressure for pruritus in hemodialysis patients. The acupoints used to reduce pruritus are the "kidney" (CO10), the "lung" (CO14), and the "heart" (CO15) points, "Shenmen" (TF4), the "endocrine" (CO18), and the "subcortical" (AT4) (12). Auricular acupressure is a traditional Chinese medicine modality with the characteristics of being easily manipulated, drugs wide range, sustained local stimulation, and manipulation is effective with cost efficiency (17). Auricular acupressure is a great potential therapy that can relieve pain, promote relaxation and insomnia, and treat discomfort in the body (17). Shenmen, the auricular point, can give peace to the soul and mind. Shenmen ears add "moisture" to the body. This physiological function is the basis for patients to be in a state of receiving treatment and calming the soul (18). The original point of the heart meridian is shenmen, which nourishes the heart zang and calms the mind so that it is suitable for sleep. The heart point is directly related to the heart organ/meridian complex in Chinese medicine. Heart Point is synergistically strengthened when used with shenmen but targets treatments related to the heart itself (18).

Five articles discuss the use of acupressure for pruritus in hemodialysis patients. The acupoints used to reduce pruritus are divided into two groups: first, are SP6, SP10, ST36, and Li-11 (11,14), second, only Li-11(13,15). Based on traditional Chinese medicine, Li-11, SP6, SP10, and ST36 is acupoint that can relieve itching (11–15). Another study by Lee showed that acupressure using a 1.2mm acupellet at the Li-11 point performed in as many as 18 sessions (for six weeks) effectively reduced pruritus complaints (19). Based on the decrease in pruritus score, using more than one acupressure point is more effective in reducing pruritus (11,13).

LIMITATION

This study is limited only to experimental study with acupressure intervention carried

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out by researchers only. The limitations of this study were that two articles in Korean language that were excluded because the articles did not have an English translation, and we had financial limitations to provide a translator.

CONCLUSION

This study suggested that acupressure may be effective in treating pruritus, but the evidence is insufficient, and other further studies are needed. Further research is needed to identified the effect of the duration of acupressure performed in each session, the number of acupressure points, the device used, and the duration of the intervention (how many weeks). However, nurse can used acupressure as a non-pharmacological therapy in hemodialysis patients to relief pruritus.

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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