

**SOUTH BAYLO UNIVERSITY**

**ACUPUNCTURE TREATMENT FOR INSOMNIA:  
A LITERATURE REVIEW**

by

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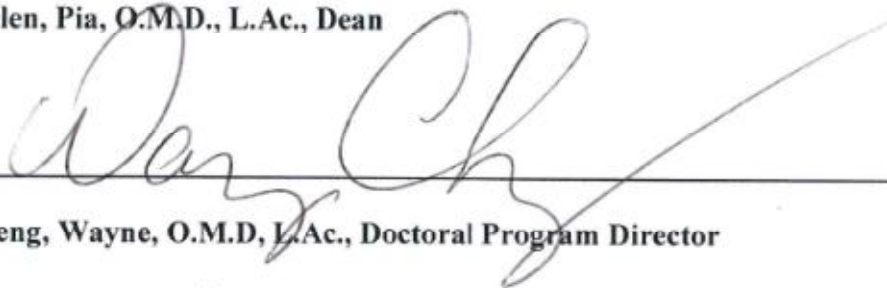
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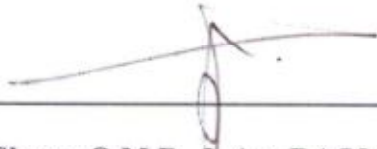
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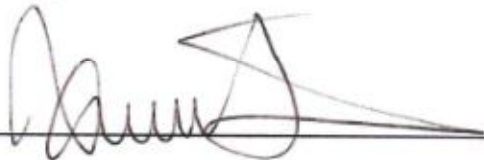
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# **ACUPUNCTURE TREATMENT FOR INSOMNIA: A LITERATURE REVIEW**

**Jotika Huy Truong**

**SOUTH BAYLO UNIVERISTY AT ANAHEIM, 2016**

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## **ABSTRACT**

The aim of this literature review is to determine that acupuncture is effective in treating insomnia by comparing among electro acupuncture versus placebo acupuncture, real acupuncture versus placebo acupuncture, routine acupuncture versus scalp acupuncture, auricular acupuncture versus sham auricular acupuncture, and sham acupuncture versus drug use, and comparing between groups of acupuncture points and special technique. The key words *insomnia* and *acupuncture* were input into Pubmed and EBSCO databases and thirteen articles on randomized controlled trials were chosen to compare and analysis. Most of the studies showed acupuncture effective in insomnia treatment, and even better when combined with special techniques or special acupoints such as electric acupuncture, auricular acupuncture, intradermal acupuncture, or scalp acupuncture etc.

The outcomes were measured by sleeping quality cognitive functioning, Insomnia Serenity Index (IS) and Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Polysomnography (PGS), Beck Depression Inventory(BDI), Athens Insomnia Scale (AIS).

In this review, acupuncture has more advantage than drug, sham acupuncture and placebo and acupuncture with special technique and special modalities have a higher outcome comparing to acupuncture itself in treating insomnia.

*Key words:* acupuncture, insomnia

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## I. INTRODUCTION

According to National Institutes of Health, insomnia affects more than thirty percent of the population. Symptoms of insomnia include difficulty in falling asleep, staying asleep, or waking up frequently or too early. During life time, a person may experience one of those symptoms. Persons who suffer from insomnia feel lack of energy during the day.<sup>[1]</sup>

According to National Sleep Foundation (NSF), insomnia is divided into acute and chronic based on its duration. Acute insomnia often occurs short because of daily life stress such as worrying about exam next day, stressful or bad news. Meanwhile, chronic insomnia is disturbed sleep that happens at least three nights per week and lasts at least three months. Conventional treatments include cognitive and behavioral treatments which are relaxation training, stimulus control, cognitive behavioral therapy (CBT). Besides, medical treatments include non-prescription and prescription medications such as benzodiazepine hypnotics, non-benzodiazepine hypnotics, and melatonin receptor agonists.<sup>[2]</sup>

In general, primary insomnia is a common health issue caused by multiple environmental and psychological factors. Patients suffering from insomnia may have difficulty initiating or maintaining sleep, or experience nonrestorative sleep together with functional impairment during the daytime without a clear medical or psychiatric cause <sup>[3]</sup>.

Acupuncture is one of the solutions to treat insomnia. Acupuncture is a technique by inserting needles into human body to manipulate energy flows around the body. People



who receive acupuncture treatment feel easier to sleep, stay in sleep longer, and have more energy after waking up.

According to Oriental Medicine, insomnia is called “Shi Mian”, categorized into four: deficiency of both the Heart and Spleen Qi, disharmony between the Heart and Kidney, Upward disturbance of the Liver Fire and Dysfunction of the Stomach.<sup>[3]</sup>

This review will discuss studies on the efficacy of acupuncture in patients with insomnia from the Electro acupuncture for primary insomnia<sup>[3]</sup>, or Electro acupuncture for residual insomnia associated with major depression disorder<sup>[4]</sup>, intradermal acupuncture improves insomnia in stroke patients<sup>[5]</sup>, acupuncture and moxibustion on insomnia<sup>[6]</sup>, scalp penetration acupuncture for insomnia<sup>[7]</sup>, abdominal acupuncture for insomnia in women<sup>[8]</sup> to auricular acupuncture with seed or pellet<sup>[11]</sup>, scraping technique used to enhance the efficacy<sup>[11]</sup> and restoring body balance state of health<sup>[15]</sup> which caused by different etiologies. The results of acupuncture treatment on subject with insomnia will be analyzed and compared. The studies show that acupuncture is effective in helping insomnia patients by showing the score before and after treatment in many aspects such as sleeping quality, time to fall asleep, daytime function and Insomnia Serenity Index (IS) and Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Polysomnography (PGS), Beck Depression Inventory (BDI), Athens Insomnia Scale (AIS.)

## II. METHODOLOGY

Internet databases PubMed and EBSCO were used to search literature. The keywords *insomnia*, *acupuncture* and *clinical controlled trial* are input through these websites.

There are no language restrict in searching. The time frame of the literature is set from 2007/01/01 to 2015/12/31. There were eighty five results shown, however, there were sixty four clinical trial articles. After reviewing, only articles that are relevant to the topic of acupuncture and insomnia will be selected for review. Moreover, only articles with free full text are chosen because of economic constraints.

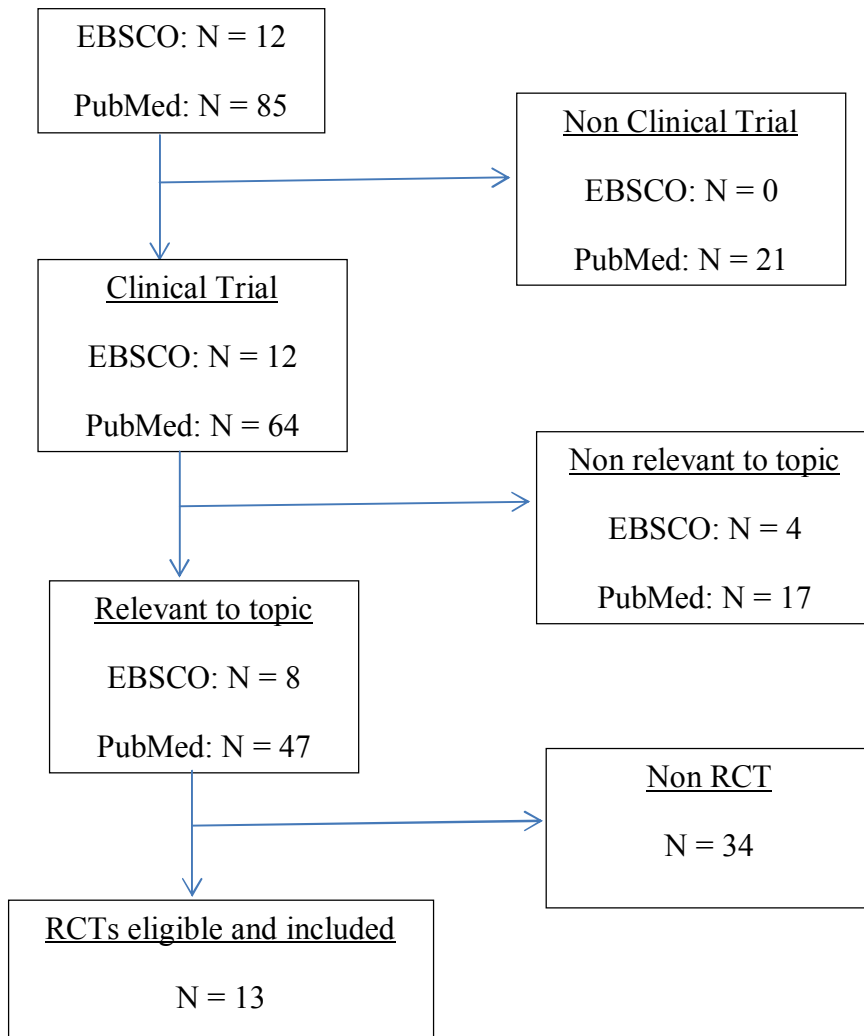
Inclusion criteria will be set on acupuncture modality with clinical trials.

Exclusion criteria will be set on modality including acupressure and massage, acupuncture point injection, case studies, animal studies, surveys, and observational studies.

The results and p-values will then be compared and analyzed.

Figure 1 and Table 1 represent the search and selection procedure and exclusion and inclusion criteria for the articles.

**Figure 1.** Research and Selection of Articles Process



**Table 1.** Exclusion and Inclusion Criteria

<b>Selection criteria</b>	<b>Excluded</b>	<b>Included</b>
Databases	0	EBSCO: 12 PubMed: 85
Clinical Trial	EBSCO: 0 PubMed: 21	EBSCO: 12 PubMed: 64
Relevant to topic	EBSCO: 4 PubMed: 17	EBSCO: 8 PubMed: 47
RCT	34	13

### III. RESULTS

There were a mass number of articles were retrieved, however, only thirteen articles were selected for this literature review. The reliable electric search engine PubMed yielded eighty five articles, but only thirteen of them met the criteria.

Finally, 13 out of 64 clinical trial records were filtered. They were performed in China, Hong Kong, Korea and Brazil. There are 5 articles in Chinese language. There were six article <sup>[10], [11], [12], [13], [14], [15]</sup> that did not have free full text, so that the summarization with be analyzed shortly among these articles.

All together 1,130 participants were included in total 13 studies. Sample size from 18 to 180 with insomnia that meet the Diagnosis of insomnia was classified under Chinese Classification of Mental Disorders (CCMD) <sup>[5, 7]</sup>. Diagnostic and Statistical Manual of Mental Disorders-Text Revision, 4<sup>th</sup> ed (DSM-IV-TR) <sup>[4, 7]</sup>.

As mentioned above, the outcome will be measured by Pittsburgh Sleep Quality Index (PSQI) <sup>[3,4,6,7,8,10,11,12,13,14,15]</sup>, Epworth Sleepiness Scale (ESS) <sup>[6]</sup>, Insomnia Severity Index (ISI) <sup>[3,4,5]</sup>, Polysomnography (PSG) <sup>[15]</sup>, Beck Depression Inventory (BDI) <sup>[15]</sup>, Sleep Efficiency (SE), Leeds Sleep Evaluation Questionnaire (LSEQ) <sup>[9]</sup>, Athens Insomnia Scale (AIS.) <sup>[5]</sup>

Moreover, statistic numbers and evidences such as demographic and clinical characteristics, psychiatric history of the sample, etc., will be shown in tables, figures and flow charts. Results with p-values of 0.05 or less are considered significant.

Table 1. Characteristics of included studies

<b>Study</b>	<b>Sample size</b>	<b>Research Methods</b>	<b>Intervention</b>	<b>Frequency-Course</b>	<b>Outcome measurement</b>
Wing-Fai Yeung, Kai-Fai Chung, Kwok-Chu Tso, et al (2011) <sup>[3]</sup>	n = 60	Randomized, single-blind, placebo-controlled, parallel control	Electro acupuncture and placebo acupuncture	3x/wk 3-week	ISI, PSQI
Wing-Fai Yeung, Kai-Fai Chung, Kwok-Chu Tso, et al (2009) <sup>[4]</sup>	n = 78	Randomized, placebo-controlled	Electro acupuncture, minimal acupuncture, or noninvasive placebo acupuncture	3x/wk 3-week	ISI, PSQI
Seung Yeop Lee, Yong Hyeon Baek, Seong Uk Park et al (2009) <sup>[5]</sup>	n = 52	Double-blind randomized controlled trial	RA, SA	Retention 3-day	ISI, AIS
Jing Guo, Lin-peng Wang, Cun-Zhi Liu et al (2013) <sup>[6]</sup>	n = 180	Double-dummy, single-blinded, randomized, placebo-controlled clinical trial	Verum group underwent verum acupuncture plus placebo; estazolam group underwent estazolam plus sham acupuncture; sham group underwent sham acupuncture plus placebo	Every other day 6-week	PSQI, ESS, SF-36
Xiyan Gao, Cuixiang Xu, Peiyu Wang et al (2013) <sup>[7]</sup>	n = 120	Randomized single-blinded	Experiment group; control group	Once every day 15 days	PSQI
Zhang-ling Zhou, Xian Shi, Shao-dan Li et al (2010) <sup>[8]</sup>	n = 70	Randomized single-blinded	routine acupuncture and scalp acupuncture	Once every day 4-week	PSQI
Wang, X., Yuan, S., Yang, H. et al (2008) <sup>[9]</sup>	n = 44	Randomized single-blinded	Acupuncture and medication group	Once a day and once	LSEQ

				every 3 days 11-day	
Jiang B, Ma ZH, Zuo F (2010) <sup>[11]</sup>	n = 125	Single-blinded, randomized pilot study	Auricular acupuncture therapy(AAT) and sham AAT	4-week N/A	PSQI
Yang SB, Mei ZG, Cai SJ et al (2014) <sup>[10]</sup>	n = 96	Randomized Single-blinded	Heart and Kidney group, Qiao Mai group and Ear acupuncture group	24-day N/A	PSG, PSQI
Xuan YB, Guo J, Wang LP, Wu X (2007) <sup>[12]</sup>	n = 46	Randomized single-blinded	Observation group and control group	N/A	PSQI
Zhang QA, Sun XH, Lin JJ, Li XL (2013) <sup>[13]</sup>	n = 131	Randomized single-blinded	Anmian group, conventional acupuncture group	Once every day 2-week	PSQI
Wang J, Wang J, Wang L, Zhang Y (2015) <sup>[14]</sup>	n = 98	Randomized single-blinded	Western medication group, acupuncture group and integrated acupuncture and medication group	4-week N/A	PSQI
Hachul H, Garcia TK, Maciel AL et al (2013) <sup>[15]</sup>	n = 18	Randomized, double-blind and placebo-controlled	Acupuncture and sham acupuncture group	5-week N/A	PSG, WHOQOL-BREF, BDI, PSQI

**Abbreviations:** ISI insomnia Severity Index, PSQI Pittsburgh Sleep Quality Index, ESS Epworth Sleepiness Scale, PGS Polysomnography, AAT Auricular acupuncture therapy, RA real intradermal acupuncture, SA Sham acupuncture, BDI: Beck Depression Inventory, AIS: Athens Insomnia Scale. LSEQ: Leeds Sleep Evaluation Questionnaire

## Intervention and Comparing

### Electroacupuncture and Placebo Acupuncture in treating primary insomnia.<sup>[3]</sup>

Yintang (EX-HN3) and Baihui (GV20) and bilateral Ear Shenmen, Sishengong (EX-HN1) and Anmian (EX) were needled and assigned electro acupuncture. De qi or the sensation of soreness, numbness, tingling, heaviness, distention, aching and so forth felt by the patient was achieved if possible. Then the electric stimulator was turned to 4-Hz frequency at constant-current for 30 minutes. Whereas, in the placebo acupuncture group,

same acupuncture points were needled. However, the needles moved inside the tube and shortened apparently after giving the pricking sensation to the participants. Then the electric stimulator also applied with zero frequency and amplitude and the subjects told it was set at a fixed level and advised to let the acupuncturist if the sensation was too strong. Both of the groups were taped by a surgical tape to secure the needle as well as the setting, acupuncturist, treatment frequency and duration.

Based on the one-way analysis of covariance (ANCOVA) P-value, there were no significant different between electro acupuncture group and placebo group at ISI and PSQI total score. ANCOVA P-value of ISI was 0.12 and PSQI was 0.86 after 1 week treatment. However, sleep efficiency (SE) in electro acupuncture group was higher than placebo group has shown that P-value was 0.002.

**Electro acupuncture – minimal acupuncture - placebo acupuncture in treating residual insomnia associated with major depressive disorder <sup>[4]</sup>**

These treatments were performed by same 3-year-experience acupuncturist in the quite room while the participants continue taking the same antidepressant medications.

In electro acupuncture group, Yintang (EX-HN3) and Baihui (GV20) and bilateral Ear Shenmen, Sishencong (EX-HN1) and Anmian (EX) was needled and applied electro stimulation same as in the research of Yeung et al <sup>[3]</sup>. Moreover, De qi sensation was achieved as possible to enhance the effectiveness.

Minimal acupuncture which was superficial needling at non-acupuncture points were named such as “Deltoidues” located half-way between Binao (LI14) and acromion; “Forarm” located 1 inch lateral to the midpoint between Shaohai (HE3) and Shenmen (HE7); “Upper arm” located 1 inch lateral to Tianfu (LU3); and “Lower leg” located half

inch dorsal to Xuanzhong (GB39). According to TCM theory, even those corrected location acupuncture points did not have any effect to treat insomnia. In addition, De qi was avoided at this section. The electric stimulation was set with same frequency and amplitude with the electro acupuncture group.

Lastly, in placebo acupuncture group, the exact points in electro acupuncture group were performed by placebo needles. The placebo acupuncture designed in Yeung et al [3] and “The placebo needles were placed 1 inch beside the acupoints to avoid acupressure effect” [4]. The zero frequency and amplitude of electric stimulator was set.

Table 2 – Insomnia Severity Index (ISI) and Pittsburgh Sleep Quality Index (PSQI) score compare

	Electro acupuncture vs Placebo acupuncture		Electro acupuncture vs minimal acupuncture		Minimal acupuncture vs Placebo acupuncture	
	P-value	Between-group effect size	P-value	Between-group effect size	P-value	Between-group effect size
<b>ISI</b>						
Baseline						
1 wk post-treatment	0.003	0.79	0.56	0.14	0.02	0.58
4 wk post-treatment	0.03	0.51	0.92	0.04	0.03	0.65
<b>PSQI</b>						
Baseline						
1 wk post-treatment	0.02	0.67	0.40	0.25	0.002	0.87
4 wk post-treatment	0.03	0.51	0.99	0.08	0.03	0.56

Table 2 showed ISI and PSQI in mixed effects model that subjects in electro acupuncture and minimal acupuncture group significantly had greater reduction scores than the placebo acupuncture group at 1 and 4 week post-treatment. However, the difference between electro acupuncture and minimal acupuncture was not significant.



## Real intradermal acupuncture and sham intradermal acupuncture in insomnia in stroke patients <sup>[5]</sup>

Post-stroke-onset insomnia was stated that “is mainly caused by anxiety resulting from hyperactivity of the sympathetic nervous system” (Palomaki et al., 2003; Leppavuori et al., 2002.) In the real intradermal acupuncture, Shenmen (HE7) and Neiguan (PC6) were inserted with intradermal needles (0.18 x 6mm) bilaterally and taped to fix it firmly in place for three days. Similarly, in Sham acupuncture group the same acupuncture points were selected but the needles did not penetrate the skin and taped as well.

Table 3. Improvement of Insomnia

	RA Group (n = 27)	SA Group (n = 25)	Significant
Insomnia Severity Index (ISI)			
At baseline	18.4 ± 2.7	18.1 ± 2.6	Not significant
At Three Days After Treatment	13.1 ± 4.3	16.5 ± 4.3	0.005
Difference	-5.4 ± 4.0	-1.6 ± 3.2	< 0.001
Athens Insomnia Scale (AIS)			
At baseline	15.8 ± 2.4	14.9 ± 2.2	Not significant
At three Days After Treatment	11.2 ± 3.3	13.8 ± 3.3	0.008
Difference	-4.6 ± 3.3	-1.2 ± 2.4	< 0.001

ISI, AIS scale showed that real acupuncture (RA) group was lower than the sham acupuncture (SA) group 3-day post-treatment.

## Efficacy of Acupuncture for Primary Insomnia <sup>[6]</sup>

Verum Acupuncture group – Estazolam group – Sham group

In the Verum Acupuncture group, Shenting (DU24), Sishencong (EX-HN1), Baihui (DU20), Sanyinjiao (SP6), and Shenmen (HT7) were chosen to insert and manipulate to achieve “De Qi” and stayed for 30 minutes. The frequency of the acupuncture was every other day for six weeks. Addition to the acupuncture, one estazolam placebo which had

exactly appearance as the true estazolam was taken 30 minutes before bedtime on the day not receiving acupuncture treatment.

In the estazolam group, the real estazolam (1mg) was taken 30 minutes before going to bed every other day. In addition, the sham acupuncture was added on the day without taking estazolam. The sham acupuncture was needling to acupuncture points that have no therapeutic effect to insomnia according to lecture review and clinical experiences. Those points were Binao (LI14), Shousanli (LI10), Yuji (LU10), and Fengshi (GB31).

Retention duration was same as the Verum Acupuncture group; however, the acupuncturist avoided using manipulation and achieved De Qi.

In the sham group, both sham acupuncture and estazolam placebo were used for six weeks. Estazolam were given 30 minutes prior to bedtime on the day without sham acupuncture given.

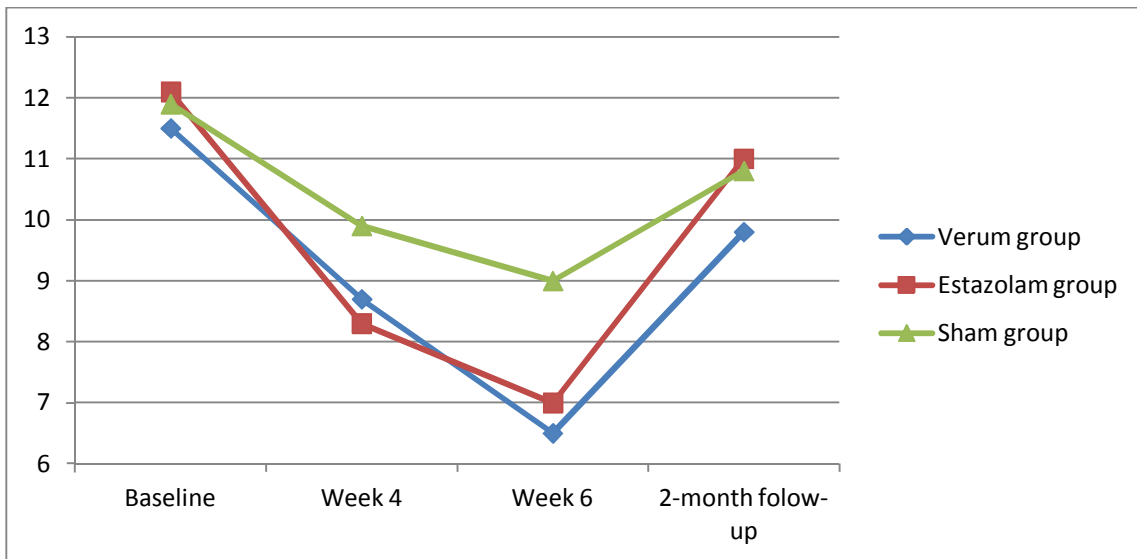


Figure 1: Change in Pittsburgh Sleep Quality Index (PSQI) and subscale scores at different times.

The PSQI score of both Verum group and estazolam group had significant reduction at four and six post-treatment, but there were no significant among groups at 2-month follow-up.

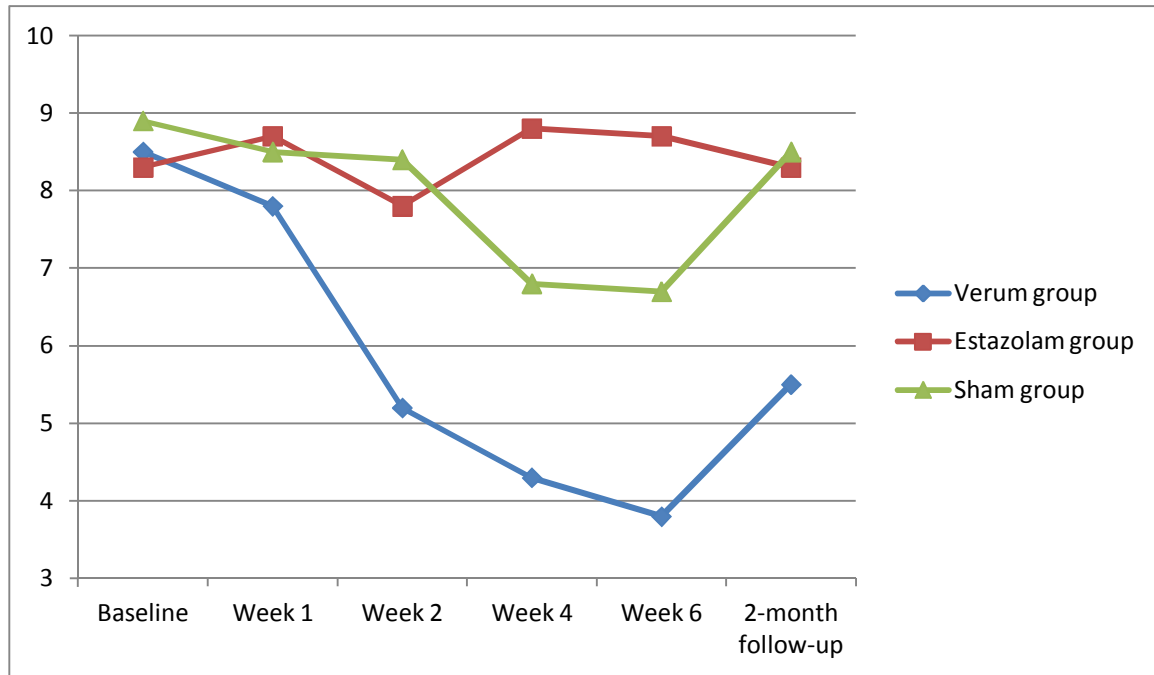


Figure 3: Change in Epworth Sleepiness Scale (ESS) score from baseline to 2-month follow-up

Comparing with sham group and estazolam group, verum acupuncture group had significant change in ESS score during the treatment and the follow-up period.

In table 4 which provided the data of SF-36 stated that the verum acupuncture group had significant improvement in vitality (VT) among three groups. Verum acupuncture and estazolam group reported improving better in social functioning (SF), role-emotional (RE) than the sham group.

Table 4: Change in SF-36 from baseline to 2-month follow-up

Item time point	Verum vs Sham	P – value	
		Verum vs Estazolam	Estazolam vs Sham
<b>PF</b>			
Week 6	0.68	0.35	0.18
2-month follow-up	0.05	0.24	0.42
<b>RP</b>			
Week 6	0.18	0.63	0.07
2-month follow-up	0.15	0.31	0.66
<b>BP</b>			
Week 6	0.85	0.24	0.18
2-month follow-up	0.30	0.63	0.13
<b>GH</b>			
Week 6	0.11	0.31	0.53
2-month follow-up	0.11	0.21	0.69
<b>VT</b>			
Week 6	0.002	<0.001	0.01
2-month follow-up	0.001	<0.001	0.10
<b>SF</b>			
Week 6	0.02	0.75	0.03
2-month follow-up	0.24	0.56	0.08
<b>RE</b>			
Week 6	0.29	0.16	0.02
2-month follow-up	0.04	0.21	0.42
<b>MH</b>			
Week 6	0.32	0.56	0.12
2-month follow-up	0.14	0.70	0.27

SF-36: 36-item short-form health survey; MH: mental health; PF: physical functioning; RP: role-physical; BP: bodily pain; VT: vitality; GH: general health; SF: social functioning; RE: role-emotional

### Curative effect of acupuncture and moxibustion on insomnia <sup>[7]</sup>.

In this research, there are Experiment group and Control group were compared base on PSQI scores. Only this RCT applied acupoints according to the difference diagnosis of TCM theory. In the Experiment group were divided into four categories TCM theory such as Heart and Spleen deficiency, Heart and Gallbladder Qi deficiency, Stagnation of Liver Qi, Yin deficiency with empty Fire syndrome.

In the Experiment group the main acupuncture points were Baihui (GV20), Sishencong (EX-HN1), Shenmai (BL62), and Zhaohai (KI6) and depended on the diagnosis additional points which support the root cause were added accordingly. In addition, moxibustion was applied at Baihui (GV20) and Sishencong (EX-HN1) for 40 mins. These following acupoint were added in case of Heart and Spleen deficiency Zhaohai (KI6), Xinshu (BL15) and Pishu (BL20). Similarly, Xinshu (BL15) and Danshu (BL19) were added for Heart and Gallbladder Qi deficiency and Xingjian (LR2) and Taichong (LR3) were added for syndrome of Liver Qi stagnation. Lastly, Taixi (KI3) and Taichong (LR3) to support Yin deficiency with empty Fire syndrome.

In the control group, Shenmen (HT7), Neiguan (PC6), and Sanyinjiao (SP6) were the main points. Similarly, supporting root cause points were the same as the experiment group. Both group receiving same manipulation once every 10 mins and De Qi were also achieved.

Table 5. Comparison of curative effects on insomnia in patients between two groups (n)

Group	n	Cure	Obvious effect	Effective	Ineffective	Total effective rate	P value
Control	59	22	13	10	14	76.3%	0.00
Experiment	57	27	11	12	7	87.87%	

Based on the PQSI score, both groups had curative effective on insomnia. However, the improvement of total PSQI score and the difference of total PSQI in the experiment group was significant than the control group which showed in table 6.

Table 6. comparison of total PSQI score pre and post treatment

Group	n	Total score pre-treatment	Total score post-treatment	Difference pre and post treatment
Control	59	14±5	5±5	8±4
Experiment	57	15±4	4±3	14±4

### Scalp penetration acupuncture for insomnia <sup>18]</sup>

This is the only research in Chinese language which comparing Scalp acupuncture and Routine acupuncture based on PSQI scores.

The Scalp acupuncture technique was used was threading technique at the following points: from Posterior Sishencong to Anterior Sishencong, from Xinhui (DU22) to Shenting (DU24), from bilateral Luoque (UB8) to Tongtian (UB7), and from bilateral Chengguang (UB6) to Qucha (UB4). The needles were retained for 30 mins, once per day for 5 days which were considered one session of treatment then rested two days. The totals were four sessions.

In the Routine acupuncture, acupuncture points were Baihui (DU20), Anmian (EX), Neiguan (PC6), Shenmen (HT7), Zusanli (ST36), Sanyinjiao (SP6), Hegu (LI4), Taichong (LV3). Both groups had same manipulation and same needles retention time. De Qi was also achieved in both groups.

Table 7. PSQI component scores before and after treatment in two groups

PSQI component	Routine acupuncture group (n=34)			Scalp penetration acupuncture group (n=32)		
	Pre-treatment	Post-treatment	Difference	Pre-treatment	Post-treatment	Difference
PSQI cumulative score	16.37±3.11	8.78±3.92*	7.59±3.01	16.97±2.33	7.16±2.22*	9.81±4.03**

\*P<0.01, vs pre-treatment; \*\*P<0.05

According to table 7, the improvement of PSQI cumulative score indicate that Scalp penetration acupuncture group (P<0.01) were higher than the routine acupuncture group (P<0.05)

### Abdominal acupuncture for Insomnia in Women <sup>19]</sup>.

Acupuncture group versus Medication group

In the acupuncture group, abdominal acupuncture was performed once a day for first three days and then once every three days for the remainder of the 11-day trial. Plus, the subjects in this group were taken a placebo pill once a day prior bedtime. There were four master acupuncture points and four adjunctive points. The master points were Zhongwan (CV12), Xiawan (CV10), Guanyuan (CV4), and Qihai (CV6) which considered “guide qi to the source.” The additional points were Shangqu (KI17), Huaroumen (ST24), Xiaofengshidian which located same level and 2.5 cuns lateral to Qihai (CV6), Qipang were located same level and 0.5 cun lateral to Qihai (CV6.) The needles were retained for 20 minutes. Moreover, patients’ eyes were covered with a mask.

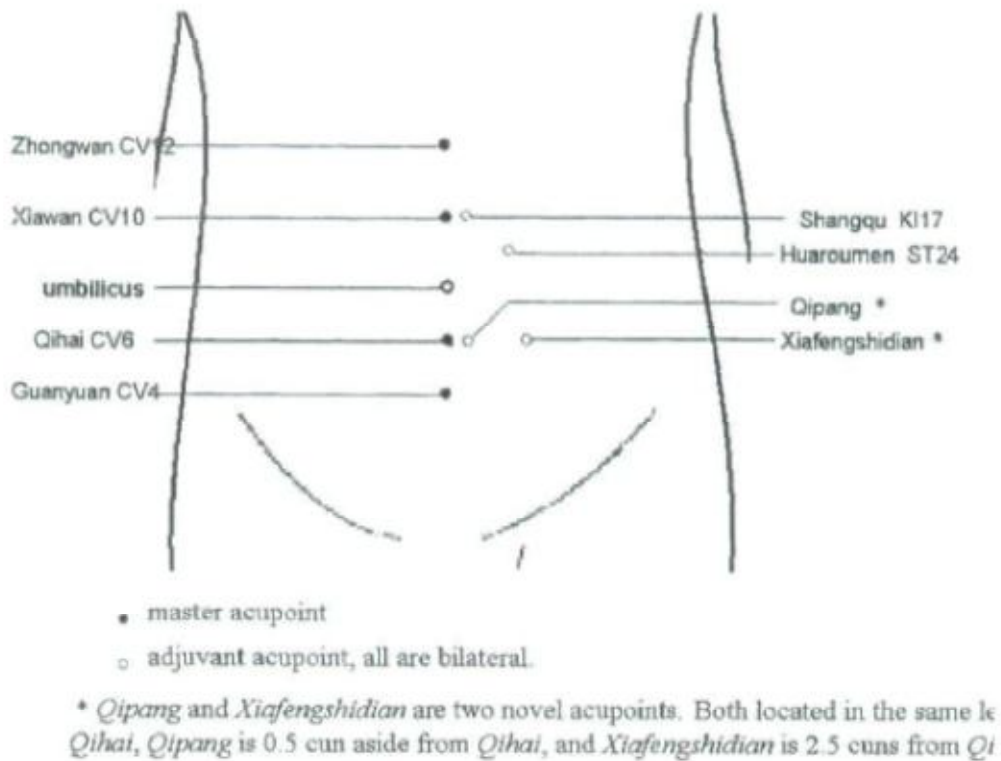


Figure 1. The master points and adjunctive points.

In the medication group, all the points were used, however, the needles were not inserted in to the skin through the guiding tube, but the needle plastic needle tube were tapped against the patient’s abdominal skin. In this group, subjects were received 1 mg of estazolam medication once a day prior bedtime in all 11-day trial.

In both group, subject’s abdomens were covered with a basket underneath a sheet. Also, frequency and time were same.

According to the Leeds Sleep Evaluation Questionnaire (LSEQ) scores, participants in acupuncture group had lower score by average of 26.32 points than the medication group.

This indicated that short-term abdominal acupuncture was more effective than medication therapeutic.

These following are summarization of not-free trials.

Authors	Objective	Methods	Results	Conclusion
Jiang B, Ma ZH, Zuo F (2010) [11]	Auricular Acupuncture Therapy (AAT) and standardized acupoints	Treatment group AAT group on active points (n=63) Control group received AAT on sham point(n=62)	-Significant improvement in PSQI total score and seven components in both group (P<0.01), significant difference seen in PSQI total score and six components score except hypnotic, significant difference in the rank, and in the mean rank of PSQI seven component.	-AAT played an effective role in improving the quantity and quality of sleep. -Standardized AAT might help to treat insomnia, especially combined with psychological and behavioral therapy
Yang SB, Mei ZG, Cai SJ et at (2014) [12]	Efficacy different points combination in treating menopausal insomnia	Group A (Heart and Kidney n=32): Xinshu(BL15), Shenshu(BL23), Sishencong (EX-HN1), Shenmen(HT7), Sanyinjiao(SP6)	-Sleep quality in PSQI indicated group C (0.78+/-0.12) was significant higher than group B (1.32+/-0.29). -Total score and cured and effective rate in	Auricular acupuncture has better curative rates higher than the restore interaction between Heart



		Group B (Qiaomai, n=32): Zhaohai(KI6), Jiaoxin(KI8), Shenmai(BL62), Pucan(BL61) Group C (ear acupuncture n=32): Shenmen(TF4) and sensitive spot at the distribution area of auricular vagus nerve.	group C [(4.34+/-1.43), 58.8%(22/32)] were higher than group A[(7.48+/-3.09), 53.1% (17/32), both P<0.05]	and Kidney group and Qiaomai group.
Xuan YB, Guo J, Wang LP, Wu X (2007) [13]	Characteristics of acupuncture in improvement of sleep quality in insomnia patients.	-Observation group – regulating mental activity (n=24): Baihui(GV20), Shenting(GV24), Shenmen(HT7) -Control group - Estazolam(n=22)	-Total effective rate (P<0.05): 83.3% in observation group, 72.7% in control group. -Prolong sleep time: estazolam was better than acupuncture. -Improvement of somniphathy and increase of daytime functional state (P<0.05): acupuncture group was better.	Acupuncture treatment was better in improvement of somniphathy and increase of daytime functional state.
Zhang QA, Sun XH, Lin JJ, Li XL (2013) [14]	Efficacy difference between scraping technique at Anmian (EX) and conventional acupuncture	-Anmian group (n=68): Anmian(EX) with needle handle was scraped gently with thumbnail from bottom to up after the needle body fixed by the index finger. Needle retained 30 mins -Convention acupuncture group (n=63): Sanyinjiao(SP6), Shenmen(HT7). Baihui(DU20) with reducing technique. Needles retained 30 mins.	-Total effective rate: 91.2% (62/68) in Anmian group, 74.6% (47/63) in conventional acupuncture group. -The factor score and total score in PSQI of Anmian group were better than conventional acupuncture group.	The scraping technique of stuck needle at Anmian (EX) was more effective than conventional acupuncture in treating insomnia.

Wang J, Wang J, Wang L, Zhang Y (2015) [15]	Efficacy difference among western medication, acupuncture and the integrated therapy of acupuncture and western medication	<p>-Western medication group (n=30): 1mg Estazolam was taken 30mins prior bedtime, 20mg oryzanol taken by mouth 3x/day for 4 wks.</p> <p>-Acupuncture group (n=35): Shenmen(HT7), Sanyinjiao(SP6), Anmian(EX), Baihui(GV20) and Sishencong(EX-HN1) with supplementary points according to differentiation, once a day. 5 treatments per week for 4 weeks.</p> <p>-Integrated acupuncture and medication group (n=35): combination of the other two groups with same dosage and points.</p>	<p>-Total effective rate: 70.0% (21/30)</p> <p>Western medication group, 93.9%(31/33) in integrated acupuncture and medication group and 97.1%(34/35) in acupuncture group.(P&lt;0.01)</p> <p>-PSQI score of post-treatment were all improved as compared with pre-treatment.</p> <p>-PSQI score in integrated acupuncture and medication group and acupuncture group were lower than medication group.</p> <p>-Four weeks after discontinuing treatment: PSQI score in western medication group ran back.</p>	<p>Integrated acupuncture and medication effected in long-term and had higher effective rate, relieved symptoms rapidly.</p> <p>-The integrated therapeutic is the first option.</p>
Hachul H, Garcia TK, Maciel AL et al (2013) [16]	effectiveness of acupuncture therapy on sleep parameters, depression symptoms and quality of life in post-menopausal women with insomnia	Acupuncture group and Sham acupuncture group in ten sessions. Total n = 18	<p>-Acupuncture group had lower PQSI score and better in improvement in psychological WHOQOL than Sham acupuncture.</p> <p>- Higher percentage of the N3+N4 stage showed in acupuncture group.</p>	Acupuncture was effective in improving quality of life and quality of sleep in postmenopausal women with insomnia.

## IV. DISCUSSION

When insomnia becomes a common problem, especially in the stressful society and in baby boomer populations, exploring new ways to help insomnia without using medication becomes increasingly urgent. Most of the randomized controlled trials in this study have shown that acupuncture treatment is effective on insomnia by showing the improving in sleep quality, total sleep, sleep efficiency, daytime functioning. Moreover, some of the randomized controlled trials even have shown the best method of acupuncture technique to optimize the effectiveness on insomnia.

Electro acupuncture, acupuncture demonstrated more effectiveness in treating primary insomnia <sup>[3,6]</sup> and insomnia associated with major depression disorder <sup>[4]</sup>, while intradermal acupuncture proved to be effective in treating insomnia in stroke patients <sup>[5]</sup>; acupuncture, acupuncture with moxibustion significant in curative effect in insomnia, in addition, scalp acupuncture with threading needling technique and acupuncture with scraping technique successfully showed the better results of effect compared to acupuncture itself, abdominal acupuncture was unique form of method treating insomnia effectively in women.

The popular group of acupuncture points used were Yintang (EX-HN3) and Baihui (GV20) and bilateral Ear Shenmen, Sishencong (EX-HN1) and Anmian (EX) which applied with electro acupuncture <sup>[3, 4, 15]</sup>

However, due to time and economic constraints, formal randomized controlled trials cannot be conducted for this review.

Choosing acupuncture points point of view, group of Baihui (GV20), Sishencong (EX-

HN1), Shenmai (BL62), and Zhaohai (KI6) plus moxibustion applied at Baihui (GV20), Sishencong (EX-HN1) for 40 mins had better result than group acupuncture points of Shenmen (HT7), Neiguan (PC6), and Sanyinjiao (SP6.)<sup>[7]</sup>

In treating menopausal insomnia, auricular acupuncture had better curative rate than body acupuncture with combination points of Xinshu(BL15), Shenshu(BL23), Sishencong (EX-HN1), Shenmen (HT7), Sanyinjiao (SP6) which based on recommunicate Heart and Kidney theory.

Importantly, De Qi was based on patient's response of felling soreness, numbness; tingling, fullness, etc. were considered one of contribution to effectiveness.

For this review, limitations cannot be avoided due to amount of time and small sample sizes. There were nine studies had below 100 patients. The largest sample size was 180 participants. Risk of bias still occurred in those studies with sham acupuncture were used. Moreover, participants may not have answered truthfully the questionnaires or their physical and psychological condition could have been affected by environment or social interactions.

Since oriental medicine and acupuncture is still young and growing in the U.S, more randomized controlled trial should have been conducted. According to time constraint and economical constraint a formal study could not be controlled. Therefore, in order to satisfy this, a longer study time and larger sample size research are recommended. The randomized controlled trials should be applied in every aspect of oriental medicine theory.

## V. CONCLUSION

The RCTs analyzed in this study have proved that acupuncture is positive effect for insomnia, and for the past reviews, the results of this literature review is mostly consistent. Some of the RCTs has shown that electro-acupuncture, auricular acupuncture to be effective than placebo acupuncture and medication, acupuncture with scraping technique, threading scalp acupuncture technique had superior effect than non-specific technique. Importantly, De Qi played as fundamental role for efficacy. The therapeutic effects in the studies still affected with time, therefore, the effects was not considered if temporary or permanent or if patients need more frequency of longer time treatments. Nevertheless, due to limitation of the current studies, strictly designed studies and larger sample size and longer study time randomized control trials and comparison between western and TCM theories are required.

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