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The Effects of Acupuncture on Anxiety: A Literature Review

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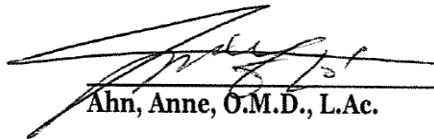
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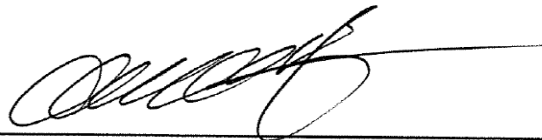
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Patricia M. Orsini

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ABSTRACT

Anxiety disorders are a widespread mental illness which can affect a person at any age and can become chronic with time. Acupuncture is considered an ancient therapeutic modality and is regarded as an unconventional therapy in today's clinical practice. Its efficacy and safety have been evaluated and reported over the past decades; however, doubts about acupuncture therapy and its beneficial and adverse effects make it an unpopular option among patients suffering from anxiety issues. Data was gathered from five different databases. One hundred fifty-eight articles that were assembled initially showed a clear indication that there was research about the subject of acupuncture. There has been a surge in analyses about acupuncture from 2010 to 2018. Most of the studies were conducted in the last decade. Only 36 research articles directly related the practice of acupuncture to anxiety and analyzed its effects. Different types of acupuncture (manual, electro, and placebo) were used with results indicating the presence of analgesic effects of acupuncture. Acupuncture subjects also reported lower anxiety levels than control subjects ($p=0.0146$). Electrical stimulation and specific acupuncture

points are some of the nonpharmacological methods that have been primary factors in pain reduction in different patients. Acupuncture methods focus on pain reduction ($p < 0.05$) in different patients and aid with sedation and anxiety relief. Previously published studies highlighted the effects of acupuncture but were organizationally inconsistent. Acupuncture's effectiveness is associated with resolving anxiety related issues linked to other medical problems. Research acknowledges the benefits of treating anxiety disorders and can be combined with other conventional treatments or medical issues and have many beneficial effects. The volume of literature evaluated produced some statistically significant results that had suggesting positive outcomes for acupuncture in treating anxiety. The review determined that acupuncture didn't have serious adverse events, yet it is a relatively safe procedure.

TABLE OF CONTENTS

	ABSTRACT	
I.	INTRODUCTION	4
	LITERATURE BACKGROUND	
	OBJECTIVE OF STUDY	
II.	MATERIALS AND METHODS	29
III.	RESULTS	36
IV.	DISCUSSION	46
V.	CONCLUSION	58
	REFERENCES	62
	APPENDIX	75

I. INTRODUCTION

I.1. Background

Acupuncture is a form of traditional Chinese medicine and includes the insertion of needles and is usually monitored by corresponding manual stimulation (Zollman & Vickers, 1999). Acupuncture has been used since 1100 BC (Liu, 1981), to cure mental illness. It has been used in China for healthcare and around the globe for over 2000 years and has gained prominence in the last decade (Vickers & Zollman, 1999). The Mayo Clinic elaborates how acupuncture works. A person lies down without moving while about 5 to 20 needles are inserted for approximately 10 to 20 minutes. Acupuncture is linked to the application of pressure, heat, or laser (Chon & Lee, 2013).

In the present time, acupuncture is being widely used for emotional, physical and mental problems. Acupuncture has been used to treat psychological disorders and has reported reductions in anxiety levels (Pilkington et al., 2007). Use of acupuncture promotes mental and emotional functioning and also helps with physical pain (Leibing et al., 2002). Acupuncture is considered an ancient therapeutic modality and is regarded as an unconventional therapy in today's clinical practice (Leo and Ligot, 2007). Its efficacy and safety have been evaluated and reported over the past decades (He and Shen, 2007).

Acupuncture is mostly considered for pain relief but also treats other multiple conditions. The American Society of Anesthesiologists recognizes it as a treatment for general low back pain, but only in combination with conventional therapy. The physiological stereotyping of acupuncture evaluates its uses in various psychological and nervous system disorders. Also, its applications in chemotherapy and stroke have been identified but haven't explicitly been

confirmed by controlled clinical trials. Of the conventional medical procedures, using acupuncture is relatively beneficial to ease the patient and aid the cure (Chou et al., 2016).

I.1.1. Recent trends

In Western medicine, acupuncture, after a medical diagnosis, accurately calculates the advantages of using acupuncture as a therapy. It has been scientifically proven to stimulate nerves in the body. The effects of pain-relieving substances produced in the body, endorphins cause the positive effects of acupuncture (ACTION, 2009).

Modern studies have exposed the therapy of acupuncture as a process that stimulates one or more points in our body that can fasten up the healing response. It can aid in the disease process or help alleviate some symptoms. Most effects of acupuncture therapy for clinical purposes can be explained through this theory. As per the present understanding, the central signaling system triggered by acupuncture therapy is the nervous system, which transmits signals through nerves that include it. They also emit biochemical impulses that impact other cells of the body. In humans, the nervous system is linked to the hormonal system through the adrenal gland, and it makes a network with every cell and body system of the body. The nerve distribution of acupuncture points is all over the body (Kaptchuk et al., 2002).

Rendering to ancient Chinese doctors, the crucial elements of effective acupuncture therapy is when a person experiences needling sensation. The sensation can vary as per treatment but is mostly described as tingling, pinching warmth, or dull pain. The acupuncture itself as a whole is not supposed to be painful. Occasionally the needling sensation qualifies as transmitting positive feedback to the part of the body. The person who puts needles should get

the "qi" while placing needles. It should be understood that getting the "qi" is described in modern times as the consequence of muscle reactions inferior to the local nervous system interface (Dimond,1971). For many acupuncture sessions, timing is critical. The therapy session usually needs to be in specific parameters. It cannot be too long, or a person will get neither tired nor too short, or the patient won't be able to reap the beneficial effects. The stimulation of points is maintained throughout with consistent activity. The incidences of some stimulus work better than others: especially when correlated to nervous system responses but is not predictable through chemical release from other cells (Allen & Richmond, 2011). Acupuncture is relatively safe in comparison to other conventional treatments and when done by trained practitioners using needle method and application of single-use needles. Infection transmission has dramatically increased in the last decade. The training and hygiene of acupuncturists are essential to reduce the risk (White & Ernst, 2004).

I.1.2. Anxiety

Anxiety refers to a 'persistent feeling of dread, apprehension and impending disaster or tension and uneasiness' (Allen & Richmond, 2011). The term 'Anxiety disorders' is used for some mental illnesses comprising of panic disorder, obsessive-compulsive disorder, phobias, traumatic stress disorder, and generalized anxiety. Anxiety can hamper an individual's capacity to think or reason. Anxiety symptoms are physical, emotional and mental and can be long-lasting (Baldwin, Woods, Lawson & Taylor, 2011).

Anxiety disorders are widespread mental illness (Kadri et al. 2007) which can affect a person at any age (Kessler et al. 2007) and can become chronic with time (Antony & Stein, 2009). Anxiety disorder is the most widespread mental disease in the U.S. and affects almost 40

million adults who are 18 years of age or older (Strine et al., 2008). This makes 18.1% of the population every year (McWilliams et al., 2003). Anxiety disorders can be easily treated, but only 36.9% of patients receive treatment (Roberge et al., 2011). It is the most common neurotic disorder 88/1,000 people, making it one person per six adults. Still there is not enough information available for the incidence and cause of anxiety disorders or is very difficult to obtain (ONS 2000).

Anxiety disorders have various types, most commonly being phobias, generalized anxiety disorder, obsessive-compulsive disorder (OCD) and post-traumatic stress disorder (NICE,2007). Anxiety disorders have various side effects including emotional instability, disturbed sleep, lack of decision making, poor concentration or physical indications such as nausea, muscle tension, and aches, diarrhea, etc. (American Psychiatric Association, 2000; WHO 2007).

Anxiety includes many kinds of psychological problems such as panic disorder, generalized anxiety disorder, phobias, OCD and post-traumatic stress disorder. They can be very harmful to a person and can even prove to be long-lasting if not cured in time. They have physical as well as emotional effects and can cause disturbed sleep, bad temper, irrational behavior, stomach problems, wrong concentration, sweating, vomiting, diarrhea, dry mouth, tremors, heart problems, lightheadedness, cold hands, muscle aches (American Psychiatric Association, 2000). These conditions aggravate with time. Sometimes people already have contacted a disease, and they become worse with anxiety, for example, irritable migraines, muscle twitching, etc. (White & Ernst, 2004).

I.1.3. Acupuncture and anxiety

The conventional therapies and interventions to cure anxiety such as anxiolytics and medicines like antidepressants or psychological programs are effective yet expensive and time-consuming. Also, they have adverse side effects. The correct method to cure anxiety cannot be restricted to a single treatment as it differs by medial analysis. Recently, acupuncture has gained favor as a treatment to cure anxiety related to immune system disease, heart disease, and inflammatory processes in humans or different traumatizations in humans. Many clinical trials of acupuncture have shown the efficacy of acupuncture in treating anxiety (Wang & Kain, 2001). These trials date back to mid-1970s. Acupuncture can treat anxiety of varying degrees but is most useful as a combination therapy. It has been categorized as a powerful treatment for depression and Anxiety (Norton et al., 1984).

Acupuncture targets the body and mind. The imbalance in the body can be maintained after acupuncture sessions. Acupuncture treatment differs from person to person depending on the severity of anxiety disorder. It also involves measuring the disorder conditions, essence, blood, energy, physical health, fluids, organs, and channels. Acupuncture points can aid energy flow efficiently, and ease symptoms of anxiety, and even help to cure it (Pilkington, 2001).

The usage of acupuncture is gaining momentum, yet people still are unaware of its benefits or dread that it may have adverse effects. Some researchers even believe that acupuncture cannot be useful for an extensive range of conditions. Some researchers also consider acupuncture is having a placebo effect and the analgesic effect of acupuncture lacks clinical attestation and could not be dissuaded bias. The cost-effectiveness of acupuncture makes it an easy option for many people. Characteristically, acupuncture is customized and grounded in philosophy and perception, but scientific research still needs work (Errington-Evans, 2012).

I.1.4. Acupuncture and other Conventional Treatments

Acupuncture treatment in comparison to various medication treatments possess fewer harmful effects and is considered comparatively safe (He, Chen, Pan, & Ying, 2014). A research review was conducted to study the quality and capacity of the evidence base backing the practice of acupuncture in curing anxiety disorders. It was found that keywords "anxiety" and "acupuncture" were used together from the year 2000 onwards. The research quality investigating acupuncture use in the management of anxiety disorders is highly variable. A large number of concerned variables were used, including treatment frequency and period of treatment. The volume of literature, expansive conditions treated, the constancy of statistically substantial results, and animal test subjects imposes positive outcomes especially keeping in mind a population of people who are resilient to conventional medicine. The research was useful in signifying the importance of acupuncture in treating anxiety. Poor methodological quality, a vast range of outcomes measured and non-comparison with other conventional treatments made reliable conclusions challenging. It is essential to conduct comparative research comprising of several treatments used to treat anxiety and rate the efficacy of acupuncture in contrast to them (Errington-Evans, 2012). Other conventional treatments have comparable effects to acupuncture therapy (Tsay, Cho & Chen, 2004). Acupuncture can be used as a complementary technique with other medical illness or substitute for conventional sedatives or analgesics (Chernyak & Sessler, 2005).

I.2. Statement of the problem

Acupuncture is considered an ancient therapeutic modality and unconventional therapy in today's clinical practice (Leo and Ligot, 2007). Its efficacy and safety have been evaluated and reported over the past decades (He and Shen, 2007). The effectiveness of acupuncture treatment still lacks conviction (Ernst,2006). Research needs to be conducted to judge the effectiveness of acupuncture therapy and determine with the help of previous studies if there are any risks involved.

I.3. The rationale of the study

Anxiety disorders are linked to chronic mental impairment (Mogg & Bradley, 1998) and are related to many other diseases (Rammal et al., 2008). Previous research work evaluated the efficacy of acupuncture for a few medical conditions, but its effectiveness is still debatable overall. The purpose of this study is to assess the evidence on the efficacy of acupuncture for treating anxiety and by signifying its benefits and adverse effects. The review aims to highlight the impact of acupuncture and determine if acupuncture is an effective method to help alleviate anxiety. The use of qualitative literature will emphasize the use of acupuncture in anxiety-related health problems and reflect the feedback from various studies whether acupuncture proved useful or not. Up-to-date information is needed for informed decision-making in public health policy and service planning.

1.4. The significance of the study

Previous research findings indicate that acupuncture is being used to alleviate anxiety, yet a thorough investigation is needed to attest the effectiveness of acupuncture in alleviating anxiety. An in-depth analysis is necessary so that practitioners and patients can make an informed decision. Acupuncture is a multifarious intervention, but the effects of the treatment whether positive and negative should be analyzed. Previous studies are open to criticism because there is a lack of comparative literature, there were some randomized trials, or appropriate studies were excluded. It is essential to rationalize the need for acupuncture to alleviate anxiety by pointing out its benefits and side effects.

1.5. Objectives:

The objectives of this study are:

1. Assessing the literature about the effectiveness of Acupuncture in treating anxiety disorders in the last decade and highlighting its beneficial effects.
2. Assessing the literature about the side effects of acupuncture, if any.

LITERATURE BACKGROUND

There is very little work primarily focusing on the effects of acupuncture on alleviating anxiety disorder. Previously published studies highlight the effects of acupuncture but are organizationally inconsistent. Hence, a review is needed to draw a conclusion and establish a link between acupuncture and anxiety. Acupuncture's effectiveness is associated with resolving anxiety related issues with other medical problems. Research acknowledges the benefits of anxiety disorders and can be combined with other conventional treatments or medical issues; and has many beneficial effects (Pilkington, 2010).

1. Anxiety Disorders in Women

Researches have been conducted treating anxiety disorders in women. These studies have assessed the effect of acupuncture in the treatment of anxiety in lactating women, pregnant women, and women facing other medical complications. Anxiety is also highly prevalent in infertile women waiting for treatment results. A systematic review was conducted using PubMed, MEDLINE, Cochrane Library, and PsycINFO; along with clinical trial registries. The study reviewed previous data of randomized controlled trials of 193 relevant titles concerning acupuncture effects of anxiety in infertile women. The research proved that acupuncture does reduce anxiety in infertile women and can be termed as an effective therapy (Bashtian et al., 2016).

Overall, there is little qualitative scientific research done on acupuncture effects on anxiety in women according to Sniezek & Siddiqui (2013). Chinese Medicine treatment using acupuncture depends on the diagnosis of each patient and a distinct group of acupoints which differs for everyone. In the systematic clinical review conducted by them, it was assessed that

anxiety prevalence in women is very high, especially in comparison to the male population. The review aimed to summarize the present evidence on acupuncture being an effective therapy for anxiety and evaluating acupuncture trial quality. Only six reviewed studies met the exclusion criteria of review. The data focused on pregnant women and provided evidence to support acupuncture as monotherapy for pregnant women.

Isoyama et al. (2012) also studied the uses of acupuncture in improving anxiety symptoms in infertile women undergoing in-vitro fertilization (IVF) treatment in 43 patients experiencing IVF. The patients were randomly placed into two groups with the test group having 22 patients, and the control group has 21 patients. Hamilton Anxiety Rating Scale (HAS) was used to test the anxiety level of each patient before and after treatment. Acupoints HT7, GV20, CV17, PC6, and Yintang were used in the test group. The mean HAS score after the 4-week period was significantly lower in the test group than in the control group (19.4 ± 3.2 vs. 24.4 ± 4.2 ; $p=0.0008$). No statistical difference in the changes in anxiety level was prevalent in both groups. Risk of anxiety was 4.77 times more in the control group. Results showed that acupuncture is beneficial in reducing anxiety symptoms and had no side effects on women undergoing IVF. Acupuncture was even considered as an option for IVF patients to help them through the treatment, but further investigation is needed to prove its validity.

Researches on acupuncture have gained momentum in the last decade. Emotional distresses lead to immune system damage, and hence their treatment can restore immune response. The present study aimed to assess the effect of an acupuncture treatment, in relieving emotional symptoms caused by anxiety based on the functioning of leukocytes (neutrophils and lymphocytes) from anxious women. Acupuncture procedure contained manual needle stimulation of 19 acupoints in 34 female 30–60-year-old patients, suffering from anxiety, as

determined by the Beck Anxiety Inventory (BAI). The most favorable effects of acupuncture appeared 72 hours after one session and lasted for one month. Impaired immune functions significantly became better by acupuncture. It was also inferred that the findings on anxiety disorders are challenging to interpret because of the vast array of interventions alongside acupuncture when compared. The outcomes were positive, but reports required more straightforward methodological details (Arranz et al., 2007).

Acupuncture effectiveness on anxiety has also been assessed in women suffering through premenstrual dysphoric disorder (PMDD) in a single-blind randomized clinical trial. The purpose of this study was to determine the effects of acupuncture on the symptoms of anxiety as a result of PMDD. Thirty volunteers with PMDD were allocated to group 1 (acupuncture) or group 2 (sham acupuncture) alternately. Both groups underwent acupuncture therapy and completed an evaluation of anxiety symptoms using the Hamilton Anxiety (HAM-A) and Hamilton Depression (HAM-D) Rating Scales. HAM-A and HAM-D scores were the same before the intervention. Afterward, symptoms of anxiety lessened in both groups; though, the symptoms were better in group 1 in comparison to group 2, with a mean reduction in HAM-A scores of 21.2% in group 2 ($p < 0.001$) in contrast to 58.9% in group 1. The decline in the mean HAM-D scores has a significant difference of ($p = 0.012$). The study suggested that acupuncture is another treatment option for anxiety issues in PMDD patients. Anxiety, mood swings, and depression were cured in both groups, and acupuncture therapy proved to have analgesic effects on women (Carvalho et al., 2013).

A randomized controlled study also evaluated the efficacy of acupuncture against placebo acupuncture in lactating mothers with preterm infants in Brazil from 2011 to 2012. Mothers with low birth weight babies were assigned to two treatment groups: acupuncture and placebo

acupuncture. Treatment sessions took place once a week, using 5 Chinese auricular points separately. The primary outcome measure was STAI-State scores, whereas salivary cortisol levels were used as a secondary outcome measure. Both measures were calculated before and after intervention and submitted to a blind assessor. STAI-State scores before and after treatment were not statistically significant, but as a group analysis was ($P < .005$) for both groups. Salivary cortisol levels stayed the same in both groups ($P = 0.0480$). A correlation between STAI and salivary cortisol couldn't be established. There was no dissimilarity in both treatments, and both posed no severe side effects. Studies targeting the effects of acupuncture on anxiety represent some severe limitations, such as small sample size and lack of in-depth research. These researches contribute to the practice of acupuncture in curing women anxiety (Haddad-Rodrigues et al., 2005).

2. Anxiety Disorders in the Elderly

Acupuncture has beneficial implications for the elderly too. Recent studies have advocated that acupuncture is a feasible alternative in alleviating elderly anxiety issues in comparison to traditional health problems. Auricular acupuncture when practiced at the relaxation point can decrease anxiety in elderly patients transported by ambulance when receiving ESWL®. The research by Mora et al. (2007) determined that the older patients who underwent ear acupressure were less anxious and believed that acupuncture had a positive effect on them. One hundred patients with renal calculi were transported to the local hospital, attended by two paramedics; were distributed into two groups: Relaxation group and Sham-treated group. Paramedic 1 collected data, while auricular acupressure was performed by paramedic 2 in patients. A visual analog scale was used to analyze anxiety score on a range of 0 to 100 mm. The

relaxation group had reduced anxiety scores upon arrival at the hospital and lower anticipation of pain scores. The Post-Intervention Anxiety visual analog scale established substantial superiority of the real treatment group ($p = 0.001$). Elderly patients receiving auricular acupressure at precise relaxation points were less anxious and more optimistic about the treatment results in comparison to the sham-treated group proving the effectiveness of acupuncture as a treatment.

3. Anxiety issues related to other Neurophysiological disorders

Previous studies have highlighted the effects of acupuncture on treating psychiatric disorders and other neurophysiological disorders. The neurophysiological effects of acupuncture on anxiety have been studied in male rats. The analgesic effects of acupuncture on anxiety were witnessed, as well as it helped in alleviating neuropathic pain (Adachi et al., 2018). Majority of Psychiatric illness and anxiety have a direct relation. Eighteen concerned adults who complained about insomnia and anxiety were also observed in an open clinical trial study involving acupuncture. Their responses showed that after five weeks of acupuncture treatment there was a nocturnal increase in endogenous melatonin secretion and significant improvements in polysomnographic measures of sleep onset latency. Also, there was a substantial reduction in anxiety scores, and the findings were consistent with clinical reports of acupuncture's relaxant effects. Acupuncture treatment may be of value for some categories of anxious patients with insomnia. (Spence et al., 2004). Another review of 12 controlled trials evaluated the evidence of how acupuncture provides desired results for the treatment of anxiety neurosis and general anxiety disorders. There were no studies on the use of acupuncture whereas there were ten random trials, out of which four were on general anxiety disorder and anxiety neurosis. Six focused on anxiety in the perioperative period. The research concluded that acupuncture is

beneficial for the treatment of generalized anxiety disorder or anxiety neurosis but that there isn't enough proof of confirmation (Pilkington et al., 2007). A single-blind randomized controlled trial was conducted to assess acupuncture effects to reduce anxiety in treating patients suffering from hyperventilation syndrome. The researchers determined that acupuncture was beneficial in reducing anxiety levels, but severity differed from patient to patient (Gibson et al., 2007). Although acupuncture treatment is gaining momentum especially in psychiatric patients, no studies have investigated auricular acupuncture (AA) to treat anxiety disorders. One study directed to compare the effectiveness of auricular acupuncture in comparison to progressive muscle relaxation (PMR) in 162 patients suffering from anxiety disorder. The results showed that treatment considerably decreased anxiety and had more long-term positive effects (Lorent et al., 2016).

Generalized Anxiety Disorder is the most recognized anxiety disorder in medical care. Clinical studies have previously been conducted, but acupuncture efficacy in treating GAD is still under experiments. A systematic review was conducted to evaluate the research regarding acupuncture intervention for Generalized Anxiety Disorder from various data sources, and randomized controlled trials were included. Two review authors independently researched papers. The clinical studies on anxiety disorders have been insufficient in determining the efficacy of acupuncture in treating Generalized Anxiety Disorder is indeterminate. Study Selection comprised of RCT's of participants that have GAD identified by operational criteria. Information related to sample size, study population, comparators, trial biases, outcomes including negative events, and methodology of statistical analysis were derived from reports. Overall the risk of bias in included studies was high. The included trials were extremely heterogeneous regarding acupuncture and control interventions. The risk of bias was recorded high in these studies studied

and included very extremely heterogeneous concerning acupuncture and its control medications as a result of which, pooling of data was not conducted. Adverse effects of acupuncture use were not reported. And there were a few methodological shortcomings. The review attests acupuncture as an effective therapy with no harmful side effects (Ma et al.,2014)

A controlled study was conducted observing the beneficial effects of acupuncture on post-stroke anxiety neurosis. It involved 67 patients out of which 34 received acupuncture treatment via electroacupuncture, and the rest took oral alprazolam. Acupoints such as Shenting (GV 24), Taichong (LR 3), Hegu (LI 4), Baihui (GV 20), Yintang (EX-HN 3), Shuigou (GV 26), Shenmen (HT 7) and Neiguan (PC 6) were picked, and electroacupuncture was performed. Hamilton Anxiety Scale (HAMA) was used to assess the severity of anxiety. Anxiety symptoms had a total effective rate of 82.35%, and in comparison, to control group, no difference could be found ($P>0.05$). The purpose of the study was to assess the effects of acupuncture on post-stroke anxiety neurosis. The symptoms were measured using the Hamilton Anxiety scale [HAMA]. The researchers concluded that acupuncture is a safe, effective and necessary method for treating post-stroke anxiety neurosis (Wu & Liu, 2008).

According to a literature review of acupuncture for psychiatric illness, there is an increase in central nervous system hormones such as ACTH, beta-endorphins, serotonin, and noradrenaline due to acupuncture. There is a positive impact of acupuncture on depression and anxiety. (Samuels et al., 2008). Chinese trials of acupuncture to alleviate generalized anxiety disorder were found equally useful to drugs; the research review was conducted with a small sample studied. Acupuncture treatment differed between trials. For instance, individualized acupuncture is used during acupuncture therapy. If one test focuses on five specific points, others might use four particular points. Sham acupuncture using nonspecific points as control

intervention was used in many studies. The quality of reporting of perioperative anxiety studies was mostly better and overall the results showed that acupuncture, precisely auricular acupuncture when used at defined targeted acupuncture points, was extremely effective in comparison to acupuncture at a sham point. This deduction was mainly based on score changes on anxiety rating scales. Physiological changes, comprising of blood pressure changes and heart rate fluctuations, were also used in many studies but do not directly relate with anxiety score changes, even with those measured in subjective assessment. The findings are preliminary data and need more investigation through control studies and evaluations. The investigation determined that the research is an encouraging indication for acute, short-term anxiety treatment but more research needs to be done for chronic anxiety disorders (Pilkington,2010).

Another review aimed to determine the volume of researches focusing on acupuncture treatment curing anxiety disorders. The quality of research investigating acupuncture usage to treat anxiety disorders was found to be extremely variable mainly due to the acupoints used, some points used session duration, treatment duration, and frequency. The research was reduced due to methodological quality and the combination of a variety of outcome measured. The volume of literature produced some statistically significant results that had studies with animal test subjects suggesting positive outcomes. The acupoints that are most frequently used are GV20 (4), PC6 (8), LR3 (5), HT7 (8), and Yintang (4). These points are mostly used in TCM and Western acupuncture. The data is valid for the purpose of acupuncture in anxiety research but in general is the acupuncture “norm” comprising of five and fifteen needles and point selection, etc. It had many methodological criticisms, but its effectiveness can be compared acupuncture to CBT, which is a joint intervention in the treatment of this anxiety (Errington-Evans,2011).

4. Anxiety issues related to Dental procedures

One study analyzed the effectiveness of auricular acupuncture in reducing anxiety before dental treatment. A random control study with 182 patients was conducted measuring anxiety before dental treatment after auricular acupuncture at the tranquilizer-, relaxation-, and master cerebral points in the auricular acupuncture group in comparison to acupuncture at sham points (shoulder and tonsil points). Anxiety was measured using the Spielberger State-Trait Anxiety Inventory (German version) before and after auricular acupuncture, before dental treatment. Auricular acupuncture proved to reduce state anxiety more effectively than sham acupuncture. The decrease is statistically significant but not impressive. Acupuncture is effective in reducing anxiety not depending on selected points: relaxation-, tranquilizer- and master cerebral points (Michalek-Sauberer et al.,2012).

Auricular acupuncture is also used to treat dental anxiety. A controlled study was conducted with 67 patients having dental extractions were randomly distributed into three groups: auricular acupuncture, placebo acupuncture, intranasal midazolam and a no treatment group as a control group. Anxiety was measured before and after the dental extraction, along with physiological variables. The midazolam group and auricular group patients were less anxious at 30 min in comparison to the placebo acupuncture group. Patient compliance and anxiety were reduced as a result of auricular acupuncture ($P = 0.032$) making it an effective dental anxiety treatment. Researchers concluded the efficacy of ear acupuncture and intranasal midazolam to cure dental anxiety and found acupuncture had analgesic effects with no side effects (Karst et al., 2007).

Another study was conducted dealing with anxiety before dental treatment. The study aimed to observe the effect of acupuncture on the level of anxiety. Eight dentists submitted 21

case reports on their patients suffering from dental anxiety. The anxiety levels were assessed through the Beck Anxiety Inventory (BAI). Patients with moderate to severe anxiety were only included. It was concluded that there was a substantial reduction in BAI scores after acupuncture treatment. Acupuncture had a positive effect on the anxiety level of patients, and it's an inexpensive treatment method (Rosted et al.,2010).

Auricular acupuncture is also proved to decrease preoperative anxiety especially in patients experiencing elective ambulatory procedures. Auricular acupuncture was found an easy to apply technique with its anxiolytic onset being comparatively rapid, and there are no side effects but just an initial minor pinch at the time of needle insertion (Wang et al.,2001).

5. Comparison with Conventional Therapies or Acupuncture types

The efficacy of acupuncture has also been studied in comparison to other conventional therapies in alleviating anxiety. The efficacy of acupuncture treatment has been proved in equivalence to other therapies. A nationally representative survey day with 2,055 respondents from 1997–1998 in USA was gathered comprising of 24 complementary alternative therapies like acupuncture in curing anxiety disorders. Data on the use of alternative therapies to cure anxiety was compared in the United States. 9.4% of the respondents were already suffering from anxiety attacks in the past year. 56.7% cured these anxiety attacks using alternative or complementary therapies. 0.9% (N=193) used acupuncture with 0.7 Standard error. The effectiveness of these therapies in treating anxiety was like other conventional therapies. (Kessler et al., 2002).

Comparative analysis was performed to assess the analgesic effects of three different acupuncture modes (manual, electro, and placebo). The results of the study indicated the presence of the analgesic effects of acupuncture. The randomized pilot study showed that manual

and electroacupuncture were effective therapies. Also, switching acupuncture modes can work for unresponsive patients (Kong et al., 2005).

Lorent et al. (2016) examined 162 patients diagnosed with anxiety disorder and assessed that after the use of acupuncture there was a decrease in anxiety, Auricular Acupuncture, and Muscle Relaxation Therapy were cross-analyzed. Each participant evaluated four items on a visual analog scale, before and after treatment which helped to assess their anxiety, anger/aggression, tension, and mood. Statistical analyses were done with the original visual analog scale scores and the Change-Intensity Index. Results showed that the treatment with Auricular Acupuncture significantly reduced anxiety, and anger/aggression throughout the four weeks, but did not have any effect on mood. Between AA and PMR, no statistically significant differences were found at any time proving both are equally-effective additional interventions.

Bae et al. (2014) found that acupuncture lessens preoperative anxiety by cross-analyzing multiple randomized controlled trials (RCTs) to evaluate the preoperative anxiolytic effectiveness of acupuncture therapy. They conducted a meta-analysis to prove that acupuncture sessions have positive effects and led to higher reductions in preoperative anxiety. The study also demonstrated that acupuncture therapy reduces preoperative anxiety in comparison to placebo treatment or no treatment at all. The findings were still considered inadequate and further research to prove acupuncture efficacy was required. In conclusion; this meta-analysis suggests that acupuncture therapy aiming at reducing preoperative anxiety has some beneficial effects as compared to placebo or nontreatment alternatives. Further RCTs should be conducted to gain a better understanding of the role of acupuncture in this context.

The reviewed studies validate the efficacy of different types of acupuncture. One study discussed acupuncture types and their effectiveness in anxiety treatment. Manual acupuncture or

electro-acupuncture was studied with people in depression. Data was more readily available on depression rather than acupuncture. The methodological quality was also much better as a lot of research work was present. Still, there was inconsistency whether manual acupuncture was better than other treatment. Though, it was suggested that in the case of electroacupuncture, therapy might not vary from medication. There is inadequate evidence of whether acupuncture has or can be used in conjunction with medication to improve treatment efficacy. The results from controlled trials were deemed useful to warrant acupuncture as an effective treatment for depression but require further research. Previous studies show the significance of acupuncture in reducing psychological distress in many randomized controlled studies and four systematic reviews. Irrespective of methodological insufficiencies, acupuncture was considered a useful treatment option for mental distress (Mukaino, Park, White, & Ernst, 2005). Reports on perioperative anxiety, specifically auricular acupuncture suggest that it is more effective than other types of acupuncture and maybe equally efficient like drug therapy in this situation. Positive findings for acupuncture in generalized anxiety disorder treatment or anxiety neurosis are still under research. Trials of acupuncture in anxiety are still lacking. Only limited evidence favors auricular acupuncture for perioperative anxiety. Promising findings direct further research in this domain (Pilkington et al., 2007).

Pilkington (2010) in his study also revealed that conventional primary care treatment was not as effective and produced a few insignificant effects. Therapeutic acupuncture over integrative treatment was not given due significance. Despite the importance of these studies, there has been no comprehensive review of procedures being used in comparison to anxiety. It is essential to undertake a discussion with the aim of justifying the use of acupuncture by existing

evidence for the treatment of anxiety. The contrast between acupuncture and other types of conventional therapies is still lacking.

6. Anxiety related to other Physical Illness

Anxiety is also linked to other physical illness. Among known complementary therapies, acupuncture is also being used. Anxiety resulting from Physical Illness can even be alleviated by acupuncture. Electrical stimulation and specific acupuncture points are some of the nonpharmacological methods that have been primary factors in pain reduction in different patients. One study is determined the effects of transcutaneous electrical nerve stimulation (TENS) on the specific acupuncture points of pain in patients being kept under the mechanical ventilators. A randomized, double-blind clinical trial was conducted with 50 patients experiencing mechanical ventilation in intensive care units in a hospital in Iran, in 2017. The patients were divided into two groups: intervention and placebo groups. The intervention group received TENS electrodes on Hegu and Zusanli points. Data were assessed using SPSS. The level of pain in patients in the intervention group decreased in comparison to the sham group, with a decline during certain hours ($p < 0.05$). The results exhibited using TENS on acupuncture points can lessen pain level. Acupuncture methods focus on pain reduction in different patients and aid with sedation and anxiety relief (AminiSaman et al., 2018).

Acupuncture treatment as a Post-chemotherapy cure was studied in a controlled trial. A research was conducted to assess whether improvement in postchemotherapy fatigue after acupuncture treatment is significant enough to permit a controlled trial. Thirty-seven patients were registered in 2 cohorts. Acupuncture was performed on patients for four weeks (twice per week) or 6 weeks (once per week). A baseline Brief Fatigue Inventory score of 4 or more was

required for an eligibility requirement for the trial. Baseline fatigue scores were high. Mean improvement after acupuncture was 31.1% making acupuncture effective in the treatment of postchemotherapy fatigue and needed further study. Patients had accomplished cytotoxic chemotherapy with acupuncture therapy, citing no adverse effects (Vickers et al., 2004).

Cancer patients suffer from the disease as well as conventional treatment. A meta-analysis evaluated the alleviation of anxiety in patients with cancer. The available literature on the clinical effects on cancer patients of acupuncture and risk of bias for certain trials was assessed. All randomized controlled trials (RCTs) using acupuncture showed that acupuncture produced minimum side effects including pain, sleep disturbance, fatigue, and some but no significant effect could be seen on the frequency of hot flashes ($P = 0.97$) or mood distress ($P > 0.05$). High risk of bias (74.63%) could be seen in selected RCTs. Analysis results favored acupuncture. The meta-analysis also confirmed that acupuncture helped to curb cancer problems with decidedly less adverse effects (Tao et al., 2015).

Acupuncture is being identified as an alternative medical treatment to alleviate anxiety-like behavior during nicotine withdrawal. Acupuncture helped the drug dependence anxiety mainly due to nicotine addiction. Rats were given frequent nicotine injections for seven days. Acupuncture was performed at acupoint HT7 or ST36. After 72 hours, the anxiogenic response has measured. The findings found that acupuncture may reduce anxiety-like behavior following nicotine withdrawal. It investigated acupuncture effectively healed the symptoms of anxiety-like behavior in nicotine addicts (Chae et al., 2008).

Several studies assessed attested that acupuncture doesn't have potential side effects. Although the therapeutic effects of acupuncture promise yet the introduction of acupuncture into modern science is gaining momentum slowly. Side effects including hypotension or skin related

problems on acupuncture site points were observed in a systematic analysis conducted (Carvalho et al.,2013). An integrative review was conducted to study the effects of acupuncture for treating anxiety. In 514 articles only 19 were included whereas eleven provided strong evidence levels. Acupuncture cured anxiety with no side effects, yet the methodological quality of research was highly questionable on this field (Goyata et al.,2015).

Erringotn-Evan (2015) evaluated forty participants of a psychiatry waiting list receiving ten weeks of acupuncture. The resulting measure was the State and Trait Anxiety Inventory, and State anxiety scores were less in the group treated with acupuncture. It examined the volume and quality studies which support the use of acupuncture in treating anxiety disorders. The quality of research investigating the use of acupuncture was highly variables especially regarding a few points to be targeted, points used, points in a session, session duration and treatment frequency. Acupuncture was proved to cure chronic anxiety which other conventional treatments couldn't cure. There were no adverse effects reported.

The efficacy of acupuncture treatment has been attested by many studies. Acupuncture in cancer patients resolved psychological symptoms like anxiety and depression. As a result, more cancer patient opt for acupuncture for these symptoms. An article reviewed the current literature from 2000 to 2013 assessing acupuncture in cancer-related psychological symptoms although there were a handful of studies about acupuncture, anxiety and cancer patients. All data approved the efficacy of acupuncture and with minimal to no side effects (Haddad & Palesh, 2014).

A study was conducted to examine whether acupuncture can enhance memory and lessen anxiety. A single-blind randomized study comprising of 90 undergraduate university students was used from January to December of 2011. The subjects completed the State-Trait Anxiety Inventory (STAI) form Y-1 (State Anxiety, SA) and Y-2 (Trait Anxiety, TA). Then, all of the

subjects were treated for 20 minutes into select acupoints. Subjects then filled the STAI form Y-1 again and completed the Automated Operation Span Task (AOSPAN) - a computerized test. The acupuncture group had a higher score than the control group which was 9.5% higher. Acupuncture subjects also reported lower anxiety levels than control subjects ($p=0.0146$). Bussel's research probed the idea of reducing anxiety and improving memory by use of acupuncture (Bussel, 2013).

One study conducted by Sakatani et al. (2014) showed the effects of acupuncture on anxiety about prefrontal cortex PFC activity. Ten patients with anxiety disorders were assessed on their anxiety levels using the State-Trait Anxiety Inventory (STAI). The patients received treatment in the Yui Clinic in Osaka. The study specifies that acupuncture aids in decreasing anxiety levels in patients but has minimal adverse effects on patients. Another randomized controlled trial to assess the impact of ear acupuncture for anxiety in a hundred elderly patients was conducted. These patients were supposed to undergo extracorporeal shock wave lithotripsy. Anxiety levels were measured by a visual analog scale. The results showed that acupuncture significantly decreased anxiety scores. There is increasing evidence that acupuncture is useful in treating somatic and psychological disorders caused by stress; however, the physiological basis of the effect remains unclear. In the present study, we evaluated the effect of acupuncture on mental conditions (i.e., anxiety) and prefrontal cortex (PFC) activity.

Scientifically acupuncture has been highlighted to treat pain and anxiety issues in subjects in German clinical trials. A systematic review was conducted which indicated the analgesic effects of acupuncture based on the outcomes of German clinical trials but failed to conclude the efficacy of treating anxiety (Kawakita & Okada, 2014). One paper evaluated medical conditions in which acupuncture was used and established a positive linkage between

acupuncture and anxiety. The paper discussed meta-analyses or systematic reviews conducted in the United States, Canada, Europe, and the United Kingdom. All reviews had methodological limitations and very few high-quality clinical trials. Some studies identified the efficacy of acupuncture on anxiety; others were unable to establish a significant linkage. The effects of acupuncture were considered safe, and a general international agreement has developed deeming acupuncture as useful to anxiety issues which occur as a result of postoperative dental problems, chemotherapy-related problems, and women issues. Reviews determined that while acupuncture is not free from adverse events, acupuncture is a comparatively safe procedure and can be equipped with other treatments being used to treat other diseases. Acupuncture effectively treats of postoperative nausea and vomiting, postoperative dental pain, and chemotherapy-related issues. Some results were difficult to understand than others, and better-quality research is needed. The review determined that acupuncture didn't have serious adverse events, yet it is a relatively safe procedure. Also, it was found that acupuncture has both long and short-term effects, but multiple studies attest that they don't have long-term consequences (Birch et al., 2004).

II. MATERIALS AND METHODS

Qualitative research is a useful tool to interpret and discuss acupuncture in depth and an all-inclusive manner. The data collection methods used through qualitative research provided an opportunity to reason and draw linkages to conduct the rationality of this research. Selecting the present research methodology of multiple qualitative studies will justify the validation of the topic.

All published Randomized Controlled Trials are comparing acupuncture with sham acupuncture, no treatment, pharmacological treatment, structured psychotherapies or standard care. The following models of Treatment were included: acupuncture, electro-acupuncture, and laser-Acupuncture.

The main principles of a Literature review are to address all available evidence and data about the current topic of research. The initial point for the literature search is to choose the articles directly related to the question, warranting that as many articles are included as possible. The search strategy was kept in line with the research question of the review and inclusion criteria was carefully outlined. Qualitative research achieves utilizes observation and data collection as it relates to an individual's real-life perception of a phenomenon. The Qualitative research method is flexible in identifying and specifying phenomenological themes as they relate to the efficacy of acupuncture (Gibbert & Ruigrok, 2010).

II.1. Study selection

A search was conducted within five search databases, and articles published between January 2010 and August 2018 were used. The search terms used were 'acupuncture' or 'effects' and 'anxiety.' Reference lists of journal articles were reviewed for additional references.

Inclusion criteria included (1) Acupuncture and anxiety (2) Comparison with other conventional therapies (3) Published in English.

Articles were excluded if (1) studies were not focused on anxiety as one of the outcome measures before and after acupuncture intervention, and (2) published in another language except English (3) Studies using data older than 2000.

Figure II.1 shows that one hundred fifty-eight articles were identified which corresponded to the inclusion criteria through the provided databases; 36 were identified through the references in these articles. After removing all the duplicate research papers, 122 remained. After further screening with the help of keywords and methodology, 72 were selected to be thoroughly read, and further 22 were excluded which didn't fully identify acupuncture. The remaining papers were segregated based on methods. 17 RCT's about anxiety and acupuncture were used. Rest of the papers comprised of literature reviews, meta-analysis, survey, integrative research, and experimental animal study.

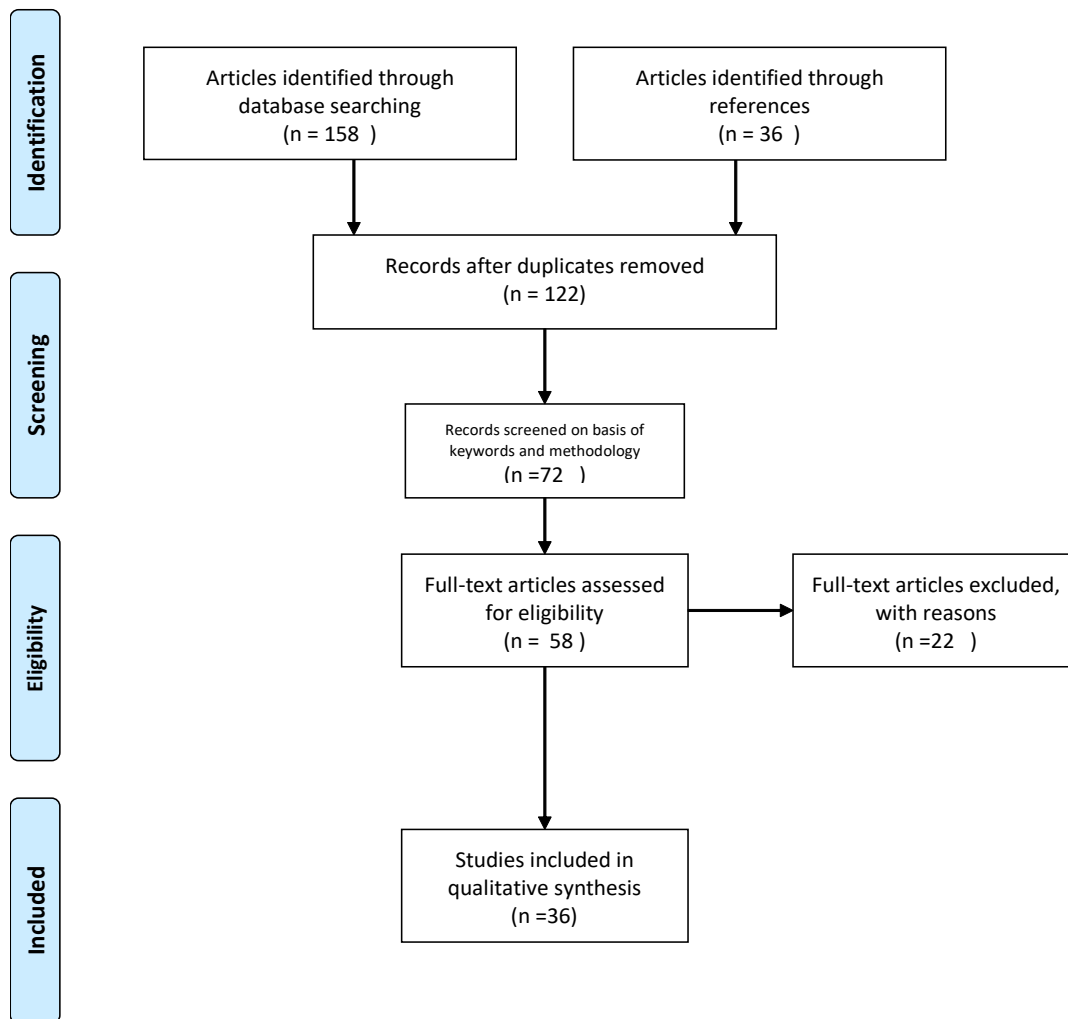


Figure II.1. The Process Flow of Literature Search

The research data collected was completely random. Initially, if data had any keywords ‘acupuncture’ ‘anxiety’ or ‘effects’ was collected. Acupuncture was always given priority. Towards final screening, all those papers which had these three words were kept, and the rest of them were deleted. In the end, there were the following kinds of researches as noted in Table II.1.

Table II.1. Literature Survey

Type of Research	Number of Study
Survey	1
Case Studies	1
Systematic Review and Meta-analysis	10
Narrative Literature Review	7
RCT	17

II.2. Search Strategy and Data selection

Five Online databases were searched from the year 2000 to 2018. The electronic bibliography databases screened included JSTOR, Elsevier, Science Direct, PubMed and PsycINFO. We included Systematic Literature reviews, Case studies, Randomized Controlled Trials (RCTs) and Group studies assessing acupuncture for anxiety. The search terms ‘Acupuncture’, ‘effects’ and ‘anxiety’ and their variations are used. Restrictions of the English

language were made. Also, reference sections of the journal were screened manually to assess if there is a reoccurrence of articles.

The following evaluations were reviewed: 1. Use of Acupuncture in comparison to medical treatments 2. The acceptance and feedback of acupuncture in previously conducted researches 3. Acupuncture treatment only to alleviate anxiety without any link to medical disease.

To conduct a literature review, studies were used that met specific criteria:

- i. Type of methodology: Systematic Literature reviews, Meta-Analysis, Clinical research, Randomized Controlled Trials (RCTs) and Group studies.
- ii. Keywords: ‘Acupuncture’, ‘pain’, ‘effects’, ‘side effects’, ‘symptoms.’
- iii. Types of acupuncture: Three types of acupuncture were used.

Body Acupuncture:

It is the most common type of acupuncture. The technique uses very thin needles at specific areas on the body, varying in depths. It can help release pain, and other body illnesses (Klauser et al., 1993).

Auricular Acupuncture:

The ear has a whole microsystem and holds stimulation of acupuncture points especially on the external ear surface for the examination and treatment of health conditions in many other areas of the body (Wang & Kain, 2001).

Electro-Acupuncture:

Electroacupuncture is the most recent form of acupuncture which uses a small electric current that is passed between pairs of acupuncture needles. It can be used in conjunction with Body Acupuncture. It is where an electro-acupuncture machine is connected to the top of the

Body Acupuncture. The patient feels a mild sensation. It may not be suitable for all patients (Ulett, Han & Han, 1998).

Types of outcome measures:

The broad-spectrum effects of acupuncture as measured by an acupuncturist and the willingness to treat a wide array of disorders varying from physiological and physical health issues need to be evaluated (Birch & Jamison, 1998). The desire to get treated by acupuncture and what benefits and problems do people perceive is extremely important to assess the viability of acupuncture (Patterson & Bitten, 2003).

II.3. Data Extraction

The research framework was developed before conducting a scholarly qualitative study; furthermore, an excel sheet was created to collect, consolidate and interpret the data that was collected. The reviewed literature comprised of data ranging from anxiety resulting from other physical ailments like dental surgery or cancer and how acupuncture was effective in curing it.

II.4. Data Analysis

All data was gathered using the predefined criteria of selected keywords and period.

II.5. Development of the database

Initially, the data collected was categorized into author information, information about the acupuncture effects on anxiety, related to adverse events and primary outcomes, methodology, and shortcomings of the papers. Each paper information was added to a single database.

III. RESULTS

Data was gathered from five different databases. One hundred fifty-eight articles that were gathered initially showed a clear indication that there was research about the subject of acupuncture. There has been a surge in analyses about acupuncture from 2010 to 2018. Most of the studies were conducted in the last decade. Only 36 researchers directly related the practice of acupuncture to anxiety and analyzed its effects.

III.1. Randomized Controlled Trials

16 Random Controlled Trials assessed the comparative effects of acupuncture treatment. Kong et al. (2005) assessed the analgesic effects of three different acupuncture modes (manual, electro, and placebo) with results indicating the presence of analgesic effects of acupuncture which can be further enhanced by switching acupuncture modes. Bussell's study(2013) in which subjects completed the State-Trait Anxiety Inventory (STAI) form Y-1 (State Anxiety, SA) and Y-2 (Trait Anxiety, TA) to assess the efficacy of select acupoints acupuncture therapy. The acupuncture group had a higher score than the control group which was 9.5% higher. Acupuncture subjects also reported lower anxiety levels than control subjects ($p=0.0146$).

Electrical stimulation and specific acupuncture points are some of the nonpharmacological methods that have been primary factors in pain reduction in different patients. Acupuncture methods focus on pain reduction ($p < 0.05$) in different patients and aid with sedation and anxiety relief (AminiSaman et al., 2018).

Acupuncture treatment as a Post-chemotherapy cure was studied in a controlled trial. Mean improvement after acupuncture was 31.1% making acupuncture effective in the treatment

of postchemotherapy fatigue; Patients had accomplished cytotoxic chemotherapy with acupuncture therapy, citing no adverse effects (Vickers et al., 2004).

The effectiveness of auricular acupuncture in reducing anxiety before dental treatment also showed positive results. Anxiety was measured using the Spielberger State-Trait Anxiety Inventory (German version) before and after auricular acupuncture, before dental treatment. Auricular acupuncture proved to reduce state anxiety more effectively than sham acupuncture. The decrease is statistically significant but not impressive. Acupuncture was effective in reducing anxiety not depending on selected points: relaxation-, tranquilizer- and master cerebral points (Michalek-Sauberer et al., 2012). Auricular acupuncture also proved to decrease preoperative anxiety especially in patients experiencing elective ambulatory procedures. Auricular acupuncture was found an easy to apply technique with its anxiolytic onset being comparatively rapid, and there are no side effects but just an initial minor pinch at the time of needle insertion (Wang et al., 2001). Auricular acupuncture is also used to treat dental anxiety. Patient compliance and anxiety were reduced as a result of auricular acupuncture ($P = 0.032$) making it an effective dental anxiety treatment. Researchers concluded the efficacy of ear acupuncture and intranasal midazolam to cure dental anxiety was high with strong analgesic effects and no side effects (Karst et al., 2007). A controlled study was conducted observing the beneficial effects of acupuncture on post-stroke anxiety neurosis was also considered. Acupoints such as Shenting (GV 24), Taichong (LR 3), Hegu (LI 4), Baihui (GV 20), Yintang (EX-HN 3), Shuigou (GV 26), Shenmen (HT 7) and Neiguan (PC 6) were pricked, and electroacupuncture was performed. Hamilton Anxiety Scale (HAMA) was used to assess the severity of anxiety. Anxiety symptoms had a total effective rate of 82.35%, and in comparison, to control group, no difference could be found ($P > 0.05$), (Wu & Liu, 2008).

A randomized controlled study also evaluated the efficacy of acupuncture against placebo acupuncture in lactating mothers with preterm infants in Brazil. STAI-State scores before and after treatment were not statistically significant, but anxiety was reduced (Haddad-Rodrigues et al., 2005). Isoyama et al. (2012) also studied the uses of acupuncture in improving anxiety symptoms in infertile women undergoing in vitro fertilization (IVF) treatment in 43 patients experiencing IVF. Hamilton Anxiety Rating Scale (HAS) was used to test the anxiety level of each patient before and after treatment. Acupoints HT7, GV20, CV17, PC6, and Yintang were used in the test group. The mean HAS score after 4-week period was significantly lower in the test group than in the control group (19.4 ± 3.2 vs. 24.4 ± 4.2 ; $p=0.0008$). No statistical difference in the changes in anxiety level was prevalent in both groups. Risk of anxiety was 4.77 times more in the control group. Results showed that acupuncture is beneficial in reducing anxiety symptoms and had no side effects on women undergoing IVF. Acupuncture effectiveness on anxiety has also been assessed in women suffering through premenstrual dysphoric disorder (PMDD). The reduction in the mean HAM-D scores has a significant difference of ($p=0.012$). The study suggested that acupuncture is another treatment option for anxiety issues in PMDD patients. Anxiety, mood swings, and depression were cured in both groups, and acupuncture therapy proved to have analgesic effects on women (Carvalho et al., 2013).

The research by Mora et al. (2007) also determined that the older patients who underwent ear acupressure were less anxious and believed that acupuncture had a positive effect on them. The Post-Intervention Anxiety visual analog scale established substantial superiority of the actual treatment group ($p = 0.001$).

The most favorable effects of acupuncture appeared 72 hours after one session and lasted for one month. Impaired immune functions significantly became better by acupuncture. It was

also inferred that the findings on anxiety disorders are challenging to interpret because of the vast array of interventions alongside acupuncture when compared. The outcomes are positive, but reports require more straightforward methodological details (Arranz et al., 2007). Several of RCT's assessed attested that acupuncture doesn't have potential side effects although the therapeutic effects of acupuncture are promising because there are no significant side effects and is safer than alternative medication (Carvalho et al., 2013).

III.2. Clinical systematic review

Two clinical systematic reviews were also included in this study in which acupuncture is being identified as an alternative medical treatment to cure anxiety-like behavior during nicotine withdrawal. Acupuncture was performed at acupoint HT7 or ST36. The results indicated that acupuncture effectively healed the anxiety-like behavior in nicotine addicts (Chae et al., 2008).

Overall, there is little qualitative scientific research done on acupuncture effects on anxiety in women according to Sniezek & Siddiqui (2013). In the systematic clinical review conducted by them, it was assessed that anxiety prevalence in women is very high, especially in comparison to the male population. Only six reviewed studies meet the exclusion criteria of review. The data focused on pregnant women and provided evidence to support acupuncture as monotherapy for pregnant women.

III.3. Case Study

A case study was conducted dealing with anxiety before dental treatment. The anxiety levels were assessed through the Beck Anxiety Inventory (BAI). Patients with moderate to severe anxiety were only included. It was concluded that there was a substantial reduction in BAI

scores after acupuncture treatment. Acupuncture had a positive effect on the anxiety level of patients, and it's an inexpensive treatment method (Rosted et al.,2010).

III.4. Clinical Study

A clinical study was also included in the literature review with eighteen concerned adults who complained about insomnia and anxiety were also observed in an open clinical trial study involving acupuncture. Their responses showed that there was a substantial reduction in anxiety scores, and the findings were consistent with clinical reports of acupuncture's relaxant effects (Spence et al., 2004).

III.5. Integrative review

An integrative review was also reviewed focusing on the effects of acupuncture for treating anxiety. In 514 articles only 19 were included which proved that acupuncture cured anxiety with no side effects, yet the methodological quality of research was highly questionable (Goyata et al.,2015).

III .6. Survey

The efficacy of acupuncture has also been studied in comparison to other conventional therapies in curing anxiety. The efficacy of acupuncture treatment has been proved in equivalence to other therapies. A nationally representative survey day with 2,055 respondents from 1997–1998 in the USA was gathered comprising of 24 complementary alternative therapies like acupuncture in alleviating anxiety disorders. Data on the use of alternative therapies to alleviate anxiety was compared in the United States. 9.4% of the respondents were already

suffering from anxiety attacks in the past year. 56.7% eliminated these anxiety attacks using alternative or complementary therapies. 0.9% (N=193) used acupuncture with 0.7 Standard error. The effectiveness of these therapies in treating anxiety was like other conventional therapies (Kessler et al., 2002).

III.7. Literature Reviews

Six narrative literature reviews were included with data ranging from anxiety from cancer to dental surgery, about acupuncture.

Scientifically acupuncture has been highlighted to treat pain and anxiety issues in subjects in German clinical trials. A systematic review was conducted which indicated the analgesic effects of acupuncture based on the outcomes of German clinical trials but failed to conclude the efficacy of treating anxiety (Kawakita & Okada, 2014).

The available literature on the clinical effects on cancer patients of acupuncture and risk of bias for certain trials was assessed. All randomized controlled trials (RCTs) using acupuncture showed that acupuncture produced minimum side effects including pain, sleep disturbance, fatigue, and some but no significant effect could be seen on the frequency of hot flashes ($P = 0.97$) or mood distress ($P > 0.05$). High risk of bias (74.63%) could be seen in selected RCTs. Analysis results favored acupuncture (Tao et al., 2015). Another research reviewed the current literature from 2000 to 2013 assessing acupuncture in cancer-related psychological symptoms although there were a handful of studies about acupuncture, anxiety and cancer patients. All data approved the efficacy of acupuncture and with minimal to no side effects (Haddad & Palesh, 2014).

Erringotn-Evan (2015) evaluated forty participants of a psychiatry waiting list receiving ten weeks of acupuncture. The resulting measure was the State and Trait Anxiety Inventory, and State anxiety scores were less in the group treated with acupuncture. Acupuncture was proved to alleviate chronic anxiety which other conventional treatments couldn't do. There were no adverse effects reported. According to a literature review of acupuncture for psychiatric illness, there is an increase in central nervous system hormones such as ACTH, beta-endorphins, serotonin, and noradrenaline due to acupuncture. There is a positive impact of acupuncture on depression and anxiety. (Samuels et al., 2008).

There is very little work primarily focusing on the effects of acupuncture on alleviating anxiety disorder. Previously published studies highlight the effects of acupuncture but are organizationally inconsistent. Hence, a review is needed to draw a conclusion and establish a link between acupuncture and anxiety. Acupuncture's effectiveness is associated with resolving anxiety related issues with other medical problems. Research acknowledges the benefits of anxiety disorders and can be combined with other conventional treatments or medical issues; and has many beneficial effects (Pilkington, 2010).

Chinese trials of acupuncture to alleviate generalized anxiety disorder were found equally useful to drugs in the selected literature, Sham acupuncture using nonspecific points as control intervention was used in many studies. The quality of reporting of perioperative anxiety studies was largely better and overall the results showed that acupuncture, precisely auricular acupuncture when used at defined targeted acupuncture points, was extremely effective in comparison to acupuncture at a sham point. This deduction was mainly based on score changes on anxiety rating scales. Physiological changes, comprising of blood pressure changes and heart rate fluctuations, were also used in many studies but do not directly relate with anxiety score

changes, even with those measured in subjective assessment. The findings are preliminary data and need more investigation through control studies and assessments. The investigation determined that the research is an encouraging indication for acute, short-term anxiety treatment but more research needs to be done for chronic anxiety disorders (Pilkington,2010).

The volume of literature produced some statistically significant results that had studies with animal test subjects suggesting positive outcomes. The acupoints that are most frequently used are GV20 (4), PC6 (8), LR3 (5), HT7 (8), and Yintang (4). These points are mostly used in TCM and Western acupuncture. The data is valid for the cure of acupuncture in anxiety research but in general is the acupuncture "norm" comprising of five and fifteen needles and point selection, etc. It had many methodological criticisms, but its effectiveness can be compared acupuncture to CBT, which is a standard intervention in the treatment of this anxiety (Errington-Evans, 2011).

III.8. Systematic Literature Review

Five systematic literature reviews also shed light on acupuncture effects on anxiety. Lorent et al. (2016) examined 162 patients diagnosed with anxiety disorder and assessed that after the use of acupuncture there was a decrease in anxiety, Auricular Acupuncture, and Muscle Relaxation Therapy were cross-analyzed. Results showed that the treatment with Auricular Acupuncture significantly reduced anxiety, and anger/aggression throughout the 4 weeks, but did not have any effect on mood. Between AA and PMR, no statistically significant differences were found at any time proving both are equally-effective additional interventions.

Researches have been conducted treating anxiety disorders in women. The study reviewed previous data of randomized controlled trials of 193 relevant titles concerning acupuncture effects of anxiety in infertile women. The research proved that acupuncture does reduce anxiety in infertile women and can be termed as an effective therapy (Bashtian et al., 2016).

Another review of 12 controlled trials evaluated the evidence of how acupuncture provides desired results for the treatment of anxiety neurosis and general anxiety disorders. There were no studies on the use of acupuncture whereas there were ten random trials, out of which four were on general anxiety disorder and anxiety neurosis. Six focused on anxiety in the perioperative period. The research concluded that acupuncture is beneficial for the treatment of generalized anxiety disorder or anxiety neurosis but that there isn't enough proof of confirmation (Pilkington et al., 2007).

Acupuncture treatment is gaining momentum especially in psychiatric patients, no studies have investigated auricular acupuncture (AA) to treat anxiety disorders. One study directed to compare the effectiveness of auricular acupuncture in comparison to progressive muscle relaxation (PMR) in 162 patients suffering from anxiety disorder. The results showed that treatment considerably decreased anxiety and had more long-term positive effects (Lorent et al., 2016).

A systematic review was conducted to evaluate the research regarding acupuncture intervention for Generalized Anxiety Disorder from various data sources, and randomized controlled trials were included. Two review authors independently researched papers. The clinical studies on anxiety disorders have been insufficient in determining the efficacy of acupuncture in treating Generalized Anxiety Disorder is indeterminate. Overall the risk of bias in

included studies was high. And there were a few methodological shortcomings. The review attests acupuncture as an effective therapy with no harmful side effects (Ma et al.,2014).

III.9. Meta-Analysis

Two meta-analyses evaluated medical conditions in which acupuncture was used and established a positive linkage between acupuncture and anxiety. All reviews had methodological limitations and very few high-quality clinical trials. Some studies identified the efficacy of acupuncture on anxiety; others were unable to establish a significant linkage. The effects of acupuncture were considered safe, and a general international agreement has developed deeming acupuncture as useful to anxiety issues which occur as a result of postoperative dental problems, chemotherapy-related problems, and women issues. Reviews determined that while acupuncture is not free from adverse events, acupuncture is a comparatively safe procedure and can be equipped with other treatments being used to treat other diseases. Acupuncture effectively treats of postoperative nausea and vomiting, postoperative dental pain, and chemotherapy-related issues. Some results were difficult to understand than others, and better quality research is needed. The review determined that acupuncture didn't have serious adverse events, yet it is a relatively safe procedure. Also, it was found that acupuncture has both long and short-term effects, but multiple studies attest that they don't have long-term consequences (Birch et al.,2004; Bae et al.,2014).

IV. DISCUSSION

The 34 research papers which were used for the literature review met all the requirements of the research question. According to the results, ten studies focused on women anxiety issues validating the fact that previous researches were more women-centric. In Table IV.1, it shows studies focused on mothers' anxiety issues (Wang et al.,2004; Haddad et al.,2005), Chemo and Post-chemo female patients' anxiety (Haddad et al.,2014; Vickers et al.,2004) and women suffering from anxiety in general (Snieszek et al.,2013; Birch et al.,2004; Arranz et al.,2007). Studies also focused on anxiety issues related to premenstrual dysphoria (Carvalho et al.,2013), infertile women (Bastian et al.,2016) and women facing dental anxiety (Rosted et al.,2010).

Table IV.1: Papers Focusing on Women Anxiety issues

Issues	Study
Mothers	Wang,2004; Haddad,2005
Chemo/post-chemo anxiety	Vickers,2004; Haddad,2014
General anxiety disorder in women	Snieszek,2013; Birch,2004; Arranz,2007
Infertile women	Bashtian,2016
Dental Anxiety	Rosted,2010
Premenstrual Dysphoria	Carvalho,2013

In Table IV.2, it is noted that Acupuncture was considered as a safe procedure in 5 studies, and four studies also recognized it as a cost-effective procedure. Acupuncture has anxiolytic effects (13 studies), analgesic effects (3 studies) and pain reduction properties (5 studies). Seven studies

considered acupuncture as an effective treatment for anxiety in comparison to other conventional therapies. A few studies referred to the acupuncture effects as fewer side effects (5 studies) which are not very serious and diminish with time varying from a few seconds to minutes. Acupuncture has Sympathoinhibitory Properties (1 study), Long term effects (1 study) and is Tolerable (1study). The terms used to define anxiety effects differed in 34 studies with a few effects common in most of the studies attesting their cogency.

Table IV.2: Positive Effects

SR#	Positive effects	Abbreviation	Frequency
1	Analgesic	An	3
2	Anxiolytic	Anx	13
3	Cost Effective	CE	4
4	Effective	Eff	7
5	Less Side Effects	LSE	5
6	Long Term Effect	LTE	1
7	Pain Reduction	PR	1
8	Safe	Safe	5
9	Sympathoinhibitory Properties	SP	1
10	Tolerable	Tol	1

In Table IV.3, the 36 studies did not directly focus on the negative effects of acupuncture. Fourteen studies attested that acupuncture has no adverse effects. One study pointed out that the acupuncture dosage was could not be determined. 2 studies pointed out that acupuncture has no side effects, whereas 3 pointed out that acupuncture has no significant side effects. Five studies

pointed out side effects which were not persistent and were for a very short time. Relative sensitivity and pain, vanished within 5 days and with no side effects (Wu et al.,2008), warmth and dizziness (Michalek et al.,2012), stabbing, numbness, soreness, throbbing, tingling, burning, heaviness, fullness, or aching (Kong et al.,2005), stinging (Pilkington,2007) and pain, fatigue, sleep disturbance, and some gastrointestinal problems (Tao et al.,2016).

Table IV.3: Adverse Effects

SR#	Adverse effects	Abbreviation	Frequency
1	No Adverse Effects	CRUH	14
2	No Side Effects	DI	2
3	Side Effects	NAE	5
4	Not Studied	NMSE	8
5	Dosage Indetermined	NS	1
6	Cured Rates Unrealistically High	NSE	1
7	No Major Side Effects	SE	3

15 studies didn't focus on acupoints. Random controlled studies mostly stressed the use of acupoints. The most common acupoints used in RCT are HT7 and PC6. Whereas in the case series, systematic review and literature review SP6 and HT6 were most used. There were not consistent acupuncture point protocols throughout the studies yet many of the studies used varied acupuncture points. Based on these studies, my findings are that the core points that helped to alleviate anxiety are those listed in Figure IV.

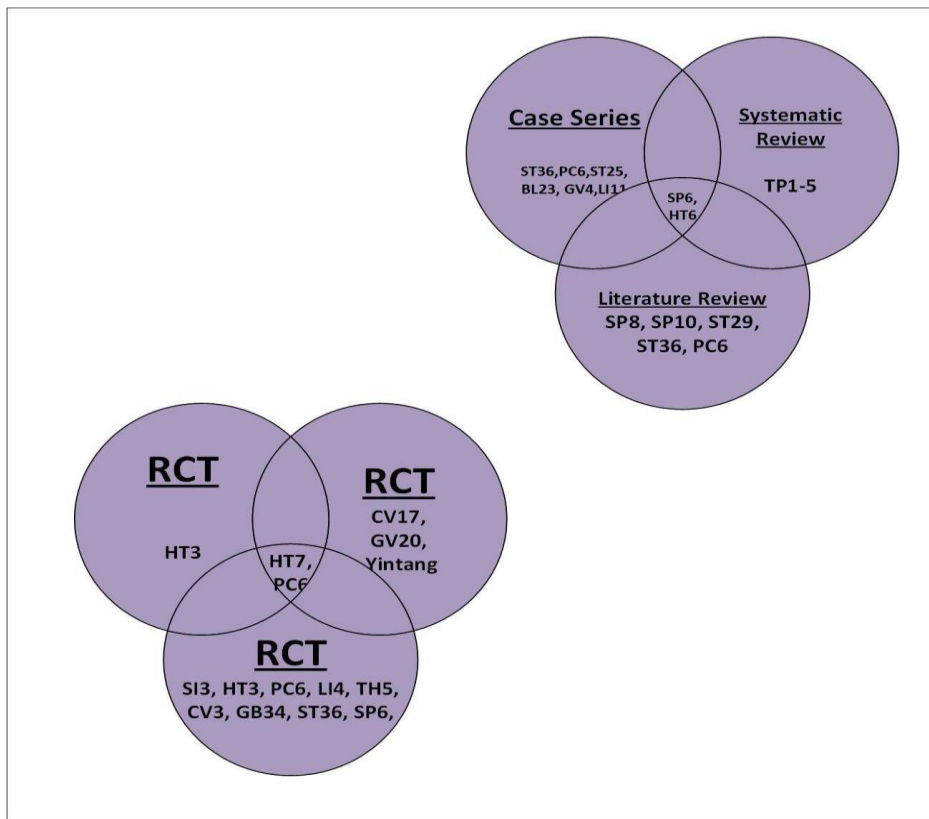


Figure IV.1. Acupoints found to relieve anxiety

The following is a brief explanation of the points noted in Table IV, and their importance when treating anxiety. Please note that some of the points were used primarily to relieve gynecological symptoms in the aforementioned studies that correlated gynecological issues with anxiety.

Heart 7 (Shenmen) - The main point on the Heart channel to Calm the Mind and open the Mind's orifices thereby relieving anxiety. It nourishes the Heart Blood, and is indicated for mental restlessness, agitation, palpitations. Considered one of the major points of the body as it can be used in any Heart pattern in order to Calm the Mind. Most effective in deficiency cases

Heart 3 (Shaohai) – Calms the mind, particularly for sadness, anxiety, palpitations. It has an important calming action on the mental level by clearing Heart-Fire (Maciocia, G. 2008).

Heart 6 (YinXi) – Calms the mind. This point also clears Heart Empty heat and is therefore useful for mental restlessness. It is the point of choice for Heart-Blood deficiency, that results in anxiety, insomnia, poor memory, and palpitations (Maciocia, G. 2008, Maciocia, G. 2012).

Spleen 6 (Sanyinjiao) – The main point on the Spleen channel to Calm the Mind. It is the crossing point of the Spleen, Liver, and Kidney channels. It is particularly indicated when the person is affected by worry and pensiveness. It also promotes sleep and it combines well with Heart 7. It nourishes the blood, helps to smooth Liver-Qi, calm the mind, and allay irritability (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

Pericardium 6 (Neiguan) – This point Calms the Mind and relieves Anxiety by opening the Mind’s orifices and resolving phlegm in the heart. It works well when there is Qi Stagnation or Heart Blood Deficiency. It has a powerful calming action on the Mind and can be used in anxiety caused by any of the Heart patterns. It also calms the mind by its indirect action on the Liver and is, therefore, good for irritability due to stagnation of Liver Qi (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

Spleen 8 (Diji) – The importance of this point in calming anxiety, comes from the fact that it regulates the Qi by harmonizing the ascending, descending, entering, and exiting of Qi. It removes obstruction, and stops pain, particularly in acute cases. It is used often in dysmenorrhea to stop pain (Maciocia, G. 2008, Maciocia, G. 2012)

Spleen 10 (Xuehai) – Invigorates blood, cools blood, nourishes blood. Because it also invigorates blood in the uterus, it is also used for irregular menstruation, painful periods, amenorrhea, menorrhagia, as well as skin eruptions and itching. This point has a wide-ranging action on blood, as a result, it affects the channels of the Spleen, Liver, and Kidneys (Maciocia, G. 2008, Maciocia, G. 2012).

Large Intestine 4 (Hegu) – Has a strong calming action. It regulates the ascending and descending of Qi to and from the head, therefore subduing Qi in the head when the person is anxious. It has a strong influence on the mind and can be used to soothe the mind and allay anxiety (Maciocia, G. 2008, Maciocia, G. 2012).

Large Intestine 11 (Quchi) – Has a wide-ranging action in many different types of conditions but first and foremost is that it clears heat. It also cools the blood (Maciocia, G. 2008, Maciocia, G. 2012) .

Small Intestine 3 (Houxi) – This point regulates the Governing Vessel and extinguishes Interior and exterior wind. It affects the mind in that it affects the brain, through the Governing Vessel. It is said to clear the mind in the sense that it helps the person to gain mental strength. On a physical level, this point strengthens the spine, but it also strengthens the mind, giving the person strength to face difficulties (Maciocia, G. 2008, Maciocia, G. 2012, O'Connor, J, et.al.,1981).

Stomach 25 (Tianshu) – This point calms the mind and opens the heart orifices. It is effective in mental irritation, anxiety, schizophrenia and mania when these are due to a Stomach disharmony, particularly Excess patterns of the Stomach (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

Stomach 29 (Guilai) – This is an important point to eliminate blood stasis in the uterus and regulate the menses. It also regulates Qi in the Lower Burner, regulates the penetrating vessel and subdues rebellious Qi (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

Stomach 36 (Zusanli) – This is a major point to tonify qi and blood in deficiency patterns. It is used in all cases of Deficiency of Stomach and Spleen and to strengthen the body and mind. It can tonify, not only, Qi, Yang, Blood and Yin, but also the Original Qi. Among all it’s many attributes, this is strong point for Calming the Mind (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

CV 3 (Zhongji) – This is a very important point for genitourinary problems. It is the main point to affect the Bladder and its function of Qi transformation. It can be used for any urinary problems and can be used in many menstrual irregularities. This point also strengthens the Kidneys and nourishes the Essence (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

CV 17 (Shanzhong) – This point is the meeting point of the Directing Vessel, Spleen, Kidney, Small Intestine and Triple Burner channels. Its actions are that of Tonifying Qi and strengthening the Gatherine Qi, opens the chest, regulates Qi and promotes the descending. As a result of this, it aids in calming the mind (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

San Jiao 5 (Waiguan) – This is a major point to release the Exterior and expel Wind-Heat. It indirectly subdue Liver-Yang rising because of it’s Triple Burner connection with the Gall Bladder, and is very much used as a distal point to treat headaches and Anxiety stemming from Livery Yang rising (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

GV 4 (Mingmen) – The governing vessel has a strong influence on the Mind (Shen) because it affects it in three different ways: 1. It is related to the yang aspect of the Essence which is the foundation of Qi and Mind and the residence of will-power. 2. The GV vessel flows through the heart and it will affect the Mind through the Heart. 3. The GV vessel enters the brain which some believe is the residence of the Mind. As a result, GV 4 clears the Mind and lifts moods and is also an important point to treat depression related to Kidney Yang Deficiency (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

GV 20 (Baihui) – Meeting point of the GV Vessel with Bladder, Gallbladder, Triple Burner, and Liver channels as well as being the point of the sea of marrow. Since this point is a meeting point of many Yang channels, it has a powerful effect in stimulating the ascending of Yang. Because of its lifting action on Yang, it has a mental effect of rising clear Yang to the Brain and Mind, therefore, clearing the mind (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

Urinary Bladder 23 (Shenshu) – This is one of the major points of the body and the main point to tonify the kidney. Besides tonifying the kidneys and nourishing the kidney essence, it has multiple other important attributes, however, for our discussion on anxiety, it is important to note that Essence is the material foundation for the Mind. If Essence is strong and flourishing, the Mind will be happy and positive. If Essence is weak, the body is always weak and exhausted, and the Mind will also suffer. This point stimulates the mind, strengthens the will-power, stimulates the spirit of initiative and lifts depression and anxiety. This is also an important point to strengthen the Uterus and regulate menstruation (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981)

Gallbladder 34 (Yanglingquan) – This point is another major point in the body as it is an extremely important point to promote the smooth flow of Liver Qi. By regulating Liver Qi, it helps to decrease, among other indications irritability, moodiness, depression, and sighing, which are some of the signs of anxiety (Maciocia, G. 2008, Maciocia, G. 2012, O’Connor, J, et.al.,1981).

Yintang (Extra Point) – Extinguishes interior wind and Calms the Mind. It helps to relieve fright, anxiety and insomnia (Maciocia, G. 2008, Maciocia, G. 2012, O'Connor, J, et.al.,1981).

The results of the literature review indicate the efficacy of acupuncture in reducing symptoms of anxiety. The research work available varied from Randomized control trials to different kinds of literature reviews. There is a growing trend in the acceptance of acupuncture, and the majority of the research data indicated that researchers advocate the use of acupuncture in junction with other medical therapies. The current research work suggests that acupuncture is an effective treatment and not some sham. The research will also help to eliminate any negative perceptions about acupuncture therapies.

The relationship between acupuncture and its popularity among women should be assessed in future studies. Also, more scientific acupuncture data is needed to prove the efficacy of acupuncture. Also, there are many studies cross evaluating the significance of acupuncture in comparison to other conventional therapies. Acupuncture is a low-cost therapy to alleviate problems such as anxiety issues related to other health problems. Further research work is needed to cross evaluate the benefits of acupuncture instead of other conventional therapies. The most significant limitation of this study is that most of the data on acupuncture is biased and there are very few analyses of direct surveys. The general perception of people needs to be evaluated to address the doubts related to acupuncture, then only the effects of acupuncture on anxiety can be adequately studied.

The literature review stresses on diverse uses of acupuncture in curing anxiety and associated health problems effectively. The application of acupuncture and its effectiveness can

be justified by providing sound evidence. Furthermore, it was essential to endorse that traditional acupuncture is effective in comparison to other medical interventions. The number of studies about acupuncture trials has increased over time. This research work highlights the use and efficiency of research work.

IV.1. Limitations

The literature includes scholarly articles on acupuncture specifically. Although the research conforms to scientific procedures that involve research methods, it is not entirely unbiased (Fassinger & Morrow, 2013). A researcher has a particular set of ideas which guide him through his research. Researcher philosophies and views might affect his approach during the different stages of his research concerning the design, data collection, review, and analysis procedures (Fassinger & Morrow, 2013). The research was tried to keep unbiased throughout this process, but bias might occur at any time throughout this research study.

This literature research is a stepping stone to highlight the effectiveness of acupuncture. The review was done with limited research volume. Literature needs to be complimented with more research work. More broadened research is needed to highlight its effectiveness in comparison to other medical interventions or procedures.

CONCLUSION

The results of the literature review indicate the efficacy of acupuncture in reducing symptoms of anxiety. It was further made clear that there are minimal, if any, side effects from acupuncture in contrast to Western Medicine drug treatment.

The research works available varied from Randomized control trials to different kinds of literature reviews. There is a growing trend in the acceptance of acupuncture, and most of the research indicated that researchers advocate the use of acupuncture in conjunction with other medical therapies. The current research work suggests that acupuncture is an effective treatment and not some sham. The research will also help to eliminate any negative perceptions about acupuncture therapies.

The relationship between acupuncture and its popularity among women should be assessed in future studies, as it was shown in this review that anxiety is more prevalent in women than in men. It has been noted that more scientific acupuncture data is needed to prove the efficacy of acupuncture; also, there are many studies cross evaluating the significance of acupuncture in comparison to other conventional therapies. Acupuncture is a low-cost therapy to alleviate problems such as anxiety issues related to other health problems

The contrast between acupuncture and other conventional therapies are still lacking. Further investigation is needed to prove its validity, and to provide more proof of confirmation that

acupuncture is not only beneficial in the treatment of anxiety, but produces less side effects than conventional Western Medicine.

The most significant limitation of this study is that most of the data on acupuncture is biased and there are very few analyses of direct surveys. The general perception of people needs to be evaluated to address the doubts related to acupuncture; then, only the effect of acupuncture on anxiety can be adequately studied.

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APPENDIX

Table. A.1: RCT-Acupoints

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Carvalho (2013)	Randomised Control Trial Hamilton Anxiety (HAM-A) and Hamilton Depression (HAM-D) Rating Scales	Acupuncture (n=15)	Sham Acupuncture (n=15)	Twice a week for two menstrual cycles, for a total of 16 attendances for each participant.	0.012	HAM-A and HAM-D scores did not differ between groups. The reduction in the mean HAM-D scores has a significant difference of (p=0.012).	No adverse effects	Analgesic effects	PC6, TE5, LI4, SP6, GB34 and LR3.
Mora (2007)	Randomised Control Trial Elderly individuals	Relaxation group (superior lateral wall of the triangular fossa) (N=50)	Sham group (point was at the tip of the concha) (N=50)	In ambulance, on the way to hospital	0.001	Elderly patients who received AA at specific relaxation points while being transported to the hospital were less anxious	No adverse effects	Anxiolytic effects	TF2 CW8

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Mora (2007)	Randomised Control Trial Elderly individuals	Relaxation group (superior lateral wall of the triangular fossa) (N=50)	Sham group (point was at the tip of the concha) (N=50)	In ambulance , on the way to hospital	0.001	Elderly patients who received AA at specific relaxation points while being transported to the hospital were less anxious	No adverse effects	Anxiolytic effects	TF2 CW8
Wu (2008)	Randomised control trial Hamilton Anxiety Scale (HAMA) was used to evaluate the severity and relief of anxiety. Post-stroke anxiety neurosis (PSAN)	Acupuncture treatment (N=34)	Orally took Alprazolam (N=33)	March 2002 to July 2005	0.051	Anxiety symptoms of the patients in the treatment group were obviously relieved with a total effective rate of 82.35%, and no remarkable difference was found as compared with that of the control group (P>0.05).	Relative sensitivity and pain, vanished within 5 days and with no side effects.	Safe and effective	GV 20, GV 24, EX-HN 3, GV 26, LI 4, LR 3, HT 7, PC 6

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Gibson (2007)	Randomised Control Trial Single-blind crossover trial Hospital Anxiety and Depression (HAD) Scale Nijmegen questionnaire and Medical Research Council Dyspnea scale	Group A: acupuncture followed by BR or Group B: BR followed by acupuncture		(30 minutes twice weekly)	0.03	Reductions were found in the HAD A (anxiety) (p 0.02) and Nijmegen (symptoms) (p 0.03) scores. There was no statistical evidence of any carryover effects.	Not studied	Anxiolytic effects	Not mentioned
Wang (2004)	Randomised double-blind, sham-controlled trial consisted of mothers and their children The State-Trait Anxiety Inventory, a self-report anxiety inventory	Acupuncture	Sham Acupuncture	30 to 80 min	0.014	Auricular acupuncture effectively reduced state anxiety in healthy volunteers and preoperative anxiety in adults undergoing ambulatory procedures	No adverse effects	Anxiolytic effects	L01, TF 6 ,TG 2 ,SF 2 SF 5

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Haddad (2005)	RCT Parallel, randomized, patient-assessor blind, placebo-controlled trial Brazil	Acupuncture (n = 14)	Placebo acupuncture, PG (n = 15)	Between 2011 and 2012. 12 weeks of treatment with the minimum of 2 sessions. Treatment duration ranged from 16 to 83 days, with mean of 41 days	0.48	Primary outcome measure was STAI-State scores (not statistically significant $P = 0.888$), and secondary outcome measure was salivary cortisol levels (Did not change after treatment in both groups $P = 0.480$).	No adverse effects	Less side effects	5 Chinese auricular points unilaterally
Vickers (2004)	RCT Patients at Memorial Sloan-Kettering Cancer Center Completed cytotoxic chemotherapy but experienced persisting fatigue	Thirty-seven patients	Not present	Twice per week for 4 weeks (25 patients) or once per week for 6 weeks (12 patients).	HADS anxiety score (0.02)	Mean improvement following acupuncture was 31.1%	No adverse effects	Effective	KI3,TH5, CV3,PC6

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Michalek (2012)	RCT Spielberger State Trait Anxiety Inventory (German version) Randomised patient-blinded study with 182 patients compared anxiety before dental treatment	Auricular acupuncture group Sham group	Non-intervention control group— Patients did not receive any anxiety-reducing intervention	20 min before ambulatory dental treatment	0.008	The decrease in state anxiety in both intervention groups was statistically significant (p<0.001) when compared to the non-intervention control group. 45% patients believed that the acupuncture actually did reduce their anxiety, 98% would want to use auricular acupuncture to reduce their anxiety on future occasions	side effects (Warmth/ Dizziness)	Long term effects	Relaxation point, tranquillizer point and master cerebral point. Acupoints finger, shoulder and tonsil
Karst (2007)	RCT Physiological variables were assessed continuously. STAI X1 and X2, VAS, sedation score, and physiologic variables	(i) auricular acupuncture, (ii) placebo acupuncture, and (iii) intranasal midazolam	No treatment group	30 min after dental extraction	0.012	Auricular acupuncture and intranasal midazolam were similarly effective for the treatment of dental anxiety	No side effects	Less side effects	Not mentioned

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Wang (2001)	RCT Blinded, randomized controlled trial consisted of 55 operating room staff members. State-Trait Anxiety Inventory. This self-report anxiety instrument	Shenmen Group: Subjects in this group received bilateral auricular acupuncture at the “shenmen” point. Relaxation Group: Subjects in this group received bilateral auricular acupuncture at a “relaxation” point	Subjects in this group received bilateral auricular acupuncture at a “sham” point, defined as an acupuncture point that is not documented to have any relaxation or anxiolytic effect	Anxiety measured at 30 min, 24 h, and 48 h	0.001	Anxiolytic effect at the “shenmen” point was not as profound as stimulation at the “relaxation” point. Body acupuncture, however, was previously suggested to alter brain neurochemistry by affecting the release of neurotransmitters such as serotonin	No adverse effects	Anxiolytic effects	HT7, PC6, HT3

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Isoyama (2012)	RCT A randomised clinical trial was performed in 43 patients undergoing IVF. Anxiety level tested before and after treatment using Hamilton Anxiety Rating Scale (HAS)	Test group (n=22)	Control group (n=21)	Four weekly sessions	0.0008	HAS score after the 4-week experimental period was significantly lower in the test group than in the control group (19.4±3.2 vs 24.4±4.2; p=0.0008).	No adverse effects	Less side effects	HT7, PC6, CV17, GV20 and Yintang
Arranz (2007)	RCT 34 female patients, age from 30 to 60 years Acupuncture protocol consisted of manual needle stimulation of 19 acupoints. Anxiety determined by the Beck Anxiety Inventory (BAI)			10 sessions Each session is of 30 mins	0.012	With regard to NK activity (natural killeractivity of leukocytes), anxious women showed a diminished function (p < 0.001) as compared to their healthy counterparts, which was increased immediately after the first acupuncture session (p < 0.05), appearing similar to the control value at one month after the end of the whole treatment (p < 0.001)	Not studied	Effective	SI3, HT3, 5, PC6, LI4, 11, TH5, CV3, 4, 6, 15, GB34, 43, ST36, SP6, LV2, UB60, KD6, GV20

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Kong (2005)	RCT Manual, Electro, and Sham Acupuncture Treatment Thirty-one right-handed subjects.			5 sessions separated at least by one week	0.001	Switching acupuncture mode may be a treatment option for unresponsive patients. Verum acupuncture (both manual and electro), but not placebo, lowered pain ratings to calibrated noxious thermal stimuli.	Side effects (stabbing, numbness, soreness, throbbing, tingling, burning, heaviness, fullness, or aching)	Less side effects	LI4, St36, Sp6
Bussell (2013)	RCT Two-group, randomized, single-blind study involving 90 undergraduate university students. State-Trait Anxiety Inventory (STAI) form Y-1 (State Anxiety, SA) and Y-2 (Trait Anxiety, TA) Automated Operation Span Task (AOSPAN) - a computerized test of working memory.	Acupuncture group (Clean Needle Technique at Sishencong)	Same acupoints were touched and swabbed with alcohol but no needles were inserted	January to December 2011 (20 minutes)	0.0146	Acupuncture subjects also reported lower SA (State Anxiety) after intervention than control subjects (p=0.0146).	No side effects	Anxiolytic effects	EX-HN1, GV24, EX-HN3, Ht 7, PC 6 and Kd 3.

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Wang (2001)	RCT Participants in this randomized, blinded, controlled trial were 91 elective ambulatory surgery patients	Traditional Chinese Medicine group (Kidney point) Relaxation group (Relaxation (4,5), tranquilizer, and master cerebral points) State-Trait Anxiety Inventory (STAI)	Control group: ear acupuncture needles at three points that have no documented effect on anxiety	30 min	0.042	Patients who received ear acupuncture with relaxation points reported significantly lower levels of anxiety after the intervention as compared with the Control group.	Not studied	Cost Effective	KID-1, HT 7,
Amini Saman (2018)	RCT Randomized double-blind clinical trial study was conducted on 50 patients undergoing mechanical ventilation in intensive care units of Imam Reza hospital in Kermanshah, Iran in 2017	TENS electrodes were placed	Placebo	30 minutes, four times in 24 h	0.04	The results showed that the use of TENS on acupuncture points can decrease the level of pain and opioid consumption in intubated patients under a mechanical ventilator.	No adverse effects	Anxiolytic effects and pain reduction	LI-4, ST36

Table. A.1 –continued.

Study	Study Design	Intervention Group	Control Group	Duration	P Value	Outcomes	Adverse effects	Positive Effects	Acupuncture Points
Lorent (2016)	Compared the effectiveness of AA versus progressive muscle relaxation (PMR), a standardized and accepted relaxation method (162)			Twice a week for 4 weeks.	p-values not significant	Before and after treatment, each participant rated four items on a visual analog scale: anxiety, tension, anger and mood. Treatment with AA significantly decreased tension, anxiety, and anger/throughout the 4 weeks, but did not elevate mood.	No adverse effects	Cost effective	Point 51 (Sympathetic point), point 55 (Shen Men), point 95 (Kidney point), point 97 (Liver point), and point 101 (Lung point)

Table A.2. Systematic Literature Review

Study	Study design	Duration	Outcomes	Adverse effects	Positive Effects	Acupuncture points
Pilkington (2007)	Systematic Literature review Searches of the major biomedical databases (MEDLINE, EMBASE, CINAHL, PsycINFO, Cochrane Library) Two reviewers (GK, KP) carried out this process independently, selecting articles based on title, abstract and indexing terms.	February and July 2004	Positive findings are reported for acupuncture in the treatment of generalised anxiety disorder	side effects (Stinging which goes away quickly)	Anxiolytic effects	ST36,PC6,ST25,LR3, BL23, GV4,LI11,MA-IC, MA-SC, MA-IC3
Ma (2014)	Systematic Literature review Data Sources CBM, CAJ, CSJD, CNKI, WanFang, EMBASE, Pubmed/MEDLINE, OVID EBM Reviewers, Cochrane Library Three studies were conducted in the China (443 participants) Main outcome measurement tools are SAS and HAMA	Through July 2016	Medication was statistically superior to acupuncture group at 1stweek time point (Figure 4). No difference was found in the baseline analysis with HAMA and SAS measurement between groups at the 2nd, 4thweek time-point. More adverse effects of medication.	No adverse effects	Safe and effective	Not mentioned

Table. A.2. –continued.

Study	Study design	Duration	Outcomes	Adverse effects	Positive Effects	Acupuncture points
Wang (2014)	Drawn from English and Chinese databases, 37 RCTs and 5 Q-E studies published up to May 31, 2013 were included in the systematic review.	Studies published up to May 31, 2013	Anxiety was reported in ten RCTs and one Q-E, based on different anxiety rating scales. Eight studies reported positive outcomes from their interventions in reducing anxiety, in comparison to a control group receiving routine medical treatment	No adverse effects	Anxiolytic effects	Not mentioned
Samuels (2008)	Literature review. Each review reached the same conclusion: because of poor design and a limited number of studies, there is no evidence that acupuncture is effective for any of these conditions.	1977-2004	Acupuncture is a safe and effective treatment option	Not studied	Less side effects	Not mentioned

Table. A.2. –continued.

Study	Study design	Duration	Outcomes	Adverse effects	Positive Effects	Acupuncture points
Errington-Evans (2011)	Literature review was conducted using Pubmed, Google scholar, AMED, BMJ, Embase, Psychinfo, Cochrane library, Ingenta connect, and Cinahl databases. Keywords were “anxiety,” “anxious,” “panic,” “stress,” “phobia,” and “acupuncture”	2000 onwards	Poor methodological quality, combined with the wide range of outcome measures used, number and variety of points, frequency of sessions, and duration of treatment makes firm conclusions difficult	Dosage indetermined	Effective	GV20, PC6, HT7, SP6, and ExHN3
Haddad (2014)	Literature review Cancer-related psychological symptoms with attention to both efficacy and acupuncture-specific methodology. Only 2 of 12 studies reporting full details of acupuncture methods	(January 2000 through April 2013)	Only a handful of acupuncture studies that were specifically designed to evaluate depression, sleep disturbance, and quality of life as primary outcomes, and no studies were found that looked at anxiety as a primary outcome	No adverse effects	Safe Tolerable Higher acceptability	Not mentioned

Table. A.2. –continued.

Study	Study design	Duration	Outcomes	Adverse effects	Positive Effects	Acupuncture points
Kawakita (2014)	Literature review Efficacy and safety of acupuncture therapy is discussed based on the results of German clinical trials	No set duration	RCTs and meta-analyses offer the strongest evidence for evidence-based medicine.	No adverse effects	Analgesic effects	TP1-5
Pilkington (2010)	Literature review Comprehensive database searches conducted in 2004 succeeding in identifying 10 randomised and two non-randomised controlled trials of acupuncture in anxiety or anxiety disorders	2004	Acupuncture treatment also varied between trials.	Reported cured rates unrealistically high	Anxiolytic effect	Not mentioned
Tao (2016)	Literature review Eligibility criteria are detailed following the PICOS framework	Not mentioned	Significant combined effect was observed for QOL change in patients with terminal cancer in favor of acupuncture (P < 0.05)	Side effects (pain, fatigue, sleep disturbance, and some gastrointestinal)	Safe and effective	Not mentioned

Table. A.2. –continued.

Study	Study design	Duration	Outcomes	Adverse effects	Positive Effects	Acupuncture points
Sniezek (2013)	A Clinical Systematic Review Summarize the existing evidence on acupuncture as a therapy for anxiety and depression in women. Two authors extracted data independently.	Not mentioned	Acupuncture helps with anxiety in pregnancy	No adverse effects	Effective	Not mentioned
Chae (2008)	Clinical Systematic Review Anxiety-like behavior and corticotrophin-releasing factor (CRF) and neuropeptide Y (NPY) mRNA expression in the amygdala during nicotine withdrawal,	72 hours after treatment	Acupuncture may attenuate anxiety-like behavior following nicotine withdrawal by modulating CRF in the amygdala.	No adverse effects	Anxiolytic effects	HT7, ST36
Rosted (2010)	Case Series Beck Anxiety Inventory (BAI) 20 patients, 16 women and 4 men, with a mean age of 40.3 years	5 min prior to dental treatment	Significant reduction in median value of BAI scores after treatment with acupuncture (26.5 reduced to 11.5; p<0.01)	Not studied	Cost effective	GV20 and EX6

Table. A.2. –continued.

Study	Study design	Duration	Outcomes	Adverse effects	Positive Effects	Acupuncture points
Spence (2004) trial study	Clinical Study 18 anxious adult subjects who complained of insomnia was assessed in an open prepost clinical	5 weeks of treatment	ignificant reductions in state ($p = 0.049$) and trait ($p = 0.004$) anxiety scores were also found	Not studied	Anxiolytic effect	Not mentioned
Birch (2004)	Meta-analysis Medical conditions in which clinical trials of acupuncture have been conducted	All research work till date	General international agreement has emerged that acupuncture appears to be effective for postoperative dental pain, postoperative nausea and vomiting, and chemotherapy-related nausea and vomiting.	No major side effects	Safe	Not mentioned
Bae (2014)	Meta-analysis Four electronic databases (MEDLINE, EMBASE, CENTRAL, and CINAHL) Fourteen publications (N = 1,034) were included.	Feburary 2014	Greater reductions in preoperative anxiety relative to sham acupuncture (mean difference = 5.63, P < .00001	No major side effects	Anxiolytic effects	EX2,HT7

Table. A.2. –continued.

Study	Study design	Duration	Outcomes	Adverse effects	Positive Effects	Acupuncture points
Goyatál (2015)	Integrative Review (CINAHL, LILACS, PUBMED-PICO, SciELO, and The Cochrane Library) among 514 articles, 67 were selected to be fully read and 19 were included	Between 2001to 2014	Acupuncture seems to be a promising treatment for anxiety; however, there is a need for improving the methodological quality of the research on this field	Not studied	Anxiolytic effects	Not mentioned
Adachi (2018) 140 male Wistar rats	Experimental Animal Study	(20 min/day/8 days)	Isoflurane enhanced the analgesic effects of Ac and EA and altered serum S100 β and left sciatic nerve NGF levels in rats with NP.	side effects (Pain,stinging)	Analgesic effects	BL24
Kessler (2002)	Survey Data on the use of complementary and alternative therapies Nationally representative survey of 2,055	1997–1998	Complementary and alternative therapies are used more than conventional therapies by people with self-defined anxiety attacks and severe depression.	No major side effects	Cost effective	Not mentioned