Acupuncture for treating depression in adults: systematic review and metanalysis

Acupuntura no tratamento da depressão em adultos: revisão sistemática e metanálise

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ABSTRACT
Aims: To analyze the scientific literature on the effects of acupuncture on depression in adults, the available treatment protocols, and to identify comparisons between the effects of acupuncture and standard depression treatments. Method: A systematic review was carried out guided by the following questions: "What are the effects of acupuncture on depression in adults?" and "Which protocol should be used for depression treatment?". The descriptors "depression", "acupuncture", and "acupuncture therapy" were used in the following databases: Medline via Pubmed, Web of Science, Cochrane, Scopus, and Lilacs. Two independent reviewers carried out the literature search, extraction, and qualitative analysis. Furthermore, the quantitative analysis was performed using the statistical software Stata. Results: From 1,126 studies identified, 49 met the study objectives. It was not possible to establish a treatment protocol due to the diversity of application of the technique. However, the studies have proved that acupuncture significantly reduces depression in adults (p-value = 0.037). Conclusion: It is concluded that acupuncture has advantages in relieving depressive symptoms when compared to standard treatments.

Keywords: acupuncture, acupuncture therapy, depression, complementary therapies, nursing.

RESUMO
Objectivos: Analisar a literatura científica sobre os efeitos da acupunctura na depressão em adultos, os protocolos de tratamento disponíveis, e identificar comparações entre os efeitos da acupunctura e os tratamentos padrão da depressão. Método: Foi realizada uma revisão sistemática orientada pelas seguintes questões: "Quais são os efeitos da acupunctura na depressão em adultos?" e "Que protocolo deve ser utilizado para o tratamento da depressão?". Os descritores "depressão", "acupunctura", e "terapia da acupunctura" foram utilizados nas seguintes bases de dados: Medline via Pubmed, Web of Science, Cochrane, Scopus, e Lilacs. Dois revisores independentes efectuaram a pesquisa bibliográfica, extracção, e análise qualitativa. Além disso, a análise quantitativa foi realizada utilizando o software estatístico Stata. Resultados: Dos 1.126 estudos identificados, 49 cumpriram os objetivos do estudo. Não foi possível estabelecer um protocolo de tratamento, devido à diversidade de aplicação da técnica. Contudo, os estudos provaram que a acupunctura reduz significativamente a depressão em adultos (p-valor = 0,037). Conclusão: Conclui-se que a acupunctura tem vantagens no alívio dos sintomas depressivos quando comparada com os tratamentos padrão.
1 INTRODUCTION

Depression is a psycho-emotional disease characterized by behavioral, cognitive, and emotional changes manifested by sadness, loss of interest in daily living activities, and impaired functional capacity. Therefore, it becomes an important public health problem because it negatively affects society\textsuperscript{(1,2)}. More than 300 million cases are estimated in people worldwide, and among all ages\textsuperscript{(3)}.

The reference treatment for depression is based on the administration of antidepressant drugs and psychotherapy. Although these treatments are effective for some people, there is a substantial proportion of patients who do not improve\textsuperscript{(4)}. This fact, associated with the financial cost, the adverse side effects resulting from pharmacotherapy, abstinence, and the long-term implications for quality of life, point to the need to include an individualized and holistic therapy in the treatment of depression\textsuperscript{(5)}.

Combined with conventional treatment, alternative and complementary approaches, such as acupuncture originated from Traditional Chinese Medicine (TCM), have often been used for treating depression. The literature already reported that this therapy could affect serotonin and norepinephrine levels in the central nervous system, similar to antidepressant drugs\textsuperscript{(2)}.

Acupuncture can be administered systematically, which involves the insertion of needles in selected points on the body, stimulated manually or through electrical stimulation to produce a therapeutic effect\textsuperscript{(6)}. It can also be auricular, involving devices such as needles, seeds, or lasers to stimulate points in the ear that will contribute to disease treatment. Therefore, an acupuncture treatment protocol for depression can be composed of multiple components\textsuperscript{(2)}, and thus, it requires scientific investigations.

Studies\textsuperscript{(2,7)} have reviewed the use of acupuncture in the treatment of depression; however, the quality of the available evidence is low, despite demonstrating that the technique is safe and has a low cost\textsuperscript{(7)}. The effectiveness of acupuncture is uncertain, especially when combined with antidepressants concurrently with the reference treatment.

It is important to identify whether, when administered with medications, acupuncture will maintain the therapeutic effects for a longer time than antidepressants alone\textsuperscript{(8)}, and whether it can potentiate it or even minimize the adverse and abstinent effects caused by such medications. Therefore, this study aims to analyze the scientific literature on the effects of
acupuncture on depression in adults, the available treatment protocols, and to identify comparisons between the effects of acupuncture and standard depression treatments.

2 METHOD

2.1 METHODOLOGICAL FRAMEWORK

A systematic literature review was developed according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement \(^9\), and based on the PICO method (P - population; I - intervention; C - comparison; O - outcomes) \(^10\) for the construction of the following guiding questions: What are the effects of acupuncture on depression in adults?" and "Which protocol should be used for depression treatment?".

2.2 SELECTION OF STUDIES

The following databases were searched: Medline via Pubmed, Web of Science, Cochrane, Scopus, and Latin American & Caribbean Literature in Health Sciences (LILACS) via Virtual Health Library. The following terms belonging to Medical Subject Headings (MeSH) and Health Sciences Descriptors (DeCS) vocabulary were used in English and Portuguese: Depression, Acupuncture, and Acupuncture Therapy. The descriptors were combined in different ways to expand the study's scope (Table 1).

<table>
<thead>
<tr>
<th>Database</th>
<th>Descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDLINE via PUBMED</td>
<td>Depression [MeSH Term] AND Acupuncture [MeSH Term]</td>
</tr>
<tr>
<td>LILACS</td>
<td>Depression [DeCS] AND Acupuncture [DeCS]</td>
</tr>
<tr>
<td>SCOPUS</td>
<td>KEY (depression) AND KEY (acupuncture) AND TITLEABS-KEY (trials),</td>
</tr>
<tr>
<td></td>
<td>TITLE-ABS-KEY (acupuncture) AND TITLE-ABS-KEY (depression) AND</td>
</tr>
<tr>
<td></td>
<td>TITLE-ABS-KEY (trials)</td>
</tr>
<tr>
<td>COCHRANE</td>
<td>depression in Keyword AND acupuncture therapy in Keyword - in Trials</td>
</tr>
<tr>
<td>Web of Science</td>
<td>TOPIC: (depression) AND TOPIC: (acupuncture therapy) AND TOPIC: (trial),</td>
</tr>
<tr>
<td></td>
<td>Topic: (acupuncture) AND topic: (depression)</td>
</tr>
</tbody>
</table>

Source: Made by the author (2021).
2.3 INCLUSION CRITERIA

The eligibility criteria for including articles, chosen according to the PICO strategy, were randomized clinical trials (RCT), in adults (patients aged 18 years or older) (P - population), studies about acupuncture as the primary intervention (I - intervention); comparison with one or more of the following groups: sham, waiting list, standard treatment / active treatment or no treatment (C - comparison); and studies about the treatment of depression (O - outcomes). Studies that did not present a full abstract for analysis, with fulltext unavailable even after requested from the authors, with pregnant women and studies that did not answer the study's guiding questions were excluded.

2.4 DATA EXTRACTION

Two independent researchers performed the data extraction. Initially, titles and abstracts of potential articles for the review were read and analyzed by one of the authors. The next phase involved the complete reading of each article by two other independent authors to confirm its relevance based on the review questions. In case of disagreement, a third researcher decided on inclusion. The results were then checked at a later stage, and disagreements were resolved by consensus among the three researchers.

In order to properly store and organize the references obtained in the search, the Endnote Web® online software was used, which allows automatic access to references by more than one researcher and the exclusion of duplicate studies.

Data collection was performed using a standardized form\(^{(11)}\) and an adapted from Moura and collaborators\(^{(12)}\), by two independent researchers, containing the following variables: identification of the article (title, authors, journal, year of publication); goals; methodological characteristics (design, sample size and loss of follow-up; inclusion and exclusion criteria); clinical data (number of patients by sex, age, diagnosis, duration of symptoms); description/protocol of interventions in the monitoring groups (type and duration of treatment, number of sessions, device used, duration of the device, points and location of needle application, type of stimulus); professional who performed the intervention, years of experience in the area; outcomes and assessment methods (number of assessments, intervals between them, measurement tools); data analysis; main results; and conclusions.

2.5 ANALYSIS OF STUDIES

The scale proposed by Jadad and collaborators\(^{(13)}\) was used to assess the studies' methodological quality, which consists of five criteria, and ranges from zero to five. Scores less
than three indicates that the study has a low methodological quality, and its results can not be extrapolated to other scenarios.

For data analysis, the statistical software Stata SE® version 12.0 was used. The absolute difference between means, with 95% confidence intervals, was selected to describe the mean differences between the groups treated with acupuncture and control (standard treatment) in the evaluation performed right after the end of treatment. The p-value <0.05 was considered statistically significant. Potential heterogeneity between studies was examined using Cochran’s Q^{(14)} and I^2^{(15)} statistics. As there was statistical significance in the test of heterogeneity of the results (p <0.05) and the calculated value of I^2 suggests a high heterogeneity (87.2%)^{(15)}, the random-effects model was adopted for the analysis.

3 RESULTS
3.1 SAMPLE SELECTION

Through the searches in the databases, 1,126 studies were identified, of which 139 were pre-selected for a full reading. After the analysis, with 100% agreement between the reviewers, 49 manuscripts met the eligibility criteria and answered the guiding questions, while eight were included in the quantitative analysis. Figure 1 shows the flowchart of the study selection process, which was submitted to the opinion of two independent reviewers for consensus on methodological qualification.

Figure 1.

Source: Made by the author (2021).
3.2 CHARACTERIZATION OF THE STUDIES

The study consisted of a total of 5,169 people with depression involved in the 49 studies. The vast majority of research were conducted in China (29; 59.18%) (17-45).

Regarding the assessment of symptoms of depression, the Hamilton Rating Scale for Depression (HRSD or HAMD) (32; 65.30%) (17-20, 22, 24-31, 33, 36, 38-42, 44, 45-54). As for the duration of depression, this has not been evaluated in most studies, however six (12.24%) studies (17, 18, 36, 40, 42, 45) selected people with symptoms of depression for at least one year, three (39, 50, 51) (6.12%) for at least two years, and four (53, 55, 56) (8.16%) for at least five years.

3.3 METHODOLOGICAL QUALITY

The evaluated studies showed little methodological bias according to the predefined methodological quality assessment criteria (13). Of the total, 38 (77.55%) studies are of high quality, with nine (18.37%) receiving a score of three (17, 25, 32, 40, 44, 47, 56-58), six (12.24%) a score of four (18, 33, 36, 50, 54, 59) and 23 (46.94%) receiving the maximum score, which is five (23, 24, 26-28, 30, 31, 34, 37-39, 41, 43, 45, 46, 49, 51, 53, 60-64). Regarding studies with scores equal to or less than two, only 11 studies (22.45%) received this rating (19-22, 29, 35, 42, 48, 52, 55, 65).

3.4 INTERVENTIONS IMPLEMENTED IN THE EXPERIMENTAL AND CONTROL GROUPS

Among the interventions implemented in the groups that received acupuncture, 23 (47.9%) studies used systemic acupuncture with manual stimulation as a single intervention; 13 (27.1%) used electroacupuncture; five (10.4%) combined systemic acupuncture and electroacupuncture, associating manual and electrical stimulation; four (8.3%) incorporated moxibustion to conventional acupuncture, combining heat stimulation and needle manipulation; two (4.7%) used auriculotherapy, and one (4.8%) used laser therapy.

Among the treatments applied in the control or comparison groups, the use of antidepressants stands out (n = 17; 34.7) (17-20, 22-24, 26, 28, 32, 38, 40-42, 55, 63, 65), and psychotherapy (n = 5; 8.1%) (36, 55, 64, 72). In addition, in seven studies (15.5%), antidepressants were associated with sham acupuncture (21, 27, 33, 35, 37, 54, 60); 12 studies (n = 26.6%) performed only sham acupuncture (25, 31, 34, 43, 45, 52, 53, 55, 57, 59, 61, 62); one study (2.2%) performed acupuncture on the tongue associated with systemic acupuncture (29); one study (2.2%) was conducted through home visits (66); and one study (2.2%) performed progressive muscle relaxation (63).
3.5 ACUPUNCTURE PROTOCOLS USED TO TREAT DEPRESSION

All studies, when analyzed in isolation, showed positive evidence of acupuncture in depression. The description of the protocols used for the analysis is presented in Table 2.
### Table 2. Description of the protocols used in the studies.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Device</th>
<th>Type of stimulus</th>
<th>Retention time</th>
<th>Number of sessions</th>
<th>Treatment duration (weeks)</th>
<th>Acupuncture points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qu SS et al. (2014) [28]</td>
<td>Needles 0.30 mm X 25 and 40 mm</td>
<td>Manual and electric</td>
<td>30 minutes</td>
<td>18</td>
<td>6</td>
<td>GV20, EX-HN3, GV16, GV14, GB20, PC6, SP6</td>
</tr>
<tr>
<td>Q He et al. (2009) [66]</td>
<td>Needles 0.3 mm × 40 mm</td>
<td>Manual</td>
<td>20 minutes</td>
<td>21</td>
<td>6</td>
<td>GV20, GV24, EX-HN3, GV26, Anmian (EX), CV17, PC6, PC7, HT7, LR3</td>
</tr>
<tr>
<td>Z Wang et al. (2017) [37]</td>
<td>Needles 0.22 mm X 40 mm</td>
<td>Manual</td>
<td>20 minutes</td>
<td>19</td>
<td>8</td>
<td>GV12, GV10, GV6, GV4, K17, ST24, Qipang (EX)</td>
</tr>
<tr>
<td>J Röschke et al. (1998) [61]</td>
<td>Needles 0.3 mm X 325 mm</td>
<td>Manual</td>
<td>30 minutes</td>
<td>12</td>
<td>4</td>
<td>UB15, UB17, UB18, H7, P6, ST40, SP5, SP6, LU1</td>
</tr>
<tr>
<td>Shi X et al (2014) [29]</td>
<td>Needles 0.30 mm × 25 mm</td>
<td>Manual</td>
<td>0.25 minute</td>
<td>6</td>
<td>Not included</td>
<td>Systemic: ST36, SP6, PC6, GV24, EX-HN3, GV20</td>
</tr>
<tr>
<td>Feng Yu et al. (2011) [22]</td>
<td>Needle</td>
<td>Manual</td>
<td>20-30 minutes</td>
<td>30</td>
<td>4</td>
<td>EX-HN5, GV24, BL4, GV20, PC6, HT7, SP6, LR3</td>
</tr>
<tr>
<td>Huipeng LU, et al (2018) [40]</td>
<td>Needles 0.32 mm X 25 mm</td>
<td>Electric</td>
<td>30 minutes</td>
<td>18</td>
<td>6</td>
<td>ST40, SP9, SP10, SP6, EX-HN1, GV20, EX-HN3, PC6, Shenmen (auricular point)</td>
</tr>
<tr>
<td>Fan Ling et al. (2016) [34]</td>
<td>Needles 0.35 mm × 25 mm</td>
<td>Manual and heat</td>
<td>30 minutes</td>
<td>24</td>
<td>12</td>
<td>GV20, EX-HN3</td>
</tr>
<tr>
<td>Liu Yi et al. (2015) [32]</td>
<td>Needles 0.30 mm X 30 mm or 40 mm</td>
<td>Manual</td>
<td>30 minutes</td>
<td>42</td>
<td>6</td>
<td>PC6, BL40, SP6, ST2 and Sizhongxue (EX).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Other acupuncture points were selected according to the client's specific conditions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LR3, LR8, LR14, CV17, GV26, PC6, HT7 and BL15</td>
</tr>
<tr>
<td>Study</td>
<td>Needles Details</td>
<td>Method</td>
<td>Duration (minutes)</td>
<td>Frequency (times)</td>
<td>Acupuncture Points</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
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<td></td>
</tr>
<tr>
<td>Li M. et al. (2017) [38]</td>
<td>Needles</td>
<td>Manual</td>
<td>20-30</td>
<td>36</td>
<td>PC6, GV26, SP6, EX-HN3, GV23, GV20, EX-HN1, GB20, ST2</td>
<td></td>
</tr>
<tr>
<td>Su-Heisen C et al. (2010) [21]</td>
<td>Not included</td>
<td>Electric</td>
<td>15</td>
<td>20</td>
<td>PC6, HT7, GB-34, ST36, K13, SP6, LR3, K1</td>
<td></td>
</tr>
<tr>
<td>Carvalho et al. (2013) [52]</td>
<td>Needles 0.20 mm × 40 mm</td>
<td>Manual</td>
<td>30</td>
<td>16</td>
<td>PC6, TE5, LI4, SP6, GB34, LR3</td>
<td></td>
</tr>
<tr>
<td>Quah-Smith I, et al (2013) [51]</td>
<td>Low intensity infrared laser (808 nm)</td>
<td>Laser</td>
<td>0.167 minutes</td>
<td>12</td>
<td>LR14, CV14, LR8, HT7, K3</td>
<td></td>
</tr>
<tr>
<td>Quah-Smith JI et al (2005) [62]</td>
<td>Low infrared laser low intensity.</td>
<td>Laser</td>
<td>0.0833 minutes</td>
<td>12</td>
<td>CV15, CV14, HT7, LR8, K10, LI4, SP6, GV20</td>
<td></td>
</tr>
<tr>
<td>Chung KF et al (2012) [49]</td>
<td>Needle 0.3mm X 25-40mm</td>
<td>Electric</td>
<td>30</td>
<td>8</td>
<td>GV20, EX-HN3, EX-HN1, GB15, GB8, EX-HN5, ST8, SP6, LR3, HT7, PC6</td>
<td></td>
</tr>
<tr>
<td>Wen X et al (2017) [39]</td>
<td>0.35 mm × 25 mm needles and intradermal needles</td>
<td>Manual</td>
<td>30</td>
<td>12</td>
<td>LI4, LR3, EX-HN3, GV20, BL15, BL23, BL19, Anmian (EX)</td>
<td></td>
</tr>
<tr>
<td>Wang X et al (2016) [35]</td>
<td>Needles 0.22 mm × 40 mm</td>
<td>Manual</td>
<td>20</td>
<td>11</td>
<td>CV12, CV10, CV6, CV4, K17, ST24, Qipang (EX)</td>
<td></td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year(s)</td>
<td>Type of Needle</td>
<td>Duration</td>
<td>Sessions</td>
<td>Protocol Description</td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------</td>
<td>----------------</td>
<td>----------</td>
<td>----------</td>
<td>--------------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
BL15, BL17, BL18, H7, PC6, ST40, SP5, SP6, LU1  
LR8, LR14, HT7, CV14 and K3  
PC6, GV26, SP6, GV20, HT7, HT1, BL40, LU5  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
4  
BL15, BL17, BL18, H7, PC6, ST40, SP5, SP6, LU1  
LR8, LR14, HT7, CV14 and K3  
PC6, GV26, SP6, GV20, HT7, HT1, BL40, LU5  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
3  
LR8, LR14, HT7, CV14 and K3  
PC6, GV26, SP6, GV20, HT7, HT1, BL40, LU5  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
3  
LR8, LR14, HT7, CV14 and K3  
PC6, GV26, SP6, GV20, HT7, HT1, BL40, LU5  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
3  
LR8, LR14, HT7, CV14 and K3  
PC6, GV26, SP6, GV20, HT7, HT1, BL40, LU5  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
| Caizhen Z (2005)               | 2005    | Needles 13+ 0.25 mm | Manual | 30 minutes | 11-15 (±)  
24  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
24  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
| Qian, X. et al (2012)           | 2012    | Needles 0.25 mm | Manual | 30 minutes | Not included  
42  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
| Whiting M et al. (2008)         | 2008    | Needles 0.25 mm | Manual | 30 minutes | Not included  
42  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
| Mao JJ et al (2014)             | 2014    | 30 mm or 40 mm needles | Electric | 30 minutes | 10 sessions  
8  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
| Lorent L et al (2016)           | 2016    | 0.25 20 mm needles | Manual | 30 minutes | 8  
4  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
| Man S et al. (2014)             | 2014    | Needles 0.30 mm X 25-40 mm | Electrical and manual | 30 minutes | 12  
4  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
| MacPherson H et al (2013)       | 2013    | Needles 0.13 to 0.35 mm X 5 to 40 mm | Manual | 53, 28 to 95 minutes | 10  
18  
Ear Points: Shenmen, Sympathetic, Kidney, Liver, and Lung (NADA Protocol)  
GV26, PC6, ST36  
The choice of points was made individually and according to MTC.  
Previously published protocol: 
<table>
<thead>
<tr>
<th>Study</th>
<th>Needle Information</th>
<th>Method</th>
<th>Duration</th>
<th>Acupuncture Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Li S. et al (2018)</td>
<td>Needles 0.3 ± 0.4 mm, 0.3 ± 0.25 mm and 0.3 ± 0.5 mm</td>
<td>Electric</td>
<td>30 minutes</td>
<td>CV4, EX-CA1, ST25, SP6, LI4, LR3, GV20, EX-HN3</td>
</tr>
<tr>
<td>Arvidsdotter T et al. (2013)</td>
<td>Needles 0.30 mm X 25 mm</td>
<td>Manual</td>
<td>30 minutes</td>
<td>GV20, CV6, PC6, HT7, LI4, LR3, SP6, ST36</td>
</tr>
<tr>
<td>Guo, T et al (2016)</td>
<td>Needles 0.25 mm X and 25-40 mm needles</td>
<td>Electric</td>
<td>30 minutes</td>
<td>GV20, EX-HN3, LR3, LI4, PC6, HT7, K3, K6, SP6, ST36</td>
</tr>
<tr>
<td>Sun, H et al (2013)</td>
<td>Needles 0.30 mm X 40 mm</td>
<td>Electric</td>
<td>45 minutes</td>
<td>GV20, ST36, LR3, SP6, PC6, HT7</td>
</tr>
<tr>
<td>Duan, DM (2009)</td>
<td>Needles 0.30 mm X 25-40 mm</td>
<td>Electric</td>
<td>30 minutes</td>
<td>GV20, EX-HN3, EX-HN1, GB15, GB8, EX-HN5, ST8</td>
</tr>
<tr>
<td>Zhang, ZJ et al (2013)</td>
<td>Needles</td>
<td>Electric</td>
<td>30 minutes</td>
<td>GV20, GV29 and 2 to 5 additional acupuncture points based on individualized treatment, according to MTC.</td>
</tr>
<tr>
<td>Xinjing, Y. et al (2020)</td>
<td>Needles 0.30 mm X 40 mm</td>
<td>Electric</td>
<td>30 minutes</td>
<td>Acupuncture: LI4, LR3, GV20, GV29 Moxibustion: BL17, BL19 Intradermal needles: BL15, BL18</td>
</tr>
<tr>
<td>Gong, J. et al (2019)</td>
<td>Moxa: cones 1 cm in diameter and 1 cm in height, Intradermal needle 0.22 mm X 5 mm</td>
<td>Manual and heat</td>
<td>30 minutes</td>
<td>PC4, LI10, SP9, SP6</td>
</tr>
<tr>
<td>Noda, Y et al (2015)</td>
<td>Needles 0.6 mm X 0.2 mm</td>
<td>Manual constant</td>
<td>4320 minutes</td>
<td>SGS 20 and EX-HN3, GV16, GB20, GV14, PC6 and SP6</td>
</tr>
<tr>
<td>Ma, S. et al (2012)</td>
<td>Needles 25–40 mm X 0.25–0.30 mm</td>
<td>Manual and electric</td>
<td>30 minutes</td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Type of Needles</td>
<td>Treatment Method</td>
<td>Duration</td>
<td>Frequency</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Vázquez, RD et al (2011)</td>
<td>Not included</td>
<td>Electric</td>
<td>30 minutes</td>
<td>12</td>
</tr>
<tr>
<td>ZHAO F et al. (2020)</td>
<td>Needles 0.25 mm x 25 mm and 0.25 mm x 40 mm</td>
<td>Manual</td>
<td>30 minutes</td>
<td>24</td>
</tr>
<tr>
<td>Almi, A. et al (2018)</td>
<td>Needles 0.25 mm x 25 mm</td>
<td>Manual</td>
<td>30 minutes</td>
<td>12</td>
</tr>
</tbody>
</table>

- HT-7 and LI-4, and ST-36, SP-6 and LR-3, GV-20 and GV- 24.5 and EX - HN3
- Shenmen (headset), BL23, BL15, PC6, SP6, EX-HN-5
- EX-HN1, GV24, GV11, GB13, HT7
- GV20, EX-HN1, EX-HN3, LI4, LR3
Among the devices used, we highlight the use of needles (43.7%), the combination of low-frequency laser and needles (35.4%), moxa and needles (8.3%), auricular needles (4.2%), and only laser (2.08%). Only three (6.25%) of the studies did not specify the type of device used. The average acupuncture session time was approximately 126 minutes.

Concerning the acupuncture points, several combinations are observed for the treatment of depression, among which the following stand out: Baihui (GV20) employed in 27 (56.3%) studies, Yintang in 22 (45.8%), Neiguan (PC6) in 19 (39.6%), Sanyinjiao (SP6) and Taichong (LR 3) in 18 (37.5%) and Shenmen in 15 (31.25%).

3.6 METANALYSIS

The comparison of the effectiveness of systemic acupuncture with the standard treatment for depression was observed in seven (14.30%) RCTs\(^\text{18, 19, 22, 26, 33, 40, 41}\) who reported the levels of depression at the end of the treatment, using HRSD or HAMD, which entered the meta-analysis. The other studies were not included in this analysis, as they did not have enough data to perform the statistical test\(^\text{44}\) as they performed acupuncture associated with another treatment\(^\text{17, 20, 28, 42, 46, 64}\), or because the control group received sham acupuncture or no treatment\(^\text{45, 47, 52}\), which did not correspond to the objectives of the present study. It should be noted that the studies included in this meta-analysis treated 645 people, of which 322 received acupuncture and 323 received drug treatment for depression.

The results showed that acupuncture was more effective in reducing levels of depression compared to standard treatments (absolute difference between means: -1.67, [95% confidence interval: -3.25 to -0.10]; p-value = 0.037), with high heterogeneity (I\(^2\) = 87.2%, p-value <0.001) (Figure 2).
4 DISCUSSION

The present study showed the positive effects of acupuncture for the treatment of depression in adults in most of the RCTs evaluated. It is believed that the synthesis of scientific evidence on the subject can contribute to the implementation of this type of intervention in clinical practice in order to complement conventional treatment.

The analysis of the methodological quality of the studies included in the review pointed to scientifically sound and high-quality reports. Thus, it is possible to infer that depression can be effectively treated by acupuncture, as observed in other studies, both as primary and complementary therapy, since the 5,169 people involved in the 49 studies analyzed had significant outcomes regarding the control of the disease symptoms.

To assess depression, the use of HRSD or HAMD was highlighted, confirming the broad history of using this tool to identify depression symptoms, both for clinical practice and for research. HAMD is considered a benchmark developed to analyze the severity of depression, assessing multiple dimensions, including mood swings, feelings of guilt, suicidal ideation, insomnia, agitation or delay, anxiety, weight loss, and somatic symptoms.

The use of acupuncture also demonstrated benefits compared to medication use. When antidepressants were applied together with acupuncture, they significantly reduced the severity of depression.

Still, it was possible to significantly reduce the depression score in adults undergoing acupuncture treatment (p-value = 0.037) compared to those who received medication in
isolation. Therefore, according to Chan et al. \cite{68}, it can be said that, compared to standard treatment, acupuncture has advantages in relieving depressive symptoms since it is also capable of affecting the levels of serotonin and norepinephrine, besides not causing side effects\cite{2}. However, it is not the intention here to recommend using this intervention to replace the standard treatment. On the contrary, it is believed that the association of acupuncture with standard reference therapy can enhance the effects of treatment and, consequently, positively impact these people's quality of life and health.

Regarding the acupuncture protocol used in primary studies, it is clear that there is heterogeneity regarding materials, methods, duration, and stimulus type. It should be noted that the primary device was the needle, followed by moxa, ear needles, and laser. The studies covered manual and electrical stimulation among the stimuli used, a recommendation for treating mental illnesses, including depression\cite{69}. Manual acupuncture comes from the fingers' precise movement, which stimulates the translation, rotation, or tremor of the needle, producing several therapeutic benefits\cite{67}. In turn, electroacupuncture consists of applying an electrical stimulus to the needle at a certain point\cite{70}. The literature shows that electroacupuncture is a method with promising effects in the short term when compared to manual acupuncture and, thus, it confers improvements in the treatment of mental illnesses when performed repeatedly, as it can induce the same effects as antidepressants.

Commonly, in the definition of the treatment protocol, the choice of acupuncture points has specific indications and is based on the observed energy imbalance, acting at the insertion site or even in other distant areas of the body. In this study, there was a lack of consensus regarding the determination of the combination of points to treat depression. However, Baihui (GV20) and Yintang were the most frequent, associated with other points. The prevalence of GV20 stimulation traditionally occurs to treat anxiety, headache, dizziness, and stroke\cite{71}. Yintang, found in 22 studies, also known as the opening point of the mind, is indicated for mental illness and improves cognitive deficits\cite{70}.

The protocol plays an essential role in the outcome of acupuncture treatment. As observed in this study, there was a lack of agreement in the elaboration of protocols for treating depression. It is believed that this fact may be related to the principles of the therapy employed, which requires an individualized and holistic treatment plan. Usually, a traditional acupuncturist will take the range of symptoms into account while evaluating the patient's energy imbalance and syndromic patterns when building a treatment plan\cite{2}. 
As a limitation of this study, it is highlighted that the Chinese databases were not consulted. Future studies should consider these bases since China is the cradle of Traditional Chinese Medicine and acupuncture.

5 CONCLUSION

Acupuncture is a promising therapy for the treatment of depression since it significantly decreased depression scores. However, these results should be evaluated with caution since RCTs' high heterogeneity limited the findings. Although acupuncture was evaluated in isolation in this study, the importance of adopting it in a complementary way to standard therapy is emphasized. In this context, it is believed that acupuncture can potentiate standard treatment since it obtained expressive results in the present investigation.

The diversity of protocols used to administer acupuncture found in this systematic review studies does not allow standardization or consensus regarding the duration of the treatment and aspects inherent to therapy, such as systemic points and devices. Future studies need to include the monitoring of this protocol, as well as its effect in the short, medium, and long term, to determine if any benefit on the severity of depression is maintained.
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