

Aromatherapy in Healthcare Professionals in a Pandemic Context: Systematic Review of Randomized Clinical Trials

Aromaterapia em Profissionais de Saúde em Contexto Pandêmico: Revisão Sistemática de Ensaio Clínicos Randomizados
Aromaterapia en Profesionales de la Salud en Contexto Pandémico: Revisión Sistemática de Ensayos Clínicos Aleatorizados

RESUMO

Objetivo: identificar a efetividade da aromaterapia entre profissionais da saúde durante a pandemia. **Método:** revisão sistemática seguindo Cochrane e PRISMA, com protocolo registrado na Prospero. Foram pesquisadas as bases PUBMED, EMBASE, COCHRANE e LILACS até dezembro de 2024 utilizando os descritores "Aromatherapy", "Health Personnel" e "COVID-19". Incluíram-se ensaios clínicos randomizados que avaliaram qualidade do sono, qualidade de vida e ansiedade por instrumentos validados. Dois revisores selecionaram estudos, extraíram dados e avaliaram o risco de viés (RoB 2.0). A metanálise utilizou modelos de efeitos randômicos. **Resultados:** 216 referências foram identificadas; após triagem, três estudos (221 profissionais) foram incluídos. Não houve evidência de melhora significativa na qualidade do sono (RR: -1.28; IC95%: -4.98 a 2.43; $I^2=51\%$) ou ansiedade (RR: -1.24; IC95%: -11.31 a 8.82; $I^2=94\%$). Qualidade da evidência: muito baixa. **Conclusão:** não foram encontradas evidências moderadas ou altas que sustentem benefícios da aromaterapia; recomenda-se a realização de ECRs robustos. (PROSPERO 2024 CRD42024508246)

DESCRIPTORES: Pessoal de Saúde; Estresse ocupacional; Aromaterapia; Pandemias

ABSTRACT

Objective: To identify the effectiveness of aromatherapy among healthcare professionals during the pandemic. **Method:** Systematic review following Cochrane and PRISMA guidelines, with a protocol registered in Prospero. PUBMED, EMBASE, COCHRANE and LILACS were searched up to December 2024 using the descriptors "Aromatherapy", "Health Personnel", and "COVID-19". Randomized clinical trials evaluating sleep quality, quality of life, and anxiety using validated instruments were included. Two reviewers independently selected studies, extracted data, and assessed risk of bias (RoB 2.0). Meta-analysis used random-effects models. **Results:** A total of 216 references were identified; after screening, three studies (221 professionals) were included. No significant improvement was found in sleep quality (RR: -1.28; 95% CI: -4.98 to 2.43; $I^2=51\%$) or anxiety (RR: -1.24; 95% CI: -11.31 to 8.82; $I^2=94\%$). Evidence quality was very low. **Conclusion:** No moderate or high-quality evidence was found to support benefits of aromatherapy; robust RCTs are recommended.

DESCRIPTORS: Personal de Salud; Occupational stress; Aromatherapy; Pandemics

RESUMEN

Objetivo: Identificar la efectividad de la aromaterapia entre profesionales de la salud durante la pandemia. **Método:** Revisión sistemática siguiendo las directrices Cochrane y PRISMA, con protocolo registrado en Prospero. Se consultaron PUBMED, EMBASE, COCHRANE y LILACS hasta diciembre de 2024 utilizando los descriptores "Aromatherapy", "Health Personnel" y "COVID-19". Se incluyeron ensayos clínicos aleatorizados que evaluaron la calidad del sueño, la calidad de vida y la ansiedad mediante instrumentos validados. Dos revisores seleccionaron los estudios, extrajeron los datos y evaluaron el riesgo de sesgo (RoB 2.0). El metanálisis utilizó modelos de efectos aleatorios. **Resultados:** Se identificaron 216 referencias; tras la selección, se incluyeron tres estudios (221 profesionales). No se encontró mejora significativa en la calidad del sueño (RR: -1.28; IC95%: -4.98 a 2.43; $I^2=51\%$) ni en la ansiedad (RR: -1.24; IC95%: -11.31 a 8.82; $I^2=94\%$). La calidad de la evidencia fue muy baja. **Conclusión:** No se encontraron evidencias moderadas o altas que respalden beneficios de la aromaterapia; se recomiendan ECA más robustos.

DESCRIPTORES: Health Personnel; Estrés Laboral, Aromaterapia; Pandemias

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INTRODUCTION

Alternative and complementary health therapies are defined as any system of medicine, practice, or product that is not part of conventional medical care¹. According to this definition, aromatherapy can be included. The term "complementary" is used when the practice is associated with traditional Western medicine, complementing treatment, while the term "alternative" applies when the therapy completely replaces conventional treatment.

In Brazil, in 2006, the Ministry of Health approved the National Policy on Integrative and Complementary Practices (PNPIC) in the Unified Health System (SUS), covering the areas of homeopathy, medicinal plants and phytotherapy, traditional Chinese medicine/acupuncture,

anthroposophical medicine, and social thermalism/crenotherapy, which promoted the institutionalization of these practices in the Brazilian health system². Among the objectives of the PNPIC are the incorporation of PICs into the SUS, with an approach focused on disease prevention and health promotion, with an emphasis on primary health care, providing continuous, humanized, and comprehensive health care; contributing to the resolvability of the system and expanding access to practices for the population, ensuring quality, efficiency, and safety in their use; and stimulating social participation, promoting the involvement of users, managers, and workers in the various scenarios of health policy implementation. From March 2017 to March 2018, 24 other therapies were included, among them aromatherapy, which is charac-

terized as an approach that uses essential oils to promote and improve health, well-being, and hygiene^{3,4}.

Aromatherapy is a PIC that uses volatile concentrates extracted from plants, called Essential Oils (EO), which are natural, complex, and highly volatile chemical compounds characterized by a strong aroma and produced as secondary metabolites of aromatic plants⁵.

EOs are substances with unique properties due to their chemical characteristic of being composed of numerous substances, which gives them the particularity of not being able to be replaced by another synthetic substance, despite their olfactory similarity. Synthetic products are called "essences" and act in a restricted way in the body because they have a specific chemical composition, while EOs act in a more comprehensive way^{5,6}.

The action of an essential oil in the body will depend on the route by which its molecules are administered, which can occur through inhalation, skin contact, or ingestion. When contact occurs through inhalation, the molecules of the essential oils stimulate the olfactory nerves, which, in turn, have a direct connection to the limbic system, responsible for emotions, feelings, and motivational impulses. "Olfactory memory" results from a process of olfactory identification of a specific aroma, associating it with a memory triggered by the limbic system⁷.

Regarding its association with Covid-19, a review that aimed to summarize what is in the recent literature on the use of aromatherapy as an integrative and complementary practice (ICP) in controlling anxiety occurring as a consequence of Covid-19 identified that there are no studies using aromatherapy for the prevention and/or cure of anxiety caused by the Covid-19 pandemic. However, there are records of the anxiolytic potential of essential oils, which improve patient well-being. Lavender essential oil (*Lavandula angustifolia* Mill) is the most widely described for use in aromatherapy, with anxiolytic potential⁸.

Although studies have highlighted the effectiveness of aromatherapy in relieving stress in nurses, few have explored this condition in nurses and other healthcare professionals related to the pandemic⁹⁻¹⁰. A cross-sectional study conducted during the second outbreak of COVID-19 in Taiwan with frontline nurses identified that after a four-week intervention, the response to psychological stress and fatigue decreased significantly in the professionals analyzed. However, there was limited improvement in physical stress in the face of a heavier workload. Therefore, the effect of diffusion in different departments showed a significant improvement in

general departments, an increase in changes in mental stress in gynecology and palliative care departments, and no effect in the ICU¹¹. However, there is no systematic review study on the subject in the literature.

In view of the above, the objective was to identify the effectiveness of aromatherapy use in healthcare professionals working in a pandemic context.

METHOD

This is a systematic review bibliographic study that was conducted according to the Cochrane methodology¹² with the aim of identifying the effectiveness of aromatherapy use in healthcare professionals who worked in the fight against Coronavirus. The protocol for this systematic review was registered in the PROSPERO® database (PROSPERO CRD42024508246)¹³ and was written in accordance with the PRISMA checklist¹⁴.

Eligibility Criteria:

The systematic review evaluated the use of aromatherapy administered to healthcare professionals working on the front lines of COVID-19. Randomized controlled studies were included in which healthcare professionals (all classes and categories) were randomly assigned to two groups: intervention group or control group, following the "PICO" methodology described below. Population: Healthcare professionals working on the front lines of COVID-19. Intervention: Use of aromatherapy at any frequency or protocol. Comparator: No use of aromatherapy and/or use of placebo. Outcomes: Metrics associated with sleep quality, quality of life, and anxiety measured using validated instruments.

Inclusion and exclusion criteria:

Randomized clinical trials that re-

ported metrics associated with sleep quality, quality of life, and anxiety using validated instruments and that used aromatherapy in at least one session were included in healthcare professionals during COVID-19. The exclusion criteria were: observational studies, non-randomization between groups, no control group in the study, and/or intervention.

Search strategy:

The electronic databases National Center for Biotechnology Information (NCBI/PubMed), Embase, Cochrane Library, and Latin American and Caribbean Health Sciences Literature (LILACS) were consulted until December 2024. Information on ongoing clinical trials was retrieved from the National Institutes of Health Clinical Trials website (<http://clinicaltrials.gov>) and the Brazilian Registry of Clinical Trials-ReBEC (<http://www.ensaioclinicos.gov.br/>).

The basic search strategy was developed for PubMed and modified as necessary for other databases. Health descriptors available in Health Sciences Descriptors (DECs) and Medical Subject Headings (MeSH) were used. The descriptors used included "Aromatherapy," "Health Personnel," and "COVID-19." There were no language restrictions, but only studies in humans were selected. References from the selected articles, including relevant review articles, were reviewed to identify all relevant studies. Grey literature was tracked through manual searching of clinical trial references.

Study selection and data extraction:

For this review, two researchers independently reviewed the titles and abstracts for eligibility. Disagreements regarding article selection were resolved by consensus or discussion with a third investigator (NOF). The study selection flowchart was created

according to PRISMA guidelines.

Two researchers independently extracted relevant data from each full-text article using a standardized form based on the Cochrane Handbook¹² with the following information: study characteristics (study site; design; randomization method; follow-up time; age of participants); participants; interventions; control; inclusion criteria; exclusion criteria; clinical outcomes (types of outcomes measured—i.e., dichotomous or continuous) and their scales used for analysis. The selection was compared for accuracy, and discrepancies were resolved by consensus or discussion with another investigator (NOF).

Assessment of risk of bias in Randomized Clinical Trials

Two investigators independently assessed the risk of bias for each eligible RCT. Discrepancies were resolved by consensus or discussion with another investigator. The RoB 2.0 tool – Risk of bias in randomized clinical trials¹⁵ was used. The following items were assessed: Bias in the randomization process (selection bias); Deviations from the intended intervention (selection bias); Bias due to missing data (detection and performance bias); Bias in outcome measurement (attrition bias); Bias in outcome reporting (information bias). For each RCT, each item was described and presented as low risk of bias, some concerns, or high risk of bias according to the classification obtained.

Data analysis

The meta-analysis used random effects models and the Mantel-Haenszel method. Associations were reported as relative risks (RR) and their 95% confidence intervals (CI). Heterogeneity was tested with the Cochrane χ^2 test, and the degree of heterogeneity was quantified with the I² statistic and its 95% CI. An I² value between 30% and 60% will be

described as moderate heterogeneity. For variability in results between studies, the I² statistic and the P value obtained from the Cochrane chi-square test were used. Review Manager (RevMan) software was used for all analyses (version 5.3; Nordic Cochrane Centre, Cochrane)¹⁶.

Assessment of evidence quality

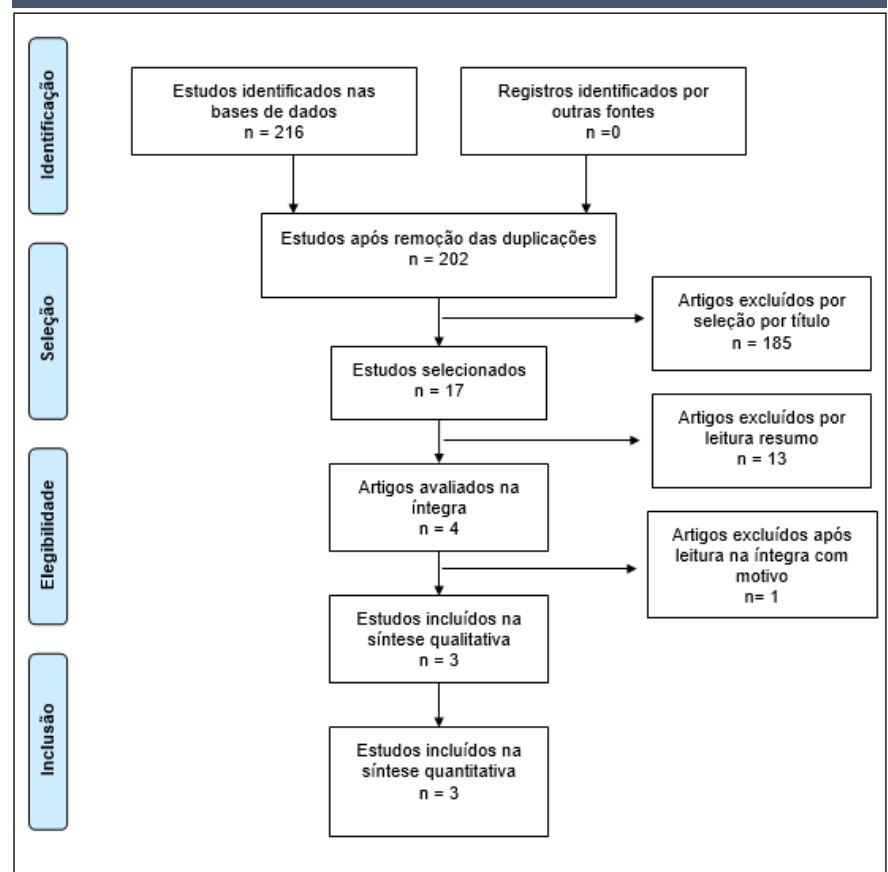
The quality of evidence was assessed using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) system¹⁷ for the most impactful outcomes.

RESULTS

Study selection:

The search of electronic health databases identified 216 references. After removing duplicates, 202 studies were potentially eligible. After screening by title, 185 studies were eliminated, leaving only 17 for screening by abstract. Four articles were selected for full-text reading. After reading and critical analysis, three articles were selected for qualitative and quantitative analysis (meta-analysis) (Figure 1). The gray lite

Figure 1 - Selection diagram of included studies:



Description of studies

The three RCTs¹⁸⁻²⁰ included a total of 221 healthcare professionals working on the front lines of COVID-19. The countries of origin

of the studies were: Iran^{18,20} and Korea¹⁹. The healthcare professionals who received aromatherapy in the studies included in the analyses were surgical technicians and nurse anesthetists

Literature Review

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¹⁸and nurses ^{19,20}. The follow-up time varied between studies, ranging from a single two-hour session on a single day ¹⁹, two 20-minute sessions over three days ²⁰, and finally thirty days of follow-up, with one session per day

totaling thirty sessions ¹⁸. Regarding the essences used as an intervention for aromatherapy application, the studies reported Damask rose oil ¹⁸, marjoram essential oil ⁽¹⁹⁾ and finally pure Pelargonium essential oil ²⁰. This

characterization is shown in Table 1. The inclusion criteria, exclusion criteria, intervention, measured outcomes, and method of measuring the outcomes included in the studies are shown in Table 2.

Table 1 - Describes the characteristics of the study country, number of participants, target population, workplace, complexity of the health service serving the population, follow-up time, number of sessions, and the essence used for aromatherapy:

Publication/authors/year	Country of study	Number of participants	Population	Workplace	Complexity	Follow-up time and number of sessions	Essences used
Effects of Inhalation Aromatherapy With Rosa damascena (Damask Rose) on the State Anxiety and Sleep Quality of Operating Room Personnel During the COVID-19 Pandemic: A Randomized Controlled/Trial, Bahareh Mahdood, Behzad Imani, Salman Khazaei/2022	Iran	GC:40 GI:40	Surgical technicians and nurse anesthetists	Operating room	Tertiary center	30 days -30 sessions	CC: paraffin oil CI: damask rose oil
Inhalation of Origanum majorana L. essential oil while working reduces perceived stress and anxiety levels of nurses in a COVID-19 intensive care unit: a randomized controlled trial/Sang Wook Lee, You Kyoung Shin,Jeong-Min Lee, Geun Hee Seol/2023	Korea	GC:28 GI:29	Nurses	COVID-19 ICU	Tertiary center	1 day - one 2-hour session during the rest period	CC: almond oil CI: marjoram essential oil
The Effect of Aromatherapy with Pelargonium graveolens (P. graveolens) on the Fatigue and Sleep Quality of Critical Care Nurses during the Covid-19 Pandemic: A Randomized Controlled Trial/Nasrin Karimi , Shirin Hasanvand , Afsaneh Beiranvand , Mohammad Gholami , Mehdi Birjandi/2023	Iran	GC:42 GI:42	nurses	ICU	Centro terciário	3 days - aromatherapy for 20 minutes, twice per shift, between 9 a.m. and 1 p.m. (morning shift) and 3 p.m. and 7 p.m. (night shift), with a one-hour break between each session.	CC: pure sunflower oil CI: pure Pelargonium essential oil

Table 2 - Characteristics of patients in the intervention group and control group, inclusion and exclusion criteria for studies, outcomes analyzed, and how they were measured in the included studies.

Publication/authors/ year	Inclusion criteria	Exclusion criteria	Intervention	Measured outcomes	Method of measuring outcomes
Effects of Inhalation Aromatherapy With Rosa damascena (Damask Rose) on the State Anxiety and Sleep Quality of Operating Room Personnel During the COVID-19 Pandemic: A Randomized Controlled Trial, Bahareh Mahdood, Behzad Imani, Salman Khazaei/2022	(1) faixa etária de 18 a 50 anos, (2) obter pontuação de 32 a 53 no inventário de ansiedade estado de Spielberger (SAI; abaixo e acima de ansiedade moderada) e (3) obter uma pontuação superior a 5 no índice de qualidade do sono de Pittsburgh (PSQI; má qualidade do sono).	(1) ter histórico de doenças conhecidas que perturbam o sono (ou seja, artrite reumatóide e enxaqueca) e distúrbios do sono (conforme mencionado pelos participantes), (2) apresentar rinite alérgica e outros problemas respiratórios e sinusite (ou seja, asma, dispneia, tosse crônica e ortopneia), (3) ter ansiedade ou distúrbios cognitivos, (4) ter histórico de doenças sistêmicas ou crônicas que afetam o sentido do olfato, (5) ter histórico de uso de medicamentos antipsicóticos, tranquilizantes e agentes hipnóticos-sedativos nos últimos 2 meses, (6) ter histórico de abuso de substâncias ou dependência de drogas/álcool, (7) ter histórico de reações alérgicas a flores, aromas e óleos de ervas ou apresentar reações moderadas a -eventos adversos graves após a aplicação de óleo de rosa damasco ou óleo de parafina durante o estudo (ou seja, irritação, coceira e erupção cutânea) e (8) ter experimentado intervenções psicológicas (ou seja, ioga, meditação e atenção plena) ou outra aromaterapia intervenções nos últimos 2 meses.	Primeira sessão demonstrativa no local de trabalho + 30 sessões noturnas com um algodão embebido da essência ou do placebo a uma distância de cerca de 20 cm do nariz com permanência de 8 horas (22h00 às 06h00) durante o sono	Questionário demográfico e de trabalho, Ansiedade Índice de qualidade do sono eventos adversos	Qualidade do sono de Pittsburgh: PSQI Ansiedade: SAI
Inhalation of Origanum majorana L. essential oil while working reduces perceived stress and anxiety levels of nurses in a COVID-19 intensive care unit: a randomized controlled trial/ Sang Wook Lee, You Kyoung Shin, Jeong-Min Lee, Geun Hee Seol/2023	Inhalation of Origanum majorana L. essential oil while working reduces perceived stress and anxiety levels of nurses in a COVID-19 intensive care unit: a randomized controlled trial	Enfermeiros na UTI COVID-19 que estivessem recebendo tratamento para doença física, fizessem uso de anti-hipertensivo ou medicamento antidiabético, e, e tivessem teve reação alérgica ao óleo essencial de manjerona. Os participantes também foram excluídos se tivessem função olfativa prejudicada, estivessem grávidas ou amamentando.	A inalação do óleo essencial começou quando o participante, que usava equipamento de proteção individual, entrou na sala de isolamento. No grupo manjerona, 0,2 ml de óleo essencial de manjerona a 3% diluído em óleo de amêndoa foi adicionado a uma gaze de que foi fixada no equipamento de proteção individual a 10 cm da ponta do nariz. O óleo de amêndoa é normalmente usado como veículo em preparações de aromaterapia. No grupo controle, 0,2 mL apenas de óleo de amêndoa foi aplicado na gaze. Cada participante foi autorizado a inalar a manjerona ou controlar a fragrância por meio da respiração natural durante um único período de 2 horas enquanto estava na sala de isolamento.	estresse e ansiedade Estado Pressão arterial média e frequência cardíaca	Estresse e ansiedade foram avaliados usando VAS separadas Inventário de Ansiedade Traço-Estado (STAI) Esfigmomanômetro eletrônico
The Effect of Aromatherapy with Pelargonium graveolens (P. graveolens) on the Fatigue and Sleep Quality of Critical Care Nurses during the Covid-19 Pandemic: A Randomized Controlled Trial/ Nasrin Karimi, Shirin Hasanvand, Afsaneh Beiranvand, Mohammad Gholami, Mehdi Birjandi/2023	The effect of Aromatherapy with Pelargonium graveolens (P. graveolens) on the fatigue and sleep quality of critical care nurses during the Covid-19 pandemic: A randomized controlled trial	Escala Visual Analógica de Fadiga (EVA-F), a fadiga foi medida 30 minutos antes da intervenção, imediatamente e 60 minutos depois. Além disso, nas manhãs dos dias de intervenção, a qualidade do sono foi avaliada por meio da Escala de Sono de Verran e Snyder-Halpern (VSH)	As fragrâncias eram inaladas por 20 minutos com respiração normal.	Fadiga qualidade do sono	Escala visual analógica Escala de Sono VSH.

SAI (The Spielberger state anxiety inventory): questionário autoperenchido de 20 itens que visa medir os sentimentos subjetivos de apreensão, tensão, nervosismo, preocupação e ativação/excitação do sistema nervoso autônomo. VSH (Escala de sono de Verran e Snyder-Halpern. Inventário de Ansiedade Traço-Estado (STAI)

Literature Review

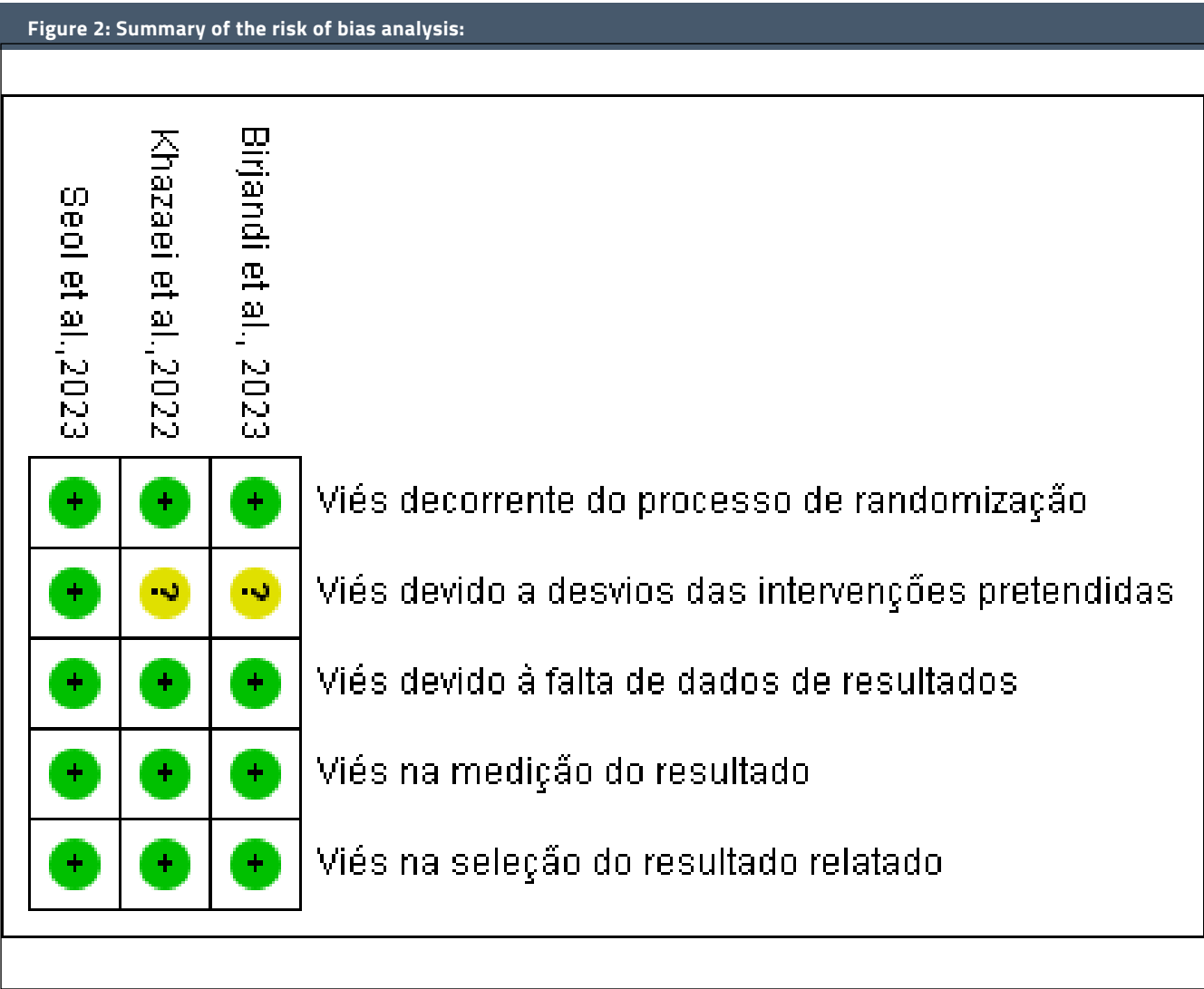
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Risk of bias

The assessment of risk of bias is summarized in Figure 2. Regarding bias arising from the randomization process, the three studies were considered to be at low risk of bias, as the sequence of numbers was generated using computer software to generate the random sequence for randomization^{18,18,20}. Regarding the analysis

of bias due to deviations from the intended interventions, two studies^{18,20} were considered uncertain, as in one study¹⁸ the participants were not blinded to the intervention, i.e., the participant was aware of the essence, while in the other, this factor was not reported²⁰. Regarding the analysis of bias due to lack of outcome data, bias in outcome measurement, and finally

bias in the selection of reported outcomes, all were considered low risk, as a large part of the randomized population was analyzed, the outcome measurement method was inadequate in all studies because it used validated scales, and finally, the data were analyzed as planned^{18,20} and without significant losses¹⁹.



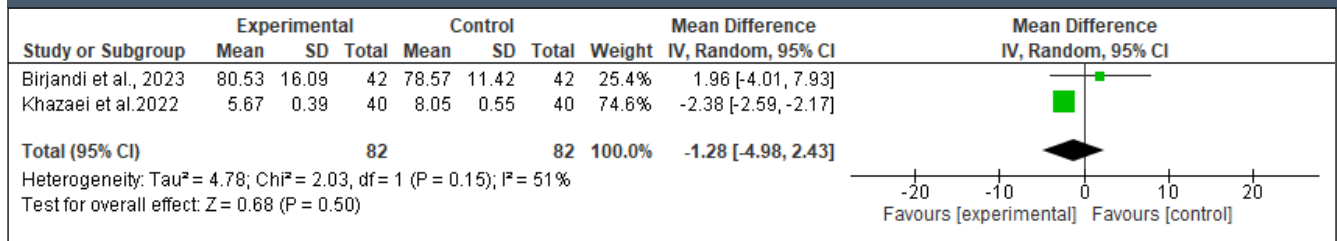
Meta-analyses

The primary outcomes were metrics associated with sleep quality, quality of life, and anxiety measured using validated instruments. Quality of life was not reported in any of

the studies analyzed. Two studies^{18,20} included in the analyses measured the sleep quality index, and the meta-analysis showed no significant difference between the control group and the intervention group that re-

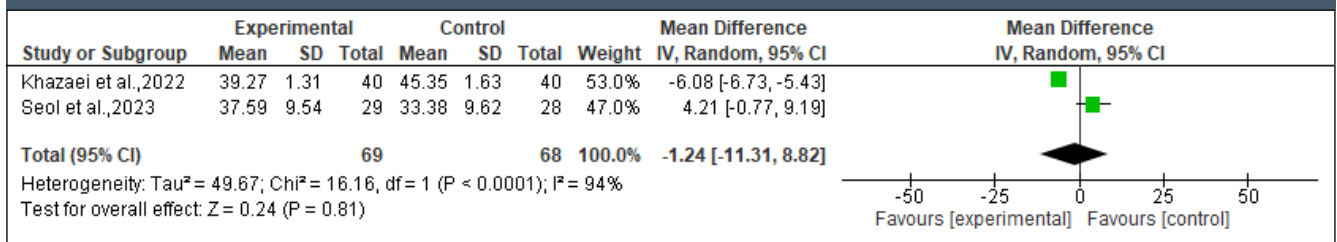
ceived aromatherapy (RR: -1.28, 95% CI: -4.98 to 2.43), with moderate heterogeneity ($I^2 = 51\%$) between studies. (Figure 3).

Figure 3- Pittsburgh Sleep Quality Index



Anxiety was analyzed in two studies^{18,19} and also showed no significant difference between the groups (RR: -1.24, 95% CI: -11.31 to 8.82), with high heterogeneity ($I^2=94\%$) between studies (Figure 4).

Figure 4-Anxiety



Assessment of evidence quality according to GRADE

The quality of evidence was assessed for the outcomes Sleep Quality

Index and Anxiety, all of which were classified as very low quality evidence (Table 3).

As fewer than ten RCTs were in-

cluded in this review, it was not possible to analyze the presence of publication bias.

Table 3-Summary of the assessment of the quality of evidence according to GRADE

Certainty assessment							Summary of evidence		
Participants (studies) Follow-up	Risk of bias	Inconsistency	Indirect evidence	Inaccuracy	Publication bias	Quality of evidence	Study event rates (%)		Potential absolute effects
							With placebo	With aromatherapy	Risk difference with aromatherapy
164 (2 studies)	non-severe	serious ^a	not serious	not serious	probably not	⊕○○○ very low	82	82	MD 1.28 lower (4.98 lower to 2.43 higher)
137 (2 studies)	non-severe	very severe ^b	not serious	Severe ^c	probably not	⊕○○○ very low	68	69	MD 1.24 lower (11.31 lower to 8.82 higher)

CI: Confidence interval; MD: Mean difference

a. methodological heterogeneity between studies; b. measurement of outcome using non-identical scales; c. wide confidence interval. Note: To determine a GRADE quality of evidence, the GRADE approach begins by assigning findings to one of two initial levels of quality, depending on the study design. Randomized trials are of high quality, while observational studies are of low quality. Evidence can be considered at four levels: High, Moderate, Low, and Very Low. Studies can be upgraded or downgraded based on certain factors:

- Risk of bias (-1 if serious risk of bias, -2 if very serious risk of bias).
- Inconsistency or heterogeneity of evidence (-1 if serious inconsistency, -2 if very serious inconsistency)
- Indirect evidence (-1 if serious, -2 if very serious)
- Imprecision of results (-1 if wide confidence interval, -2 if very wide confidence interval)
- Publication bias (-1 if likely, -2 if very likely) * Small events and wide confidence interval. Low quality of evidence: the authors do not trust the effect estimate and the actual value may be substantially different from this.

DISCUSSION

Summary of evidence

This is the first systematic review to evaluate the use of aromatherapy during COVID-19 in healthcare professionals.

The findings were inconclusive regarding sleep quality, suggesting it was better in the experimental group -1.28 (-4.98 to 2.43) with moderate heterogeneity, justified by the presence of clinical and methodological heterogeneity due to differences in intervention and study design.

Regarding anxiety analysis, there is also a suggestion that the intervention group is favorable; however, there is high heterogeneity, which is referred to as significant clinical heterogeneity, resulting in statistical heterogeneity. In one study⁽¹⁸⁾, the Spielberger State Anxiety Inventory was used to measure anxiety, while in another study¹⁹, anxiety was measured by the IDATE Trait Anxiety Scale.

The Spielberger State Anxiety Inventory measures the general state of anxiety and is a comprehensive questionnaire. In the IDATE, which is a variation of the first scale, the state scale requires participants to describe how they feel "right now, at this moment" in relation to 20 items presented on a 4-point Likert scale: 1- absolutely not; 2- a little; 3- quite a lot; 4- very much. Similarly, the trait scale also consists of 20 items, but the participant is instructed to respond according to how they "usually feel," according to a new 4-point Likert scale: 1- almost never; 2- sometimes; 3- often; 4- almost always^{21,22}.

A systematic review aimed at evaluating the effectiveness of aromatherapy and massage in relieving stress in nurses found that the evidence did not sufficiently prove that aromatherapy, massage, and aromatherapeutic massage are effective in reducing work-related stress in nurses. Therefore, high-quality RCTs are needed

to verify the effects of these interventions on nurses' stress levels in the future²³.

An RCT published in 2023 that included 108 healthcare professionals with the aim of examining the effects of lavender oil inhalation on stress and job satisfaction among healthcare professionals identified that the intervention carried out during the intervention group's work shifts (8 hours a day for a period of 5 days) with lavender oil inhalation through a diffuser, and the placebo group was exposed to distilled water inhalation containing light yellow food coloring, that before the intervention, no significant difference was found in stress levels and job satisfaction between the intervention, placebo, and control groups. After the intervention, the intervention group had significantly lower work stress levels and significantly higher job satisfaction levels than the placebo and control groups ($P < 0.05$). Inhaling lavender oil can reduce work stress and improve job satisfaction²⁴.

Limitations

This systematic review has limitations, the main one being the small number of clinical trials and women included in the analysis. The decision to include only RCTs may also be a limiting factor for the analyses, but the choice was based on the search for studies that reported the best design to obtain the best available evidence.

The small number of clinical trials included resulted in a small population analyzed, and this factor contributed to the wide confidence interval between studies, as well as in instruments derived for analysis of the same outcome.

CONCLUSION

Implications for practice

No moderate or high-quality evidence was found in RCTs to prove that there are favorable effects of aro-

matheapy use during COVID-19 in healthcare professionals. Thus, there is no evidence to suggest the use of aromatherapy in future pandemic situations in healthcare professionals.

Implications for future research

It is recommended that RCTs be designed to include large populations and well-defined designs, focused on healthcare professionals and the use of aromatherapy, since even outside of pandemics and stressful situations in healthcare, evidence on its application is limited. Another factor that supports the development of this research is the ease with which PICS can be applied and the fact that healthcare professionals are a population that requires special attention.

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