Original Research

Clinical Aromatherapy Applied to the Elderly: Data Mining and Systematic Review

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Abstract: This systematic review aimed to map the scientific landscape of clinical aromatherapy and to understand how its use has been addressed in the care of the elderly population. Based on the analysis of practices involving inhalation and massage with essential oils, particularly lavender were identified. The main therapeutic purposes included improved sleep quality, reduced anxiety, agitation in dementia patients, psychological stress, and chronic pain, as well as enhancement of cognitive function and subjective well-being. Nevertheless, the review highlights the need for more standardized protocols and further studies with larger samples and long-term follow-up. Aromatherapy thus emerges as a promising resource for humanized and holistic elderly care.

Keywords: Aromatherapy. Elderly Health. Systematic Review.

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1. Introduction

The aging of the global population represents one of the most significant social phenomena of the 21st century, with direct impacts on health policies, care models, and clinical practices. It is estimated that by 2050, more than 2 billion people will be over 60 years old, increasing the urgency for therapeutic approaches that prioritize the well-being, functionality, and overall health of the elderly. In this context, non-pharmacological therapeutic methods, especially those aimed at managing conditions such as insomnia, anxiety, chronic pain, and cognitive disorders, have been gaining traction among the complementary resources offered to the elderly in health institutions, homes, and rehabilitation centers. Among the rising integrative therapies, clinical aromatherapy stands out: a therapeutic practice that utilizes essential oils extracted from aromatic plants to promote symptomatic relief and restore emotional and physiological balance. Although its roots trace back to ancient civilizations, such as the Egyptian and Persian, the term "aromatherapy" was coined only in 1937 by French chemist René-Maurice Gattefossé, after the

publication of his eponymous work. Since then, the practice has evolved from empirical and domestic use to a therapeutic modality studied in the field of integrative medicine, with recognized applications in nursing, physiotherapy, palliative care, and geriatrics (1-5). Despite the growing variety of clinical studies on the subject, systematic reviews that critically and comprehensively gather the main scientific findings on the use of aromatherapy for the elderly are still scarce. The literature lacks a consolidated overview that allows for an understanding of both the therapeutic efficacy of aromatherapy and the clinical contexts in which its application has proven most relevant—such as in managing symptoms associated with dementia, chronic pain, sleep disturbances, itching, and emotional suffering.In light of this gap, the present article proposes a systematic review with data mining from the SCOPUS database, aiming to map the scientific evidence related to the clinical use of aromatherapy in the elderly (1-15). The objective is to provide a detailed and critical portrait of clinical aromatherapy in the elderly, identifying its therapeutic potentials, methodological challenges, and future opportunities for its safe and effective integration into elderly care practices.

2. Material and Methods

The methodology applied in the research aimed to answer the questions: "What is the scientific landscape of clinical aromatherapy?" and "How has the clinical use of aromatherapy for the elderly been addressed?" This study adopted a systematic review approach with bibliographic data mining, with the objective of mapping, categorizing, and analyzing the scientific production on the clinical application of aromatherapy in the elderly. The methodological choice aims to ensure both analytical depth and breadth of the collected data, respecting criteria for reproducibility and academic rigor. The publications were collected using the SCOPUS database, with no restriction on the year of publication, limiting the search only to completed articles and excluding review documents. Table 1 presents the combinations of keywords from the surveys conducted. The number of articles published by year, by country, and by area were plotted and analyzed using the QtiPlot and Datawrapper software.

Table 1. Keyword combinations in the respective order of the surveys.

KEYWORDS
"AROMATHERAPY"
"AROMATHERAPY" AND "CLINICAL"
"AROMATHERAPY" AND "CLINICAL" AND "ELDERLY OR OLDER"

The data processing occurred in two complementary stages: quantitative and qualitative. Initially, the articles obtained in the searches were organized into spreadsheets and analyzed with the support of QtiPlot and Datawrapper software, generating graphs that allowed for visualizing the distribution of publications by country, thematic area, and year of publication. The validation and synthesis of the data were conducted in light of the PRISMA protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), adapted to the scope of this review with data mining. The critical analysis sought to ensure the internal coherence of the studies, valuing those with greater methodological robustness, clarity in the description of interventions, and statistically significant results. The discussion of the findings was structured around recurring thematic axes, such as reduction of anxiety, improvement of cognition, pain control, promotion of sleep, and relief of symptoms associated with dementia—allowing for an integrated reading of the therapeutic effects of clinical aromatherapy on the health and well-being of the elderly population.

3. Results

3.1 - Initial Survey

The analysis of data extracted from the SCOPUS database reveals a comprehensive panorama of the scientific production involving the use of aromatherapy in clinical contexts, focusing on elderly populations. In Figure 1, the concentration of articles in the fields of Medicine (40%) and Nursing (14%) is observed, highlighting the recognition of aromatherapy as a complementary practice in health care, especially regarding the emotional and psychosocial aspects of patients (1-5).

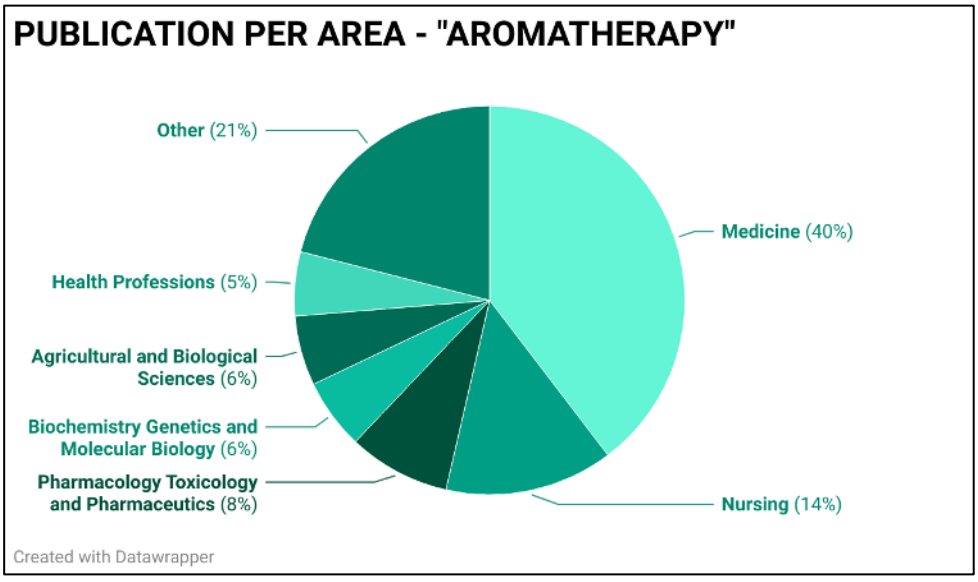

Figure 1 - Publications by area of the survey with the word "Aromatherapy" in the SCOPUS database.

The Figure 2 shows the geographical distribution of publications containing the term "Aromatherapy." Among the 3,032 records found, 235 did not have a country defined and were disregarded. The United States stands out as the main producer of literature on the subject, followed by Iran, the United Kingdom, and Japan. Brazil ranks 14th, with 66 published articles.

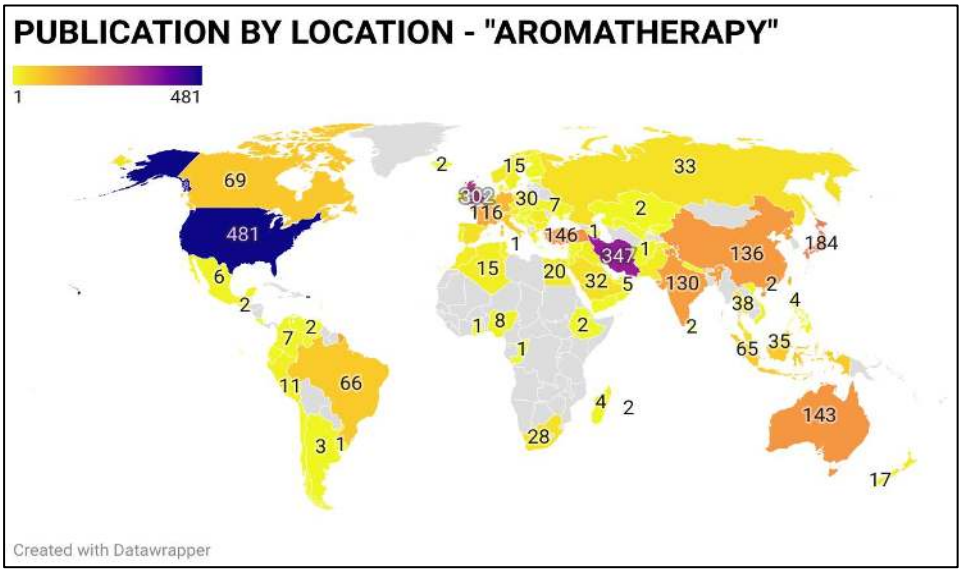

Figure 2 - Publications by location of the survey with the word "Aromatherapy" in the SCOPUS database.

After the initial refinement by thematic area (Medicine, Nursing, and Health Professions), 2,275 articles were found. Of these, 210 did not have a location identified. By further narrowing the results with the expression "Aromatherapy AND Clinical," the number of publications dropped to 1,185. In this refinement, Iran moved to first place with 260 articles, followed by the USA (202) and the UK (146), while Brazil gained 13th place in clinical aromatherapy publications (Figure 3).

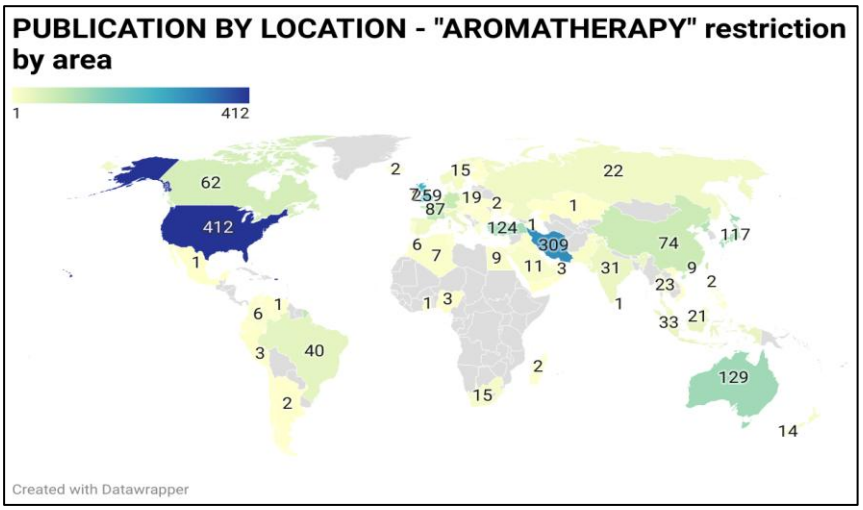

Figure 3 - Publications by location of the survey with the word "Aromatherapy," refining by area (medicine, nursing, and health professions) in the SCOPUS database.

In the final refinement, applying the terms "Aromatherapy AND Clinical AND Elderly OR Older," 110 articles were obtained. After screening and applying inclusion and exclusion criteria, 15 studies were selected for detailed analysis, as they met the clinical investigation criteria for aromatherapy in individuals aged 60 years or older. The findings show that the clinical application of aromatherapy in the elderly has been effective in multiple aspects, particularly in relieving pain, anxiety, sleep disturbances, and agitation, especially in contexts such as palliative care, geriatric wards, and dementia treatment (1-5). The convergence of the evaluated studies highlights the importance of aromatherapy as a complementary therapeutic resource for promoting quality of life in old age (7-15). However, there is a need for more longitudinal studies with diverse samples to establish evidence-based clinical guidelines, especially in developing countries like Brazil, which still lack systematic investment in this field. Given the international panorama revealed by the bibliometric analysis, which pointed out countries like the United States, Iran, and the United Kingdom as the main scientific producers on aromatherapy, with Brazil ranking 13th, a significant advance in publications related to the clinical application of essential oils was observed. Although no temporal cutoff was established for selecting the studies included in this systematic review, the analysis of the retrieved data shows a significant concentration of publications starting in the 1990s, with a notable increase especially after 2010. Figure 4 presents the publications by year of publication, created from the data mining conducted, showing that the scientific production involving aromatherapy, especially in clinical contexts and in the elderly population, has intensified in recent decades.

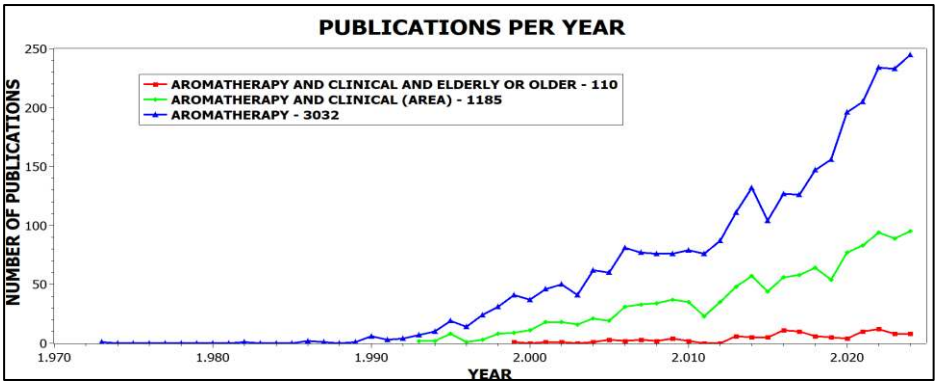

Figure 4 - Publications by Year of the surveys conducted.

3.2- Analysis of the selected studies

Bahrami et al. (1) explored the effects of aromatherapy massage with lavender in elderly patients with acute coronary syndrome. Although the primary focus was on reducing anxiety and physiological parameters, the authors also observed a significant decrease in self-reported depression, especially in female participants. Improvement in sleep quality was one of the most frequently investigated therapeutic purposes in the

reviewed studies, and the results found point to the efficacy of aromatherapy in regulating the sleep cycle among the elderly. In particular, the use of lavender essential oil, either alone or combined with other oils, such as chamomile or orange, demonstrated positive effects in inducing sleep. In the study conducted by Ebrahimi et al. (2), for example, community-dwelling elderly who inhaled lavender and chamomile for 30 consecutive nights showed a significant reduction in anxiety and stress scores, and, above all, an expressive improvement in sleep quality. The study by Ünal Aslan and Altın (3) directly evaluated this variable in elderly post-stroke patients through the Oxford Happiness Questionnaire. The results showed that both foot massage alone and massage combined with lavender aromatherapy contributed to a significant increase in happiness, satisfaction, and sense of well-being, reinforcing the role of integrative practices in physical and emotional rehabilitation. The combined use of tactile and olfactory stimuli enhanced the effects, reinforcing the role of aromatherapy integrated with other sensory approaches in elderly care. These data are consistent with the study conducted in Taiwan by Cheng et al. (4), in which the combination of three-dimensional virtual reality and aromatherapy had a positive impact on the perception of well-being and sleep quality in institutionalized elderly. The intervention, conducted over nine weeks, promoted not only physical relaxation but also emotional and social benefits, reflected in better sleep patterns. One of the most recent studies, conducted by Can et al. (5), evaluated the effects of inhaling lavender and rosemary in 63 diabetic elderly over four weeks. Participants were divided into three groups (lavender, rosemary, and control), and the results showed significant improvements in concentration, orientation, and short-term memory in the intervention groups, measured by the Blessed Orientation Concentration Test (BOMCT). The study highlights the cognitive vulnerability associated with type 2 diabetes and reinforces the role of aromatherapy in preventing and modulating the effects of this impairment. Studies focusing on physical or behavioral symptoms (6-8) that investigated the topical and inhalation use of lavender essential oil in elderly patients with dementia pointed to positive subjective effects perceived by their caregivers. The authors identified effective reductions in agitation among dementia patients, especially in managing non-aggressive motor behaviors and irritability. The data reinforce the idea that the cognitive profile of the elderly influences the response to essential oils, paving the way for personalized approaches within complementary therapies. The authors suggest that the decrease in irritability and impulsivity achieved with lavender use facilitated engagement in daily activities and social interactions, important elements for maintaining residual cognitive skills. Lin et al. (8) showed a reduction in agitation in elderly with dementia, but also in indirect improvements in cognition associated with regularization of sleep and decreased irritability. Although cognitive function was not the primary outcome of the study, the authors indicate that more organized behaviors and better responses to the environment could be related to indirect cognitive gains provided by relaxation promoted by aromatherapy. The protocol was simple, nightly application with diffusers, and well tolerated, making it replicable in long-term care institutions. The case study by Yoshiyama et al.

(09), which used a mixture of essential oils in hand massages for elderly patients with dementia over four weeks, highlighted the positive qualitative impact, such as greater interaction with caregivers and expressions of comfort and relaxation during the sessions. Jimbo et al. (10) provided evidence of the efficacy of aromatherapy in patients with Alzheimer's disease, through inhalation of rosemary and lemon essential oils in the morning and lavender and orange in the evening. The results suggest acting on stress levels and promoting states of relaxation and attention, even in cases of established deterioration, as in Alzheimer's disease. The use of aromatherapy in managing chronic pain and osteoarticular symptoms conducted by Yip and Tam (11) in 59 elderly with moderate to severe knee pain caused by osteoarthritis showed statistically significant reductions in pain, joint stiffness, and functional limitation in the intervention group, with effects superior to those observed in the placebo and control groups. Although the effects did not remain significantly after four weeks. Another relevant study was conducted by Satou et al. (12), which consisted of applying aromatic massages twice a week, using a mixture of geranium and peppermint oil diluted in jojoba oil. Although the primary focus was on reducing psychological stress, the authors also reported improvement in physical discomfort and a sense of bodily relief during and after the sessions. Qualitative reports indicated a decrease in muscle tension and a sense of physical relaxation, corroborating findings from studies that associate aromatherapy with the management of musculoskeletal pain.

4. Considerations

Regarding the first question, "What is the scientific landscape of clinical aromatherapy?", there has been a progressive consolidation of the field, with a significant increase in publications in the last decade. Aromatherapy has been the subject of clinical trials, quasi-experimental studies, and experiential reports that investigate it both in isolation and in combination with other therapeutic techniques, such as massage, acupressure, and virtual reality. The reviewed studies point to a search for scientific evidence that goes beyond the traditional empirical use of essential oils, especially in hospital and institutional contexts. As for the second question, "How has the clinical use of aromatherapy for the elderly been addressed?", the results reveal that the practice has been widely applied in interventions aimed at relieving symptoms associated with aging. The most frequent approaches focus on treating anxiety, agitation in cases of dementia, sleep disturbances, chronic pain, and depressive symptoms. The construction of more robust and replicable evidence can strengthen the presence of the practice in public health services, especially in Brazil, where the National Policy of Integrative and Complementary Practices (PNPIC) already recognizes aromatherapy as one of the legitimized approaches in the Unified Health System (SUS).

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Conflicts of Interest: None.

Supplementary Materials: None.

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