

Review

Yoga as a Potential Tool for Filling Implementation Gap in Promoting Better Mental Health in Geriatric Age Group at Global Level: A Scoping Review

Vikas Dhikav ^{1,*}, Prerna Bhati ², Pankaj Kumar ³, Praveen Kumar Anand ³

1. Centre for Evidence for Guidelines, Department of Health Research, MoHFW, Govt. of India; Formerly at ICMR-NIIRNCD Jodhpur, Rajasthan 342005, India; E-Mail: vikasdhikav@hotmail.com
2. Amity Institute of Pharmacy, Amity University, Noida, UP, India; E-Mail: prernab1199@gmail.com
3. ICMR-National Institute of Implementation Research on Non-Communicable Diseases, Jodhpur, Rajasthan 342005, India; E-Mails: stats.pankaj@gmail.com; pk.anand@dmrcjodhpur.nic.in

* **Correspondence:** Vikas Dhikav; E-Mail: vikasdhikav@hotmail.com**Academic Editor:** Ines Testoni**Special Issue:** [Cardiovascular Risk Factors Among Older Adults with Cognitive Impairment](#)

OBM Geriatrics
2024, volume 8, issue 3
doi:10.21926/obm.geriatr.2403284

Received: June 18, 2023
Accepted: July 14, 2024
Published: August 05, 2024

Abstract

This scoping review aims to review the effectiveness of yoga as a complementary intervention for improving mental health outcomes in the geriatric population globally. Yoga is practiced by millions worldwide. Since practitioners of yoga claim to have calmer minds and better psychological and physical health, this topic needs to be reviewed at length. There is a considerable treatment gap worldwide in treating mental disorders, especially in old age, and there is a shortage of low-cost, feasible, and acceptable preventive or treatment options available to tackle mental ailments for the senior population at large. Yoga can potentially act as a low-cost intervention for promoting better mental health. The article reviews yoga as an implementation strategy for meeting this global challenge. Information related to “Yoga and Mental Health” and “Yoga and old age” was searched in two databases, i.e., PubMed and



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Google Scholar, using a standard search strategy and search strings. Only the articles published in the English language were selected. A standard data extraction form was used to extract and tabulate the data. A comprehensive search strategy (annexed) yielded only two papers as the work on implementation research on mental health is dismal. Both were excluded as the papers did not belong to implementation research. However, for the sake of narrative review, a common search strategy in PubMed included key terms such as “yoga and aging and mental health” and yielded 54 results out of which 7 were included for this scoping review. Comprehensive advanced search from Google Scholar revealed 4850 articles. Screening found 1 implementation research abstract only and two clinical trials. None was included as they did not belong to implementation research. Considering the potential that yoga has as a preventive and therapeutic option, scientific work on implementation research involving mental health and yoga is required. Considering the bludgeoning amount of work done on the subject, there is a possibility of including the same in mainstream medicine as a low-cost preventive or therapeutic option to address the implementation gap in mental health, especially for the senior age group.

Keywords

Older adults; implementation gap; mental health; yoga; treatment gap

1. Introduction

Mental Health, as per the World Health Organization, is “A state of well-being in which the individual realizes his or her abilities, can cope with the normal stresses of life, can work productively and fruitfully, and can make a contribution to society” [1]. Mental illnesses are “Substantial disorders of thinking, mood, perception, orientation/memory that grossly impairs judgment, behavior, capacity to recognize reality or ability to meet the ordinary demands of life, mental conditions associated with the abuse of alcohol and drugs”. This definition excludes mental retardation [1].

Studies have shown that *yoga* can relieve stress and boost useful neurochemicals in the brain that can help reduce anxiety and depression. Collectively, these chemicals can help promote better mental health. For this article, the senior group was considered to be individuals above the age of 60 years or more. In 2019, the number of people aged 60 years and older was 1 billion, per the World Health Organization. This number will increase to 1.4 billion by 2030 and 2.1 billion by 2050. This increase is occurring at an unprecedented pace and will accelerate in the coming decades, particularly in developing countries like India, China, etc.

Yoga (Sanskrit = Yuj; means to unite) is a popular and culturally acceptable non-pharmacological intervention believed to be useful and practiced by 300 million practitioners worldwide. There are many types of *yoga*: *hatha* *yoga* is an element of *raja* *yoga* and deals mainly with physical postures and breathing. *Karma* *yoga* emphasizes spiritual practice to help the individual “unify” body, mind, and heart through certain practices in daily life and work. *Bhakti* *yoga*, a devotional form, generally encompasses chanting, reading of scriptures, and worship practices.

A cross-cultural study at 14 centers across the world found that 25% of the attendees at primary care suffered from one or more diagnosable mental ailments [1]. The burden of Mental ailments in developing countries is high. For example, in India, 1 in 7 Indians are affected [1, 2], and the treatment gap is high (70-86%) [1] due to limited trained manpower [3, 4]. It has been realized that apart from medications, alternative treatment options like yoga could be integrated into mainstream medical curricula to help graduates offer psychiatric treatments at low cost.

Historically, *yoga* as a practice was first described by Sage Patanjali in his classic book (*Yoga Sutra-ashtanga*) [1-14]. Each of the eight limbs described in this text could work as an independent discipline, the most popular being *hathiyoga*, focused on *yogasnas* and breathing exercises. Yoga is among the most popular complementary and alternative therapies/approaches in the world and is the fastest-growing.

Current scoping review was done to collate the published scientific information related to yoga, and its effectiveness in dealing with mental ailments and improving mental health. The goal was also to assess and propose the feasibility of the integration of yoga as a low-cost non-pharmacological intervention to address the treatment gaps in the elderly in lower- and middle-income countries.

2. Methods

Information related to “Yoga and Mental Health” and “Yoga and old age” was searched in two databases i.e. PubMed and Google scholar, using standard search strategy and search strings. Detailed search strategies in both databases are given in Table 1 & Table 2. Only the articles published in English language were selected. A standard data extraction form was used to extract and tabulate the data. A comprehensive search strategy (annexed) yielded only two papers, as the work on implementation research on mental health is dismal. Both were excluded as the documents did not belong to implementation research. However, for the sake of narrative review, a typical search strategy including critical terms such as “yoga and aging and mental health” was used. It yielded 54 results, out of which 7 were selected for this scoping review (Table 3), considering their relevance for the elder. However, implementation research on the mental health involving elderly is limited and work needs to be done to outline the benefits of yoga as noted in the clinical trials.

Table 1 Search Strategy summary 1- PubMed.

Search number	Query	Timeline	Results
1	“Yoga asanas” [tw] OR “Yoga therapy” [tw] OR “yoga” [Mesh] “Therapeutic Yoga” [tw] OR “Evidence-based Yoga” [tw] OR “Useful Yoga” [tw] OR “yoga” [MeSH] OR “yoga”[MeSH Terms] OR “yoga”[All Fields] OR (“yoga”[All Fields] AND “therapy”[All Fields]) OR “yoga therapy”[All Fields] OR “therapeutics”[MeSH Terms] OR “therapeutics”[All Fields] “evidence”[All Fields] OR “evidence”[All Fields]	1970-2024	9281
2	“old age” [tw] OR “older adults” [tw] OR “old people” [tw] OR “elderly health” [tw] OR “senior citizens” OR “Geriatrics” OR Geriatrics [tw]	1967-2024	8410

3	"psychological health", [tw] "psychiatric health" [tw], "spiritual health" [tw], "mental well-being" [tw], "mental fitness" [tw], "mental health care" OR "mental health"[mesh] {implementation}[Tiab] OR {implementing}[Tiab] OR {implemented}[Tiab] OR {operations}[Tiab] OR {delivery}[Tiab] OR {deliver}[Tiab] OR {implementation science}[Tiab] OR {translational science}[Tiab] OR	1974- 2024	526
4	{translational research}[Tiab] OR {Translational Medical Research}[Tiab] OR {quality improvement}[Tiab] OR {policy}[Tiab]	1965-2024	9212
5	#1 AND #2	1979-2024	550
6	#3 AND #4	1989- 2024	69
7	#1 AND #2 AND #3 AND #4	2013-2024	2

Table 2 Search Strategy summary 2- Google Scholar.

Search number	Query	Timeline	Results
1	"Yoga therapy" "yoga" "Therapeutic Yoga" "Evidence based Yoga" "Useful Yoga" "yoga" "yoga" "yoga" "yoga" "therapy" "yoga therapy" "therapeutics" "evidence" "evidences" "old age" "older adults" "old people" "elderly health" "senior citizens" "Geriatrics" Geriatrics "psychological health" "psychiatric health" "spiritual health" "mental well-being" "mental fitness" "mental health care" "mental health" "implementation" "implementing" "operations" "delivery research" "implementation research" "translational science" "translational research" "Translational Medical Research" "quality improvement studies" "policy research" "Randomized Clinical Trials" "Trials"	Published till 2024	4850

Table 3 Trials addressing mental health issues in older adults.

Sr No	Author/s	Intervention	Sample size (n =)	Main finding
1	Rocío Rodríguez-Romero et al., 2020 [15]	Yoga, walking, mindfulness	55	In community-dwelling people with moderate loneliness, perception of loneliness, depressive symptoms, social support and the mental health component of the quality of life improved significantly.
2	Verma S et al., 2021 [16]	Yoga of Immortals (YOI) mobile application	1,505	Significant reduction in depression and anxiety-related symptoms and insomnia.

3	KM Chen et al., 2009 [17]	70-min silver yoga exercise program	139	Mental health indicators of the participants in test group were better than the control group ($p < 0.05$).
4	Lee KC, Tang WK, Bressington D. 2019 [18]	Mindful yoga intervention	18	Mindful yoga may be an acceptable/useful intervention for older adults with depression.
5	P Saravanakumar et al., 2018 [19]	Tai chi and yoga are mindfulness-based exercise interventions	19	<i>Tai chi</i> and yoga appear good for emotional and intellectual wellness.
6	Thakur M et al., 2023 [20]	Heartfulness intervention and control group	100	Cortisol levels significantly decreased ($p < 0.001$) after the intervention as compared to the non-meditators group.
7	Teresa J Kelechi et al., 2022 [21]	Gentle Yoga and yogic Breathing; Behavioural Activation	30	Non-pharmacological interventions needed for community dwelling older adults.

3. Results

A comprehensive search strategy (Table 1 & Table 2) yielded 2 articles in the PubMed search database, but both were excluded as the papers did not belong to implementation research. Results indicate that the research in this area is in its infancy, and a lot of work needs to be done, but yoga has the potential to be a valuable treatment for older people with mental health issues. Trials addressing mental health issues in older adults are given in Table 3.

A comprehensive advanced search from Google Scholar was conducted using the search string mentioned in Table 2 and revealed 4850 articles. A screening of the entire number was done manually and found that there was 1 implementation research abstract only and two clinical trials. None was included as they did not belong to implementation research.

4. Discussion

4.1 Why Explore Yoga in Mental Health in Geriatric Age Group?

Practice of yoga is recognized as a form of medicine addressing both mind and body and integrating physical, mental, and spiritual aspects of health. Stress is a major contributor to cognitive and neurological ailments like stroke, etc. Also, since the very nature of yoga is holistic, cardiovascular health could improve, and stress may get reduced with yoga, which could improve mental health.

Yoga is a popular form of exercise that has been shown to lower stress hormones, increase gamma amino butyric acid (GABA), and promote relaxation. Hormones like endorphins may contribute to the feel-good factor associated with practicing yoga. Also, yoga can increase dopamine, serotonin, etc., which have mood-elevating properties. It is essential to know that these chemicals can help reduce anxiety and promote good mood. That means yoga has anti-anxiety and antidepressant effects. It is also proposed that some limbic conditioning is being done by yoga in

the brain's temporal lobe. This may help alleviate anxiety and produce a tempered response to stressful situations.

4.2 Neuroanatomical Basis of Yoga

Practitioners who did regular yoga have been shown to have a thicker cerebral cortex and larger brain hippocampus [5]. A recent review has compared the effect of several relaxation techniques on depression and anxiety in older adults and found yoga along with music effective for depression and anxiety. Also, the impact of yoga was longer-lasting than other interventions. Mechanisms of the usefulness of yoga are given in Figure 1 & Figure 2.



Figure 1 Cognitive/psychological domains affected positively by practicing regular yoga.

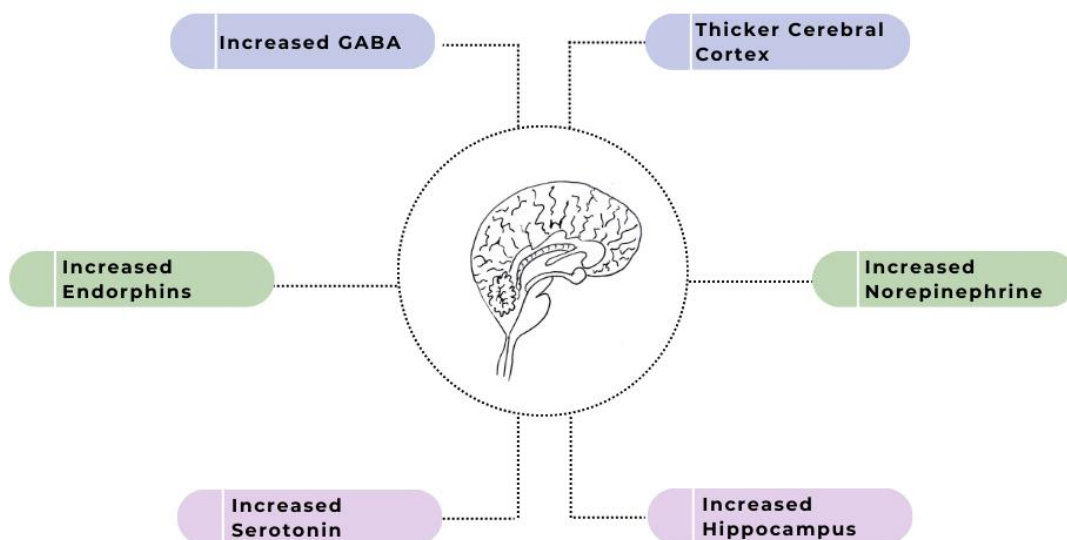


Figure 2 Neurobiological basis of yoga and potential mechanisms of how yoga contributes towards better mental health.

Some studies have found that yoga could help patients with post-traumatic stress disorder, especially when used as an add-on treatment to standard therapy. It can help reduce manifestations of post-traumatic disorder and bring about a reduction in intrusive memories and a calmer state of

mind by promoting parasympathetic nervous system activities. Also, patients with mild cognitive impairment and those with early dementia seem to be benefitted in terms of memory and verbal recall.

4.3 Potential of Yoga as a Low-Cost Intervention

It has generally been said that regular yoga creates calmness, reduces stress and relaxes the mind. Reduction in anxiety and mood elevation potentially contributes towards better attention. Also, improvement in sleep produces therapeutic benefits that make yoga a useful low-cost, acceptable mental health prompting intervention. This is because lack of sleep or poor sleep in old age is a major risk factor/accompaniment to several major mental ailments.

4.4 Ancient Practice

It has been shown that regular yoga practice promotes muscle strength, improves flexibility and facilitates well-being [6-9]. Yoga produces an anti-stress response and a sense of psychological and physical well-being [10-13].

It has been noted that bodily healing occurs more promptly with a positive mindset than a negative one. Therapeutic yoga is useful in improving respiratory, cardiovascular function and treat emotional dysregulation. Reduction in stress, anxiety, depression, chronic pain and improvement in sleep pattern improve overall quality of life and well-being [14, 22-25].

4.5 Dhikav Yoga

This is a new and emerging form of yoga [26-31] that has had a prompt acceptance in the Western world as well as by the people at large who are affected with disorders of intimacy. One of the main reasons of this quick acceptance and popularity is that, both men and women find it hard to verbalize intimacy disorders (e.g. premature ejaculation, pelvic pain during intimacy, dryness of vagina etc). Since there were claims about the effectiveness of yoga in improving potency of men who practiced it in isolation, “Dhikav yoga protocol” was investigated to assess the same claim scientifically. Three studies that have been back to back over a decade have been extensively reported in media.

A Nature Group Journal hailed one of the studies as a “breakthrough” in medicine. This study compared yoga protocol containing 12 *yogasanas* with fluoxetine and the results showed that yoga was as good or better. Bedroom Yoga or *Kama Yoga* classes have been started across the Western World, basing their work on our published work. In summary, this work has helped yoga become “new Viagra,” or a natural male sexual stimulant or a tool to make men last longer. It is difficult for a patient with sexual dysfunction to seek medical advice due to stigmas. Hence, the beneficial effects of *Dhikav Yoga*, which can be done in privacy cannot be overstated. The side effects of such a protocol have not been reported so far in last 15 years or so. Additionally, practicing yoga could avoid the side effects of conventional medicines. The best part is that such yoga is cheap and readily available. *Dhikav Yoga* protocol is being practiced widely by the people who are affected with sexual dysfunction, both men and women at present. More comparative studies with conventional medicines could be done where the comparison can show comparative efficacy of *Dhikav Yoga* protocol in larger sample sizes. Though these studies have been done in middle-aged adults, they

also have relevance for older adults. The reasons are: a substantial number of older adults remain sexually active, have similar issues related to intimacy, and also yoga offers them a treatment at home where none exists. On disorders of intimacy, unfortunately, patients do not visit physicians. Hence, it could be important to include exercises such as these at home in their routine should the need arise. Yoga exercises like the ones mentioned in this protocol have the potential to address mental health issues as well. [26-31]

4.6 Yoga in Promoting Mental Health

Studies have shown that yoga could be useful in several disorders related to aging e.g. mild cognitive impairment, muscle strength, falls and balance and help ease cancer-related symptoms [32]. It has been suggested that the regular practice of yoga in camps, parks, yoga clubs etc. could promote mental health among older adults. Yoga has been found to contribute to a significant increase in psychological well-being and improve quality of life compared to no intervention. The effects are distinct from any other physical activity [33]. Available evidence suggests that yoga appears to be equal and/or superior to routine exercises in most outcome measures studied. Importantly, emphasis on breathing, mindfulness, and the importance of maintaining yogic postures differentiate yoga practices from other physical exercises [34]. The practice of *yoga* in the perinatal period in women has shown promise in improving mental health and well-being [35]. Yoga is effective in improving attention, executive functions, and memory of cognition, while depression in mental health compared to active control among the elderly [36]. Results provide support for the practice of yoga to improve cognitive functioning related to symptoms of post-traumatic stress disorder while also improving mental health symptoms such as sleep and quality of life [37]. Yoga is associated with improved health-related quality of life among older adults, and two hours of practice per week appeared optimal [38].

Studies have indicated that yoga-based interventions with long-term mental health conditions, in addition to anxiety and/or depression [39], could be done. Due to the implications of yoga in a variety of mental disorders and promoting mental health, there is growing interest among medical professionals in both physical and psychological health [40].

Evidence has been found to support school-based yoga programmes in neuro diverse populations with improvements in self-concept, subjective well-being, executive function, academic performance and attention [41]. Yoga as an intervention has also been effective in anger management [42].

Individuals who practice yoga are not free of health concerns, but most believe their health improves because of yoga. Yoga might benefit older women with chronic health conditions [43]. Yoga also has the potential to address substance abuse [44]. Intervention has been useful for nurses, who often face much caregiver stress [45]. Based on the effectiveness of yoga, it has been proposed that it be included in mental healthcare services [46]. Yoga was found to be helpful during the COVID-19 pandemic [47]. Even the variation of yoga e.g. laughter yoga is proposed to have potential [48]. In ongoing situations, yoga could be done online, likely making this low-cost intervention even more acceptable [48]. Yoga as an intervention is helpful in common mental disorders [49-51].

4.6.1 Yoga in Common Mental Disorders

Common mental disorders [1] include generalized anxiety, depression, somatization disorders, obsessive-compulsive disorders, and conversion disorders. There is an attempt to integrate yoga as a low-cost modality in handling them [52]. A recent review indicated promising results regarding the impact of physical activity on mental health disorders [53, 54]. Yoga has been tried for medically unexplained symptoms as well [54]. A mixed-method study showed that yoga could complement the existing treatment options, e.g., cognitive behavioral therapy for common mental disorders such as anxiety and depression [55]. A summary recommendation suggested the effectiveness of yoga in common mental disorders [56]. Online platforms can even deliver yoga as an intervention, and tele-yoga therapy appears feasible with minimum technology and the availability of good internet access in common mental disorders [57]. The trainer must be assessed for suitability and provided guidelines for achieving desired outcomes [57].

4.6.2 Yoga as an Implementation Strategy to Address Implementation Gap in Handling Mental Health Issues

Yoga has the potential to act as an implementation strategy for the population at a global level, especially in lower- and middle-income countries, to address mental health issues related to older adults. The global size of yoga as an industry is around \$37.46 billion, more than half of the size of the mobile industry across the world, indicating its popularity and cultural acceptance. Standard yoga protocols (1-hour video) can be put up in the “yoga rooms,” which can help people do yoga at ease or at their convenience in community health centers, city parks, towns, community halls, etc. Older adults could do yoga in the morning/evening or whenever they want or are free/at ease.

5. Conclusions

Though exact number is hard to estimate but there are about 300 million yoga practitioners in the world at present, about half of them from India and one in 3rd Indian accepts doing yoga. *Hatha yoga* [52], a psychology-based treatment for common mental disorders, has been proposed.

Yoga and mental health represent an opportunity of a crossroad of dialogue between ancient wisdom and modern psychology/psychiatry-based practices [53].

Yoga therapy has been tried even when the scientific explanation of symptoms does not exist [54] (e.g. Psychosomatic symptoms) and yoga has been found to complement cognitive behavioral therapy for common mental disorders [55, 58].

Considering the staggering number of elderly in developing countries like India (10.11% population of >60 years of age and a projection of rise of the same by 300% in 2050) and China and about 20.5% mental health morbidity in older adults from India, low cost non-pharmacological options must be explored for implementation to address mental health issues among older adults.

Yoga appears to be a feasible, acceptable, non-pharmacological, low-cost intervention that has the potential to improve both physical and mental well-being and can help reduce the large treatment gap for mental disorders in low-, middle- or higher-income countries. Considering the recent surge in the popularity of yoga worldwide, this low-cost, culturally accepted intervention with an impact on physical and mental health could be recommended to individuals at large to improve or maintain better mental health for geriatric patients.

6. Future Directions

There have been initiatives [59-69] regarding including yoga in medical doctors' (MBBS curriculum), acknowledging the importance of discipline [59]. The same has been proposed for dental, nursing, and paramedicals [60]. This appears due to published papers involving yoga and medical students [61], where yoga has been shown to reduce stress. Currently, yoga is sprouting worldwide, including in China [62, 63] where about 10 million people practice yoga regularly. Randomized control trials have suggested that yoga like/associated interventions e.g. *pranayama* [64]/*jyoti Trataka* [65]/*ocular exercises* [66] in addressing tinnitus, and open angle/high tension [67] glaucoma, post-orgasmic syndrome [68] and autonomic functions [69] respectively. Advocacy for integration of alternative system of medicine in the mainstream healthcare has been done [70] to meet the implementation gap [71] among older adults.

Author Contributions

Vikas Dhikav conceptualized research question, framed search strategy, did search, written, edited and finalized the manuscript for final publication. **Prerna Bhati** did editorial corrections, did diagram and table making, and contributed to search strategy of the manuscript. **Mr Pankaj & Praveen Kumar Anand** did proof reading of manuscript.

Competing Interests

The authors have declared that no competing interests exist.

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