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Effect of yoga on acquired immunodeficiency syndrome (AIDS)

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Abstract

The most severe type of HIV infection is represented by the disease known as AIDS. AIDS is characterized by intractable immune deficit, rare malignant neoplasms, and opportunistic infections. The main objective of this study was to do a systematic review to examine the effects of yoga intervention on Acquired Immunodeficiency Syndrome (AIDS). Data was collected from PubMed and Web of Science. Randomized controlled trials published in English from the inception of the database until 31st October, 2025, were included. It may be concluded that one promising stress-reduction strategy is yoga. However, the restricted number of research limits the literature. To further assess the advantages of yoga, randomized controlled trials using objective metrics of HIV-related outcomes are required.

Keywords: Yoga, acquired, immunodeficiency, syndrome

Introduction

The challenges of living with a complicated and highly stigmatized health condition lead to significant rates of psychological stress among people living with HIV/AIDS (PLWHA). The prevalence of depression among PLWHA is estimated to be as high as 42%, which is two to four times higher than in non-HIV samples ^[1]. It has been discovered that long-term stress and depression symptoms impair immunological function, which could hasten the course of HIV disease ^[2, 3]. In addition, anxiety and depression have a detrimental effect on PLWHA's quality of life (QOL) and lead to poor drug adherence ^[4]. It is not unexpected that PLWHA had higher prevalence rates of stress, anxiety, and depression given the stigma and chronicity of HIV medication. PLWHA are more likely to experience chronic pain and sleep difficulties in addition to mental health comorbidities ^[5]. According to recent meta-analyses, over 58% of participants had sleep issues, while the prevalence of chronic pain varies between 55 and 67% among research ^[6]. Understanding the body of research supporting current non-pharmacological approaches is crucial, especially in light of the growing interest in non-pharmacological treatment alternatives for mental and behavioural health issues ^[7]. Interventions based on mindfulness are also successful in lowering distress and enhancing mental health ^[8, 9]. Additionally, meta-analytic assessments of stress-management programs for PLWHA revealed benefits in tiredness, general quality of life, and a number of psychological categories (such as sadness, anxiety, and distress) ^[10]. The meta-analysis's authors documented the results of a number of therapies, such as tai chi, massage, aerobic exercise, and relaxation techniques ^[11, 12]. The three most popular types of yoga are Sudarshan Kriya, Iyengar yoga, and Hatha yoga. Although the majority of Hatha yoga practices in western culture generally incorporate breathing and meditation, the majority of Hatha yoga practices usually concentrate on postures and physical motions ^[13]. The main components of Iyengar yoga, a Hatha style, are exact alignment of certain postures and breathing exercises ^[14, 15]. Props are typically used to facilitate practice for practitioners with different levels of yoga experience or physical capabilities. Iyengar yoga has been shown to enhance mood-related factors, such as anger, anxiety, and despair, as well as pain-related outcomes ^[16, 17, 18]. Numerous breathing techniques are incorporated into Sudarshan Kriya yoga (SKY), a type of breathing yoga ^[19].

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SKY has been shown to enhance general wellbeing and lessen symptoms of anxiety, sadness, sleeplessness, and distress^[20, 21]. Regardless of the style or form of yoga, a recent review of randomized controlled trials comparing yoga interventions to non-yoga control conditions found that yoga improves mental health outcomes^[22]. However, the authors also noted that the meditative aspect of yoga seems to be especially helpful for psychological wellbeing. Despite yoga's growing popularity in clinical settings, little is known about how it affects PLWHA. Although PLWHA seem to be particularly interested in mind-body practices (like yoga), little is known about the possible advantages of these practices for this demographic. Studies on PLWHA have mostly been left out of previous reviews and meta-analyses looking at the advantages of yoga. The current systematic review and meta-analysis looked at the growing corpus of research evaluating the effectiveness of yoga as an intervention for PLWHA in order to fill this vacuum in the literature. With regard to stress processes, psychological and behavior. Despite yoga's growing popularity in clinical settings, little is known about how it affects PLWHA. Although PLWHA^[23] seem to be particularly interested in mind-body practices (like yoga), little is known about the possible advantages of these practices for this demographic. Studies on PLWHA have mostly been left out of previous reviews and meta-analyses looking at the advantages of yoga.

Aim of the study

The current systematic review and meta-analysis looked at the growing corpus of research evaluating the effectiveness of yoga as an intervention for PLWHA in order to fill this vacuum in the literature. With regard to stress processes, psychological and behavioural health, general quality of life, and biomarkers of HIV disease progression, specifically sought to ascertain whether yoga therapies would enhance these outcomes. Oral health, general quality of life, and biomarkers of HIV disease progression, specifically sought to ascertain whether yoga therapies would enhance these outcomes and also mechanism behind it.

Methods

A systematic literature search was conducted in PubMed, Web of Science, and J-Store with no data restrictions, up to 21st October, 2025. Yoga training intervention studies were included. In total, data from 209 papers and 8 research articles were included for the synthesis of this review regarding measures of Acquired Immunodeficiency Syndrome (AIDS). This methodological approach guarantees a thorough yet adaptable study appropriate for collecting the wide range of information on yoga and acquired immunodeficiency syndrome (AIDS), although not exactly following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses criteria. The inclusion criteria; non-randomized research, commentaries, and those without main data or pertinent outcomes were not included. In order to illustrate yoga's influence on acquired immunodeficiency syndrome (AIDS), the researcher narratively aggregated data on study design, sample size, interventions, and outcomes. Studies that assessed a yoga intervention among PLWHA, contained a control condition, measured physiological stress markers, psychological stress, or illness progression biomarkers, and supplied the statistics required to compute effect sizes were included. Excluded studies were those that sampled children or adolescents (M age <18 years); did not provide enough information to compute effect sizes; or sampled people who were not HIV positive (or presented results in a manner that

prevented us from distinguishing outcomes according to HIV status).

Result and Discussion

After eliminating duplicate data, search produced 209 unique records. To make sure all available studies were located, the reference sections of review articles or comments were examined. Nine studies satisfied the initial inclusion requirements, but one was disqualified for using three active conditions (i.e., three yoga interventions) in place of a control condition^[24]. There were eight records left, comprising one published conference abstract^[31], seven full-text articles^[25, 26, 27, 28, 29, 30], and one. One of the major studies had further information in a supplemental paper^[32]. Hatha, Sudarshan Kriya, Iyengar, Ashtanga Vinyasa, and integrative practices were among the various forms of yoga. The most popular elements of the intervention were Dhyana (meditation), Asanas (postures), and Pranayama (breathing exercises). In order to enhance the yoga program, three therapies added other elements (such as spiritual chanting and social support). Yoga practice at home was promoted by three interventions. There were, on average, 35 yoga sessions available (SD = 27), with each session lasting between 60 and 90 minutes (M = 66, SD = 13). Participants' yoga practice duration ranged from 16 to 91 hours (M = 40, SD = 31), according to the studies that provided data to estimate the intervention dose (k = 5). The data supporting the use of yoga as an intervention for people living with HIV was reviewed in this review and meta-analysis. Numerous health concerns, such as psychological stress, chronic pain, and cardiovascular risk reduction, have been researched in relation to yoga as a complementary treatment strategy^[34]. Fewer research, nevertheless, have looked into yoga intervention in relation to HIV. Actually, only seven empirical studies that provided a yoga intervention program and evaluated its effectiveness by comparing results to a control group were found throughout our search. The meta-analysis's findings offer preliminary evidence in favour of yoga as a PLWHA intervention, especially when it comes to psychological and stress-related outcomes. PLWHA who took part in a yoga program reported feeling less stressed, having less symptoms of anxiety, and having better positive affect. Since increases in positive affect have been shown to be protective against stress and depression, they are especially significant^[35]. Furthermore, because it promotes healthy behaviours like social interaction and physical activity and leads to better sleep, positive affect is associated with physical health^[35]. Stress has also been linked to physical health issues, such as weakened immune systems and faster HIV disease development^[36]. Yoga may be especially helpful for people living with HIV because of the findings of decreased anxiety. Anxiety has been linked in previous research to poor adherence to antiretroviral therapy^[37]. When compared to baseline, the current study's within-group effects indicate that yoga practitioners experienced lower levels of depression and better quality of life just after completing yoga programs. On the other hand, controls' within-group effects showed no gains in any outcome following the intervention. Although further between-group designs are required, the distinct within-subject benefits for yoga groups in depression and QOL offer preliminary evidence that yoga may help these additional outcomes. A longer follow-up period might have produced discernible group effects on QOL and depressed symptoms. This theory is especially pertinent to QOL, which may necessitate long-term shifts in affect and mood before more general elements change. The short follow-up period may

have contributed to the meta-analysis's failure to demonstrate a meaningful impact of yoga on CD4+ and other indicators of disease progression. PLWHA may be more likely to practice health-promoting habits including taking their medications as prescribed, eating a balanced diet, and exercising if yoga helps them deal with stress and psychological problems. Additionally, only a small number of research evaluated yoga's impact on physiological stress markers, making it impossible to include them in the current meta-analysis. The most significant disadvantage of this meta-analysis is the small number of studies assessing a yoga program in PLWHA. This problem is further worsened by the fact that the results reported in different studies are not consistent. This resulted in the limitation of several between-group effect size calculations to two studies. The inability to measure HIV-related consequences objectively is another limitation. The paucity of papers reporting these results may have limited capacity to identify more consistent changes in biological variables and stress processes. Furthermore, it's possible that the included studies were underpowered to identify meaningful between-group variations because they were primarily pilot trials with small sample numbers. The fact that this meta-analysis only looked at one post-intervention evaluation is another drawback. Researcher was unable to evaluate the long-term effects of yoga since there were so few research that used numerous follow-up time periods. Finally, there was little control over the time and attention given to participants in the active treatment groups because the control conditions were either evaluation only or treatment as usual. However, these trials offer encouraging preliminary data indicating that yoga regimens for PLWHA are feasible.

Conclusions

Researcher hypothesize that yoga may help PLWHA with their psychological and stress-related outcomes based on the current review and meta-analysis. But more research with a strict approach is required. A randomized controlled design with an attention control should be used in future research. Participants (and assessors) should be as blinded as feasible to the relevant research hypotheses and results. Additionally, assessors ought to be blind to the participants allocated conditions. Utilizing technology-assisted assessment techniques, like computer- or tablet-administered tests, would be one way to lessen the possibility of bias brought on by assessors being aware of participants' intervention conditions. In order to identify changes in immune function and viral load, future research should continue to gather objective data (such as CD4+), when resources allow, and employ validated measures of subjective stress, emotional states, sadness, anxiety, and quality of life. To identify changes in immune function and to demonstrate long-lasting coping and psychological benefits, longitudinal designs evaluating 12 or 18 months after the intervention may be necessary. "Booster" or "refresher" sessions might be required to encourage long-lasting therapeutic benefit, in line with other intervention research. All things considered, the literature's data points to yoga as a viable complementary medicine strategy for PLWHA and shows that it is effective in enhancing psychological results. These results and suggestions for further study on yoga for PLWHA are highlighted in this review and meta-analysis.

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