Addiction & Health

https://ahj.kmu.ac.ir
10.34172/ahj.1721
AHJ. 2025;17:1721

Original Article

Effects of a Yoga Intervention on Helplessness and Blood Pressure Among Adult Males with Chronic Alcohol Addiction

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Abstract

Background: Alcohol use disorder (AUD) is associated with psychological distress, particularly helplessness, and elevated blood pressure. Yoga as a complementary intervention lacks robust evidence in Indian clinical settings.

Methods: This single-arm, non-randomized pretest–posttest study enrolled 34 adult males (age 21–40) with DSM-5 alcohol dependence at a government-supported de-addiction center in India. Twenty-eight completed a six-week group-based Hatha yoga intervention (five sessions/week, instructor-led; 70% asana, 20% pranayama, 10% meditation; ≥85% attendance required). The primary outcome was self-reported helplessness measured by the Self-Managerial Helplessness Scale (HS-MGBR; 0–100, higher scores = greater helplessness). Secondary outcomes included systolic and diastolic blood pressure (measured with a manual sphygmomanometer, non-dominant arm). Paired-samples *t*-tests quantified mean pre–post changes, with analyses exploratory and no multiplicity adjustment.

Findings: Mean Helplessness Scale (HS-MGBR) scores declined from 81.2 (SD = 7.8) to 75.4 (SD = 7.2) [$t(27) = 4.93$, $P < .0000368$]. Systolic blood pressure reduced from 133.2 (SD = 6.4) mmHg to 126.4 (SD = 6.7) mmHg [$t(27) = 6.28$, $P < .00000102$], and diastolic from 86.7 (SD = 4.6) mmHg to 81.2 (SD = 4.4) mmHg [$t(27) = 7.02$, $P < .000000151$], using paired t-tests. No serious intervention-related adverse events occurred.

Conclusion: The Six-week structured yoga program was associated with moderate, significant reductions in both helplessness and blood pressure among men with alcohol dependence in residential care. Yoga shows promise as a feasible adjunct to addiction treatment. Controlled studies are warranted to confirm effects.

Keywords: Yoga, Alcoholism, Blood pressure, Substance-related disorders

Citation: Sharma N, Krishna NR, Barnwal SL. Effects of a Yoga Intervention on Helplessness and Blood Pressure Among Adult Males with Chronic Alcohol Addiction. *Addict Health*. 2025;17:1721. doi:10.34172/ahj.1721

Received: July 26, 2025, **Revised:** September 21, 2025, **Accepted:** November 29, 2025 **ePublished:** December 16, 2025

Introduction

Background and Treatment Context

Alcohol use disorder (AUD) is a significant public health concern globally and particularly in India, where over 10 million individuals meet formal criteria for alcohol dependence.[1,2] AUD is strongly associated with elevated risks for hypertension, depression, and anxiety.[3,4] The 2019 National Mental Health Survey highlighted that nearly 80% of affected persons cannot access adequate interventions,[5] with the burden particularly acute among Indian men.[1]

Beyond physiological impairments, AUD is consistently linked to helplessness, a construct encompassing perceived lack of control, diminished self-efficacy, and emotional exhaustion.[6,7] Helplessness predicts reduced motivation for recovery, poor treatment adherence, and increased relapse risk.[8,9] Among Indian men with AUD, these effects may be magnified by financial stress, stigma, and poor access to mental health care. Furthermore, negative mood states often intersect with hypertension, which is frequently comorbid with AUD.[3,10] Current evidence implicates chronic autonomic dysregulation and increased sympathetic tone as key factors underlying persistently elevated blood pressure in alcohol dependence.[11]

Standard treatment modalities in India include pharmacotherapy and psychosocial counseling,[12,13] yet these approaches show limited effectiveness, with initial dropout rates of 61.3% within one month[14] and relapse rates ranging from 3.4% to 90% over 1–36 months.[15] Two major limitations are increasingly recognized: insufficient integration of medical management for comorbidities like hypertension,[10] and infrequent targeting of psychological

constructs despite mounting evidence of their critical role in recovery.[8] This has spurred growing interest in complementary approaches—particularly yoga—as adjuncts to standard AUD therapies.[16]

Evidence and Knowledge Gaps

Yoga, a traditional Indian system combining physical postures, breathwork, and meditation, is increasingly recognized for dual psychological and physiological benefits in chronic disease populations.[16,17] Systematic reviews and meta-analyses demonstrate that yoga interventions can reduce sympathetic arousal, improve cardiovascular function, and lower blood pressure with effect sizes comparable to aerobic exercise.[18] A recent multicenter Indian randomized controlled trial has demonstrated clinically meaningful reductions in both blood pressure and psychological distress among patients with comorbid AUD and hypertension.[18]

On the psychological front, yoga and mind-body practices are associated with significant reductions in anxiety, depression, and perceived stress, constructs closely related to helplessness.[19,20] Recent Indian studies have documented improvements in mental well-being and quality of life following yoga interventions in de-addiction settings.[21,22]

Despite promising findings, important knowledge gaps remain. First, most interventional research on yoga for substance use disorders has been conducted in Western contexts, with limited applicability to Indian settings.[16,22] Second, although the burden of comorbid hypertension and mood disturbance among Indian adults with AUD is well documented,[3,23] few studies have systematically measured both physiological and psychological outcomes in the same cohort. Moreover, few Indian studies have employed robust randomized designs or adhered to transparent reporting guidelines.[22] As a result, there remains a lack of high-quality, context-relevant data to guide the implementation of yoga-based interventions in Indian addiction care pathways.

Study Aim

To address these deficiencies, the present study evaluated the effects of a structured, six-week yoga intervention on the primary outcome, self-reported helplessness (HS-MGBR score), the secondary outcome, and clinically measured blood pressure, in adult males with chronic alcohol dependence attending a residential rehabilitation center in India. We hypothesized that participation in a group-based yoga program would be associated with significant reductions in both helplessness and blood pressure. The study methodology was developed to integrate validated measures and conform to international reporting standards, contributing high-quality evidence to inform practice and research on holistic strategies for managing AUD and related comorbidities in India.

Methods

Study Design, Setting, and Recruitment

This single-group pretest–posttest study was conducted from February 1 to mid-March 2023 at a government-supported residential de-addiction center in Bhopal, India. Consecutive sampling was used. A total of 50 potential participants were screened from center records and interviewed to confirm AUD diagnosis, Hindi literacy, and physical readiness for yoga; 10 were excluded due to major psychiatric or medical comorbidities, and 6 declined due to the lack of interest, resulting in 34 participants enrolled with written informed consent. Ethical approval was obtained from the Institutional Ethics Committee of Lakshmibai National Institute of Physical Education, Gwalior. This study was not preregistered, as it was an exploratory pilot conducted within a real-world clinical setting with limited resources; the protocol is available upon request from the corresponding author.

Participants

Inclusion criteria required males aged 21–40 years, at least two weeks in the residential program, no regular yoga practice in the past six months, and sufficient Hindi literacy to complete study forms. Exclusion criteria included major psychiatric or medical comorbidities, dependence on substances other than nicotine, severe withdrawal requiring acute management, physical limitations to yoga, or advanced prior yoga experience. Of the 34 enrolled participants, six discontinued before post-testing (health complications n = 2; low motivation n = 3; personal reasons n = 1), leaving 28 completers. Participant flow is detailed in Figure 1, a CONSORT-style diagram.

Intervention

A certified instructor delivered Hatha yoga sessions five days per week for six weeks in a dedicated, well-ventilated hall. Session length progressed from 30 minutes in

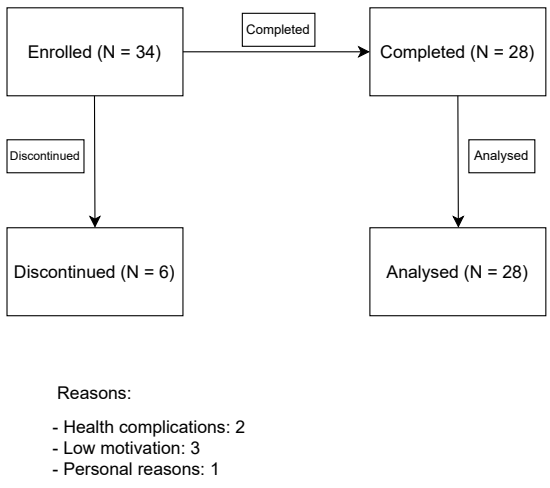

Figure 1. CONSORT-style flow diagram of participant progression through the study
(N = 34 enrolled, N = 28 analyzed)

weeks 1–2, to 40 minutes in weeks 3–4, to 50 minutes in weeks 5–6, with each session comprising roughly 70% asana (postures), 20% pranayama (breathwork), and 10% meditation. Adherence was defined as attending at least 85% of sessions ($\geq$26 of 30). The asana component included specific poses such as Tadasana (Mountain Pose), Vrikshasana (Tree Pose), Uttanasana (Forward Bend), Bhujangasana (Cobra Pose), Balasana (Child's Pose), Adho Mukha Svanasana (Downward-Facing Dog), and Shavasana (Corpse Pose), and others were progressively introduced based on the participant's ability. Pranayama techniques included Anulom Vilom (Alternate Nostril Breathing), Kapalabhati (Skull Shining Breath), and Bhramari (Bee Breath). A detailed session plan is available from the corresponding author.

Assessments

Pre- and post-intervention assessments (within three days of completion) were conducted by staff blinded to attendance. To ensure assessor blinding, assessment staff were not involved in intervention delivery or attendance tracking and received no information about participants' session participation. Blinding was maintained by assigning assessments to a separate team, with data collection forms omitting attendance details, verified by a blinded supervisor. Fidelity monitoring was implemented through weekly reviews of session logs by a senior instructor, ensuring adherence to the planned structure (70% asana, 20% pranayama, 10% meditation) and technique accuracy. 10% of sessions were randomly observed by an independent assessor to verify consistency, with no major deviations reported. Given the single-arm, non-randomized design, participant and instructor blinding were not feasible; participants were aware of their intervention participation, and the instructor delivered the sessions, precluding blinding of either group.

Helplessness

The Helplessness Scale (HS-MGBR; Mathur & Bhatnagar, 2012) was used to assess perceived helplessness. This 22-item, self-report scale is validated for Hindi-literate populations aged 14 years and older. Scores range from 0 (no helplessness) to 100 (maximum helplessness). The scale demonstrates good test–retest reliability ($r = 0.77$–0.83 for males; $r = 0.75$–0.80 for females) and acceptable concurrent validity ($r = 0.76$–0.81).

Blood Pressure

Systolic and diastolic blood pressure (SBP and DBP) were measured twice per assessment using a calibrated (January 2023) manual sphygmomanometer on the non-dominant arm, with participants seated and at rest for at least five minutes. The sphygmomanometer was calibrated against a mercury standard before the study and rechecked monthly to maintain accuracy within ± 2 mmHg. Measurements were performed by a blinded nurse trained in standardized blood pressure measurement techniques, with the two readings averaged for each time point.

Baseline covariates collected included age, marital status, and duration of alcohol use. Double data entry and standardized protocols ensured data accuracy.

Analysis and Ethics

This pilot study lacked an a priori power calculation, with the sample size (34 enrolled, 28 analyzed) determined by feasibility based on available participants from February 1 to mid-March 2023. The unit of assignment and analysis was explicitly the individual participant. The study was not preregistered due to its pilot nature and resource limits; the protocol is available upon request from the corresponding author or ethics committee. Participant confidentiality and ethical standards were maintained.

All analyses used Jamovi 2.4, with normality assessed by Shapiro–Wilk tests and Q–Q plots, confirming normality of difference scores ($p > 0.05$). Pre–post changes employed paired t-tests for helplessness (HS-MGBR score) and blood pressure measures, as the primary and secondary outcomes, respectively, based on this normality, with Wilcoxon signed-rank tests planned as an alternative for non-normal data; Cohen's d was reported for effect sizes. No subgroup or ancillary analyses were conducted, as the study focused on overall pre-post changes in the primary and secondary outcomes. Analyses were exploratory, with no multiplicity adjustment or subgroup analyses. All 28 completers were analyzed, with no missing data reported. The complete-case approach was justified by the low attrition rate (18%) and the assumption of missing at random for the 6 dropouts, supported by the pilot's small sample size and lack of interim data, precluding sensitivity analyses. The group-delivered intervention could introduce clustering, but this was not adjusted for due to the small cohort (34, reduced to 28) and the feasibility focus. Future studies may consider cluster adjustments. Statistical significance was set at $p < 0.05$ (two-tailed). No adverse events occurred.

Results

Participant Characteristics

A total of 34 adult males with chronic alcohol dependence were enrolled in the study. Six participants discontinued before final assessment (health complications $n = 2$; low motivation $n = 3$; personal reasons $n = 1$), leaving 28 who completed the full six-week intervention and pre-/post-measurements. Baseline demographic characteristics are reported for the 28 completers in Table 1. Baseline data for the 6 dropouts were not fully collected due to early departure, limiting comparison; however, screening data indicate their mean age was approximately 30.2 years ($SD = 4.8$, range: 22–39), similar to completers, though other variables (e.g., HS-MGBR, blood pressure, duration

Table 1. Demographic and Baseline Characteristics (N = 28)

Variable	Mean ± SD or n (%)
Age (years)	29.6 ± 5.3
Marital Status	
Single	10 (35.7%)
Married	15 (53.6%)
Divorced	3 (10.7%)
Duration Alcohol Use (years)	8.1 ± 2.6
Education	
Secondary	8 (28.6%)
Higher Secondary	14 (50.0%)
Graduate	6 (21.4%)

Note: Characteristics are reported for the 28 completers only.

of alcohol use) were not recorded for dropouts.

Primary Outcomes

Helplessness

The primary outcome, mean helplessness scores (HS-MGBR) significantly decreased from 81.2 ± 7.8 at baseline to 75.4 ± 7.2 post-intervention. The mean pre-post change was -5.8 points (95% CI: -7.8 to -3.8), $t(27) = 4.93$, < 0.0000368, with a large effect size (Cohen's $d = 0.86$ [0.47, 1.23]), as shown in Table 2. Paired t-tests were chosen based on the Shapiro-Wilk test, confirming normality of the helplessness score differences ($P > 0.05$).

Secondary Outcomes

Blood Pressure

The secondary outcome, systolic blood pressure decreased from 133.2 ± 6.4 mmHg at baseline to 126.4 ± 6.7 mmHg post-intervention ($P < 0.00000102$, $P < 0.00000102$, Cohen's $d = 1.07$ [0.66, 1.47]). Diastolic pressure decreased from 86.7 ± 4.6 mmHg to 81.2 ± 4.4 mmHg ($t(27) = 7.02$, $P < 0.000000151$, Cohen's $d = 1.20$ [0.78, 1.62]), detailed in Table 3. Paired t-tests were selected following confirmation of normality in blood pressure difference scores via the Shapiro-Wilk test ($P > 0.05$), as the sample size (N = 28) supported this parametric approach over non-parametric alternatives.

Adherence and Safety

The analytic sample comprised the 28 participants achieving the ≥ 85% session attendance cutoff. Of the 34 enrolled, six discontinued (health complications n = 2; low motivation n = 3; personal reasons n = 1), and adherence was confirmed by daily attendance registers. Adverse events (AEs) were solicited through daily attendance registers, where participants reported any discomfort, and weekly check-ins with the instructor to assess health status; AEs were defined as any new or worsening physical symptoms (e.g., muscle soreness, pain) related to the intervention. No serious adverse events or protocol violations were reported. Mild, transient muscle soreness was noted by three participants during week one, resolving without intervention; no medical consultations were required for these or the two discontinuation-related health complications.

Table 2. Helplessness Scores Pre- and Post-Intervention (N = 28)

Timepoint	Mean ± SD	Range	Mean Change [95% CI]
Pre-Intervention	81.2 ± 7.8	62–94	
Post-Intervention	75.4 ± 7.2	58–88	-5.8 [-7.8,-3.8]

Note: Data reflect the 28 completer-only participants.

Table 3. Systolic and Diastolic Blood Pressure Pre- and Post-Intervention (N = 28)

Variable	Pre (Mean ± SD)	Post (Mean ± SD)	Mean Change [95% CI]
Systolic BP (mmHg)	133.2 ± 6.4	126.4 ± 6.7	-6.8 [-8.9,-4.7]
Diastolic BP (mmHg)	86.7 ± 4.6	81.2 ± 4.4	-5.5 [-7.2,-3.7]

Note: Data reflect the 28 completer-only participants.

Discussion

The present study found that a six-week group-based Hatha yoga intervention was linked with improvements in the primary outcome, helplessness (HS-MGBR score), and secondary outcome, blood pressure, among men in residential treatment for alcohol dependence in Bhopal, India. These findings align with international evidence showing that mind–body interventions, including yoga and mindfulness, can reduce psychological distress, craving, and relapse rates among people with alcohol use disorder.[24,25] Similar benefits have been observed in the Indian context, with studies reporting psychological improvements, quality of life, and reductions in relapse when yoga is integrated into standard alcohol dependence therapy.[22,26] Furthermore, although most prior research focused on psychological endpoints, reductions in blood pressure in our study support a more holistic assessment of intervention effects, as alcohol dependence is a risk factor for psychological distress and cardiovascular morbidity.[27]

The reduction in helplessness observed in our participants following the yoga intervention is clinically meaningful, as psychological distress and perceived lack of control are known barriers to sustained recovery from alcohol dependence.[8,28] Our findings are consistent with the international reports that mindfulness-based interventions, including yoga, can enhance self-efficacy, emotional regulation, and overall quality of life among individuals in recovery from substance use disorders[29,30]. Notably, similar improvements in psychological well-being and quality of life have also been reported in Indian cohorts when yoga is integrated into standard alcohol dependence treatment.[31] The observed reductions in both systolic and diastolic blood pressure, although modest, are also of potential clinical significance. Recent cohort

studies have demonstrated that individuals with alcohol dependence remain at elevated risk for cardiovascular complications even after abstinence.[27] Our findings, therefore, reinforce the notion that interventions for alcohol dependence must address both psychological and physiological aspects of health.

These findings suggest that yoga could be a valuable addition to standard de-addiction care in India, particularly in settings where access to specialized mental health and cardiovascular services is limited[32]. Evidence from international randomized controlled trials supports the feasibility and acceptability of mind–body interventions, such as yoga, as adjuncts to conventional addiction treatment, with benefits for both psychological and physical health outcomes.[33] Similar positive experiences have been documented in Indian studies, where integration of yoga and meditation into alcohol dependence rehabilitation was associated not only with reductions in distress and craving but also with meaningful improvements in overall quality of life[34]. Given the chronic, relapsing nature of alcohol dependence, interventions that build recovery capital—including skills, social support, and holistic health—are recognized as crucial for sustained recovery.[8] Yogic practices are particularly well-suited to this goal, as they are relatively low-cost, easily scalable, and can be delivered by trained professionals even in low-resource, community-based, or residential settings. Our findings, together with this growing evidence base, provide a strong rationale for policy-makers and clinicians to consider integrating structured yoga programs into routine care for individuals recovering from alcohol dependence in India and other resource-limited regions.

Our study has several strengths, including a real-world, residential setting and the use of validated outcome measures. However, several limitations must be recognized. The single-arm design, lacking a randomized control group, limits internal validity by preventing direct attribution of observed improvements in helplessness and blood pressure to the yoga intervention, likely overestimating effects due to potential confounding factors such as natural recovery or placebo effects common in addiction settings.[35] Additionally, the complete-case approach, analyzing only the 28 completers out of 34 enrolled (17.6% attrition, including two due to health complications, three due to low motivation, and one due to personal reasons), may bias results, with the remaining participants potentially being more motivated or healthier, suggesting a probable positive bias in the reported intervention benefits. Self-selection bias may have influenced our results, as participants who volunteered for yoga may have had different baseline characteristics or higher motivation, an issue that has also been noted in the international trials of complementary therapies for addiction.[36] Our sample was restricted to male participants attending a single center, reflecting a common limitation in addiction research from India but potentially limiting generalizability to women and non-residential settings. Scaling up this intervention would require trained instructors with expertise in Hatha yoga and addiction support, as well as dedicated facilities with sufficient space for group sessions, which may pose challenges in resource-limited settings. Outpatient settings might differ, potentially reducing adherence due to less structured environments and competing daily demands compared to the residential context. Finally, the lack of long-term follow-up, while typical of initial feasibility studies, underscores the need for future research to assess the durability of intervention effects, a priority has been highlighted in recent methodological guidelines for behavioral interventions in addiction.[8]

Future research should employ rigorous randomized controlled designs with active and passive control groups to isolate the specific effects of yoga from other influences.[22] Broader sampling strategies, including women and outpatient populations, would enhance generalizability, and extended follow-up periods are needed to clarify the sustainability of benefits. Mechanistic studies could also investigate the pathways by which yoga influences neurobiological and cardiovascular outcomes in alcohol dependence.[28] Given the chronic and relapsing nature of the disorder, research is also needed on how integrated, holistic interventions might enhance recovery capital and long-term quality of life in diverse populations.[8]

Conclusion

The significant reduction in helplessness scores suggests that yoga may enhance participants' sense of control and self-efficacy, potentially reducing barriers to recovery and relapse risk. The improvements in blood pressure are noteworthy, given the high burden of hypertension among chronic alcohol users.[4] These physiological benefits may be mediated by yoga's effects on autonomic regulation and stress reactivity.[11]

Acknowledgements

We would like to express our gratitude to the university's Ethics Committee and the study participants.

Authors' Contribution

Conceptualization: Nikhil Sharma.
Data curation: Nikhil Sharma.
Formal analysis: Nikhil Sharma and Nibu R. Krishna.
Investigation: Nikhil Sharma and Nibu R. Krishna.
Methodology: Nikhil Sharma, Nibu R. Krishna, and Suresh Lal Barnwal.
Project administration: Nikhil Sharma and Suresh Lal Barnwal.
Resources: Suresh Lal Barnwal.
Software: Nikhil Sharma and Nibu R. Krishna.
Supervision: Nibu R. Krishna and Suresh Lal Barnwal.
Validation: Suresh Lal Barnwal.
Visualization: Nikhil Sharma and Nibu R. Krishna.

Writing–original draft: Nikhil Sharma.

Competing Interests
The authors declare that they have no conflicts of interest.

Data Availibility Statement
All data were collected prospectively at the de-addiction center in Bhopal, Madhya Pradesh, India. Participant confidentiality was maintained according to the institutional ethics standards. No personally identifiable information is disclosed. Due to ethical constraints and the sensitive nature of the participant data collected in a residential de-addiction setting, a de-identified dataset deposit in a public repository is not feasible, as it risks breaching participant confidentiality despite anonymization efforts, given the small sample size and specific demographic details. However, a data dictionary detailing variable, coding, and measurement methods is available upon request from the corresponding author. Access to the de-identified dataset can be requested from the corresponding author, subject to approval by the Institutional Ethics Committee of Lakshmibai National Institute of Physical Education, Gwalior, to ensure compliance with ethical guidelines and participant consent limitations. Interested parties should submit a research proposal outlining their intended use, which will be reviewed to safeguard participant privacy.

Ethical Approval
Registration number code: Academic/PhD/460/1088.

Funding
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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