

The Impact of Yoga Intervention on Liver Health in Individuals with Alcohol Addiction: A Pre-post Intervention Study



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RESUMEN

Introducción: la adicción al alcohol es un problema de salud pública asociado con múltiples efectos adversos, incluida la disfunción hepática. Los tratamientos convencionales se centran en la abstinencia y en intervenciones psicológicas, pero terapias complementarias como el yoga han despertado interés por su potencial en la recuperación. **Objetivo:** este estudio investigó los efectos de una intervención estructurada de yoga sobre los niveles de SGPT, un marcador de función hepática, en personas con adicción al alcohol. **Método:** se utilizó un diseño pre-post intervención con asignación aleatoria a un grupo experimental ($n = 18$), que recibió una intervención de yoga, o a un grupo de control ($n = 15$), sin yoga. Los niveles de SGPT se midieron al inicio y tras cuatro semanas de intervención. Se realizó un análisis estadístico, incluido ANCOVA, para comparar los niveles de SGPT post-intervención entre los grupos, y se controlaron los valores iniciales. **Resultados:** el grupo experimental mostró una reducción significativa en los niveles de SGPT en comparación con el grupo de control. ANCOVA confirmó una diferencia estadísticamente significativa entre los grupos ($p = 0.035$), lo que indicó que el yoga tuvo un impacto positivo en la función hepática. **Discusión y conclusiones:** una intervención de yoga estructurada puede reducir significativamente los niveles de SGPT en personas con adicción al alcohol, lo cual sugiere su potencial como terapia complementaria para mejorar la salud hepática y apoyar la recuperación.

Palabras clave: adicción al alcohol, transaminasa glutámica pirúvica sérica, salud hepática, yoga, atención primaria de salud.

ABSTRACT

Introduction: alcohol addiction is a pervasive public health issue associated with various adverse health outcomes, including liver dysfunction. Conventional treatment approaches for alcohol addiction often focus on substance withdrawal and psychological interventions. However, there is growing interest in exploring complementary therapies, such as yoga, for their potential to enhance overall well-being and support addiction recovery. **Objective:** this study aimed to investigate the SGPT levels, a marker of liver function, in individuals with alcohol addiction. **Method:** a pre-post intervention design was employed, with participants randomly assigned to either an experimental group ($n = 18$) receiving a structured yoga intervention, or a control group ($n = 15$) not participating in yoga practices. SGPT levels were measured at baseline and after a four-week intervention period. Statistical analysis, including ANCOVA, was conducted to compare post-intervention SGPT levels between groups while controlling for baseline levels. **Results:** participants in the experimental group demonstrated a significant reduction in SGPT levels following the yoga intervention, compared to those in the control group. ANCOVA revealed a statistically significant difference in post-intervention SGPT levels between groups ($p = 0.035$), indicating the impact of yoga in improving liver health in individuals with alcohol addiction. **Discussion and conclusions:** the findings suggest that a structured yoga intervention may lead to a significant decrease in SGPT levels among individuals with alcohol addiction or alcohol abuse disorder. These results highlight the potential of yoga as a complementary therapy for promoting liver health and supporting addiction recovery efforts.

Keywords: alcohol addiction, serum glutamic pyruvic transaminase, liver health, yoga, primary health care.

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INTRODUCTION

Alcohol addiction is a major global public health concern, since it contributes to adverse health outcomes, including liver dysfunction. Among liver function tests, serum glutamic pyruvic transaminase (SGPT) serves as a key indicator of hepatocellular injury, with elevated levels commonly observed in individuals with alcohol addiction, reflecting ongoing liver damage, and inflammation (Cook, 1998; Han et al., 2020; Park et al., 2014; Teschke, 2018). Managing alcohol use disorder in individuals with coexisting liver disease presents significant therapeutic challenges, often requiring a multidisciplinary approach (Leggio & Lee, 2017).

While conventional treatments for alcohol addiction focus on substance withdrawal and psychological interventions, complementary therapies such as yoga have gained attention for their potential role in overall well-being and recovery. Yoga, an ancient mind-body practice, incorporates physical postures (asanas), breathing techniques (pranayama), and meditation (Balaji et al., 2012; Miller, 2024).

Its acceptability and feasibility among individuals in substance use disorder recovery have also been positively evaluated in recent studies (Gorvine et al., 2021; Petker et al., 2021). Beyond addiction, yoga has demonstrated therapeutic benefits across a range of primary care conditions, reinforcing its value in general health promotion (Hampton & Bartz, 2021). Research suggests that yoga can improve physiological parameters such as heart rate, blood pressure, and immune function (Field, 2016; Ross & Thomas, 2010), as well as reducing inflammation and stress-related disorders (Ross & Thomas, 2010; Moszeik et al., 2022). Additionally, Thorp et al. (2020) demonstrated that exercise training benefits patients with non-alcoholic fatty liver disease (NAFLD) by reducing hepatic inflammation, implying potential relevance for alcohol-related liver damage. Despite evidence supporting yoga's broad health benefits, the research that specifically examines its impact on liver function in alcohol addiction is limited. Understanding whether yoga can mitigate alcohol-induced liver damage could provide a novel, accessible adjunct to conventional treatment strategies. This study aims to address this gap by assessing changes in SGPT levels before and after a structured yoga intervention. If yoga is found to positively influence liver health, it could be integrated into addiction treatment programs as a non-invasive, cost-effective strategy to support liver function, reduce inflammation, and enhance overall recovery outcomes.

METHOD

Design

This study employs a pre-post intervention design with two groups: an experimental group receiving a structured yoga intervention and a control group without a yoga intervention.

Participants

33 male participants from a rehabilitation center of Madhya Pradesh, Bhopal, India were randomly assigned to either the experimental or control group. Inclusion criteria included individuals diagnosed with alcohol addiction, aged between 25 to 40 years, and willing to participate in the study. Exclusion criteria included the presence of severe medical conditions and the inability to commit to regular attendance for the duration of the study.

Procedure

SGPT levels were measured at baseline and after the four-week study period using reports obtained from participants by taking their blood samples. The yoga sessions were conducted in the morning, 5 days a week, and the duration was between 40 and 50 minutes per session (Figure 1).

Data Analysis

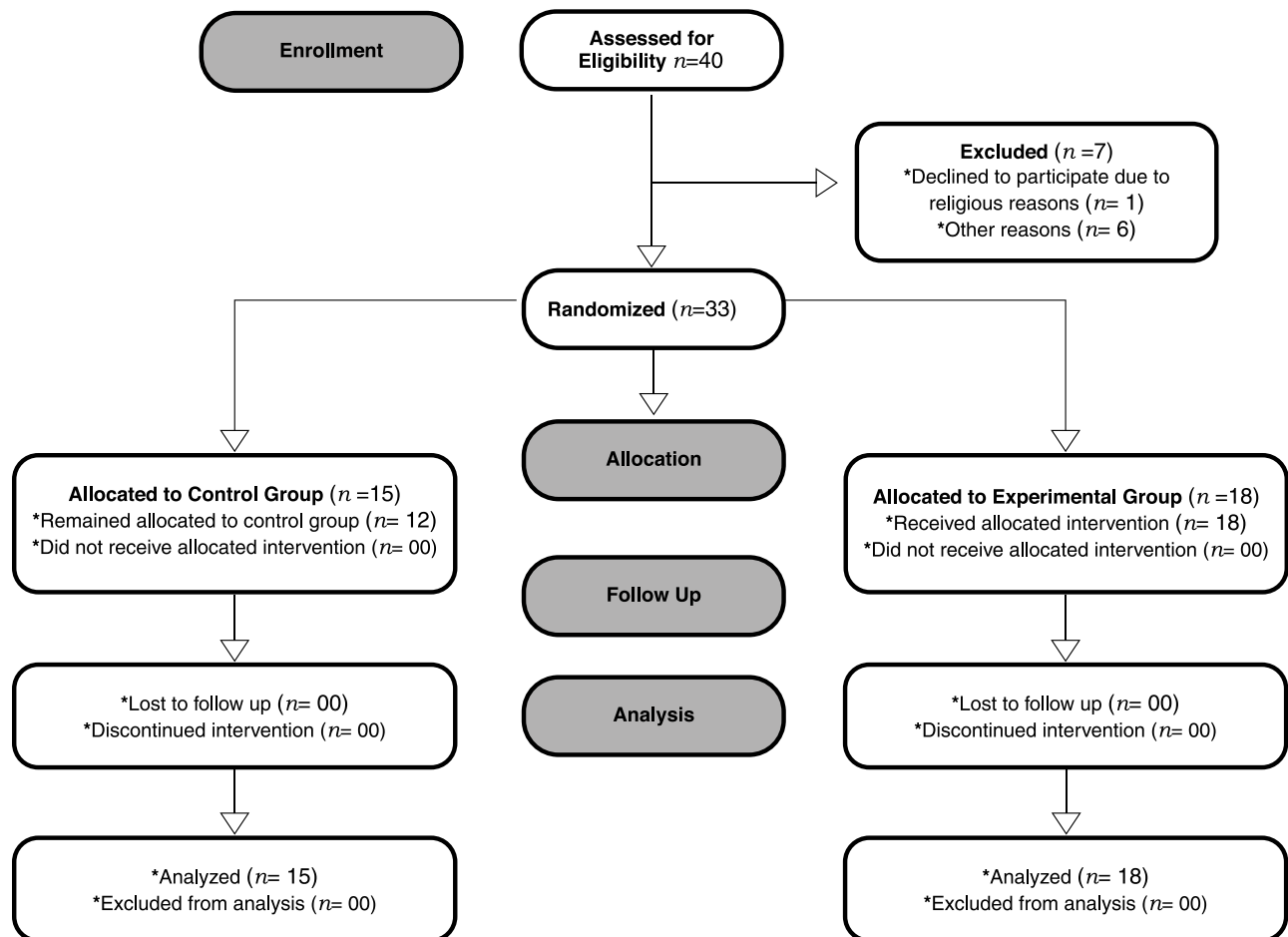
The primary analysis involved conducting an analysis of covariance (ANCOVA) to compare post-intervention SGPT levels between the experimental and control groups while controlling for baseline SGPT levels as a covariate. ANCOVA is employed in this study to adjust for baseline SGPT levels, ensuring that any differences observed post-intervention between the experimental and control groups are not due to initial variability. This method enhances the precision of our results by reducing error variance and increasing statistical power, allowing for a more accurate assessment of the yoga intervention's impact on SGPT levels.

Ethical Considerations

This study adhered to ethical principles like informed consent, ensuring confidentiality and privacy, and prioritizing beneficence and non-maleficence. Participation was voluntary with the right to

Figure 1

Consort Flow Diagram



withdraw, and the study received ethical approval from a committee, in this case from the Institution Ethics Committee of Lakshmibai National Institute of Physical Education in Gwalior, Madhya Pradesh, India [Foil number: IEC/LNIPE/128/16]. Approval from the participants was taken before considering them for the study. Confidentiality of participant data was maintained throughout the study.

RESULTS

Baseline Characteristics

Participants in the experimental group ($n = 18$) had a mean age of 33.5 years ($SD = 4.2$), while those in the control group ($n = 15$) had a mean age of 34.2 years ($SD = 3.8$). The duration of alcohol addiction ranged from 5 to 10 years in both groups.

Comparison of Baseline SGPT Levels

At baseline, the mean SGPT level was 40.22 U/L in the experimental group and 43.01 U/L in the control group.

Changes in SGPT Levels

Following the four-week intervention period, the mean SGPT level decreased to 35.40 U/L in the experimental group and 40.15 U/L in the control

Table 1
Descriptive Statistics

Group	Mean	Std. deviation	N
Treatment	35.4039	6.28777	18
Control	40.1507	7.00726	15
Total	37.5615	6.94597	33

Table 2
ANCOVA Results (Tests of Between-Subjects Effects)

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	1313.833 ^a	2	656.916	85.664	.000
Intercept	.130	1	.130	.017	.897
Pre	1129.481	1	1129.481	147.289	.000
Group	37.344	1	37.344	4.870	.035
Error	230.055	30	7.668		
Total	48102.513	33			
Corrected total	1543.888	32			

Note: ^a = R Squared = .851 (Adjusted R Squared = .841)

group. (Table 1)

Comparison of Post-Intervention SGPT Levels

As shown in Table 2, the effect of group assignment (experimental vs. control) was significant ($F = 4.870$, $p = 0.035$), suggesting that there was a significant difference in post-intervention SGPT levels between the experimental and control groups, after controlling for pre-intervention scores.

DISCUSSION AND CONCLUSIONS

The findings suggest that the structured yoga intervention led to a significant reduction in SGPT levels among individuals with alcohol addiction when compared to those who did not participate in yoga practices. These results support the potential impact of yoga as a complementary therapy for improving liver health in this population. If yoga is shown to consistently reduce liver enzyme levels, it could become an integral part of treatment protocols aimed at addressing alcohol-induced liver damage, potentially improving overall recovery outcomes in alcohol addiction treatment.

The reduction in SGPT levels observed in this study highlight yoga's potential to mitigate the liver damage associated with alcohol addiction. Given that liver dysfunction is a common and serious consequence of chronic alcohol use (Rehm et al., 2013; Substance Abuse and Mental Health Services Administration, 2019), incorporating yoga into addiction treatment programs could provide a non-invasive, cost-effective approach to support liver health and enhance recovery. Furthermore, the physiological benefits of yoga, such as stress reduction and improved immune function, may complement traditional therapies, making yoga a valuable addition

to holistic addiction management (Ross et al., 2012).

These findings could inform clinical practice by promoting yoga as a complementary therapy for liver health and addiction recovery.

The present study sought to assess the impact of a structured yoga intervention on SGPT levels in individuals with alcohol addiction. The results revealed a statistically significant reduction in SGPT levels among participants who underwent the yoga intervention compared to those in the control group.

This finding suggests that yoga may have a beneficial effect on liver health in individuals suffering from alcohol addiction, aligning with the growing body of literature that supports the hepatoprotective potential of mind-body practices.

The reduction in SGPT levels observed in the experimental group aligns with prior research that suggests that yoga can reduce inflammation and improve physiological markers associated with liver function (Teschke, 2018; Teschke, 2018). Specifically, Teschke, 2018 demonstrated that exercise training, which includes practices akin to yoga, can reduce liver inflammation and hepatic steatosis in NAFLD patients. Our findings extend this research by suggesting that similar benefits may apply to individuals with alcohol-induced liver damage. Moreover, Xu et al. (2014) emphasized the importance of exploring innovative and non-pharmacological approaches for managing alcoholic liver disease, which supports the rationale for integrating yoga as a complementary modality in treatment protocols.

Additionally, the significant decrease in SGPT levels supports the hypothesis that yoga may serve as a complementary therapeutic approach in addiction recovery, not only by aiding in stress reduction and emotional regulation (Khanna & Greeson, 2013) but also by directly improving physiological markers of liver health. The reduction in liver enzymes

seen here may be attributed to yoga's potential to enhance parasympathetic activity, reduce stress, and thereby decrease liver inflammation, as previously suggested by Field (2016) and other studies linking mind-body interventions to improved immune function. This is also supported by findings from Wolff et al. (2013), who demonstrated yoga's positive effects on physiological outcomes like blood pressure and quality of life, further validating its systemic health benefits in clinical settings.

The implications of these findings are considerable, and suggest that integrating yoga into conventional treatment programs for alcohol addiction could offer additional benefits by mitigating liver damage, a common consequence of prolonged alcohol use. The Sivapuram et al. (2020) citation is relevant because their study discusses the prevalence of alcohol use in India, which aligns with the context of alcohol addiction being a significant public health issue and reinforces the need for complementary therapies like yoga in managing addiction. However, the mechanisms by which yoga exerts these hepatoprotective effects remain unclear, warranting further investigation. Future research should explore the specific components of yoga that contribute to these outcomes, such as the role of asanas, pranayama, and meditation in reducing liver enzyme levels.

In conclusion, this study provides preliminary evidence that yoga may serve as an effective complementary therapy for improving liver health in individuals with alcohol addiction. These findings contribute to the broader discourse on the role of alternative therapies in addiction recovery, supporting the need for more comprehensive studies to fully elucidate the therapeutic potential of yoga in this context (Shahab et al., 2013).

Limitations of the Study

While the results are promising, the limitations must be acknowledged: a limited number of participants may affect the generalizability of the results. Future studies should aim for larger, more diverse samples to confirm these findings. Participants were recruited from a single location, which may limit the diversity in experiences and perspectives; thus, including individuals from varied geographical and cultural backgrounds could improve the generalizability of the results. The four-week intervention period may not fully capture the long-term effects of yoga on liver health. Longer studies are needed to assess whether the observed benefits are sustained over time.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

CONTRIBUTION AUTHORS

Nikhil Sharma: conceptualization, methodology, investigation, formal analysis, data curation, software, visualization, writing – original draft, project administration.

Nibu R. Krishna: supervision, writing – review & editing.

Suresh Lal Barnwal: supervision, writing – review & editing.

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