



Effect of Adjuvant Yoga Therapy on Craving in Patients of Alcohol Dependence Syndrome (ADS)

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Abstract:

Introduction: Alcohol consumption is widely gaining attention owing to its potential for addiction and health implications. There is a high pervasiveness of alcoholism in Pondicherry, Union Territory, India. Alcohol misuse leads to numerous social, economic, and health problems. Besides, motor vehicle accidents, dementia, depression, homicide, and suicide are alcohol use disorders. A significant block to recovery from alcoholism is substantial alcohol craving and its chronic relapsing nature. **Aim:** To study brief and daily adjuvant yoga therapy's effects on craving in patients undergoing an alcohol de-addiction program at de-addiction clinic, department of Psychiatry, Mahatma Gandhi Medical College & Research Institute (MGMC&RI) in Pondicherry. **Settings and design:** 71 male patients undergoing an alcohol de-addiction program were recruited as subjects and randomly divided into Group A, who received Yoga therapy as per the CYTER protocol for a minimum of 7 daily sessions of 1.5 hours each session, daily counseling, warm-ups (Jathis) and standard medication, and Group B, who only received standard medical management. **Methods and materials:** Alcohol Craving Questionnaire (ACQ SF-R) was administered to all patients before and after the intervention. **Statistical analysis used:** Statistical analysis was carried out using JASP-0.9.2.0 software. Wilcoxon test was performed for intragroup comparisons, and the Mann-Whitney test was performed for intergroup comparison to arrive at the p values. **Results:** The scores in the intergroup comparisons were as follows: Craving-Compulsivity ($p=0.0892$), Craving-Expectancy ($p=0.0069$), Craving-Purposefulness ($p<0.0001$), Craving-Emotionality ($p=0.0126$), Craving-General craving ($p<0.0001$). Whereas, in the intragroup comparisons, the scores were as follows: Craving-Compulsivity ($p<0.001$), Craving-Expectancy ($p<0.001$), Craving-Purposefulness ($p<0.001$), Craving-Emotionality ($p<0.001$), Craving-General craving ($p<0.001$) **Conclusion:** The present study supports previous studies on benefits of Yoga and concludes that yoga therapy helps in managing craving levels of patients of Alcohol Dependence Syndrome (ADS).

Key Words: addiction, craving, Yoga, ADS, alcohol

Key message: A combination (i.e., a package) of yogic counseling, Pranayamas, Asanas, Kriyas, Jathis, and yogic relaxation, along with prescription drugs, should be the yoga therapy protocol in the management of ADS patients. After the initial consultation, the medical fraternity should begin prescribing yoga therapy to patients such that they continue to reap the benefits from day one.

Introduction:

Alcohol Dependence Syndrome (ADS) is a cluster of behavioral, perceptive, and physiological phenomena that arise after regular substance use and that, despite its adverse effects, entails a persistent urge to take the drug, posing difficulties in regulating its use. It affects day-to-day operations and commitments, and often there is a state of physical withdrawal. Dependence syndrome can be present for a single psychoactive substance (e.g., cigarettes, alcohol, or diazepam), for a class of substances (e.g., prescription drugs), or for a wider variety of psychoactive substances that are pharmacologically distinct. (ICD-10).^[1]

According to the World Health Organization, the global disease epidemic related to alcohol and illegal drug misuse causes more than 5 percent of the total disease burden, and the adverse use of alcohol claims 2.5 million lives per year.^[2] In the first year after alcohol or tobacco withdrawal, when relapse rates continue to remain as high as 95 percent, there is growing concern about substance use disorders.^{[3][4]} Anxiety precipitates alcohol relapse by interrelated cognitive, emotional, physiological, and behavioral processes. Some of these mechanisms include a conservative bias against signs related to alcohol, thinking suppression, insufficient emotion regulation capacity, and emotional reactivity that leads to repeated drug-seeking behavior.^[5]

Southeast Asia and the Western Pacific regions continue to show increasing patterns in the consumption of alcohol. In the Southeast Asia region, per capita pure alcohol consumption increased by more than 50 percent between 1980 and 2000. Likewise, between 1970-1972 and 1994-1996, alcohol consumption in India, per capita, increased alarmingly by 106.7 percent. The total number of alcohol users in India in 2005 was 62.5 million, 17 percent of them being dependent users, representing 20 percent-30 percent of hospital admissions due to alcohol-related problems.^[6] The state-wise prevalence rate in Gujarat's western portion is the lowest (7 percent) and the highest (75.0 percent) in Arunachal Pradesh. In South India, the incidence of current alcohol use has ranged from 33 percent to 50 percent. The overall incidence of alcohol use among individuals aged 18 years was 9.7 percent in Pondicherry, and it was 17.1 percent exclusively among men. In the age group aged 55 years, the highest prevalence was (17.1 percent). For illiterates and educated to the primary level, the highest incidence decreased with a growing education level. One-third of users started drinking before 20 years of age, and the most common reason for alcohol consumption was to get relief from pain or fatigue arising from their professional work.^[6]

Gitananda Yoga™ (classic Rishiculture ashtanga yoga): The Yoga Parampara of ICYER at Ananda Ashram Pondicherry, South India, is the Classical Rishiculture Ashtanga Yoga as synthesized by Yogamaharishi Dr. Swami Gitananda Giri. Yogamaharishi Dr. Swami Gitananda Giri received the rich Vedic Rishi concepts from his Ashtanga Yoga Master Sri Swami Kakananda Ji, a Bengali saint, who initiated Swami Gitananda at the age of ten years into this ancient Yoga teaching in Swamiji's ancestral childhood home in Maharajganj, Bihar. Swami Gitananda maintained his relationship with his Guru, who lived in Swamiji's ancestral home, up to Swami Kakananda's Samadhi on October 26, 1967. The present resident Acharya is Yogacharini Meenakshi Devi Bhavanani (Ammaji), her son Yogacharya Dr. Ananda Balayogi Bhavanani, and Yogacharini Smt. Devasena Bhavanani^[7]

Subjects and Methods:

The sessions were held in the male ward, department of psychiatry, MGMC&RI. The patients were screened for the study after fulfilling the inclusion and exclusion criteria. The patients were included after their withdrawal state. The patients were educated about the study, and informed consent was taken from them. The Department of Psychiatry conducted block randomization, and the patients were divided into two groups consisting of Group A, i.e., the 38-subject intervention group (13 discontinued), and Group B, i.e., the 33-subject control group (8 discontinued). For pre-and post-study tests, the Alcohol Craving Questionnaire (ACQ SF-R) was used.^[8] The intervention group (n=25) received 7 personalized daily yoga sessions, including counseling along with standard medication (anti-craving medication), while the control group (n=25) received only standard medical management (anti-craving medication). The study was registered in the Clinical Trials Registry of India (CTRI/2019/06/019583).

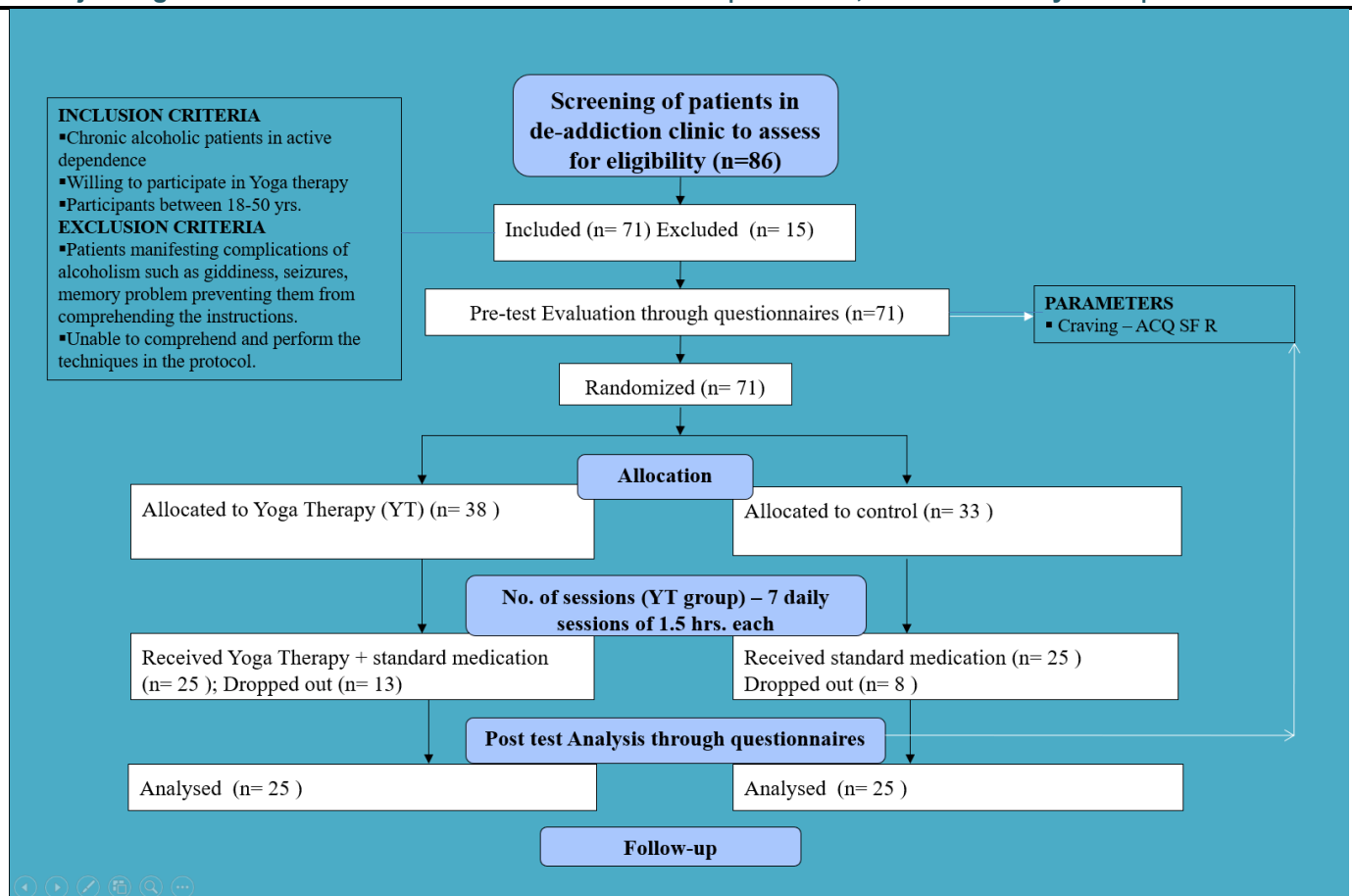


Fig.1: Algorithm about the randomized allocation of participant

Yoga therapy was given to the patients in the experimental group as per a validated protocol. Few small changes in practice have been made based on individual needs. The following were standard for all practices:

- Resting for 1 to 3 minutes before moving to the next practice in sequence
- All tasks were conducted with slow and regulated movements.
- Take assistance (of the wall, a pillar, chair, and cushion)
- Drinking water at periodic intervals.
- The therapist was 'typically' dressed (without the 'Apron') so that the patients felt relaxed and got a friend's feeling and could approach him in the event of frustration or doubt.
- The warm-up strategies (Jathis) and counseling formed a significant part of the overall kit, in addition to the below.

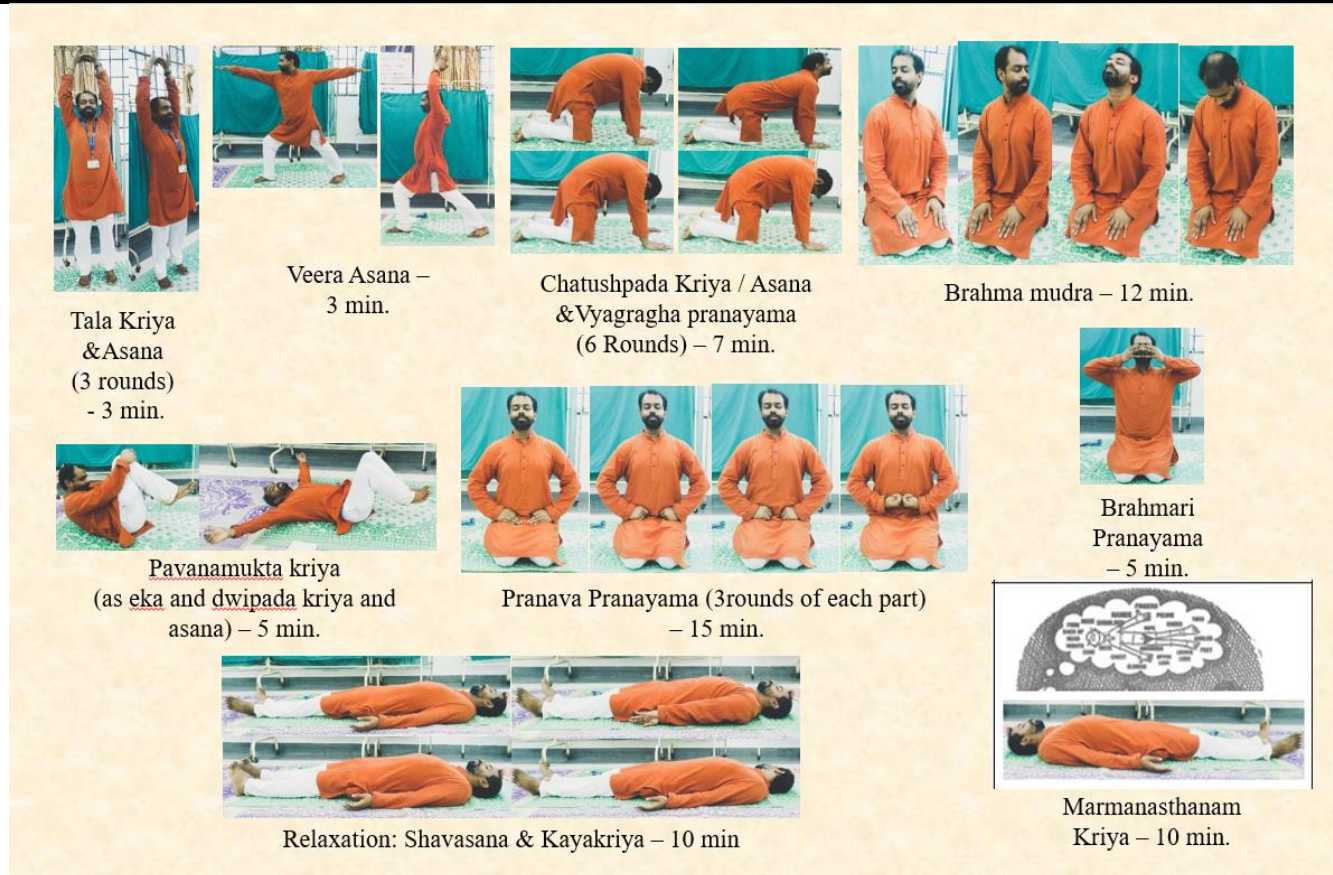


Fig2: Different Yoga Therapy techniques used for the study (Author's demonstration)

Demographic data:

The median age of the intervention group was 38 years (22-55), while that of the control group was 39 (28-62). All the patients, mostly from the nearby villages, were male. Some of them were daily wage earners, some were farmers, and some had small businesses. Their monthly income was in the range of INR 10000-15000, with most of them having their own houses and married. Most of them had kids attending college or school.

Statistical analysis:

The information was analyzed using non-parametric tests because there was no normality in the data. The outcomes are given in Tables 1-6. The Wilcoxon matched-pairs signed-ranks test provides the values as a median (range) for intragroup comparison. For intergroup comparison, the Mann-Whitney U test provides actual P values. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ was deemed to signify importance in intra-group comparisons and # $p < 0.05$; ## $p < 0.01$; ### $p < 0.001$ in intergroup comparisons. The following are the results of the study given in tables, along with the related graphs.

Results:

ACQ SF-R - Factor 1-Compulsivity (COMP): This score showed mild change ($p=0.0892$) in the compulsivity levels due to craving in the intervention group compared to the control group. The intragroup comparisons showed a significant change ($p<0.001$). However, there was no record of any significant change in the control group. The Delta% change showed significance ($p=0.0048$) [Table 1, 6]

ACQ SF-R- Factor 2-Expectancy (PCT): This score showed significant change ($p=0.0069$) in the expectancy levels due to craving in the intervention group compared to the control group. The intragroup comparisons showed a significant change ($p<0.001$). However, there was no record of any significant change in the control group. The Delta% change showed significance ($p=0.0055$) [Table 2, 6]

ACQ SF-R–Factor 3-Purposefulness (PURP): This score showed significant change ($p < 0.0001$) in the purposefulness levels due to craving in the intervention group compared to the control group. The intragroup comparisons showed a significant change ($p < 0.001$). However, there was no record of any significant change in the control group. The Delta% change showed significance ($p < 0.0001$) [Table 3, 6]

ACQ SF-R– Factor 4-Emotionality (EMOT): This score showed significant change ($p = 0.0126$) in the emotionality levels due to craving in the intervention group compared to the control group. The intragroup comparisons showed a significant change ($p < 0.001$). However, there was no record of any significant change in the control group. The Delta% change showed significance ($p = 0.0006$) [Table 4, 6]

ACQ SF-R– Factor 5-General Craving Index (GCI): This score showed significant change ($p < 0.0001$) in the general craving levels due to craving in the intervention group compared to the control group. The intragroup comparisons showed a significant change ($p < 0.001$). However, there was no record of any significant change in the control group. The Delta% change showed significance ($p < 0.0001$) [Table 5, 6]

Tables:

Table 1. Comparison of Alcohol Craving Questionnaire (ACQ – Craving - Compulsivity) values before and after Study period in yoga and control patients; n=25

	Yoga median (range)	Control median (range)	p-value
Pre	3.67 (1.33, 5.33)	2.33 (1.00, 6.33)	0.0359
Post	2.00 (0.67, 6.33) ***	2.33 (1.00, 6.33)	0.0892

Values are given as median (min. value, max. value). *** $p < 0.001$ by Wilcoxon test for intragroup comparisons and actual p values given for intergroup comparison by the Mann-Whitney test.

Table 2. Comparison of Alcohol Craving Questionnaire (ACQ – Craving - Expectancy) values before and after Study period in yoga and control patients; n=25

	Yoga median (range)	Control median (range)	p-value
Pre	3.67 (1.00, 5.33)	2.67 (1.00, 6.33)	0.8082
Post	1.67 (0.33, 4.33) ***	2.67 (1.00, 6.33)	0.0069

Values are given as median (min. value, max. value). *** $p < 0.001$ by Wilcoxon test for intragroup comparisons and actual p values given for intergroup comparison by the Mann-Whitney test.

Table 3. Comparison of Alcohol Craving Questionnaire (ACQ – Craving - Purposefulness) values before and after Study period in yoga and control patients; n=25

	Yoga median (range)	Control median (range)	p-value
Pre	4.33 (1.67, 6.00)	4.67 (2.00, 6.33)	0.9458
Post	1.67 (1.00, 7.67) ***	5.00 (2.00, 7.00)	<0.0001

Values are given as median (min. value, max. value). *** $p < 0.001$ by Wilcoxon test for intragroup comparisons and actual p values given for intergroup comparison by the Mann-Whitney test.

Table 4. Comparison of Alcohol Craving Questionnaire (ACQ – Craving - Emotionality) values before and after Study period in yoga and control patients; n=25

	Yoga median (range)	Control median (range)	p-value
Pre	4.00 (1.00, 6.67)	3.00 (1.00, 7.00)	0.2002
Post	1.67 (0.67, 3.67) ***	2.33 (1.00, 6.67)	0.0126

Values are given as median (min. value, max. value). *** $p < 0.001$ by Wilcoxon test for intragroup comparisons and actual p values given for intergroup comparison by the Mann-Whitney test.

Table 5. Comparison of Alcohol Craving Questionnaire (ACQ – Craving – General craving) values before and after Study period in yoga and control patients; n=25

	Yoga median (range)	Control median (range)	p-value
Pre	16.33 (8.33, 19.67)	13.67 (8.00, 21.33)	0.1566
Post	8.00 (3.67, 15.67) ***	12.67 (7.67, 20.67)	<0.0001

Values are given as median (min. value, max. value). *** p <0.001 by Wilcoxon test for intragroup comparisons and actual p values given for intergroup comparison by the Mann-Whitney test.

Table 6. Comparison of delta percentage ($\Delta\%$) values in yoga and control groups; n=25

Alcohol Craving Questionnaire (ACQ-SFR)	Yoga ($\Delta\%$ in median (range))	Control ($\Delta\%$ in median (range))	p-value
Compulsivity	-50.00 (-84.62, 83.33)	0.00 (-70.0, 275.0)	0.0048
Expectancy	-54.55 (-84.62, 66.67)	-11.11 (-82.3, 200.0)	0.0055
Purposefulness	-54.55 (-78.57, 35.29)	0.00 (-68.4, 233.3)	<0.0001
Emotionality	-53.85 (-87.50, 16.67)	-10.00 (-66.67, 137.5)	0.0006
General Craving	-48.98 (-78.85, 14.63)	0.00 (-44.00, 54.17)	<0.0001

Values are given as median (min. value, max. value). Delta (Δ) is the difference between pre-and post-values in yoga and control groups. Delta% is the percentage change in delta values. Actual p values were given for intergroup comparison by Mann-Whitney test.

Discussion:

The study was conducted at the de-addiction clinic, department of Psychiatry, MGMC&RI in Pondicherry to understand adjuvant yoga therapy's impact on ADS patients' craving. The patients were selected after randomization into two groups. Yoga therapy based on a validated 'Classical Rishiculture Ashtanga Yoga lineage' protocol was delivered individually to patients by a professional, using a very personalized approach along with adjustments and help where appropriate.

The patients in the present study were chronic alcoholics and were in active dependence. In a study in 2017, Mary E. McCaul et al. concluded that Higher Beck Anxiety Inventory (BAI) and Anxiety Sensitivity Index-3 (ASI-3) scores were correlated with a greater self-reported craving for alcohol during early alcohol abstinence, but not PSS scores. The BAI scores were positively associated with cortisol and alcohol craving caused by laboratory tested stress. ^[15] Gupta et al. in their study concluded that yoga therapy and standard medication help manage stress, anxiety, and depression levels of patients with Alcohol Dependence Syndrome (ADS). ^[16] The present study on craving was conducted with patients after their withdrawal state.

The ACQ SF-R – Compulsivity parameter deals with the urge and desire to drink in anticipation of losing control over drinking. The patients believed that, if they do not drink, it can become difficult for them to continue drinking (which they like) as it gives them relief from day-to-day tensions. It also helps them during their work as most of them had a repeated work profile, i.e., they do the same work daily without any room for much innovation. Hence, they need not have to apply their mind quite often towards something new. The alcohol keeps them high in spirit to perform their work.

After the yoga intervention, the patients started acknowledging that something much higher and more spiritual exists, way above just a bottle of alcohol, which was easy to acquire. Many Jathis (body loosening, warm-up practices) would have helped them acquire self-control and balance by throwing out the negatives (perspiration). The Pranayamas such as Brahma mudra, Sparsha mudra, Pranava AUM, Brahmari Pranayama would have grounded them, thereby creating a sense of security within them, creating a more positive 'craving for yoga.' It was seen in the patients' response to Yoga, where they got ready before the sessions and practiced with full joy and enthusiasm. They even called up their fellow patients to join and shared their experiences with them. It shows how yoga practices could be instrumental in bringing changes in the patients' mindsets, thereby controlling their urge and desire for drinking.

The ACQ SF-R – Expectancy parameter deals with the urge and desire to drink in anticipation of the positive benefits of drinking. Most of the patients drank alcohol to get rid of stress, anxiety, come out of depressive states, feel positive and social status among their friends and co-workers. They believed, and in one-way, alcohol indeed gives a kick. The patients were unaware of the harmful effects of alcohol and expected it to bring positivity. Counseling of both the patient and their caregivers played a vital role in educating them about alcohol's harmful effects. The caregivers, mostly the patients' wives, took this very seriously and made sure that their husbands follow what has been told to them. The wives bear the burnt the most in ADS cases, and in some cases, the patients became violent and even hit their wives during the counseling sessions. However, with time and as they practiced more, normality started coming, and a sense of harmony was noticed in them.

The ACQ SF-R – Purposefulness parameter deals with the urge and desire, coupled with intent and 'planning to drink.' The patients were skeptical about this question most of the time. It might have been due to their environment (hospital ward), where they didn't have much choice other than to say 'Strongly agree' (5,6 or 7 on the scale of 1-7) when the related questions were asked. The patients generally feel that positivity when they meet a doctor or get admitted to get better and start responding 'positively.' The other factor could be that if they say that they are planning to drink, they might 'not get discharged' early, since most of them were daily wage earners, and had to go back sooner. All the three questions in this parameter were 'negative' questions and got reversed to arrive at actual raw scores. Therefore, by reversing the scores, the actual state of mind was reflected in the raw score, which in brief meant that 'they won't change their habit.'

After the intervention period, most of the intervention group patients sincerely vowed that they wouldn't drink at all in the future, and they would join a yoga center near to their home and practice daily. Changes were seen not just statistically but also in real-time with their smiling faces, harmony with their caregivers, and the people around.

The ACQ SF-R – Emotionality parameter deals with the urge and desire to drink in anticipation of relief from withdrawal/negative affect. If one doesn't drink, they can get withdrawal symptoms soon, i.e., an urge or desire to drink starts once again.

With time, the patients do get over-emotional concerning their drinking pattern or behavior. The patient starts expecting or anticipating the sense of 'negative' thoughts of drinking in the future. Hence, they try to 'twist' their urge to drink in the future by being emotional and craving in the present! They thought that their present craving for alcohol was encouraging, as it can protect them in the future. Without realizing that it could be just an illusion (people need to be conscious enough to be non-illusionary), they start drinking.

Some people's brains are more likely to respond to alcohol by inducing feelings of reward and enjoyment, leading them to seek that sensation more often and thus crave alcohol more than people whose brains do not function that way. Another factor for craving was low blood sugar levels. The pranayama practices and the loosening and warming up techniques of the 'Gitananda yoga lineage' are rock solid and give stability to the mind, body, and soul by working on the bottlenecks stored in the form of emotions, pain, and thoughts through patterned regulation of breath (e.g., 4in-2hold-4out-2hold).

The ACQ SF-R – General craving index deals with the ADS patients' overall cravings. In one of the studies, Murphy et al. concluded that craving was correlated with Alcohol Use Disorder (AUD) severity, quantitative indices of drinking, and adverse consequences of alcohol abuse out of the 12 symptoms evaluated. When considered with the DSM-IV AUD criteria, craving aggregated with other symptoms to form a unidimensional syndrome.^[9]

The post scores within the control group were statistically low, and some of them relapsed and again came back after a couple of weeks.

Fewer studies are conducted on this subject, and most of the studies were related to a craving for smoking. In one of the studies to determine the effect of yogic breathing on craving and withdrawal symptoms in abstaining smokers, Shahab et al. found that even simple breathing techniques can reduce cigarette craving levels in laboratory conditions. However, in-field setting, it needed more research.^[10] Elibero et al. tried to compare the effects of cardiovascular exercise and the Hatha yoga intervention group. He found a decrease in craving levels, increased positive behavior, and decreased negative behavior in both groups. However,

there was an average reduction in the Hatha intervention group. ^[11] Contrary to the previous finding, the present study showed a significant reduction in craving levels. In another study in 2016, Bhagabati et al. concluded that Yoga therapy significantly reduces anxiety symptoms and cravings in patients of alcohol dependence but not depressive symptoms. Secondly, practicing Yoga for a more extended period has progressive benefits. ^[12] In another pilot study in a de-addiction center, Gupta et al. concluded that adjuvant yoga therapy had a positive impact in decreasing cravings, thereby improving alcohol dependency control, and recommended that in such de-addiction centers, yoga therapy should become a daily feature. ^[13] The present study fills the lacuna for a comprehensive study on alcohol craving amongst ADS patients, especially in a hospital setting.

Conclusion:

We conclude from the present study that Yoga therapy and standard medical management has a definite role in reducing craving levels in ADS patients. The statistics showed evidence of reducing patients' craving levels in just 6-7 Yoga sessions, thereby paving the way for a long-term reduction in craving. Because a habit or sticky pattern takes time to change, it is advised to follow the long-term routine. It is evident from the study that if Yoga therapy is followed for a sufficiently long term of maybe 3-6 months or 1 year, it's possible to eradicate the drinking habit and craving for the same ultimately and other health and spiritual benefits.

The problem occurs with patients when their divine connections, their universal calling, are not connected with them, and therefore their 'innate spirituality' is absent or in conflict zones, and then there is also no innate connection with the higher self. That's where the actual disease is, spiritually. Instead of working only on the symptoms, working at the root cause becomes the therapist's dharma. During the therapy session, a connection between the patient, the therapist, and the Universe is established. It leads to a spiritual giving and taking of divine energies leading to the healing process's beginning and acceleration. The intent and efforts of all three parties are the keys. ^[14]

Yoga is an empowering journey of the self and empowers individuals to the best of their potential since everything is inside us. The zeal to change lies inside us, but it diminishes with time, and we start losing hope. Daily yoga practices work at root levels and empower our minds, bodies, and spirits to carve out the best possible of 'we' from within ourselves.

In the management of craving, Yoga practices, including counseling, Jathis, and prescription medicine (all as a package), has shown promising results in improving the patients' physical, mental, emotional, and spiritual aspects.

I hope that this study 'spiritually,' 'statistically' and 'clinically' answered several questions and paved the way for more studies on the same subject in the correct direction. I hope that my fellow researchers shall come up with more creative ways to deal with craving.

Recommendations:

- The Yoga therapy protocol must combine yogic counseling, Pranayamas, Asanas, Kriyas, relaxation techniques, and prescribed medication to treat ADS patients.
- To be incorporated into the AYUSH protocol for ADS treatment, more comprehensive and long-term research, maybe for 3-6 months, with many follow-ups, is required. It is concluded in a study by Bhagabati et al. that Yoga has progressive benefits over a more extended period. ^[12]
- The medical fraternity should begin encouraging Yoga during the initial appointment of ADS patients so that patients begin to reap the benefits from day one.

Limitations:

- There is significantly less chance of the patient performing yoga after being released, so a significant concern is long-term benefit calculation.
- Most patients didn't want to stay long due to job overload and family commitments, so convincing them was a real challenge.
- There is no guarantee that lifestyle changes are acceptable for them, including dietary changes, due to their work schedules, family, and financial stresses.

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Conflicts of interest: There was no record of any conflict of interest.

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Declaration: This is part 2 of 4 of the same study ^[16]

References:

1. International Statistical Classification of diseases and related health problems 10th revision (ICD-10) version for mental and behavioral disorders. 2010;5
2. World Health Organization. Resources For The Prevention And Treatment Of Substance Use Disorders. [online] Available at: <http://www.who.int/gho/substance_abuse/en/index.html> [Accessed 30 September 2020].
3. Brandon TH, Vidrine JI, Litvin EB. Relapse and relapse prevention. *Annu Rev Clin Psychol* 2007;3(1):257–284.
4. Miller WR, Westerberg VS, Harris RJ, Tonigan JS. What prevents relapse? Prospective testing of antecedent models. *Addiction* 1996;91(Suppl):S155–S172.
5. Tyagi A, Cohen M, Reece J, Telles S. An explorative study of metabolic responses to mental stress and yoga practices in yoga practitioners, non-yoga practitioners, and individuals with metabolic syndrome. *BMC Complement Altern Med* 2014;14(1):445.
6. Ramanan VV, Singh SK. A study on alcohol use and its related health and social problems in rural Pondicherry, India. *J Family Med Prim Care* 2016;5:804-8.
7. Bhavanani AB. *** ICYER ***. [online] Icyer.com. Available at: <http://www.icyer.com/The_Tradition.htm> [Accessed 30 September 2020].
8. Singleton et al. MANUAL. Alcohol Craving Questionnaires (ACQ-NOW and ACQ-SF-R). Background, Scoring, and Administration. 1994.
9. Murphy C, Stojek M, Few L, Rothbaum A, MacKillop J. Craving as an alcohol use disorder symptom in DSM-5: An empirical examination in a treatment-seeking sample. *Experimental and Clinical Psychopharmacology*. 2014;22(1):43-49.
10. Shahab L, Sarkar B, West R. The acute effects of yogic breathing exercises on craving and withdrawal symptoms in abstaining smokers. *Psychopharmacology*. 2012;225(4):875-882.

11. Elibero A, Janse Van Rensburg K, Drobos D. Acute Effects of Aerobic Exercise and Hatha Yoga on Craving to Smoke. *Nicotine & Tobacco Research*. 2011;13(11):1140-1148.
12. Bhagabati D, Kumar A, Borbora SA, Bora U, Sharma H. Assessment of the effectiveness of yoga therapy as an adjunct in patients with alcohol dependence syndrome. *Open J Psychiatry Allied Sci*. 2017;8:40-5.
13. Gupta K, Bhavanani AB, Ramanathan M, Rajasekar B, Sarkar S, Dayanidy G. Effect of Adjuvant Yoga Therapy on Craving in Participants of an Alcohol De-addiction Program: A Pilot Study. *J Basic Clin Appl Health Sci*. 2019;2(4):138–141.
14. Gupta K. What is normal? An experiential perspective. Unpublished [Internet]. 2020; Available from <http://rgdoi.net/10.13140/RG.2.2.35381.09449>
15. McCaul ME, Hutton HE, Stephens MA, Xu X, Wand GS. Anxiety, Anxiety Sensitivity, and Perceived Stress as Predictors of Recent Drinking, Alcohol Craving, and Social Stress Response in Heavy Drinkers. *Alcohol Clin Exp Res*. 2017 Apr;41(4):836-845.
16. Gupta K, Bhavanani AB, Sarkar S, Ramanathan M, Rajasekaran B. Effect of adjuvant yoga therapy on stress, anxiety, and depression in participants of an alcohol deaddiction program. *International Journal of Creative Research Thoughts (IJCRT)*. ISSN:2320-2882. 2020;8(12): 2093-2101.

