

## Research Report

# THE SEVERITY OF ALCOHOL DEPENDENCE SYNDROME AND ITS SOCIO-DEMOGRAPHIC AND CLINICAL CORRELATES-A CROSS-SECTIONAL STUDY.

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### ABSTRACT

**Background:** In Kerala, according to National Family Health Survey 4, 37.5% of males and 1.6% of females use alcohol. Even though the physical and mental health morbidity of alcohol dependence is well-known, studies are less. The study assessed the severity of alcohol dependence and its different socio-demographic and clinical correlates. **Materials and Methods:** A hospital-based cross-sectional study was conducted among alcohol dependence syndrome patients. Total sample size 100 was achieved by consecutive sampling. Data was collected using a semi-structured proforma, which included severity of alcohol use using severity of alcohol dependence questionnaire (SADQ). Chi-square test and logistic regression analysis were done to find the relationship between variables. **Results:** All the participants were males. The majority were between 30-60 years, from a rural background (64%), belonged to low socioeconomic (85%) nuclear families (65%). The majority of the participants had started using alcohol before 20 years of age (85%), were using alcohol for more than ten years (97%), had comorbid nicotine use (80%), at least one previous admission (91%) and a positive family history of alcohol use (72%). All the participants in the study had moderate to severe ADS. On comparing different variables with the severity of ADS, age of onset, the number of previous admissions and comorbid nicotine use were significant. Logistic regression analysis found the age of onset (p-value 0.019) and nicotine use (p-value 0.002) as the predictors of severity of ADS. **Conclusion:** Study points to the need for early intervention programs targeting the high-risk population and the need for addressing nicotine use among persons with ADS.

**Keywords:** Alcohol dependence, severity of alcohol use, clinical factors, socio-demographic factors

### INTRODUCTION

Alcohol is consumed worldwide. The pattern of alcohol use and problems related to alcohol use vary widely, but the burden of disease and death remains significant in most countries.<sup>1</sup> Harmful use of alcohol ranks among the top five risk factors for disease, disability, and death throughout the world.<sup>2</sup> Alcohol consumption has been identified as an important risk factor for illness,

disability, and mortality.<sup>3</sup> Drinking alcohol is associated with a risk of developing health problems such as alcohol dependence syndrome (ADS), liver cirrhosis, cancers, and injuries. Alcohol use is contributing to approximately 3.3 million deaths (5.9% of all deaths worldwide) and other mortality in the form of accidents

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and disease each year.<sup>4</sup>

According to the global status report on alcohol and health published by WHO in 2018, some 2.3 billion people (43% of the population) are current drinkers.<sup>1</sup> National Family Health Survey 4 (NFHS-4), published in 2015-2016, reports an average prevalence of alcoholism in India as 29.3 % and 1.2 % in males and females, respectively. However, the corresponding estimates are 37.5% and 1.6% in Kerala.<sup>5</sup> Prevalence of alcohol use is varied in different states and regulatory policies and alcohol control programs vary across India, with poor enforcement and implementation.<sup>6</sup>

Alcohol use can result in various physical, mental, and social consequences. Continuous alcohol use leads to many acute and chronic health problems, including increased risk of morbidity and mortality.<sup>7</sup> A systematic review from India found out that there is a significant association between road traffic accidents and alcohol use.<sup>8</sup> Patterns of drinking have been linked to chronic diseases such as coronary heart disease (CHD) and sudden cardiac death.<sup>9</sup> Alcohol use itself can induce psychiatric disorders, and mental health problems can be comorbid with alcohol dependence syndrome.<sup>10</sup> Mood disorders are the most common psychiatric comorbidity among treatment-seeking alcoholic patients, affecting up to 80% of alcoholics at some point in their life span.<sup>11</sup> Alcohol use of a family member can harm other family members, mental health. Especially children and spouses who are exposed to a first-degree relative's alcohol problem are at risk for problems.<sup>12</sup> Employees' substance use and related absenteeism can negatively impact productivity and the economy.<sup>13</sup>

Alcohol use can present as a continuum from occasional drinking to dependence syndrome. The ICD-10 defines ADS as a cluster of physiological, behavioural, and cognitive phenomena in which the use of alcohol takes on much higher precedence for a given individual than other behaviours that once had greater value.<sup>14</sup> According to the 2018 global status report on alcohol and health, the prevalence of alcohol dependence syndrome among males in India is 9.1%, and in females, it is 0.4%.<sup>1</sup> A study from Tamil Nadu observed that 67% of alcohol consumers had a problematic drinking pattern, with 52.5% having a hazardous/harmful drinking pattern and 14.7% were found to be dependent alcoholics.<sup>15</sup> A study from Kerala reported that the prevalence of alcohol dependence among males is

38.41%.<sup>16</sup> Another study among school-going children of Kerala reported that the overall prevalence of lifetime alcohol use among adolescents was 15% (23.2% for boys and 6.5% for girls). The mean age at onset of alcohol use in this study was 13.6 years.<sup>17</sup> These studies point to the growing problem of alcohol use in our country and the state.

A Few studies have pointed out different socio-demographic and clinical factors that can influence alcohol dependence. A study looked at the clinical profile and coping in patients with ADS and found that most of the subjects were young adults with a mean age of 42 years, 58% started consuming alcohol at a very young age (<21 years). Those from the higher age group and those who were unemployed had significantly more severity of alcohol dependence.<sup>18</sup> Another study from India looked at the socio-demographic and clinical characteristics of ADS and found that the mean age of the population was 36.22 ( $\pm$  8.751) years. Most were married (66%), employed (82%) and from a rural setting.<sup>19</sup> A study from Kerala found that 52.42% of those seeking de-addiction comes under the middle age group with the mean age of 42 years. Most subjects had either a high school certificate or below (84.4%), and 32.9% of the patients were skilled workers.<sup>20</sup>

Even though few studies looked at different socio-demographic and clinical correlates of ADS, such studies are rare from Kerala. This study aims to find out the various socio-demographic and clinical factors associated with the severity of ADS. This will help us better understand the condition and plan intervention programmes targeting such factors to help people with ADS.

## MATERIALS AND METHODS

### Study Setting and Sampling

The data for the current study were taken from a larger cross-sectional study conducted at the de-addiction centre of a tertiary level psychiatric hospital for assessing the caregiver burden of ADS and various factors associated with the severity of caregiver burden. The study was conducted from November 2017 to December 2018. The sample size was 100, which was calculated from the findings of a previous study that measured caregiver burden (74%) among ADS patients and substituted those values in the formula for

calculating sample size for a cross-sectional study.<sup>14</sup> A consecutive sampling was used among the patients admitted to the de-addiction centre, meeting the inclusion criteria until the sample size was reached. Relevant approvals were obtained from the institutional ethics committee and the scientific committee of mental health centre Trivandrum.

### Inclusion and Exclusion Criteria

#### Inclusion Criteria

- Any person who was 18 -65 years old with a primary diagnosis of ADS according to The ICD-10 Classification of Mental and Behavioural Disorders, Diagnostic Criteria for Research (DCR) was included in the study.<sup>15</sup>

#### Exclusion Criteria

- Those who had another primary psychiatric diagnosis.
- Those who use substances other than alcohol and tobacco.
- Those who were unable to give valid consent.

The first two exclusion criteria were kept because if there is another comorbid psychiatric disorder and substance use disorder, this can influence the caregiver burden, which was a primary objective of the larger study.

#### Tools Used

ICD-10 Classification of Mental and Behavioural Disorders, DCR for confirming the diagnosis.<sup>15</sup>

1. The severity of the Alcohol Dependence Questionnaire-SADQ.<sup>16</sup>

The SADQ is a short, self-administered, 20-item questionnaire designed to measure the severity of alcohol dependence. There are five subscales with four items in each: Each item is scored on a 4-point scale, ranging from "Almost Never" to "Nearly Always," resulting in a corresponding score of 0 to 3. Thus, the maximum possible score is 60, and the minimum is 0. The scale was translated to Malayalam before being given to patients. The Malayalam scale was validated using the translation and back-translation method.

2. Semi-Structured Proforma

A semi-structured proforma was used to collect socio-demographic factors like age, gender, education, occupation, socioeconomic status etc. and clinical

factors like age of first drink, duration of alcohol use, number of previous admissions, nicotine use, and family history.

#### Data Collection and Analysis

The data collection started after getting informed written consent from the patient and a relative. The patient was interviewed once the acute treatment phase was complete and after ensuring that the patient had no features of delirium. Primary psychiatric diagnosis was made using The ICD-10 -DCR and verified by a consultant in the department. Socio-demographic and other variables were collected using a semi-structured proforma. The severity of alcohol dependence was measured using the Severity of Alcohol Dependence Questionnaire (SADQ).<sup>16</sup>

The data was coded and entered into the Microsoft excel 2013 version. Percentages & means with their respective confidence intervals were used to summarise data. The Chi-square test was used for categorical data. The odds ratio with a 95% confidence interval was calculated in the case of binary variables. Fischer's exact test was used to calculate the P-value, and a value of less than 0.05 was taken as significant. Backward stepwise logistic regression analysis was used to study the relationship among independent variables (demographic and clinical variables), which were more frequently present in subjects with severe alcohol dependence. All data analysis was performed under the supervision of a biostatistician using Microsoft Excel software and IBM SPSS Version 16. STROBES cross-sectional reporting guidelines were used for reporting the findings.

### RESULTS

Data from all the 100 subjects were used in the analysis. Socio-demographic factors are summarised in Table.1 and clinical variables in Table.2.

None of the socio-demographic variables factors was found to have a statistically significant association with the severity of alcohol dependence ( Table.3).

Among clinical variables, lower age of onset of alcohol use, ie., <20 years, (P-value = 0.021), having more than two previous admissions for alcohol dependence (P-value =0.014) and comorbid nicotine use (P-value 0.001;odds ratio 6.50, confidence interval 2.26-18.69) had statistically significant associations with severe alcohol dependence.

Table 1. Socio-demographic profile of ADS patients.

Socio-demographic factors	Variable	Frequency (%)
Gender	Male	100(100%)
	Female	0(0%)
Age	<30 Years	5(5%)
	30-60 Years	91(91%)
	>60years	4(4%)
	Hindu	74(74%)
Religion	Christian	16(16%)
	Muslim	10(10%)
Place Of Origin	Urban	36(36%)
	Rural	64(64%)
Family Type	Nuclear	65(65%)
	Joint	35(35%)
Socioeconomic Status	BPL	84(84%)
	APL	16(16%)
Marital Status	Unmarried	21(21%)
	Married	63(63%)
	Separated	16(16%)
	Illiterate	8(8%)
Education	Primary	77(77%)
	Secondary And Above	15(15%)
Employment	Employed	72(72%)
	Unemployed	28(28%)

In stepwise logistic regression analysis (Table 5), age of onset of alcohol use and history of comorbid nicotine use were associated with the severity of alcohol dependence.

## DISCUSSION

Kerala is a state with high per capita alcohol use, and according to NFHS 4, 37.5% of males and 1.6% of

females use alcohol in the state.<sup>5</sup> In our study, we aimed to find out the various socio-demographic and clinical

Table 2. Clinical Profile of ADS Patients

Clinical factors	Variable	Frequency (%)
Age of onset of alcohol use	<20 years	85(85%)
	20-40 years	14(14%)
	>40 years	1(1%)
Duration of alcohol use	5-10 years	3(3%)
	>10 years	97(97%)
Number of previous admissions	No admissions	9(9%)
	<2admissions	52(52%)
Nicotine use among patients	>2admissions	39(39%)
	Using	80(80%)
Family history of mental illness	Not using	20(20%)
	Present	11(11%)
Family history of alcohol use	Absent	89(89%)
	Present	72(72%)
Severity of alcohol dependence (SADQ score)	Absent	28(28%)
	Severe (>30)	73(73%)
	Moderate (16-30)	27(27%)
	Mild (<16)	0(0%)

factors associated with alcohol dependence. We wanted to find out the relationship between these factors and the severity of alcohol dependence syndrome. Finding out these relationships is very important in understanding the illness and policymaking. This was a hospital-based cross-sectional study conducted in a tertiary level referral psychiatry hospital in Kerala. All the data was collected after getting permission from the institutional ethics committee and informed consent from the participant and a primary caregiver. We had included the data from all participants in the final analysis.

In the present study, all patients were male, which is similar to the substance use pattern in Kerala, with the majority of the people using alcohol being males.<sup>5</sup>

Table 3. Relationship between socio-demographic variables and severity of Alcohol Dependence

Socio-demographic factors	Variable	SEVERITY OF ADS		Chi Square	Df	P Value	Odds Ratio (CI)
		SADQ>30 (severe)	SADQ 16-30 (moderate)				
Religion	Hindu	55	19	0.95	2	0.62	-
	Christian	12	4				
	Muslim	6	4				
Place Of Origin	Urban	43	21	3.04	1	0.10	0.41 (0.10-1.13)
	Rural	30	6				
Family Type	Nuclear	45	20	1.33	1	0.34	0.56 (0.21-1.50)
	Joint	28	7				
Socioeconomic Status	BPL	64	20	2.71	1	0.12	2.48 (0.82-7.53)
	APL	9	7				
Marital Status	Unmarried	17	4	1.94	2	0.37	-
	Married	43	20				
	Separated	13	3				
Education	Illiterate	7	1	0.92	1	0.67	2.75 (0.32- 23.5)
	Primary and above	66	26				
Employment	Employed	49	23	3.19	1	0.08	2.81 (0.85-9.06)
	Unemployed	24	4				

Similar findings had been reported in other studies from India, where the entire participants were male.<sup>17,18</sup> But a recent review article by G. Gururaj et al. reported an increasing trend of alcohol use among females in some states.<sup>6</sup> This means that even though the treatment-seeking population among ADS patients are mostly males, it is no longer the case. The mean age (SD) of the patient population was 41.8(9.1); most of the patients (91%) were between 30 -60 years. Other studies also had a similar patient profile. This is an important finding because it shows how alcohol use affects the most economically productive age group of our society and adds to the burden of the disease.<sup>17,19</sup> In most studies, the mean age varied from 37 to 43 years. A majority (64%) of the patients were from a rural background. This is an interesting finding because even though the study centre is located in an urban area, most patients seeking help are from rural backgrounds. This might be due to the higher perceived stigma among the urban populace and

the affluent, who may then prefer private consultations or general hospital settings rather than a psychiatric hospital. This fact had been explained in a study by Mishra N et al.<sup>20</sup> The majority (84%) of the patients belonged to BPL families. This can be because the government hospital services are utilised by the socio-economically backward population in our country as treatment is mostly free of cost. Most studies have reported that most of the treatment-seeking population in ADS belongs to a low socioeconomic status. However, in one study by Khushboo Dewani et al., 78 % ( N=50) of the population belonged to APL families.<sup>19,21,22,23</sup> 65% of the participants were from a nuclear family. Most of the Indian studies also reported a similar result.<sup>21, 22, 24</sup> Among the participants, 63% were married, and 16% were separated. In most Indian studies<sup>22, 24</sup> majorities of the participants were married, unlike western studies.<sup>25</sup> This difference is probably due to Indian customs, culture and strong marital system.

Table 4. Relationship between socio-demographic variables and severity of ADS.

Socio-demographic factors	Variable	Severity of ADS		Chi Square	Df	P-Value	Odds Ratio (CI)
		SADQ>30 (severe)	SADQ 16-30 (moderate)				
Age Of Onset of Alcohol Use	< 20 years	66	19	7.75	2	0.021*	-
	20-40 years	6	8				
	> 40 years	1	0				
Duration of Alcohol Use	> 10 years	72	25	2.469	1	0.177	5.67 (0.50-66.29)
	5-10 years	1	2				
Number of Previous Admissions	No admissions	4	5	8.557	2	0.014*	-
	< 2	35	17				
	>2	34	5				
Nicotine Use Among Patients	Using	65	15	13.81	1	0.001*	6.50 (2.26-18.69)
	Not using	8	12				
Family History of Mental Illness	Present	8	3	0.000	1	1.000	0.985 (0.24-4.02)
	Absent	65	24				
Family History of alcohol use	Present	56	16	2.978	1	0.131	2.26 (0.88-5.79)
	Absent	17	11				

\*P&lt;0.05

Table 5. Logistic regression analysis of those factors showed statistical significance.

Variables	Adjusted OR (95% CI)	P-value
Age of onset of alcohol use	1.586 (1.298-18.378)	0.019*
History of nicotine use	1.783 (1.873-18.866)	0.002*
Previous number of admissions	-0.060 (0.538-1.648)	0.834

\*P&lt;0.05

Regarding the education of the patients, 77% had received primary education, 15% had received secondary education or above. This is probable because Kerala is a state with a high literacy rate.<sup>26</sup> Studies by

Tagad et al., and Johnson et al., reported similar results, but a study by Reddy et al. reported a lower education status among their participants.<sup>21,22,24</sup> In our study, 72% of patients were employed in some kind of job and 28% were not employed at the time. Most of the Indian studies reported a higher rate of employment among patients with ADS, mostly engaging in unskilled or semiskilled jobs<sup>22</sup>

Regarding the age of onset of alcohol use, in our study, 85% of patients started using alcohol before the age of 20 years. This is an important observation as this points towards the need for developing early education and intervention programmes for school going children and adolescents regarding alcohol use. Johnson et al., in their study, found that the mean age of onset of alcohol use was  $21.39 \pm 5.34$  years.<sup>24</sup> The Collaborative Study of the Genetics of Alcoholism (COGA) group found the mean age at onset of alcoholism was 25 years.<sup>27</sup> Our study found a much lower age of onset than the above

studies. Tagad et al. and Reddy et al. reported a lower age of onset, 18.6 years and 18.9 years, respectively.<sup>21,22</sup> In our study, 97% of the patients had used alcohol for more than ten years. This is much higher than the results from studies by Mattoo et al., where only 68% of patients had used alcohol for more than ten years.<sup>28</sup> A long duration of alcohol use can lead to the chance of developing many physical complications of alcohol use. Reddy et al. reported that it takes less than ten years to develop a dependence level of alcohol use from the first drink.<sup>22</sup> Among patients, 91% had at least one previous admission and 39% had more than two previous admissions. This points to the chronic and relapsing nature of alcohol dependence and the need for relapse prevention and aftercare programs for those who are discharged from care.<sup>29</sup> This can also be explained by the fact that the study was conducted in a tertiary referral hospital, so people with more severe illness and previous treatment failure are catered here.

Regarding nicotine use, 80% of the participants in the current study were smokers. Khushboo Dewani et al. reported that the prevalence of smoking among patients with ADS was 70%.<sup>23</sup> Smoking rates among alcoholics have been estimated to be as high as 90%, with smokers being far more likely to consume alcohol than non-smokers. Smokers dependent on nicotine have a 2.7 times greater risk of becoming alcohol dependent than non-smokers.<sup>30</sup> This can also affect the successful treatment of alcohol dependence and may increase alcohol use. It also points to the need to address the nicotine use among ADS patients while they are on the deaddiction programme, which is often neglected, and this can result in an increased chance of relapse.

We had compared different socio-demographic and clinical factors with the severity of alcohol dependence using the chi-square test. None of the socio-demographic factors had any significant association with the severity of alcohol dependence. The study was conducted in a tertiary care referral hospital, which exactly doesn't represent the socio-demographic structure of the community, and this might be a reason for such a finding. A.K. Dwivedi et al. reported a similar finding where they couldn't find any significant relationship between different socio-demographic or clinical factors and severity of alcohol dependence.<sup>31</sup> Another study by Ch. Prashanth et al. found that age more than 45 years and being unemployed are

significantly associated with severity of alcohol dependence.<sup>19</sup> B. T. Vignesh et al. found that persons with low annual income, less education and those who work during night shifts had more severe dependence.<sup>17</sup>

While comparing different clinical parameters with the severity of alcohol dependence, we found out that those who started using alcohol early (less than 20 years) had a statistically significant association with severe alcohol dependence. This is an important finding because the early use of alcohol can interfere with education and job opportunities. Those who start using alcohol earlier are at an increased risk of developing alcohol dependence syndrome at an early age. This finding had been stressed in the study by Hingson et al. They report that those who begin drinking before the age of 14 years are more likely to experience alcohol dependence within ten years of the first drink.<sup>32</sup> Johnson et al. studied the effect of age of onset of alcohol use on severity of dependence. They found that a lower age of onset (less than 18 years) is a very important predictor of the severity of alcohol dependence.<sup>24</sup>

Those who had more than two previous admissions and those who use nicotine along with alcohol were also found to be significant predictors of the severity of alcohol dependence. Previous studies reported that those who smoke are at an increased risk of developing alcohol dependence syndrome and relapse.<sup>30</sup> Studies reported shared genetic, neurobiological, and psychosocial mechanisms associated with concurrent alcohol and nicotine dependence.<sup>30</sup> We need to address the nicotine use among those who come for alcohol dependence treatment which many clinicians often overlook. The relationship between more than two previous admissions and the severity of ADS can be a reverse association also, as more severe illness leads to more relapses and admissions. We could not find any association between factors like duration of alcohol use, family history of alcohol use and severity of dependence. But a study by Johnson et al. found a positive correlation between family history of alcohol use and severity of dependence.<sup>24</sup> We conducted a backward stepwise logistic regression analysis to determine the strength of the independent variables in predicting the severity of the burden. After the analysis, the patient's age of onset of alcohol use and comorbid nicotine use were the significant predictors of severity of alcohol dependence.

In our study, we tried to use fairly good statistical methods within the limitations of a cross-sectional study. We found out that majority of the treatment-seeking population had severe dependence. Factors like the age of onset of alcohol use, number of admissions and nicotine use were found to be the significant predictors of severity of ADS. The study points to the need for implementing early screening and intervention programmes for people with problematic alcohol use to prevent the development of ADS. Since the study was conducted in a referral hospital and the sample size was only 100, the findings may not be generalisable. More detailed studies are needed to understand the links between social and clinical factors and the severity of ADS.

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None declared.

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