

## Impact of alcohol consumption on the risk of developing Depression. A Comparative study in young and middle aged adult.

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### KEYWORDS

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Depression, Young  
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health

### ABSTRACT

#### Introduction:

Alcohol use disorder (AUD) is a prevalent mental health disorder that affects millions of individuals worldwide. Alcohol is a substance that can lead to several negative physical and mental health outcomes, like depression. This study aims to fill this gap by investigating the prevalence of these mental health issues among young adults and middle-aged adults who use alcohol.

**Objectives:** This study evaluates alcohol consumption levels and mental health indicators in young and middle-aged adults, considering socioeconomic factors.

**Methods:** This cross-sectional study in Erode Tertiary Care Hospitals examines alcohol consumption's correlation with mental health in 252 young and middle-aged adults (18-59 years). Utilizing ROSOFTWARE, a 5% margin of error and 95% confidence interval determined the sample size. Inclusion criteria involved individuals with depression, a history of alcohol use, while severe mental health disorders and Comorbidities were excluded. Data collection employed standardized tools like the Hamilton Depression Rating Scale alongside a socio-demographic and alcohol consumption questionnaire. Spanning 12 months, the study aims to offer insights into alcohol's impact on mental health in a demographic.

**Result and Discussion:** In our study young and middle-aged adults (18-59 years) were compared to determine the mental health effect of alcohol consumption by Hamilton Depression Rating Scale. Among 128 young adults and 124 middle aged adult, indicated a positive relation between the alcohol and mental health. Interestingly, both age group had mental health problem but the young adults were more prone than middle aged adult because of developmental and structural changes.

**Conclusion:** This study compares the impact of alcohol consumption on Depression in young and middle-aged adults. It highlights higher risks of Depression in young adults. These findings emphasize age-related differences in alcohol's impact on mental health, offering insights for tailored prevention and intervention strategies to address associated burdens in both age groups.

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Alcohol use disorder (AUD) is a prevalent mental health disorder that affects millions of individuals worldwide. Alcohol is a substance that can lead to several negative physical and mental health outcomes, like depression. This study aims to fill this gap by investigating the prevalence of these mental health issues among young adults and middle-aged adults who use alcohol.

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**Keywords:** *Alcohol, Depression, Young aged adult, Middle aged adult mental health.*

## **INTRODUCTION**

Since the dawn of written history, alcoholic beverages have been an integral part of human communities. The World Health Organization (WHO) ranks alcohol consumption as the third highest risk factor for disease and disability globally.<sup>1</sup> According to the 2019 National Survey on Drug Use and Health (NSDUH), 85.6 percent of individuals aged 18 and older have consumed alcohol at some point in their lives.<sup>2</sup> In India, analysis by The Lancet in 2022 revealed that alcohol consumption was highest among men aged 40-64 years, with an increase of 5.63% since 1990, followed closely by the 15-39 age group, which saw a rise of 5.24%.<sup>3</sup> This trend is particularly concerning given that alcohol consumption can lead to numerous adverse physical and mental health outcomes, including depression, anxiety, and cognitive impairment.<sup>4</sup> Young adults, whose brains are still developing, especially in areas responsible for decision-making and impulse control, are particularly vulnerable to these harmful effects.<sup>5</sup>

Evidence suggests that alcohol consumption negatively impacts brain development in adolescents and young adults, potentially leading to abnormal gray matter development and increasing the risk of developing alcohol use disorders.<sup>6,7</sup>

Despite the wealth of comparative studies examining depression prevalence between various age groups, there is a notable gap in research specifically comparing depression rates between young adults and middle-aged adults who consume alcohol. This study aims to address this gap by investigating the prevalence of depression among young adult (18-39 years) and middle-aged adult (40-59 years) alcohol consumers in India. By focusing on these age groups, we seek to better understand the relationship between alcohol consumption, age, and depression, potentially informing more targeted interventions and public health strategies.

**Materials and Methods:** This cross-sectional comparative study was conducted over a six-month period in the Psychiatry department of Erode Tertiary Hospitals. The sample size of 252 was determined using ROSOFTWARE, with a 5% margin of error and a 95% confidence interval. Participants were male adults aged 18-59, diagnosed with depression, and were categorized into two groups: young adults (18-39 years) and middle-aged adults (40-59 years). Each age group was further divided into alcohol consumers and non-alcoholics. Alcohol consumers were defined as individuals who reported consuming alcohol past 12 months or more. Alcoholics were categorized according to National Institute on Alcohol Abuse and Alcoholism (NIAAA) definition.<sup>8</sup> Non-alcoholics were defined as individuals who reported no alcohol consumption in the past 12 months. The study focused exclusively on male patients due to the significantly lower prevalence of alcohol consumption among Indian women (2% in women compared to 21% in men), making it challenging to obtain a representative sample of female alcohol consumers in this population.<sup>9</sup>

Individuals with severe psychiatric disorders such as schizophrenia or bipolar disorder, those using substances other than alcohol, and those with significant comorbidities were excluded from the study. Data collection utilized standardized tools, primarily the Hamilton Depression Rating Scale (HDRS) to assess the severity of depression.<sup>10</sup> Relevant demographic and clinical information was gathered from patients' case sheets. The study was conducted after obtaining clearance from the Institutional Review Board, ensuring adherence to ethical guidelines. Informed consent was obtained from all participants, and confidentiality of personal information was maintained throughout the study. Statistical analysis was performed using appropriate tests to compare depression severity between alcohol consumers and non-alcoholics within and across the two age groups, with a significance level set at  $p < 0.05$ .

## RESULT AND DISCUSSION:

The study involved a total of 252 participants, categorized by age into two age groups and the Table 1 highlight significant demographic diversity among the participants, which is crucial for understanding the varied impact of educational and occupational backgrounds on health outcomes. The educational status of participants shows a broad range, from illiteracy to postgraduate education, indicating varied access to and completion of formal education among the population. The occupational distribution of the participants shows a significant proportion engaged in professional jobs (39.7%), followed by farming, business, and labor. This distribution suggests that a substantial number of participants may have stable income sources, which can affect their health behaviors and access to health care.

The analysis of alcohol consumption reveals distinct patterns between the two age groups. A higher percentage of young adults (64.8%) are alcohol users compared to middle-aged adults (58.1%). This finding is consistent with existing literature suggesting that younger individuals are more likely to engage in risk behaviors, including alcohol consumption. Understanding these patterns is essential for developing age-targeted interventions to address alcohol-related health issues.

The study assessed the severity of depression using the Hamilton Depression Rating Scale (HDRS) among different age groups and alcohol consumption statuses. The participants were categorized into young adults and middle-aged adults, with further subdivision into alcoholic and non-alcoholic groups. The results are summarized in Table 3. The findings indicate that moderate depression is the most prevalent severity level in young aged adults and mild depression in middle-aged adults, regardless of their alcohol consumption status. Severe depression is more common among young alcoholic individuals compared to their middle-aged counterparts. These results suggest significant differences in depression severity influenced by age and alcohol consumption.

The study revealed that moderate depression was the most prevalent severity level across all groups, with notable differences in patterns of depression severity between alcoholic and non-alcoholic individuals, as well as between young and middle-aged adults. Young alcoholic adults exhibited a higher tendency towards severe depression (30.12%) compared to their non-alcoholic counterparts (11.11%), suggesting that younger individuals who consume alcohol are at a heightened risk for severe depressive symptoms.

The analysis of Hamilton Depression Rating Scale (HDRS) scores reveals important differences in depression severity between young adults (18-39 years) and middle-aged adults (40-59 years), particularly among alcohol consumers. The results are summarized in Table 4.

Among alcohol consumers, young adults consistently showed higher mean HDRS scores across all depression severity levels compared to middle-aged adults. For mild depression, young adult alcohol consumers had a mean score of  $13.8 \pm 2.5$ , significantly higher than the  $12.9 \pm 2.1$  observed in middle-aged alcohol consumers ( $p=0.042$ ). This trend was even more pronounced in moderate depression ( $22.1 \pm 1.9$  vs.  $20.7 \pm 2.2$ ,  $p=0.001$ ) and severe depression categories ( $28.9 \pm 2.3$  vs.  $27.1 \pm 2.0$ ,  $p=0.005$ ).

These statistically significant differences suggest that alcohol consumption may have a more detrimental effect on mood in young adults compared to middle-aged adults. Interestingly, among non-alcoholics, the differences in HDRS scores between age groups were minimal and not statistically significant. For mild depression, young adult non-alcoholics had slightly lower scores ( $12.1 \pm 2.7$ ) compared to middle-aged non-alcoholics ( $12.3 \pm 2.6$ ,  $p=0.687$ ). This pattern held true for moderate ( $20.9 \pm 1.6$  vs.  $20.5 \pm 1.8$ ,  $p=0.412$ ) and severe depression ( $26.5 \pm 1.9$  vs.  $26.2 \pm 2.0$ ,  $p=0.751$ ) categories as well. The lack of significant differences in HDRS scores among non-alcoholics suggests that age alone may not be a determining factor in depression severity. Instead, it underscores the potential role of alcohol in exacerbating depressive symptoms, particularly in young adults.

The larger standard deviations observed in the alcohol consumer groups, especially in the young adult category, indicate greater variability in depression severity among alcohol users. This could

reflect the heterogeneous effects of alcohol on individuals, possibly due to factors such as drinking patterns, genetic predisposition, or environmental stressors [11].

It's noteworthy that the gap in HDRS scores between alcohol consumers and non-alcoholics widens as depression severity increases, particularly in the young adult group. This suggests that alcohol consumption may have a dose-dependent effect on depression severity, with heavier drinking potentially leading to more severe depressive symptoms [12].

The higher prevalence and severity of depression among young adult alcoholics can be attributed to several factors. Firstly, the developing brain in young adults is more susceptible to the neurotoxic effects of alcohol. The prefrontal cortex, which plays a crucial role in emotion regulation and decision-making, continues to develop well into the mid-20s [13]. Alcohol consumption during this critical period may disrupt normal neurodevelopmental processes, potentially leading to long-lasting alterations in mood regulation systems [14].

Neuroimaging studies have shown that alcohol abuse in young adults is associated with reduced hippocampal volume and disturbed white matter integrity [15]. The hippocampus, crucial for memory formation and emotional processing, is particularly vulnerable to alcohol-induced damage. This structural alteration may contribute to the development and persistence of depressive symptoms [16].

Furthermore, alcohol affects several neurotransmitter systems implicated in mood regulation. Chronic alcohol use can lead to dysregulation of the serotonergic and GABAergic systems, both of which are involved in the pathophysiology of depression [17]. Young adults may be more sensitive to these neurochemical imbalances due to their still-maturing neural circuitry.

The pattern of alcohol consumption typical among young adults, often characterized by binge drinking, may exacerbate the risk of depression. Binge drinking has been associated with more pronounced cognitive deficits and greater alterations in brain structure compared to regular moderate drinking [18]. This may explain the higher depression scores observed in our young adult alcoholic group.

Alcohol use during young adulthood can also interfere with important developmental tasks such as education completion, career establishment, and formation of stable relationships. Failure to achieve these milestones may contribute to feelings of low self-worth and hopelessness, key features of depression [19].

Moreover, early-onset alcohol use has been linked to an increased risk of developing alcohol use disorders (AUDs) later in life [20]. The prolonged exposure to alcohol and its associated negative consequences may contribute to the development and maintenance of depressive symptoms.

It's important to note that the relationship between alcohol use and depression is likely bidirectional. While our study focuses on how alcohol consumption may lead to depression, pre-existing depressive symptoms may also drive individuals to use alcohol as a form of self-medication [21].

Our findings underscore the critical need for early intervention and prevention strategies targeting young adults. Given the potentially long-lasting impact of alcohol on the developing brain and its association with depression, efforts to delay the onset of alcohol use and reduce binge drinking among young adults should be prioritized in public health initiatives.

Future longitudinal studies are needed to further elucidate the causal pathways between alcohol use and depression in young adults, and to investigate potential interventions that may mitigate the negative impact of alcohol on mental health in this vulnerable population.

**Tables:**

<b>Variables</b>	<b>Numbers (n=252)</b>
Age groups (Years)	
18-39	128
40-59	124
Educational Status	
Illiterate	47
Primary	11
Middle	17
Secondary	22
Higher Secondary	48
UG	86
PG	21
Occupation	
Farmer	54
Business	42
Labors	42
Professionals/Job	100
Student	14
Alcohol users	
18-39	
With Alcohol	83
Without Alcohol	45
40-59	
With Alcohol	72
Without Alcohol	52

**Table 1: Demographic Characteristics**

<b>Variables</b>	<b>Numbers (n= 155)</b>
Type of Drink	
18-39	
Beer	30
Whisky	25
Brandy	28
40-59	
Beer	18
Whisky	6
Brandy	48
Frequency of drinking	
18-39	
Daily	25
Weekly	38
Monthly	4
Occasionally	16
40-59	
Daily	24
Weekly	22
Monthly	12
Occasionally	14
Number of pegs	
18-39	
1-2	18
3-6	37
>6	28
40-59	
1-2	29
3-6	28
>6	15

**Table 2: Pattern of Alcohol consumption**

S.No	Depression severity level(HDRS)	Young Adult		Middle Aged Adults	
		Alcoholic n=83(%)	Non-Alcoholic n=45(%)	Alcoholic n=72(%)	Non-Alcoholic n=52(%)
1	Absence of depression(0-7)	0	0	0	0
2	Mild depression(7-17)	20(24.09)	25(55.55)	31(43.05)	34(65.38)
3	Moderate depression(18-24)	38(45.78)	15(33.33)	29(40.27)	14(26.92)
4	Severe depression(25 and above)	25(30.12)	5(11.11)	12(16.66)	4(7.69)

**Table 3. Depression Severity Levels in Alcoholic and Non-Alcoholic Individuals Across Different Age Groups**

	Alcohol consumers Hamilton Depression Rating Score Mean±SD		P -value	Non-alcoholics Hamilton Depression Rating Score Mean±SD		P -value
	18-39	40-59		18-39	40-59	
Mild depression(7-17)	13.8±2.5	12.9±2.1	0.042	12.1±2.7	12.3±2.6	0.687
Moderate depression(18-24)	22.1±1.9	20.7±2.2	0.001	20.9±1.6	20.5±1.8	0.412
Severe depression(25 and above)	28.9±2.3	27.1±2.0	0.005	26.5±1.9	26.2±2.0	0.751

**Table 4. Mean Score (SD) of Hamilton Depression Rating Scale**

**Conclusion:**

In conclusion, this study highlights the differential impact of alcohol consumption on the risk of developing Depression, with a comparative analysis between young and middle-aged adults. The findings indicate that young adults who consume alcohol face a significantly higher risk of experiencing severe Depression compared to their middle-aged counterparts. Overall, this research enhances our understanding of the potential age-related differences in the influence of alcohol consumption on mental health. To offer valuable insights for developing targeted prevention and intervention strategies to reduce the burden of depression associated with alcohol consumption in young adults and middle-aged adults.

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