Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 6 (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

The Impact Of Bmi And Gender Disparities On Nafld Among Young Adults

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Cite this paper as: Subashini.G, Murugaraj.T, Shanmugananth Elayaperumal, Jannathul Firthous.M, Raveena Thilagam.S, (2025) The Impact Of Bmi And Gender Disparities On Nafld Among Young Adults. *Journal of Neonatal Surgery*, 14 (6), 49-55.

ABSTRACT

Background: Non-alcoholic fatty liver disease (NAFLD) is an abnormal buildup of fat in the liver, which can lead to inflammation and cirrhosis. The purpose of this study was to determine the prevalence of NAFLD in teenagers and how it related to clinical and biochemical markers.

Objective: The purpose of this research was to find out the prevalence of non- alcoholic fatty liver disease among young adults.

Method: This cross-sectional analytical investigation was carried out in Puducherry. The study included males and females who provided informed consent and fulfilled inclusion criteria. Between the ages of 18 -35, 100 non-alcoholic persons (male and female) participated in the study all subjects had ultrasonography to rule out fatty liver. SPSS software version 22.0 was used to statistically evaluate all of the results.

Result: Overall, 71% of male had NAFLD and 29% of female had NAFLD. Men are more likely than female to acquire NAFLD. The Ultrasonogram's fatty liver grading system showed that 40.2% of participants had grade 1, 20.8% had grade 2, and 0.5% had grade 3. Overweight were more likely than Normal weight to acquire NAFLD in this study, which covered both sexes. According to this study, NAFLD affected 36.4% of Normal weight and 63.6% of Overweight.

Conclusion: Therefore, co-morbidities, risk factors, and gender inequities all have a substantial impact on the development of NAFLD. Males in particular who are overweight are more likely to get the NAFLD. Co-morbidities, like BMI, are important in development of NAFLD. NAFLD and its effects may be lessened if these risk factors are addressed with targeted interventions.

Keywords: *Non- alcoholic fatty liver disease, Risk factors, gender disparities, young adults, co-morbidities.*

1. INTRODUCTION

Non-alcoholic fatty liver disease is the most prevalent cause of chronic liver disease. About 25% to 33% of people worldwide suffer from non-alcoholic fatty liver disease (NAFLD). It encompasses a variety of liver conditions, from simple liver steatosis to non-alcoholic steatohepatitis (NASH). The most advanced type of the disease, known as NASH, is typified by hepatocyte enlargement, inflammation, and hepatocellular damage, either with or without fibrosis. Numerous liver-related sequelae, including cirrhosis, liver failure, and hepatocellular carcinoma, are linked to the progression of non-alcoholic fatty liver disease (NAFLD)[1]. After ruling out secondary causes of hepatic fat buildup, such as heavy alcohol consumption, long-term steatogenic pharmaceutical usage, or monogenic genetic illnesses, non-alcoholic fatty liver disease (NAFLD) is defined as the presence of hepatic steatosis by imaging or histology.

The development of NAFLD is facilitated by the concurrent adoption of a more sedentary lifestyle and consumption of a high-calorie diet, whereas the prevalence of ALD is increased worldwide by a spiraling upward trend in alcohol use, earlier drinking ages, and higher per capita alcohol consumption.[21] Inadequate exercise, sleep duration, and nutritional variables are all linked to an elevated risk of non-alcoholic fatty liver disease. Although obesity is a significant risk factor for NAFLD, current research has shown that lean people can also have NAFLD.

About 10–20% of adolescents have this type of chronic liver disease, which is the most prevalent in this age group. Excess weight gain and obesity, which are connected to consuming too many refined foods and not exercising, are the main risk factors for non-alcoholic fatty liver disease (NAFLD) in adolescents and young adults.[2,3] A significant predictor of NAFLD is visceral adipose mass.[4] South Asians are more viscerally adipose than Caucasians, which raises the incidence of NAFLD in Asian Indians.[5] It is crucial to make the diagnosis early in adolescents since elevated liver enzymes are typically observed in children after the age of nine. These enzymes may be a warning indication for potential liver damage or inflammation.[2] NAFLD is becoming more significant because to its strong correlation with metabolic syndrome, its potential contribution to the development of cardiovascular disease, and its link with diabetes and poor glucose tolerance. [9]

The highest rates of NAFLD in adults over 18 are found in the Middle East and South America, followed by Asia, North America, Europe, and Africa. NAFLD is thought to affect 25.2% of people over the age of 18 worldwide. A recent meta-analysis found that the prevalence of NAFLD has sharply increased throughout Asia. It showed notable regional variation and a pooled frequency of 29.6% throughout Asia[15,16] More than or equal to 5% of hepatic fat accumulation is required for the diagnosis of non-alcoholic fatty liver disease (NAFLD), and other liver disease etiologies like viral hepatitis, autoimmune liver disease, hemochromatosis, Wilson's disease, drug-induced liver disease, and heavy alcohol use must be ruled out[19]. Although NAFLD has historically been thought of as the metabolic syndrome's hepatic manifestation, an increasing amount of data points to NAFLD as a potential major contributor to the metabolic syndrome. NAFLD affects the cardiovascular, endocrine, renal, and extrahepatic cancers, and its hepatic symptoms are only one part of a multi-organ systemic disease.[20]We conducted this study to determine the prevalence of NAFLD and to learn more about the clinical factors that may be linked to a higher risk of NAFLD in adolescents, including age, gender, pubertal status, body mass index (BMI), central adiposity, body fat percentage[8].

2. METHODOLOGY

STUDY DESIGN: This study was a cross-sectional study. **SAMPLE SIZE:** 100 Sample. **STUDY SETTING:** study sessions were held in Mahatma Gandhi Medical College and research institute, Puducherry. where the subjects were assessed, data were collected. **STUDY METHOD**: All the participants were selected by convenient sampling. **INCLUSION CRITERIA**: Participant age (18 to 35). Both male and female gender will be included in the study. Both obese and non-obese people will be included in the study. Willing to participate. **EXCLUSION CRITERIA**: People with alcoholic habit will be excluded. People with other liver disease. People with history of renal impairment, thyroid disorders.

3. PROCEDURE

A total of 100 patients diagnosed with NAFLD from the General Medicine Department will be included in the study. Comorbidities such as BMI will be recorded. Gender prevalence will be analysed. NAFLD grading will be done using ultrasound, categorizing it into Grade 1, Grade 2, Grade 3 based on hepatic echogenicity and vessel visibility. Statistical analysis will assess correlations between NAFLD grades and comorbidities. Ethical approval will be obtained, and informed consent will be taken from all participants while ensuring confidentiality of data.

4. ULTRASOUND FEATURES FOR DIAGNOSING FATTY LIVER

Liver to kidney contrast, parenchymal brightness, bright vessel wall, deep beam attenuation, and define gallbladder wall.

Based on the conventional qualitative grades, NAFLD was labelled from grades 0 to 3.

• Grade 0 - Normal

• Grade 1 - Represented by a slight diffused increase in fine echoes in the hepatic parenchyma with normal visualization of the diaphragm and intrahepatic vessel borders (mild).

• Grade 2 - Represented by a moderate diffused increase in fine echoes with slightly impaired visualization of intrahepatic vessels and diaphragm (moderate).

• Grade 3 - Represented by a marked increase in fine echoes with poor or no visualization of the intrahepatic vessel borders, diaphragm, and posterior portion of the right lobe of the liver (severe).

5. RESULT

Overall, 71% of male had NAFLD and 29% of female had NAFLD. Men are more likely than female to acquire NAFLD. The Ultrasonogram's fatty liver grading system showed that 40.2% of participants had grade 1, 20.8% had grade 2, and 0.5%

had grade 3. Overweight were more likely than Normal weight to acquire NAFLD in this study, which covered both sexes. According to this study, NAFLD affected 36.4% of Normal weight and 63.6% of Overweight.

6. STATISTICAL ANALYSIS

Descriptive statistics were used to summarize the data collected in simple numerical form using MS Excel. The data was then statistically analysed and presented in the form of pie charts and bar diagrams. A total of 100 participants data were collected from NAFLD patients.

FIG 1: GENDER DISTRIBUTION AMONG NAFLD:

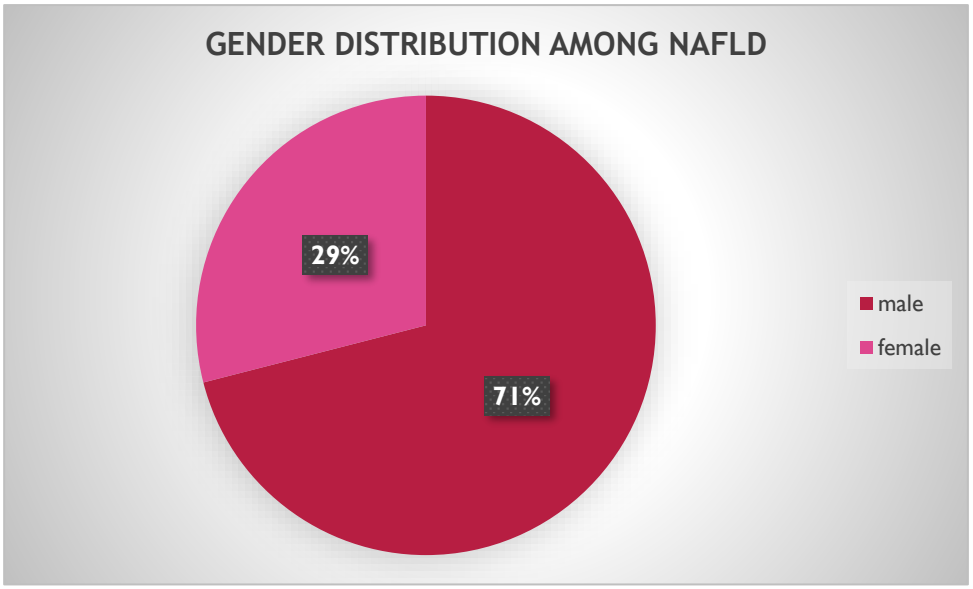

TABLE: 1

GENDER	PERCENTAGE
Female	29%
Male	71%

The table shows that 29% of NAFLD patients are female, while 71% are male. This indicates a higher prevalence of NAFLD among males compared to females.

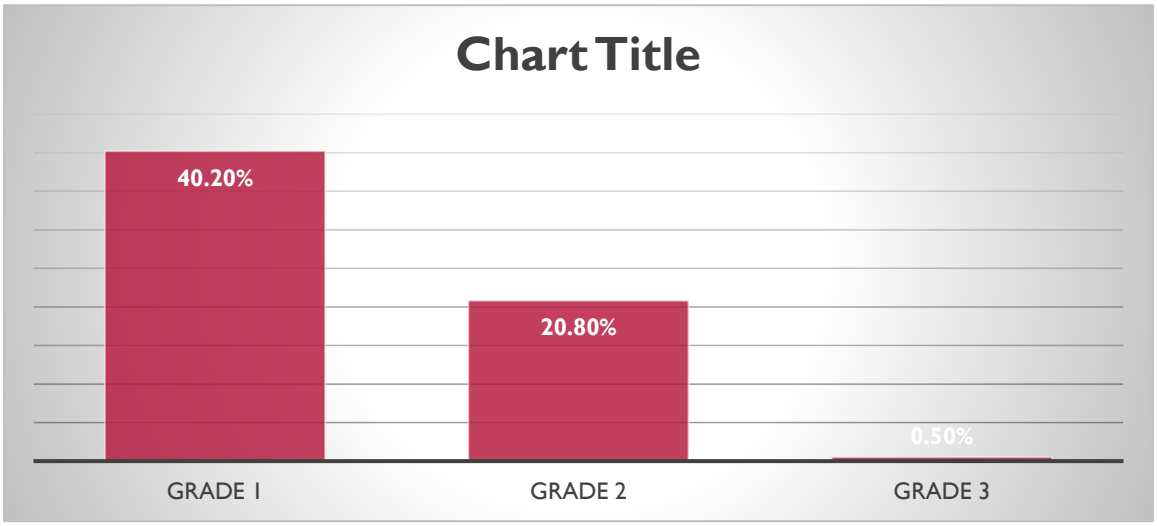

FIG 2: ULTRASONOGRAM'S FATTY LIVER GRADING SYSTEM:

TABLE:2

Grade	Percentage
Grade:1	40.2%
Grade:2	20.8%
Grade:3	0.5%

A pie chart shows ultrasonogram's fatty liver grading system showed that 40.2% of participants had grade 1, 20.8% had grade 2, and 0.5% had grade 3.

FIG 3: BMI DISTRIBUTION AMONG NAFLD:

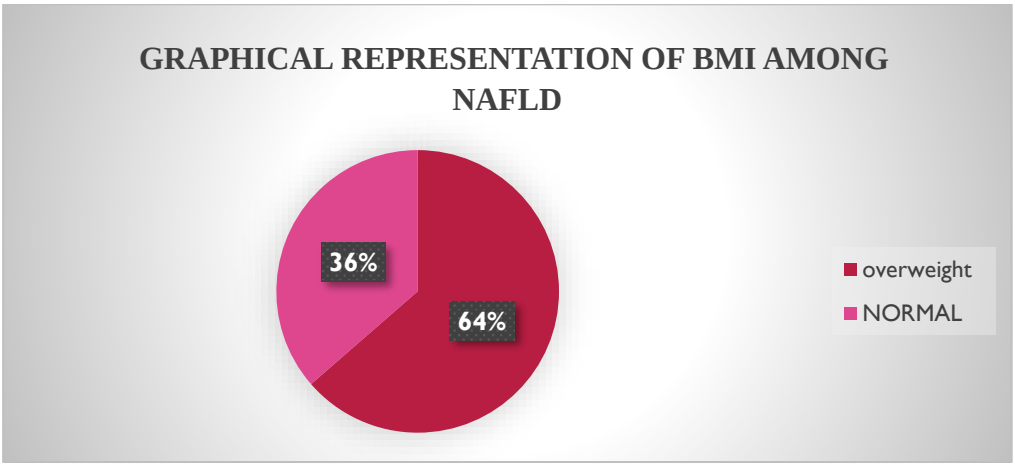

TABLE:3

BMI	PERCENTAGE
Overweight	63.6%
Normal	36.4%

A pie chart shows that overweight were more likely than normal weight to acquire NAFLD. which covered both sexes. According to this study, NAFLD affected 36.4% of normal weight and 63.6% of overweight.

FIG 4: AGE DISTRIBUTION AMONG NAFLD PEOPLE:

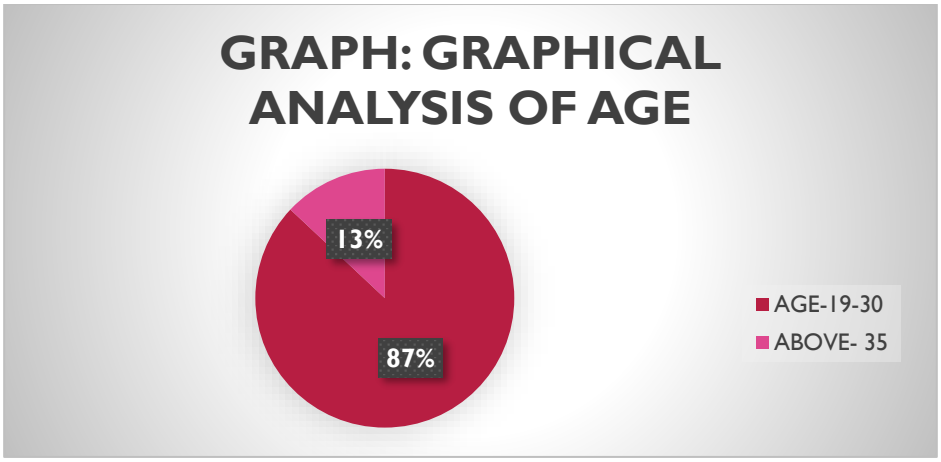

TABLE:4

AGE	PERCENTAGE
Age between 19-35	87%
Above 35	13%

A pie chart shows that 87% of NAFLD people fall under the age criteria and 13% of people fall above the age of 35 years.

7. DISCUSSION

According to this analytical cross-sectional study, 71% of male and 29% of the female population had NAFLD, and Grade 1 non-alcoholic fatty liver disease are more likely than other Grade which was identified by ultrasonography. According to a meta-analysis, the prevalence of NAFLD is 25.24% worldwide[10]. Between 9 - 32 percent of Indians are thought to have non-alcoholic fatty liver disease (NAFLD)[11]. A population-based study in coastal south India found a 49.8% prevalence rate. A higher burden of NAFLD, which has a high prevalence, should raise concerns because it may increase the chance of developing serious liver disorders such NASH, cirrhosis, fibrosis, hepatocellular carcinoma, and death in the future. According to a community-based prevalence study of NAFLD based on ultrasound results, the rates were 30.7% in rural Haryana, 32.2% in metropolitan Chennai, and 16.6% in urban Mumbai[11,12].

NAFLD was assigned a grade between 0 and 3 according to the traditional qualitative classification system. 40.2% of the NAFLD patients in this study had a grade of 1, or mild[14]. NAFLD was significantly more likely to occur in participants with larger waist circumferences. The findings supported earlier studies that found a substantial correlation between this parameter and NAFLD. Abdominal obesity alone was revealed to be a predictor of NAFLD in this investigation. Asians are more prone than Westerners to have extra visceral fat, which increases the risk of obesity-related disorders, and to have abdominal fat deposition[17].This is true even if their BMI is the same. Asians are more susceptible to diabetes mellitus and cardiovascular risk factors due to their central adiposity, even if their BMIs are lower. Asians have a higher prevalence of NAFLD while having lower BMIs, which could be due to an aberrant accumulation of visceral fat[18].

According to this meticulously carried out meta-analysis, the global prevalence of NAFLD for the whole study period (1990–2019) is 30.1%. However, our trend analysis revealed that the prevalence of NAFLD has risen from 25.3% between 1990 and 2006 to 38.2% between 2016 and 2019. Over almost three decades, the frequency of NAFLD has increased by 50.4%. These rates are in line with the expanding worldwide obesity and type 2 diabetes epidemic and are higher than those we reported in 2016.[23]

Non-alcoholic fatty liver disease encompasses a range of conditions, from non-alcoholic steatohepatitis with variable degrees of inflammation and fibrosis to simple hepatic steatosis without noticeable inflammation or fibrosis. It is a clinical condition that, by definition, affects patients who have never consumed alcohol, but has histological characteristics similar to alcohol-induced liver damage. Hepatic steatosis with an inflammatory component that may be linked to fibrosis is known as non-alcoholic steatohepatitis (NASH), while fat accumulation in hepatocytes without accompanying inflammation or fibrosis is at the other end of the histological spectrum. In as many as 20% of cases, this can develop into cirrhosis. It is now known that one of the main causes of cryptogenic cirrhosis is NASH. NASH has an unclear cause, but it is commonly linked to hyperlipidemia, obesity, and type 2 diabetes. The metabolic syndrome is the collective term for abdominal obesity, hypertension, diabetes, and dyslipidemia.[22]

CONCLUSION

This study emphasizes the important role that risk factors, co-morbidities, and gender play in the development of NAFLD. NAFLD is more common in males than in women, with a higher prevalence of 71% in the former group. Furthermore, the study shows that 63.6% of overweight participants had NAFLD, indicating that overweight people are more vulnerable to the disease than people of normal weight. The majority of cases are classified as grade 1 (40.2%) on the ultrasonogram's fatty liver grading system, which denotes early-stage liver injury. These results highlight how crucial it is to address weight-related risk factors and gender inequities in the prevention and treatment of NAFLD.

8. ETHICAL CONSIDERATION

Before collecting any data, it is essential to obtain informed consent from all participants. This ensures they understand the study's goals, processes, and their right to withdraw at any moment. Protecting confidentiality and privacy is crucial; data should be securely stored and only accessible to authorized individuals.

AUTHOR CONTRIBUTION: Subashini. G the author. A study was designed, data was gathered, analyzed, and evaluated. Dr. T. Murugaraj wrote the article, revised it critically, and approved the final version before it was published.

FUNDING SOURCE: No funding

CONFLICTS OF INTEREST: No conflict of interest

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