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# The Silent Pandemic: Investigating the Prevalence of Non-Alcoholic Fatty Liver Disease (NAFLD) in Low-Income Urban Communities

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**Copyright © 2025 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License** (CC BY-NC **4.0**) which permits unrestricted use, distribution, and reproduction in any medium for noncommercial use provided the original author and source are credited. ABSTRACT: Background: Non-Alcoholic Fatty Liver Disease (NAFLD) is emerging as a significant public health concern globally, especially in urban low-income populations due to lifestyle and metabolic risk factors. Despite its silent progression, awareness and early detection remain low in Bangladesh. Objective: This study aimed to assess the prevalence of NAFLD and its associated sociodemographic, clinical, and biochemical factors among low-income urban workers in Dhaka. Methods: A cross-sectional study was conducted from October 2024 to March 2025 among 200 purposively selected indoor and outdoor patients (100 males and 100 females) of non-alcoholic fatty liver disease from the Medicine Department of Dhaka Medical College. Data were collected through interviews, physical examinations, and biochemical tests. NAFLD was diagnosed via abdominal ultrasonography. *Results:* The overall prevalence of NAFLD was 52.0%, higher among males (58.0%) than females (46.0%). Most participants were aged 31-45 years (42.0%), and 24.0% had no formal education. Obesity (20.0%), overweight (44.0%), and elevated waist circumference (57.0%) were common. Hypertension and diabetes were present in 46.0% and 38.0%, respectively. Biochemical abnormalities included elevated triglycerides (57.0%), ALT (49.0%), and low HDL (46.0%). Awareness was poor-only 13.0% had heard of NAFLD, and 33.0% were aware that obesity affects liver health. Conclusion: NAFLD is highly prevalent among low-income urban workers in Dhaka, linked with obesity, poor physical activity, and metabolic disorders. Low awareness highlights the need for community-level interventions and early screening programs.

**Keywords:** NAFLD, Low-Income Population, Urban Health, Obesity, Bangladesh, Cross-Sectional Study.

#### INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD) encompasses a spectrum ranging from simple steatosis to non-alcoholic steatohepatitis (NASH) and cirrhosis<sup>1,2</sup>. It stands as a major contributor to liver-related mortality and is closely linked with pronounced insulin resistance and an elevated risk of cardiovascular diseases<sup>3-5</sup>. A significant proportion of individuals diagnosed with type 2 diabetes mellitus and metabolic syndrome eventually develop NAFLD<sup>6,7</sup>, and in some cases, the disease can further advance to malignancy<sup>3,8</sup>. At present, NAFLD is recognized as the leading cause of hepatic dysfunction in developed nations, and projections suggest it will assume a similar position in developing countries over the coming decades.

In Western countries, the prevalence of NAFLD is estimated to range between 20% and 30%9-11. The prevalence rates reported in the Middle East, Japan, and China mirror those observed in Western populations, falling between 15% and 30%. In Asia, NAFLD prevalence varies across regions; specifically, in the Indian subcontinent, urban areas report rates between 16% and 32%, while rural areas show a prevalence of around 9% to 16%<sup>11,12</sup>. Bangladesh is similarly witnessing a growing prevalence of NAFLD, which is largely attributed to shifts in dietary habits and increasingly sedentary lifestyles <sup>13-15</sup>. According to a report from the World Health Organization (WHO) published in May 2014, liver diseases account for 2.82% of all deaths in Bangladesh, ranking as the eighth leading cause of mortality. The age-adjusted death rate is noted to be 19.26 per 100,000 people. Chronic liver diseases (CLDs) are responsible for 37% to 69% of liver-related illnesses in Bangladesh, and NAFLD represents a significant share of this burden 14-16. This study was undertaken to assess the prevalence of NAFLD among low-income male and female workers attending the Medicine Department of Dhaka Medical College, and to explore the sociodemographic and clinical factors associated with the condition. The findings are expected to help inform targeted screening, prevention, and health education strategies for this at-risk group.

## **METHODOLOGY**

This cross-sectional study was conducted in Dhaka city over six months, from October 2024 to March 2025. A total of 200 adult patients, comprising an equal number of males and females (100 each), aged 18 years and above, were selected through purposive sampling. All participants were permanent residents of Dhaka and belonged to the low-income socioeconomic group, with current employment in various forms of manual or informal labor. Both indoor and outdoor patients attending the Department of Medicine at Dhaka Medical College during the study period were considered for inclusion. The inclusion criteria required participants to be permanent Dhaka residents, classified as low-income, engaged in labor-intensive or informal occupations, and free from significant alcohol consumption, defined as more than 20 grams per day for men and more than 10 grams per day for women. Patients diagnosed with chronic liver diseases, including hepatitis B or C, autoimmune hepatitis, or drug-induced liver injury, were excluded from the study. Data collection was conducted through face-to-face interviews using а pre-tested, structured questionnaire that gathered information on sociodemographic characteristics, occupational history, medical background, lifestyle habits, and dietary patterns. In addition, anthropometric measurements such as height, weight, and Body Mass Index (BMI) were recorded. Laboratory investigations were performed, including liver function tests, fasting blood glucose, lipid profiles, and abdominal ultrasonography to assess the presence of hepatic steatosis. The diagnosis of Non-Alcoholic Fatty Liver Disease (NAFLD) was confirmed based on ultrasound evidence of fatty liver, excluding any known alternative causes. Before data collection, informed written consent was obtained from all participants. The purpose, procedures, potential benefits, and confidentiality measures of the study were thoroughly explained to each participant in their native language, and participation was entirely voluntary. Descriptive statistics were employed to summarize the collected data, while the prevalence of NAFLD and its associations with clinical and lifestyle factors were analyzed using appropriate statistical methods.

# RESULTS

Variable	Category	Male (n=100)	Female (n=100)	Total (n=200)	Total (%)
Age Group (years)	18–30	24 (24.0%)	28 (28.0%)	52	26.0%
	31–45	46 (46.0%)	38 (38.0%)	84	42.0%
	46-60	30 (30.0%)	34 (34.0%)	64	32.0%
Education Level	No education	18 (18.0%)	30 (30.0%)	48	24.0%
	Primary	28 (28.0%)	34 (34.0%)	62	31.0%
	Secondary	32 (32.0%)	22 (22.0%)	54	27.0%

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	SSC or above	22 (22.0%)	14 (14.0%)	36	18.0%
Monthly Income (BDT)	<10,000	34 (34.0%)	32 (32.0%)	66	33.0%
	10,000–15,000	50 (50.0%)	44 (44.0%)	94	47.0%
	>15,000	16 (16.0%)	24 (24.0%)	40	20.0%

Table 1 shows that the majority of participants were aged 31–45 years (42.0%). Females had a higher percentage of no formal education (30.0%) compared to males (18.0%),

while males had higher education attainment at the SSC or above level (22.0% vs 14.0%). Most participants (47.0%) earned between 10,000–15,000 BDT monthly.

Occupation	Male (n=100)	Female (n=100)	Total (n=200)	Percentage (%)
Day laborer	44 (44.0%)	6 (6.0%)	50	25.0%
Garment worker	10 (10.0%)	48 (48.0%)	58	29.0%
Domestic worker	2 (2.0%)	30 (30.0%)	32	16.0%
Shopkeeper/Vendor	28 (28.0%)	6 (6.0%)	34	17.0%
Others	16 (16.0%)	10 (10.0%)	26	13.0%

#### Table 2: Occupational Distribution by Gender

Table 2 illustrates that male participants were predominantly day laborers (44.0%) and shopkeepers/vendors (28.0%), while the majority of

female participants worked in garment factories (48.0%) or as domestic workers (30.0%).

Table 3: Lifestyle and Physical Activity Patterns							
Variable	Category	Male (n=100)	Female (n=100)	Total (n=200)	Total (%)		
Working hours/day	<6 hours	12 (12.0%)	30 (30.0%)	42	21.0%		
	6–9 hours	54 (54.0%)	42 (42.0%)	96	48.0%		
	>9 hours	34 (34.0%)	28 (28.0%)	62	31.0%		
Physical activity level	Low	30 (30.0%)	62 (62.0%)	92	46.0%		
	Moderate	42 (42.0%)	34 (34.0%)	76	38.0%		
	High	28 (28.0%)	4 (4.0%)	32	16.0%		
Smoking status	Smoker	54 (54.0%)	10 (10.0%)	64	32.0%		
	Non-smoker	46 (46.0%)	90 (90.0%)	136	68.0%		

## Cable 3: Lifestyle and Physical Activity Patterns

Table 3 describes that more females worked less than 6 hours per day (30.0%), while males worked longer. Low physical activity was

reported in 62.0% of females and 30.0% of males. Smoking was significantly more prevalent among males (54.0%) than females (10.0%).

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Variable	Category	Male (n=100)	Female (n=100)	Total (n=200)	Total (%)		
BMI Category	Normal	42 (42.0%)	30 (30.0%)	72	36.0%		
	Overweight	40 (40.0%)	48 (48.0%)	88	44.0%		
	Obese	18 (18.0%)	22 (22.0%)	40	20.0%		
Waist circumference	Elevated	50 (50.0%)	64 (64.0%)	114	57.0%		
Hypertension	Yes	50 (50.0%)	42 (42.0%)	92	46.0%		
Diabetes	Yes	42 (42.0%)	34 (34.0%)	76	38.0%		

### Table 4: Clinical and Anthropometric Characteristics

Table 4 shows that 44.0% of participants were overweight, and 20.0% were obese. Elevated waist circumference was observed in 64.0% of

females and 50.0% of males. Hypertension and diabetes were slightly more common in males.

Parameter	Abnormal Male	Abnormal Female	Total Abnormal (n)	Percentage (%)			
Elevated ALT	56 (56.0%)	42 (42.0%)	98	49.0%			
Triglycerides >150 mg/dL	62 (62.0%)	52 (52.0%)	114	57.0%			
Fasting glucose >110	50 (50.0%)	38 (38.0%)	88	44.0%			
Low HDL	48 (48.0%)	44 (44.0%)	92	46.0%			

**Table 5: Biochemical Profile Abnormalities** 

Table 5 shows that the most common abnormality was elevated triglycerides (57.0%), followed by low HDL (46.0%) and elevated ALT (49.0%). Abnormal biochemical markers were more common among males.

Table 0. INAPLD Trevalence and Awareness							
Variable	Category	Male (n=100)	Female (n=100)	Total (n=200)	Total (%)		
NAFLD Detected (via USG)	Yes	58 (58.0%)	46 (46.0%)	104	52.0%		
Heard of NAFLD	Yes	20 (20.0%)	6 (6.0%)	26	13.0%		
Previous liver check-up	Yes	30 (30.0%)	18 (18.0%)	48	24.0%		
Aware that obesity affects the liver	Yes	42 (42.0%)	24 (24.0%)	66	33.0%		

Table 6: NAFLD Prevalence and Awareness

Table 6 narrates that NAFLD was detected in 52.0% of participants, higher among males (58.0%) than females (46.0%). Only 13.0% had ever heard of NAFLD, and just 24.0% had previous liver check-ups. Awareness about the liver impact of obesity was low, especially among females.

# DISCUSSION

The present study investigated the prevalence and associated factors of Non-Alcoholic Fatty Liver Disease (NAFLD) among 200 lowincome urban workers in Dhaka, equally divided between males and females. The overall prevalence of NAFLD was found to be 52.0%, with a higher proportion among males (58.0%) compared to females (46.0%). Another study reported that a higher prevalence of NAFLD among men, possibly due to gender differences in fat distribution and lifestyle habits13. Sociodemographic data revealed that the majority of participants (42.0%) were aged between 31-45 years, which is consistent with other studies indicating that NAFLD is most common in middle-aged adults. Educationally, 24.0% had no formal education, and 31.0% only reached the primary level. Females had a higher rate of no education (30.0%) compared to males (18.0%). Educational level has been linked to awareness and health-seeking behavior, and low education may contribute to the lack of knowledge about liver diseases in this population.

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Occupationally, day laborers comprised 25.0% of the participants, predominantly male, while 48.0% of the females were garment workers. Physical activity was reported as low in 46.0% of the total sample, especially among females (62.0%), which may be linked to higher rates of metabolic disorders. More than half of the males (54.0%) were smokers, while 90.0% of females were nonreflecting gender-specific smokers, lifestyle behaviors. In terms of clinical characteristics, 44.0% of participants were overweight and 20.0% were obese. Elevated waist circumference was observed in 57.0% of the total sample, with females being more affected. Similar trends were reported in many studies, where central obesity was a significant predictor of NAFLD among Bangladeshi adults<sup>15</sup>. Hypertension (46.0%) and diabetes (38.0%) were also prevalent, reinforcing the metabolic basis of NAFLD as noted in prior abnormalities research⁵. Biochemical were significant: 57.0% had elevated triglycerides, 49.0% had elevated ALT, and 46.0% had low HDL levels. Another study emphasized dyslipidemia and elevated liver enzymes as key indicators of NAFLD<sup>4,5-40</sup>. Alarmingly, only 13.0% of participants had ever heard of NAFLD, and just 24.0% had undergone a previous liver check-up. Awareness that obesity impacts liver health was evident in only 33.0% of participants. This underscores the

urgent need for targeted health education, especially in low-income settings. In summary, the high prevalence of NAFLD among low-income workers in Dhaka is associated with modifiable factors such as obesity, sedentary lifestyle, smoking, and lack of awareness. The findings emphasize the need for early screening, lifestyle interventions, and public health policies tailored to vulnerable urban populations.

# CONCLUSION

The study highlights the high prevalence of Non-Alcoholic Fatty Liver Disease (NAFLD) among low-income urban workers in Dhaka, with significant associations to obesity, poor physical activity, and metabolic disorders like hypertension and diabetes. The findings emphasize the critical need for early screening, health education, and lifestyle interventions targeting this vulnerable population. Given the low level of awareness about NAFLD, particularly in low-income communities, public health initiatives should focus on increasing knowledge about the disease and its risk factors, thereby reducing the burden of this silent epidemic.

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