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INVESTIGATING THE NUTRITIONAL STATUS OF THE PATIENTS SUFFERING FROM CHRONIC LIVER DISEASE

Original Research

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ABSTRACT

BACKGROUND: Chronic liver disease (CLD) is a global health issue, contributing significantly to morbidity and mortality, arising from various causes, including viral hepatitis, alcohol misuse, autoimmune disorders, genetic factors, and toxin exposure.

OBJECTIVE: This study aimed to evaluate the nutritional status of CLD patients.

METHODOLOGY: A cross-sectional design was employed with 208 participants aged 20–45 years at Ghurki Trust Teaching Hospital, Lahore. Simple random sampling was used for participant recruitment, and data were collected using demographic questionnaires, anthropometric measurements (BMI), the International Physical Activity Questionnaire (IPAQ), a Food Frequency Questionnaire (FFQ), the Chronic Liver Disease Questionnaire (CLDQ) for quality of life (QoL), and the Mini Nutritional Assessment (MNA) for malnutrition status. SPSS was used for analysis, with $p<0.05$ as the significance threshold.

RESULTS: The study found that most participants were aged 36–40 years, with an equal gender distribution. Females had poorer Quality of Life (QoL) than males. Physical activity and BMI showed no significant correlation with QoL, and half of the participants had a healthy weight. Dietary habits indicated balanced intake, with daily consumption of dairy, fruits, vegetables, meat, and tea, and cereals and oils consumed 2–3 times daily. The malnutrition indicator score revealed most patients were at risk of malnutrition. Malnutrition status was linked to BMI, QoL, and intake of cereals, dairy, fruits, and red meat, but not vegetables, vegetable oil, or tea. Further research on nutritional interventions is needed.

CONCLUSION: The study involved 36-40-year-olds, with equal gender distribution. Females reported poorer Quality of Life compared to males. Most had a healthy weight, and daily consumption of dairy, fruits, vegetables, meat, and tea. Malnutrition was associated with BMI, QoL, cereal intake, dairy, fruits, and meat. Further research on targeted nutritional interventions is recommended to improve QoL in this group.

KEY TERMS: Chronic liver disease, CLD, Nutritional status, Quality of Life, QOL, Dietary habits, BMI, Physical activity level.

INTRODUCTION

Chronic liver disease (CLD) is a major global cause of death and is strongly linked to obesity, excessive alcohol intake, and sedentary lifestyles. It is defined as the progressive decline of liver function—affecting clotting factor production, detoxification, and bile excretion—over a period of up to six months[1]. The most common causes include viral infections, alcohol use, toxins, and nonalcoholic fatty liver disease (NAFLD)[2]. Liver function is typically evaluated using biochemical markers such as GGT, ALP, AST, and ALT[3].

A wide range of conditions—including viral hepatitis, chronic alcohol use, autoimmune disorders, genetic abnormalities, and drug- or chemical-induced injury—can lead to CLD, contributing significantly to global morbidity and mortality[4]. Cirrhosis, a major consequence of CLD, ranked as the 11th leading cause of death and 15th leading cause of morbidity worldwide in 2016, accounting for 2.2% of all deaths[5]. In 2017, 1.32 million people died from CLD, with men representing the majority of deaths. In Asia, 9–10 million individuals experience viral liver infections, while a much larger number suffer from non-viral liver diseases; Pakistan has one of the highest CLD prevalence rates in the region[6]. Symptoms of CLD may be specific to the underlying condition or nonspecific, such as fatigue, anorexia, and weight loss, and may progress to jaundice, hepatic encephalopathy, portal hypertension, ascites, esophageal varices, or hepatocellular carcinoma[7].

Diagnosing malnutrition in early cirrhosis is challenging due to the absence of universally accepted assessment methods and uncertainty regarding routine screening efficiency. Dietary journals remain one of the simplest and most effective tools for monitoring intake[8]. The Subjective Global Assessment (SGA) incorporates factors such as weight, dietary intake, gastrointestinal symptoms, functional capacity, metabolic needs, and clinical history, and is validated as a reliable nutrition assessment tool in cirrhotic patients[9]. However, common biochemical markers like albumin, pre-albumin, and retinol-binding protein are unreliable due to liver failure. Serum total protein correlates more with disease severity than malnutrition, while immunological markers such as complement levels and lymphocyte count lack sensitivity and specificity. The creatinine-height index may be accurate only when renal function remains intact[10].

METHODS

This cross-sectional study, conducted over four months at Ghurki Trust Teaching Hospital Lahore, included 208 randomly selected participants aged 20–45 years to evaluate the relationships among chronic liver disease (CLD), physical activity, dietary habits, nutritional status, and quality of life. The sample size was calculated using a standard formula with a 95% confidence level and 5% margin of error. Eligible participants were those diagnosed with or showing symptoms of CLD and willing to provide informed consent, while those outside the age range, unwilling to participate, or having other medical conditions were excluded. Data were collected using a self-administered questionnaire covering demographics; anthropometric measurements such as weight, height, and BMI; physical activity assessed through the International Physical Activity Questionnaire (IPAQ), which categorizes activity levels based on MET-minutes/week as low, moderate, or high[11]; dietary habits analyzed through a Food Frequency Questionnaire (FFQ) evaluating consumption patterns of major food groups[12]; quality of life measured using the Chronic Liver Disease Questionnaire (CLDQ), which includes 29 items across six domains—fatigue, activity, emotional function, abdominal symptoms, systemic symptoms, and worry [13]; and nutritional status determined using the Mini Nutritional Assessment (MNA), categorizing individuals as well-nourished, at risk of malnutrition, or malnourished[14]. Participants were briefed on study objectives and assisted when needed to complete the questionnaire, and confidentiality was ensured throughout. Data analysis was performed using SPSS, applying descriptive statistics and Chi-square tests to examine associations between CLD and variables including physical activity, lifestyle, and dietary behaviors, with p-values <0.05 considered statistically significant.

RESULTS

In this research, the nutritional status of patients with chronic liver diseases was assessed by examining age, gender, BMI, physical activity, dietary habits, and Quality of Life (QoL). Associations between BMI, gender, physical activity, and QoL were also analyzed.

Table 1: Demographics of the patients

Characteristics	Frequency	Percentage
Age		
20-25	24	12%
26-30	33	16%
31-35	39	19%

36-40	63	30%
41-45	49	23%
Gender		
Male	104	50%
Female	104	50%

Among 208 participants, age distribution was well-balanced across the 20–45 age range. The sample included an equal proportion of males and females (50% each), ensuring gender balance.

Representation of the BMI of patients

Most patients had a healthy BMI (50%), followed by overweight (40%). Only 7% were obese and 3% underweight, indicating that the majority maintained acceptable weight ranges.

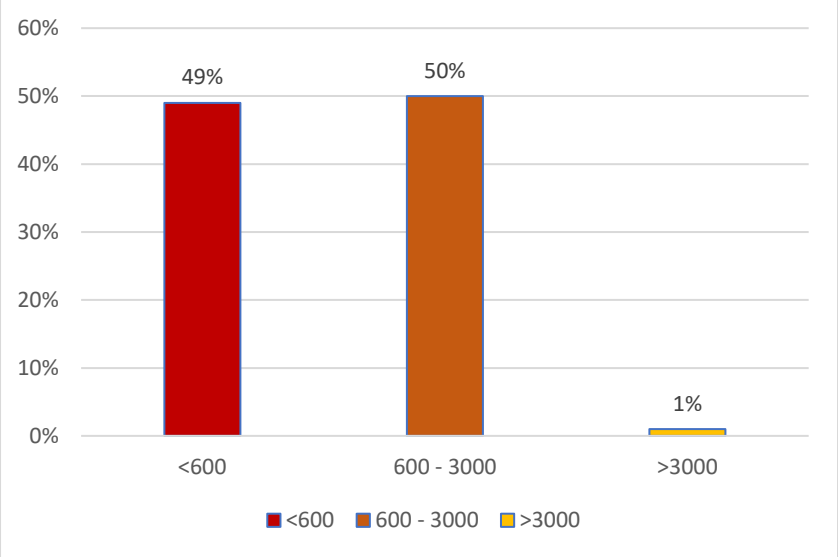

Figure 1: Bar Graph Representation of the Physical Activity (IPAQ) level of the patients

Half of the participants were moderately active (50%), 49% were sedentary, and only 1% had vigorous activity, showing low engagement in high-intensity physical activity.

Table 2: Frequency Distribution of CLDQ domains

	<5 (Poor)		**≥5 (Good)**	
CLDQ Domains	Frequency	Percentage	Frequency	Percentage
Abdominal Symptoms	104	50%	104	50%
Fatigue	106	51%	102	49%
Systemic Symptoms	108	52%	100	48%
Activity	102	49%	106	51%
Emotional Function	104	50%	104	50%
Worry	100	48%	108	52%
	<30 (Poor QOL)		≥30 (Good QOL)	
	Frequency	Percentage	Frequency	Percentage
Total Score	102	49%	106	51%

QoL results were mixed. Abdominal Symptoms and Emotional Function were evenly split between good and poor outcomes. Fatigue and Systemic Symptoms were slightly worse, with over half reporting poor scores. Overall, QoL was nearly evenly divided (49% poor, 51% good).

Association of BMI with Quality of Life (QOL) of patients

BMI was not significantly associated with QoL (p=0.146). Both healthy and overweight groups showed nearly equal distributions of good and poor QoL. Gender was significantly associated with QoL (p=0.000). Male patients predominantly reported good QoL, while most females reported poor QoL. No significant association was found (p=0.532). Patients with poor and good QoL were distributed similarly across activity levels. MNA results showed discrepancies between screening and malnutrition indicator scores. Screening identified 43% as malnourished, while the indicator score classified 44% as at risk and only 26% as malnourished.

Table 3: Association of Quality-of-Life Index with Malnutrition Indicator Score

CLDQ total Score	Malnutrition Indicator Score			Total	P-Value
	Normal Nutrition Status	At risk of Malnutrition	Malnourished		
<30 Poor QoL	19	54	31	105	0.001*
>30 Good QoL	44	37	22	103	
Total	63	91	54	208	

A significant association was found (p=0.001). Poor QoL was mostly linked to malnutrition or being at risk, while good QoL was associated with normal nutritional status.

DISCUSSION

In this study, the dietary status of patients with Chronic Liver Disease was assessed among 208 male and female participants aged 20 to 45 years. Anthropometric measurements were taken to calculate BMI, physical activity levels were assessed using IPAQ, dietary habits were evaluated through the Food Frequency Questionnaire, and quality of life (QoL) was measured using the CLDQ, with BMI, gender, and physical activity later analyzed for their association with QoL. The results showed that BMI had no significant relationship with QoL, as underweight patients mostly had poor QoL, healthy-weight individuals showed almost equal distribution between good and poor QoL, overweight participants had equal representation in both QoL categories, and obese individuals exhibited mixed outcomes; this lack of statistical significance was confirmed by a p-value of 0.146. Previous studies reported similar findings, suggesting that although obesity prior to liver disease may have negative effects, higher BMI in advanced liver disease may be associated with better survival, though not necessarily better QoL, while another study also found no relationship between BMI and HRQoL. In contrast, one study reported that higher BMI and female gender negatively affected QoL in NAFLD patients. Gender in the present study showed a significant association with QoL (p=0.000), with males reporting better QoL, as 80 male patients had acceptable QoL compared to only 23 females, while the majority of female participants (81) reported poor QoL. Supporting evidence from a 2020 study showed males scoring higher on physical functioning and pain, although females scored better on emotional well-being, while another study contradicted these findings by showing no significant association between gender and QoL. Physical activity levels showed no significant relationship with QoL (p=0.532); most participants fell into the low or moderate activity categories, and similar distributions were seen in both good and poor QoL groups. Previous literature supports this, noting barriers to exercise in liver patients and unclear effects of physical activity on QoL, though another study reported positive effects of home-based exercise on fatigue, suggesting potential QoL improvement. QoL assessment using the CLDQ showed that abdominal symptoms and emotional function were evenly divided between good and poor outcomes, fatigue and systemic symptoms were slightly worse, while activity and worry domains had higher positive scores; overall, 49% had poor QoL and 51% had good QoL. Other studies reported similar CLDQ patterns in CLD and NASH patients, confirming domain-specific deficits and highlighting variability in QoL depending on disease severity. Dietary assessments showed that 43% of patients consumed cereals daily and 56% consumed them 2–3 times per day, indicating frequent cereal intake, consistent with recommendations emphasizing adequate calories and protein in CLD diets and studies showing whole grains benefiting NAFLD outcomes. Milk consumption data revealed 37% drank milk daily, with smaller percentages drinking it weekly or more frequently, while 9% never consumed milk; studies show dairy consumption may reduce NAFLD risk, though one meta-analysis linked high milk intake to increased liver cancer risk. Most participants consumed fruits daily or several times weekly, and vegetables were consumed at least daily by most patients; research suggests dried fruit may reduce liver cancer risk and that vegetable intake is more strongly associated with reduced NAFLD risk than fruit intake. Red meat intake varied, with 36% consuming it 1–3 times monthly and fewer consuming it more frequently; studies show high red meat and saturated fat intake increases CLD and HCC risk. Most patients used vegetable oils 2–3 times daily, though the type of fat consumed is more relevant than quantity, with monounsaturated and polyunsaturated fats being less harmful than saturated fats. Tea consumption patterns showed that 51% drank tea once daily and 41% drank it 2–3 times per day, with studies showing mixed results regarding its protective role in liver disease. Nutritional assessment using the MNA revealed discrepancies between screening and malnutrition indicator scores, showing 30% with normal nutrition, 27–44% at risk, and 26–43% malnourished; other research shows inconsistencies among different nutritional screening tools in liver disease patients. Furthermore, BMI and QoL in this study showed a significant association with malnutrition status, and cereal, dairy, fruit, and red meat intake were significantly linked to malnutrition, whereas vegetable, oil, and tea consumption were not. This study had limitations, including

a relatively small sample size and inclusion of patients with both chronic and acute liver conditions, suggesting that larger, more focused studies are needed to better understand the nutritional status of patients with chronic liver disease.

CONCLUSION

This study examined the dietary habits, nutritional status, and quality of life (QOL) of individuals with chronic liver disease. Gender showed a significant association with QOL, with women reporting poorer QOL than men. BMI and physical activity levels showed no meaningful correlation with QOL, as most patients had a healthy BMI and engaged in moderate physical activity. Dietary assessment showed generally balanced eating patterns, with regular consumption of dairy, fruits, vegetables, meat, tea, cereals, and oils. QOL results revealed an almost even split, with 49% of patients having poor QOL and 51% good QOL. Fatigue and systemic symptoms were the most negatively affected domains, while activity levels and worry had more positive scores. Malnutrition assessments indicated that many patients were either malnourished or at risk of malnutrition. BMI and overall QOL were significantly related to malnutrition status. Dietary items such as cereals, dairy, fruits, and red meat were significantly associated with malnutrition, while vegetables, vegetable oils, and tea were not. The study concludes that further research is needed to better understand the nutritional status of patients with chronic liver disease.

AUTHOR's CONTRIBUTION:

Author	Contribution
Ayesha Shabir	Conceptualization, Methodology, Formal Analysis, Writing - Original Draft, Validation, Supervision, Formal Analysis
Andleeb Shakoor	Methodology, Investigation, Data Curation, Writing - Review & Editing
Aroosha Saif	Investigation, Data Curation, Formal Analysis, Software
Sana Siddique	Software, Validation, Writing - Original Draft

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