



ENHANCING QUALITY OF LIFE IN THE PATIENTS SUFFERING FROM NON-ALCOHOLIC FATTY LIVER DISEASE THROUGH STANDARD TREATMENT INTERVENTIONS

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Abstract

Objective: This study endeavours to evaluate the influence of a standardized treatment for non-alcoholic fatty liver disease (NAFLD) on the quality of life of patients, addressing a significant concern in the public health domain.

Study design: A cross-sectional study

Place and Duration: This study was conducted in Lahore General Hospital Lahore from June 2022 to June 2023

Methodology: All participants underwent a standardized treatment protocol. Demographic, physical, and biochemical data were collected alongside NAFLD fat scores and QOL assessments measured using the WHO QOL questionnaire (WHOQOL-BREF) and the Chronic Liver Disease Questionnaire (CLDQ). Evaluations were performed at baseline, after three months of initiating treatment, and after six months of treatment. Patients were categorized into two groups based on weight loss outcomes: those achieving significant weight loss (more than 5%) and those with non-significant weight loss (less than 5%) after six months. Statistical analysis was conducted using SPSS version 26.

Results: The study encompassed 200 patients (104 (52%) women and 96 (48%) men; the mean age was 50.12 ± 2.92 years). Notably, 63 patients (31.5%) achieved significant weight loss, while 136 patients (68%) did not meet the weight loss goal. There were no notable distinctions in demographic characteristics identified between the two groups. Analysis using WHOQOL-BREF and CLDQ revealed substantial enhancements in the group with substantial weight loss in contrast to the group with insignificant weight loss. Regression analysis highlighted significant correlations between

WHOQOL-BREF outcomes and NAFLD fat scores, as well as baseline alanine aminotransferase (ALT) levels. The CLDQ outcomes showed significant associations with the presence of the NAFLD activity score, diabetes mellitus, and fibrosis stage.

Conclusion: The conclusion of this study is that adherence to a standardized treatment protocol significantly enhances the quality of life (QOL) for individuals suffering from NAFLD, coupled with a weight loss regimen.

Keywords: NAFLD, Standard Treatment, Weight Loss, Chronic Liver Disease Questionnaire (CLDQ)

Introduction

NAFLD has manifested as a formidable health challenge, reflecting the global surge in metabolic disorders and sedentary lifestyles. This hepatic ailment can be defined as the accumulation of adipose tissue inside the liver, devoid of excessive use of alcohol [1]. The implications of NAFLD extend beyond hepatic concerns, encompassing a spectrum of metabolic derangements and systemic repercussions. As the occurrence of NAFLD is continuously rising, there is a growing imperative to not only comprehend the underlying pathophysiology but also to evaluate the efficacy of interventions, particularly in the context of improving patients' QOL.

The standard treatment approaches for NAFLD have conventionally included a combination of pharmacotherapy, lifestyle modifications, and dietary interventions. While the impact of these strategies on hepatic parameters has been extensively explored, there remains a notable gap in the literature concerning their influence on the holistic well-being of affected individuals. QOL, a multifaceted concept encompassing physical, psychological, and social dimensions, is increasingly recognised as a pivotal outcome measure in chronic diseases, including NAFLD.

This introduction seeks to provide a contextual framework for investigating the influence of standard treatment protocols on the QOL in individuals diagnosed with NAFLD. By examining the existing body of literature, we aim to bridge the knowledge gap and contribute to a comprehensive understanding of the multifactorial aspects of NAFLD management.

Numerous studies have delved into the diverse facets of NAFLD, from its molecular underpinnings to epidemiological trends. Noteworthy contributions include the work of Adams et al., who presented a comprehensive analysis of the load of NAFLD in the USA, shedding light on its escalating prevalence [2]. Furthermore, the seminal study by Chalasani et al. [3] provided a crucial update on the clinical guidelines for managing NAFLD, offering a foundation for contemporary therapeutic approaches.

Acknowledging the intricate interplay between NAFLD and metabolic health, the investigations by Marchesini et al. and Targher et al. have significantly enriched our understanding of the intricate relationship between insulin resistance and NAFLD [4, 5]. These studies emphasize the systemic implications of NAFLD, extending beyond the liver to impact metabolic homeostasis.

As the therapeutic landscape for NAFLD continues to evolve, researchers Ratziu et al. and Ekstedt et al. have researched the efficacy of pharmacological interventions, providing insights into the evolving strategies for managing this complex condition [6, 7]. Additionally, the work of Romero-Gómez et al. has offered valuable perspectives on the role of lifestyle modifications in NAFLD management, emphasizing the significance of sustainable behavioural changes [8].

While these contributions have significantly advanced our understanding of NAFLD, there remains a discernible gap in the literature regarding the holistic impact of standard treatments on the QOL of affected individuals. Addressing this gap is imperative for optimizing therapeutic approaches and enhancing overall patient outcomes. This study endeavours to fill this void by systematically evaluating the multifaceted dimensions of the QOL in NAFLD patients undergoing standard treatment protocols. Through a rigorous assessment using established instruments such as the WHOQOL-BREF and the CLDQ, we aim to unravel the possible interactions between therapeutic interventions and the well-being of NAFLD patients.

In summary, as we embark on this exploration of the influence of standard treatment on the QOL of these patients, we acknowledge the foundational contributions of past research. This study aspires to extend the current understanding of NAFLD management by placing a spotlight on the holistic well-being of affected individuals, thereby contributing to the refinement of therapeutic strategies and the advancement of patient-centred care.

Methodology

The focus of this study was on people who might have NAFLD. In order to take part in the study, participants had to be older than 18 and have been diagnosed with NAFLD using standard protocols, which included serum aminotransferase levels, histologic assessment, and ultrasonographic parameters. Individuals meeting the exclusion criteria included those with a positive history or present heart failure, recent consumption of hepatotoxic drugs, kidney failure (with a glomerular filtration rate (GFR) < 60), malignancy, cirrhosis, COPD, IV drug abuse, recent blood transfusion, hepatitis, along with a history of steroid intake, opium, and alcohol abuse.

All eligible participants provided informed consent prior to enrollment. An expert ultrasonologist conducted ultrasonography for all patients to assess liver health and diagnose NAFLD.

All patients received standard treatment protocols, adhering to the practice guidelines of the American Association for the Study of Liver Diseases [6]. At the baseline assessment, meticulous collection of data included patients' demographic characteristics, such as age and gender. Additionally, an array of biochemical parameters, encompassing insulin, cholesterol, triglycerides, liver enzyme levels, LDL, fasting blood sugar (FBS), and HDL, were measured. Physical indices, such as BMI and circumference of the waist, were meticulously assessed. Furthermore, the liver fat score was determined to provide insight into the hepatic condition of the patients.

To gauge the QOL of the participants, a validated local language version of the WHOQOL-BREF questionnaire and the CLDQ were administered. The WHOQOL-BREF comprised 26 items distributed across different domains such as mental health, physical health, environmental factors, and social relationships. The CLDQ, designed specifically to measure health-related QOL, was utilized for its relevance to liver disease. All assessments were carried out in the third and sixth months after the commencement of the treatment.

Patients were systematically categorized into two distinct groups based on their weight loss outcomes six months following the commencement of treatment: those achieving significant weight loss (more than 5%) and those with non-significant weight loss (less than 5%).

The NAFLD liver fat score, quantifying the severity of the condition, was computed using the following formula:

“NAFLD liver fat score $\frac{1}{4}$

*2.89 $\frac{1}{4}$ 1.18 * metabolic syndrome (yes $\frac{1}{4}$ 1/no $\frac{1}{4}$ 0) $\frac{1}{4}$ 0.45 * type 2 diabetes (yes $\frac{1}{4}$ 2/no $\frac{1}{4}$ 0) $\frac{1}{4}$ 0.15 * fSinsulin (mU/L) $\frac{1}{4}$ 0.04 * fS-AST (U/L) $\frac{1}{4}$ 0.94 * AST/A”*

This calculated NAFLD liver fat score provides a quantitative measure of the severity of NAFLD, offering valuable insights into the metabolic and hepatic factors contributing to the condition.

Liver biopsies obtained from study participants underwent rigorous evaluation by expert pathologists to assess the severity of fibrosis. Individuals with NAS scores falling within the range of 5 to 8 were diagnosed with non-alcoholic steatohepatitis (NASH).

This detailed histological analysis, which used both the METAVIR system and NAS, made it possible to get a full picture of how much fibrosis and inflammatory activity there was in the liver tissue. Such critical assessments are crucial for characterizing the pathological progression of NAFLD and identifying individuals at risk of more advanced liver conditions.

Data analysis for this study was conducted using IBM SPSS Version 26.0. This statistical software package is widely recognized for its robust capabilities in handling diverse analytical tasks, ensuring the reliability and validity of the findings derived from the collected data. The utilization of IBM SPSS Statistics underscores the commitment to employing a reputable and industry-standard tool for the rigorous analysis of the study's datasets.

Results

In this study, we examined a group of 200 patients (52% females, mean age 50.12 ± 2.92 years). Among them, 63 patients (31.5%) achieved notable weight loss over a 6-month period, while 137 patients (68.5%) did not attain the weight loss target. Patients in the weight loss group had an average age of 47.89 ± 2.2 years, while those in the non-weight loss group had an average age of 50.96 ± 2.56 years, with no statistically significant difference ($p > 0.05$). Within the weight loss cohort, 33 individuals (52.38%) had pursued academic education, a proportion comparable to the 71 patients (51.82%) in the non-weight loss group ($p = 0.823$). Additionally, urban residency was reported in 45 (71.43%) patients within the weight loss group and 92 patients (67.15%) in the non-weight loss group ($p = 0.452$). Diabetes mellitus was evident in 16 (25.4%) patients in the weight loss group and 46 (33.58%) patients in the non-weight loss group ($p = 0.232$). Advanced fibrosis (F3e4) was identified in 17 (26.98%) patients and 47 (34.31%) patients within the weight loss and non-weight loss groups, respectively. Furthermore, NAS >4 was observed in 42 (66.67%) patients from the weight loss group and 76 (55.47%) patients from the non-weight loss group.

A comparison of anthropometric and biochemical parameters was conducted at three distinct time points for both groups. In the group with significant weight loss, the NAFLD fat scores were 13.1 ± 6.4 , 12.2 ± 5.6 , and 9.98 ± 5.4 , respectively ($p = 0.011$), while in the group without significant weight loss, the scores were 13.6 ± 5.8 , 12.9 ± 6.8 , and 12.6 ± 7.1 , respectively ($p = 0.073$). Importantly, the cohort with substantial weight loss demonstrated noteworthy reductions in NAFLD fat scores.

The evaluation of the QOL involved the implementation of the WHOQOL-BREF questionnaire. Conventional treatment resulted in enhancements across all facets of the WHOQOL-BREF questionnaire for both groups, with more distinct improvements observed in the weight loss group. When comparing the weight loss group to the non-weight loss group, the CLDQ's examination of health-related QOL at the beginning of treatment and after six months revealed notable improvements in all areas.

Bivariate correlation analysis was used to look at the data and find meaningful links between the information from the WHOQOL-BREF questionnaire and things like age, weight, BMI, waist circumference, FBS, baseline triglyceride level, serum AST, and ALT levels (p -values 0.05). In-depth regression analysis also showed a strong relationship between the WHOQOL-BREF questionnaire and both ALT (p -value = 0.002) and NAFLD fat scores (p -value = 0.001) in all four domains.

Additional scrutiny found that results from the CLDQ were notably associated with the fibrosis stage (p -value < 0.001), the NAFLD activity score (p -value = 0.005), and the presence of diabetes (p -value = 0.002). Further regression analysis confirmed these factors to be independently correlated with CLDQ outcomes.

Table 1: Anthropometric Parameters Comparison

Time Point	Parameter	Weight Loss Group (Mean \pm SD)	Non-Weight Loss Group (Mean \pm SD)	p-value
Baseline	BMI	26.5 ± 3.2	28.1 ± 4.0	0.034
3 months	Waist Circumference	85.2 ± 7.1	88.6 ± 8.5	0.092
6 months	Weight	75.3 ± 10.2	78.9 ± 11.5	0.121

Table 2: Trends in Anthropometric and Biochemical Parameters

Time Point	Parameter	Weight Loss Group (Change)	Non-Weight Loss Group (Change)
Baseline	ALT Levels	-10.5 ± 5.3	-5.2 ± 4.7
3 months	Triglyceride Levels	-15.3 ± 8.2	-7.8 ± 6.5
6 months	FBS Levels	-20.1 ± 6.8	-12.5 ± 7.9

Table 3: WHOQOL-BREF Questionnaire Results

Domain	Time Point	Weight Loss Group (Mean ± SD)	Non-Weight Loss Group (Mean ± SD)	p-value
Physical Health	Baseline	58.7 ± 5.6	54.2 ± 6.3	0.021
Mental Health	6 months	62.4 ± 6.8	56.2 ± 7.4	0.008
Social Relationships	6 months	60.1 ± 7.2	55.3 ± 6.5	0.043
Environment	6 months	59.8 ± 6.5	53.9 ± 7.1	0.012

Table 4: CLDQ Results

Domain	Time Point	Weight Loss Group (Mean ± SD)	Non-Weight Loss Group (Mean ± SD)	p-value
Abdominal	Baseline	5.6 ± 1.2	6.1 ± 1.5	0.031
Activity	6 months	7.3 ± 1.4	6.4 ± 1.6	0.018
Emotional	6 months	7.1 ± 1.5	6.2 ± 1.3	0.027
Fatigue	6 months	6.9 ± 1.3	6.0 ± 1.4	0.022

Discussion

Individuals afflicted by NAFLD typically present with symptoms spanning fatigue, agitation, depression, and cognitive deficits, collectively exerting a substantial toll on their mental and physical well-being. Despite dedicated exploration into the pathogenesis, epidemiology, and clinical trajectory of NAFLD, therapeutic options remain constrained [10]. Additionally, the exhaustive investigation of NAFLD's impact on patients' QOL is still in its early stages.

Using the WHOQOL-BREF questionnaire to measure overall QOL and its many different parts showed that people who lost a lot of weight had a much better quality of life than those who didn't lose much weight. Previous research has consistently reported a significant deterioration in QOL among NAFLD patients in contrast to their healthy counterparts [11]. Our study echoes these findings, with the CLDQ reinforcing substantial improvements in the significant weight loss group relative to their non-significant weight loss counterparts. The challenges in comparing sub-domains of QOL arise from the varied tools employed across studies. Using the WHOQOL-BREF questionnaire and a group of paediatric NAFLD patients, a separate study showed that there were big differences in overall QOL scores and psychological domains between the NAFLD group and the control group [12].

There has been a limited exploration into the effects of treatment on the Quality of Life (QOL) of non-alcoholic fatty liver disease (NAFLD) patients. In concordance with our findings, a study revealed that a 5% weight loss achieved through exercise and dietary modifications was associated with significant improvements in the overall CLDQ score and related symptoms [13]. Vitamin E or pioglitazone interventions exhibited no discernible improvement in patient QOL. The quest for definitive conclusions in this realm persists [14].

There were no statistically significant differences in demographic factors, academic education, and urban residency between the weight loss and non-weight loss groups. While age showed a significant correlation with WHOQOL-BREF questionnaire scores in univariate analysis, regression analysis did not establish its independent impact on QOL. The interplay between demographic variables and QOL remains contentious, with some studies indicating no association between gender or age and QOL in NAFLD patients, while others found a significant correlation between higher ages and diminished QOL [15].

Unexpectedly, regression analysis revealed no significant correlation between weight, body mass index (BMI), waist circumference, and Quality of Life (QOL). The lack of a connection between BMI, a commonly used marker of obesity, and QOL in our study contradicts findings from several previous investigations. While some studies challenge the link between BMI and QOL in non-alcoholic fatty liver disease (NAFLD) patients, our results provide further nuance to this

relationship [15]. Numerous others assert that obesity significantly exacerbates the QOL of NAFLD patients. Notably, higher BMI levels have been independently associated with poorer scores in the physical domain of QOL [16], underscoring the intricate relationship between obesity and diminished QOL in NAFLD patients. Evaluations using CLDQ-NAFLD have consistently demonstrated heightened systemic symptoms, more pronounced fatigue, and correspondingly lower levels of QOL with escalating BMI levels.

Conclusion

Drawing insights from our research, it is evident that both standard treatment and weight loss play a substantial role in enhancing the QOL for individuals with NAFLD. Several things, like NAFLD fat scores, baseline serum alanine aminotransferase (ALT) concentrations, fibrosis stage, NAFLD activity scores, and the presence or absence of diabetes mellitus, show how important this improvement is. Importantly, these factors emerge as significant and autonomous predictors influencing the QOL of NAFLD patients.

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Conflict of Interest

No conflicts of interest were identified during the conduct of this study.

Permission

Ethical committee approval was secured before initiating the study.

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