Assessment of Knowledge and Quality of Life among Patients with Metabolic Associated Fatty Liver Disease

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Abstract

Background: Metabolic associated fatty liver disease (MAFLD) is defined by the presence of ≥5% hepatic steatosis without excluding other liver diseases, including alcoholic liver disease. Patients with MAFLD often suffer from fatigue, anxiety, depression, cognitive impairment, and low self-esteem, which negatively affect their health-related quality of life (HRQOL) and physical functioning. **Aim of the study:** This study aimed to assess knowledge and quality of life among patients with Metabolic associated fatty liver disease. **Research design:** A descriptive exploratory research design was conducted. **Subjects:** A purposive sample of 81 adult MAFLD patients. **Setting:** Benha University Hospital, including internal medicine and hepatology/gastroenterology outpatient clinics in Qalyubia Governorate, Egypt. **Tools of data collection**: Data was collected using two tools; **Tool I:** a structured interview questionnaire and **Tool II:** The chronic liver disease questionnaire for Nonalcoholic fatty liver disease. **Results:** Most patients (86.4%) had poor knowledge about MAFLD. Additionally, 64.2% of patients had low HRQOL. Among those who experienced fatigue and low activity, 69.1% and 64.2% respectively also had poor HRQOL. **Conclusion:** The study revealed insufficient knowledge among MAFLD patients and significantly reduced HRQOL. A positive correlation was observed between patients' knowledge and their HRQOL. **Recommendations:** Ongoing educational and training programs are essential to enhance patient knowledge, support informed decision-making, and improve health outcomes and quality of life in MAFLD patients.

Keywords: Knowledge, Patients, Quality of Life, Metabolic Associated Fatty Liver Disease

Introduction:

Metabolic associated fatty liver disease can be defined as the presence of more than 5% hepatic steatosis without excluding other liver diseases, including alcoholic liver disease **(Eslam et al., 2020).** Metabolic associated fatty liver disease is the term suggested in 2020 to refer to fatty liver disease related to systemic metabolic dysregulation. It replaces the outdated term nonalcoholic fatty liver disease (NAFLD) and aims to improve diagnostic criteria and tailored treatment strategies for the disease **(Kaya & Yilmaz, 2022).**

Most individuals with MAFLD are asymptomatic, and the diagnosis is often discovered incidentally during workup for elevated liver function tests or via imaging for another purpose. Compared to the non-MAFLD population, a higher rate of fatigue impairing physical function has been found in MAFLD/MASH patients. Energy level is found to be lower in patients with significant hepatic fibrosis compared to a normal/mild hepatic fibrosis group **(Yamamura et al., 2021).**

Pruritus has also been reported among MASH patients **(Younossi et al., 2020).** Other symptoms include abdominal bloating/swelling, abdominal discomfort, abdominal pain, sleep disturbance, or apnea

and dyspepsia can be a symptom of the disease **(Bayrak, 2021; Geier et al., 2021).**

Besides fatigue, MAFLD patients may also experience other symptoms such as anxiety, depression, cognitive impairment, and loss of self-esteem. These symptoms significantly impact patients' well-being **(Said et al., 2024).** In Recent studies about HRQoL of MAFLD patients, it was proven that patients with MAFLD experienced significant impairment in HRQOL and performance of physical activities than healthy controls **(Glass et al., 2022).**

Cardiovascular disease, a leading cause of death in adults, is being observed. Dyslipidemia is currently the most prevalent obesity-related comorbidity seen **(Tolman et al., 2019).** Patients may suffer from poor musculoskeletal health, limited physical function, menstrual irregularities, and psychological distress interfere with adopting healthy lifestyle practices **(Ranjan et al., 2022).**

Health Related Quality of Life (HRQL) is a multidimensional construct that can comprehensively evaluate the patient's health status, including physical, emotional, mental and social well-being **(Dou et al., 2022).**

Lack of awareness of a MAFLD diagnosis suggests an issue in the patient-healthcare professional, particularly nurse communications which is likely multifactorial and stems to large extent from the MAFLD misnomer. Possible factors include the poor understanding of MAFLD among patients and healthcare providers, the lack of current screening guidelines for the disease, particularly among the high-risk patient with metabolic diseases and the asymptomatic nature of MAFLD early in the disease course **(Castera et al., 2019).**

Significance of the study:

Metabolic associated fatty liver disease (MAFLD) has become the most common chronic liver disease with an estimated global prevalence of 25% of adults **(Tomah et al., 2022)**. Worldwide prevalence of MAFLD is considerably higher than previously estimated and is continuing to increase at an alarming rate. Greater awareness of MAFLD and the development of cost-effective risk stratification strategies are warranted to address the growing burden of MAFLD **(Riazi et al., 2022).**

Egypt, a Middle Eastern country with a population of ~100million, with 60% of them being younger than 30 years, is considered among the highest 10 nations in prevalence of obesity. Overall, the Middle East and North Africa (MENA) region has one of the highest MAFLD prevalence rates, which is estimated to affect 31.8% of all adults. Young adults are often overlooked under the presumption they are 'healthy'; however, the presence of MAFLD among this population could represent a major public health issue and may become a significant burden to healthcare systems in this region **(Tomah et al., 2021).**

According to the annual report of the statistical office, Benha University Hospital (2022), the total number of patients admitted with MAFLD to general medicine department was 100 cases **(Statistical Office at Benha University Hospital, 2022).**

Aim of the study:

The present study aimed to assess knowledge and quality of life among patients with metabolic associated fatty liver disease.

Research Questions:

1. What is the patient's knowledge levels regarding MAFLD?
2. Does metabolic associated fatty liver disease affect health related quality of life?
3. Is there a correlation between patient's knowledge and their health related quality of life regarding MAFLD?

Subjects & Method:

Research Design: A descriptive exploratory research design was used.

Setting of the study:

This study was conducted in internal medicine department, internal medicine clinic and hepatology and gastroenterology outpatient clinic for patients follow up at Benha University hospital, Qalyubia Governorate, Egypt.

Subjects:

A purposive sample of (81) adult patients with MAFLD were recruited in this study based on retrospective statistical data of the number of patients with MAFLD admitted to Benha University hospital was 100 patients in 2022. The sample size calculation done on **Solvin's formula** that was adopted from **(Saha and Paul, 2021)** as the following:

$$n = \frac{N}{1+N\,(e)2}$$

Where:

n= sample size (81)

N= total population (100)

e= margin error (0.05)

$$n = \frac{100}{1+100\,(0.05)2}$$

Inclusion Criteria: Patients aged 21-60 years old; conscious and able to communicate with others and the patients who were willing to participate in the study and had the ability to provide informed consent.

Exclusion criteria: Patients with neuropsychiatric conditions, patients with other causes of chronic liver disease, patients with history of hepatic decompensation (clinical ascites, hepatic encephalopathy, variceal bleeding) **(Younossi et al., 2019)** and patients with hepatocellular carcinoma, cholangiocarcinoma, gallstone disease and cardiovascular disease like Coronary heart disease **(Mantovani et al., 2020; Xiao et al., 2023)** were be excluded.

Data Collection Tools:

Two tools were utilized in the study for collecting pertinent data.

Tool 1: Patients Structured Interview Questionnaire: It was designed by the researchers after reviewing recent and related literature and it was written in clear simple Arabic language. It consists of three parts:

Part 1: Demographic data: It concerns demographic characteristics of the study sample such as age, gender, marital status, place of residence, level of education and occupation.

Part 2: Patient's Medical history, it was used to assess the studied patient's past, present and family history of MAFLD, type of comorbid diseases, complaints, Risk factors, duration of MAFLD diagnosis, symptoms, smoking, height, weight, BMI**.**

Part 3: Patient' knowledge assessment: Adapted from (Aljahdli et al., 2021); pre and posttest, it was used to assess patients' knowledge related to MAFLD. It includes three sections:

Section one: Patient's knowledge about MAFLD disease included (13 items); liver organ, function of liver, definition of MAFLD, risk factors, clinical manifestation, investigations, management, medications, complications, surgeries, prevention and follow up

Section two: Patient's knowledge about the diet related to MAFLD included (5 items); healthy food for the liver, harmful food for the liver, importance of drinking water, principles in a healthy diet for liver health and weight loss and important tips for dealing with fatty liver.

Section three: Assessment of patient's knowledge about the Physical activity/exercises related to MAFLD included (3 items); recommended sports for liver health, benefits of exercising and increasing physical activity and guidelines recommendations about physical activity regimen related to MAFLD.

Scoring system:

The correct answer was scored one and incorrect answer was scored zero. The total score of knowledge was 21 (100%). These scores were summed up and converted into percentage score.

The total level of patient's ' knowledge score was categorized as follows:

- > 80% of total score considered good level of knowledge.
- 60- 80 % of total score considered average level of knowledge.
- < 60 % of total score considered poor level of knowledge.

Tool 2: The chronic liver disease questionnaire for Nonalcoholic fatty liver disease CLD-NAFLD/NASH:

It was adapted by the researchers from **Younossi et al., (2019)**, modified and translated into Arabic. It was used three times; pre, post one month and post three months of educational program implementation. This tool assesses aspects of HRQoL that are related directly to the underlying disease. For patients with MAFLD, several tools have been developed and validated. One of the more popular tools is Chronic Liver Disease Questionnaire–nonalcoholic fatty liver disease [NAFLD]/NASH) **(Golabi et al., 2019).**

It had 36 items grouped into 6 domains: abdominal symptoms, activity, emotional, fatigue, systemic symptoms, and worry. All the questions were formulated as "How much of the time" or "How often you experienced a problem", and a 1–7 Likert scale was introduced for the responses (the score of 1 would correspond to "All of the time", and the score of 7 to "None of the time") **(Younossi et al., 2019).**

Scoring system:

The overall CLDQ score was calculated as an average of all domains. Higher score on the questionnaire was indicative of minimum symptoms and lower score indicated more pronounced symptoms **(Huang et al., 2021).**

The total CLDQ- NAFLD/NASH score was categorized as follows:

- <50% of total score considered Low health related quality of life.
- 50-70% of total score considered average health related quality of life.
- >70% of total score considered good health related quality of life.

Administrative design

An official permission to carry out the study was obtained by submission of an official letter from the dean of Faculty of Nursing at Benha University to the director of Benha University Hospital. This letter explained and clarified the aim and objectives of the study to obtain permission to conduct the study.

Tools Validity and reliability

The face and the content validity of the tools were ascertained for comprehensiveness, relevance, simplicity, clarity and ambiguity through a jury of five experts from the medical and surgical nursing department, Faculty of Nursing at Benha University. Based on the opinion of the panel of expertise some modifications were made and then the final form was developed based on recent literatures and used for data collection.

Reliability was tested statistically to ensure that the tools were reliable before data collection. It was evaluated using test-retest method by Cronbach's alpha test which is used to measure internal consistency. Reliability of the Knowledge Assessment Questionnaire was 0.896, and for the chronic liver disease questionnaire for Nonalcoholic fatty liver disease was 0.903.

Ethical considerations:

An approval was obtained from the Scientific Research Ethics Committee/ Faculty of Nursing Code, REC- MSN- P 113 before initiating the study work. Official permissions for data collection were

generated from hospital directors and head managers of the internal medicine inpatient and outpatient departments at Benha University hospital by submission of a formal letter from the dean of Faculty of Nursing at Benha University. An informed consent is obtained from patients after explaining the aim of the study. They also were informed that their participation was optional, and they had the right to withdraw at any time without any consequences. The Researchers assured patients' anonymity and confidentiality of data and explained that these data would be used only for patient's benefits and the purpose of the study.

Pilot study

Pilot study was conducted on 10% of the patients (8) in order to test the applicability and clarity of the study tools, to estimate the time needed for each tool to be filled in as well as to identify any possible obstacles that may hinder data collection. Based on the results of the pilot study, the minor modifications were done to be more applicable tools for data collection. Patients involved in the pilot study were excluded from the study sample. The pilot study was done before starting the study from the beginning of December 2023 to end of December 2023.

Field work

The actual field work was carried out through six months from beginning of January 2023 to the end of June 2023. Data was collected according to the policy of the study settings, the Researchers attended the setting 3 days/week (Saturday, Tuesday and Thursday) during morning and afternoon shifts. Before data collection, the Researchers welcomed each patient and informed him/her about title, aim of the study, tools and outcomes to obtain their cooperation.

The Researchers once explained the aim of the study to all participants in simple Arabic words. Each patient was interviewed individually using the structured interview questionnaire (tool 1 & 2). The interview lasted about 30-45 minutes, including periods of discussion according to the patients' progress, health condition and feedback.

Patients always had the opportunity to ask questions, express their feelings and anxiety concerning their symptoms and their disease and to have more in-depth discussions. The Researchers continued to reinforce the patients to gain information, answered any raised questions and encouraged them to give feedback.

Statistical Analysis

All statistical analyses were performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). Continuous data were normally distributed and were expressed in mean ±standard deviation (SD). Categorical data were expressed in number and percentage. The Chi-square test (or fisher's exact test when applicable) was used for comparison of variables with categorical data. Correlation co-efficient test was used to test correlations between two variables with continuous data. The reliability (internal consistency) test for the questionnaires used in the study was calculated. Statistical significance was set at $p<0.05$.

Results

Table (1) shows that the age of 49.4% of the patients was between 50 and 60 years old, with Mean ±SD 50.6 ±7.6, 71.6% were females, most of them were married with a percentage of 81.5%, 69.1% were living in an urban areas, 48.1% had secondary education, 39.5% were working in a private work, 92.6% of them their nature of work changed after their illness and 61.3% of those patients reported that they need to rest from time to time, respectively.

Table (2) shows that 59.3% of the patients had been diagnosed with MAFLD for less

than 6 months, 100% of them hadn't been hospitalized previously due to fatty liver disease and 92.6% hadn't a family history of metabolic associated fatty liver disease. Regarding risk factors for MAFLD, 100% of the studied patients had high cholesterol level and reported that they were taking high calories diet, 96.3% of the patients were obese and 76.5% had lack of physical activity. Concerning comorbidities diseases, 100.0% of the studied patients suffered from hyperlipidemia and 55.6% were diabetic patients. 76.5% of the studied patients weren't smokers and 38.3% were moderately obese.

Figure (1) shows that 86.4% of studied patients had poor knowledge regarding metabolic associated fatty liver disease.

Table (3) shows that 6.7 ±2.3, 11.2 ±3.7, 13.5 ±4.4 and 13.5 ±4.4 had abdominal symptoms, low activity and fatigue and systemic symptoms, respectively. While the highest HRQOL domain was the emotional function.

Table (4) illustrates that 69.1% and 64.2% of studied patients who suffered from fatigue and low activity had low HRQOL

Figure (2) shows that 64.2% of the studied patients had low HRQoL and only 9.9% of the studied patients had good HRQOL.

Table (5) shows that there was statistically Positive correlation between studied patients Knowledge total score and HRQoL total score and total score.

Table (1) Frequency distribution of the demographic characteristics of the studied patients with MAFLD (n=81)

Demographic characteristics:	No.	%
Age (Years)		
30 < 40	9	11.1
40 < 50	32	39.5
50 – 60	40	49.4
Mean ±SD	50.6 ±7.6	
Gender		
Male	23	28.4
Female	58	71.6
Marital status		
Single	15	18.5
Married	66	81.5
Residence		
Rural	25	30.9
Urban	56	69.1
Educational level		
Illiterate	8	9.9
Read & write	23	28.4
Secondary	39	48.1
Higher education	11	13.6
Occupation		
Work (Governmental)	15	18.5
Work (Private)	32	39.5
Not work (Housewife)	30	37.0
Not work (on Retirement)	4	4.9
Did the nature of your work change after illness?		
No	6	7.4
Yes	75	92.6
If the answer is yes, what is the type of change? (n=75)		
Inability to work for long periods	24	32.0
I need to rest from time to time	46	61.3
I became completely unable to move	5	6.7

Table (2) Frequency distribution of the studied patients with MAFLD regarding their medical history (n=81)

Medical History	No.	%
Onset of the diagnosis with MAFLD		
Less than 6 months	48	59.3
From 6 months to a year	33	40.7
Previous hospitalization		
No	81	100.0
Yes	0	0.0
Family History of Metabolic Associated Fatty Liver Disease		
No	75	92.6
Yes	6	7.4
If the answer is yes, what is the relationship? (n=6)		
First degree (Father/Mother)	6	100.0
Risk Factors		
Obesity	78	96.3
Hypertension	41	50.6
High cholesterol level	81	100.0
Intake of fast-food meals	21	25.9
High calories diet	81	100.0
Lack of physical exercises	62	76.5
Genetic	3	3.7
Comorbidities Diseases (Chronic)		
Diabetes	45	55.6
Hyperlipidemia	81	100.0
Hypertension	39	48.1
Smoking		
No	62	76.5
Yes	19	23.5
If the answer is yes, how long have you been smoking? (n=19)		
From one year to less than five years	0	0.0
More than five years	19	100.0
Number of cigarettes per day? (n=19)		
Less than a pack of cigarettes	10	52.6
A pack of cigarettes	9	47.4
Height (meters) (Mean ±SD)	1.65 ±0.09	
Weight (K.G.) (Mean ±SD)	99.56 ±8.03	
BMI (K.G./M^2)		
Overweight	3	3.7
Moderately Obese	31	38.3
Severely Obese	22	27.2
Morbidly Obese	25	30.9

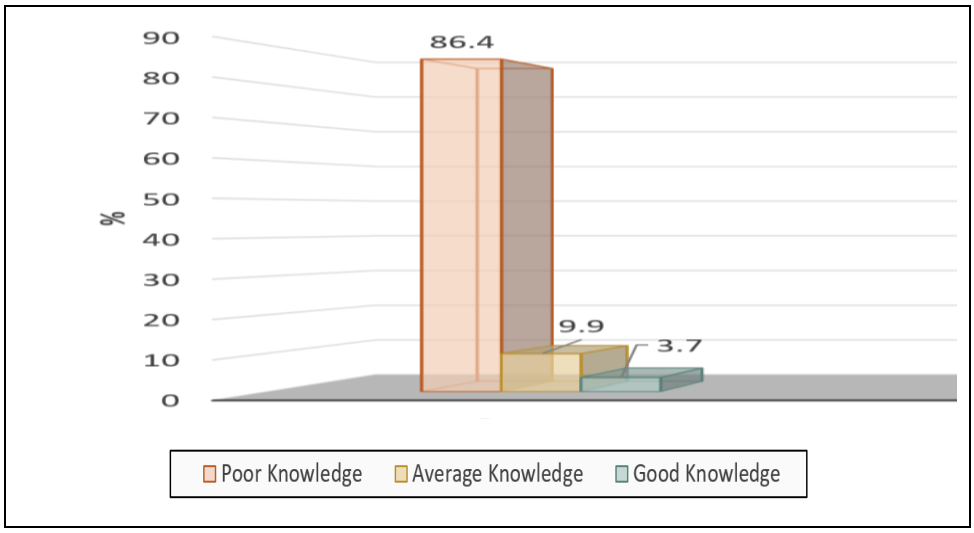

Figure (1) Comparison of studied patients' total knowledge level regarding MAFLD (n=81).

Table (3) Comparison of HRQoL by the chronic liver disease questionnaire domains for Nonalcoholic fatty liver disease CLD – NAFLD mean scores and standard deviation

CLD – NAFLD domains	Mean ±SD
Abdominal symptoms	6.7 ±2.3
Fatigue	13.5 ±4.4
Systemic symptoms	13.5 ±4.4
Activity	11.2 ±3.7
Emotional function	20.2 ±6.8
Worry	15.7 ±5.2
Chronic liver questionnaire score	80.5 ±26.9

Table (4) Comparison of the studied patients HRQoL Levels

HRQOL Domains	HRQOL Levels					
	Low HRQoL		Average HRQoL		High HRQoL	
	No.	%	No.	%	No.	%
Abdominal symptoms	50	61.7	23	28.4	8	9.9
Fatigue	56	69.1	21	25.9	4	4.9
Systemic symptoms	50	61.7	23	28.4	8	9.9
Activity	52	64.2	19	23.5	10	12.3
Emotional function	48	59.3	19	23.5	14	17.3
Worry	50	61.7	20	24.7	11	13.6

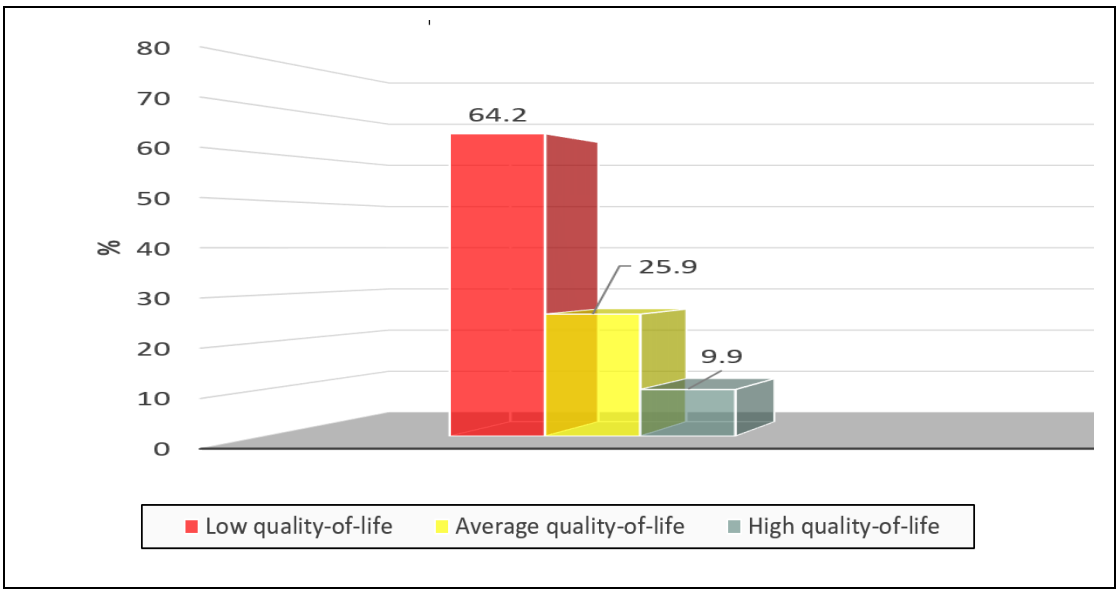

Figure (2) Comparison of the studied patients HRQoL domains' total scores

Table (5) Correlation between studied patients Knowledge total score with Health Related Quality of Life total score:

HRQOL	Knowledge total score	
	r	P
HRQOL total score	0.150	0.180

Discussion

Health-Related Quality of Life (HRQOL) among patients with MAFLD can be significantly impacted by the symptoms and complications associated with the condition. Patients with MAFLD may experience decreased physical activity and limitations in daily functioning due to fatigue and systemic symptoms **(Funuyet-Salas et al., 2024).**

Concerning Frequency distribution of the demographic characteristics, regarding age, the present study result illustrated that slightly less than half of the studied patients their ages were between 50 and 60 years old. This might be due to MAFLD tending to be more prevalent in middle-aged adults, particularly those between 50 and 60 years old.

Possible reasons for this result might include the following: some individuals may die of other diseases at older ages as fatty liver can significantly increase overall mortality, and thus these individuals are not counted as part of the MAFLD population; compared with older population who typically retire, middle-aged who are at the peak of their careers may experience more pressure and engage in social behavior that may lead to unhealthy lifestyles, which can increase their risk of having metabolic disorders.

The result of the present study was consistent with **Fan et al., (2021),** who studied "Prevalence and risk factors of metabolic associated fatty liver disease in the contemporary South China population" and documented that slightly less than one third of

the studied patients their ages were 50 years old or older.

This result disagreed with **Kandil et al., (2024)** who studied "Echocardiographic Abnormalities and Carotid Artery Atherosclerosis in Metabolic Associated Fatty Liver Disease Patients" in Egypt and documented that the mean age of the studied group was 43.69 ± 11.36.

Concerning gender; the present study result represented that more than two third of the studied patients were females. This might be due to sex-specific genetic predispositions that affect lipid metabolism, and fat storage making females more susceptible to MAFLD. In addition, the prevalence of MAFLD in women aged over 50 years old could be related to the age range for menopause. Similarly, these results were consistent with **Kandil et al., (2024)**, who found that three quarters of the studied patients were female. Moreover, these results in the same line with **Roesch-Dietlen et al., (2023),** who studied "Prevalence of metabolic associated fatty liver disease in patients with gallstone disease. Study on a cohort of cases in South-Southeastern Mexico" and found that more than three-quarters of the studied patients were women.

While, the result of the present study disagreed with **Ruiz-Manriquez et al., (2022),** who studied "Prevalence of metabolic-associated fatty liver disease in Mexico and development of a screening tool: The MAFLD-S-Score" and found that more than half of the studied patients were males.

Regarding marital status, the present study result indicated that the majority of the studied patients were married. This might be explained as most of studied population and the age of MAFLD susceptibility were middle aged, and most people in such age are married. This result was in accordance with **Shalaby et al., (2023),** who conducted a study entitled " Prevalence and Possible Risk Factors of Metabolic Associated Fatty Liver Disease (MAFLD) in Non-Obese Individuals in El-Minia Governorate–Egypt" and found that more than two thirds of the studied patients were married.

The result of the present study contradicted with **Abdelkhalik et al., (2024),** who carried out a study entitled "Unveiling metabolic dysfunction-associated fatty liver disease: Knowledge gaps and attitudes among Lebanese university students" and documented that the majority of the studied patients were single.

Regarding the residence, the current study's result indicated that more than two thirds of the studied patients were living in urban areas. This might be due to the urban population often have a greater access to processed, and fast foods that is rich in refined carbohydrates, fats, and sugars which can lead to obesity, the primary risk factors for MAFLD.

The result of the present study were consistent with **Du et al., (2024),** who studied "Effects of Interventions for Improving Awareness and Knowledge of Nonalcoholic Fatty Liver Disease Among Chinese Young Adults for Prevention of Liver Cancer—A Randomized Controlled Trial" and revealed that more than half of the studied patients were living in urban areas.

This results disagreed with **Someili et al., (2024),** who performed a study entitled "Knowledge, attitudes, and determinants of nonalcoholic fatty liver disease among adults in Jazan province: A cross-sectional study" and found that more than half of the studied population lived in rural areas.

Concerning the educational level, the current study result illustrated that slightly less than half of the studied patients had secondary education. This might be due to people with secondary level of education may

have limited health literacy, which affects their ability to understand the main risk factors for MAFLD disease such as poor dietary choices, sedentary lifestyles, and limited access to healthcare resources.

The results of the present study agreed with **Koutny et al., (2023),** who performed a study entitled "Relationships between education and non-alcoholic fatty liver disease in Salzburg, Austria", and found that two fifths of the studied patients had secondary education. This result disagreed with **Zhu et al., (2024),** who studied "The association between educational attainment and the risk of nonalcoholic fatty liver disease among Chinese adults" and found that most of the studied patients had middle educational level lower than secondary school.

Regarding the occupation, the present study results showed that slightly less than two fifths of the studied patients were working in private work. This might be because the private sector offers a wide range of employment options, including entrepreneurial opportunities. This result is supported by **Abebe et al., (2022),** who mentioned that more than one third of the studied patients were a private employee. The present study result disagreed with **Younossi et al., (2024),** who found that more than half of the studied patients were governmental employers.

The present study findings indicated that slightly less than three fifths of the studied patients had been diagnosed with MAFLD for less than 6 months, all of them didn't hospitalize due to fatty liver, and the majority of them didn't have family history of MAFLD. This might be because MAFLD is often silent or asymptomatic, especially in the early stages. Therefore, many individuals with simple fatty liver do not experience significant clinical symptoms that would lead to hospitalization.

These findings were supported with **Abdelkhalik et al., (2024),** who found that slightly less than two thirds of the studied participants had no previous history of hospitalization due to MAFLD. In addition, the same results agreed with **Someili et al., (2024),** who found that more than three-quarters of the studied population had no family history of MAFLD.

Whereas these finding was in disagreement with **Guo et al., (2022),** who studied “Non-alcoholic fatty liver disease pathogenesis and natural products for prevention and treatment” and found that more than half of participants had family history of metabolic diseases including hypertension, dyslipidemia and T2DM which highlights both the role of genetics, as well as habits and sociocultural norms in the development of metabolic syndrome.

Regarding the risk factors for MAFLD; the results of the present study indicated that all the studied patients had high cholesterol level and taking high calories diet, the vast majority of them were obese, and more than three quarters of them don't perform physical exercises. This might be because these are the most commonly seen risk factors among patients with MAFLD. Therefore, previous study of **Zhang et al., (2023),** assumed that the triglyceride is sensitive in forecasting early MAFLD.

the result of the present study agreed with **Chen et al., (2021),** who found that the prevalence of MAFLD increased sharply with increasing BMI, reaching more than half in obese individuals.

This result disagreed with **Li et al., (2020)** who studied "Prevalence and Risk Factors of Metabolic Associated Fatty Liver Disease in Xinxiang, China" and found that the participants with MAFLD were more likely to have moderate physical activity.

Concerning the comorbidities diseases; the present study results denoted that all the

studied patients were suffering from hyperlipidemia, and more than half of them were diabetic. This might be because hyperlipidemia and diabetes mellitus are closely related conditions, and their connection is both metabolic and pathophysiological. The relationship between them is often bidirectional: hyperlipidemia (elevated blood lipid levels) can increase the risk of developing diabetes, and conversely, diabetes (especially type 2 diabetes) can worsen hyperlipidemia.

The results of the present study were consistent with **Cheng et al., (2024),** who carried out a study entitled "Prevalence and clinical outcomes in subtypes of metabolic associated fatty liver disease in Taiwan Bio-Bank" and found that slightly less than two thirds of the studied participants were suffering from hyperlipidemia while more than two thirds of them were diabetic.

In the same line, the results of the present study were consistent with **Yilmaz et al., (2021),** who studied "The prevalence of metabolic-associated fatty liver disease in the Turkish population: A multicenter study", and found that more than half of the patients were diabetic patients and those with dyslipidemia.

These results disagreed with **Abdelkhalik et al., (2024),** who found that more than one third of the studied participants were suffering from hyperlipidemia and diabetes mellitus.

Concerning smoking habit; the present study result showed that more than three quarters of the studied patients were nonsmokers. This might be because two third of the study patients were females and have adopted a non-smoking culture based on their Arab culture. Also, the studied patients might have the knowledge that smoking is a well-established risk factor for many diseases, including MAFLD.

The result of the present study was in agreement with **Jang et al., (2023),** who studied "Association between smoking cessation and non-alcoholic fatty liver disease using NAFLD liver fat score in Korea" and found that the majority of the studied patients were nonsmokers. , the results of the present study disagreed with **Al Tawil et al., (2024),** who found that nearly half of the studied participants were active smokers.

As for the Body Mass Index (BMI); the present study results represented that more than two thirds of the studied patients were moderately obese. This might be explained as obesity is strongly associated with dyslipidemia, which is considered a major component of metabolic syndrome and closely linked to MAFLD. These results of the current study were consistent with **Someili et al. (2024),** found that nearly one third of the studied population were obese.

The result of the present study disagreed with **Riekki et al., (2023),** who studied "Prevalence and associated factors of metabolic-associated fatty liver disease in overweight Finnish children and adolescents" and found that slightly less than half of the studied population were severely obese.

According to the symptoms of steatohepatitis; the present study findings described that most of the studied patients were suffering from weight gain, fatigue, abdominal discomfort and increased waist circumference, as well as elevated liver enzymes. This might be due to these are the most common symptoms among individuals with MAFLD due to metabolic dysfunction, fat accumulation, and the livers' inability to process fats efficiently.

These results were in the same line with **Tincopa et al., (2021),** who found that most of the studied patients tended to report associated symptoms, primarily fatigue, abdominal pain and elevated liver enzymes.

Regarding the studied patients' total level of knowledge regarding MAFLD; the

present study result indicated that more than three quarters of the studied patients had poor Knowledge regarding MAFLD.

This might be due to MAFLD is a silent condition in its early stages, often lacking noticeable symptoms. As a result, many patients may not seek medical information or education unless they experience advanced or related complications. The asymptomatic nature contributes to underestimation of its seriousness. Also, there is often a lack of structured patient education programs specifically addressing liver diseases like MAFLD in many healthcare settings, especially in resource-limited environments. Health education tends to focus on more commonly known conditions such as diabetes or hypertension, even though these are closely linked to MAFLD.

Similarly, this result agreed with **Chen et al., (2019),** who carried out a study entitled "Survey of nonalcoholic fatty liver disease knowledge, nutrition, and physical activity patterns among the general public in Beijing", and found that the majority of the studied patients had poor total knowledge regarding MAFLD. In addition, this result also supported with **Alqahtani et al., (2024),** who carried out a study entitled "Knowledge about metabolic dysfunction-associated steatotic liver disease among the medical professionals from countries in the Mena region", and found that most of the studied participants had poor total level of knowledge regarding MAFLD. The results of the present study was against **Abdulfattah et al. (2024),** who found that more than half of the studied participants were aware of MAFLD.

The current study result revealed that the lowest HRQOL domain was abdominal symptoms followed by activity then fatigue.

As for the comparison between the HRQOL Levels; the present study results indicated that more than two thirds of the studied patients who were suffering from fatigue and low activity had low HRQOL. Fatigue and low activity in (MAFLD) can result from several physiological and metabolic factors. Chronic low-grade inflammation and insulin resistance contribute to impaired energy metabolism, leading to persistent fatigue.

Additionally, elevated liver fat accumulation and fibrosis can disrupt metabolic homeostasis, affecting muscle function and physical endurance. Sleep disturbances, common in MAFLD due to obesity and associated conditions like obstructive sleep apnea, further exacerbate daytime fatigue. Psychological factors, including depression and anxiety, which are more prevalent in MAFLD patients, also play a role in reduced physical activity and overall lethargy.

The result of the present study were in the same line with **Huber et al., (2019),** who performed a study entitled "Health-related quality of life in non-alcoholic fatty liver disease associates with hepatic inflammation in Germany", and found that most of the studied patients who were suffering from fatigue and low activity level had low HRQOL, and stated that health education intervention is needed to improve the studied patients total HRQOL.

The same results disagreed with **Yilmaz et al., (2023),** who performed a study entitled "Impairment of patient-reported outcomes among patients with non-alcoholic fatty liver disease: A registry-based study in Turkey", and found that the majority of the studied patients who were suffering from negative emotional/functional well-being, and worry had low HRQOL

Moreover, the present study results showed that more than two thirds of the studied patients had low HRQOL. This result might be due to that MAFLD has multisystemic physical symptoms and psychological

complications on the patient's which can negatively affect HRQOL.

The same result also supported by **Papatheodoridi et al., (2023),** who carried out a study entitled "Health-related quality of life in patients with nonalcoholic fatty liver disease: A prospective multi-center UK study" and found that all the studied patients had low total HRQOL mean score. Further, this result was similar to **Younossi et al., (2024),** who found that all the studied patients with MAFLD substantially had lower total HRQOL mean score and recommended the importance of conducting a health education program in order to improve their quality of life.

Also, the same result agreed with **Puneem et al., (2023),** who studied "Health-related quality of life and its determinants among South Indian type 2 diabetes patients with and without non-alcoholic fatty liver disease " and found that the mean score of HRQOL domains among all the studied patients significantly were low.

The current study results revealed that there was a statistically positive correlation found between studied patients' total score of knowledge regarding MAFLD and the total score of all HRQOL. This might be due to lack of knowledge, which can be a real cause to have unhealthy lifestyle, diet and physical activity which can worsen the disease process and make symptoms and disease consequences more complicated and worsens HRQOL as a result.

The results of the present study agreed with **Tincopa et al., (2024),** who found that there were positive correlations found between the studied patients' total level of knowledge regarding MAFLD and their total HRQOL score.

On the same line, the results were supported by **Huber et al., (2019),** who found that there were highly statistically significant positive correlation found between the studied patients total knowledge related to MAFLD and their total HRQOL regarding the activity, and fatigue. Moreover, these results were similar to **Funuyet-Salas et al., (2024),** who performed a study entitled "Health-related quality of life in non-alcoholic fatty liver disease: A cross-cultural study between Spain and the United Kingdom", and found that there were highly statistically significant correlations found between the studied patients' total knowledge score regarding MAFLD and their total HRQOL score regarding the systemic symptoms, fatigue, and worry.

Conclusion:

There was lack of knowledge between MAFLD patients regarding their disease. Also, patients with MAFLD have significantly low HRQOL. There was a positive correlation between patient's knowledge and their health related quality of life regarding MAFLD.

Recommendations

- The need for continuous educational and training programs for patients with metabolic associated fatty liver disease to support patients, improve their HRQOL, help make their decisions regarding medical interventions and improve their health outcomes.
- Replication of the study using a larger probability sample from different geographical regions for generalization of results.

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تقييم المعرفة وجودة الحياة بين المرضى المصابين بمرض الكبد الدهني المرتبط بالتمثيل الغذائي

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يمكن تعريف مرض الكبد الدهني المرتبط بالتمثيل الغذائي بوجود دهون في الكبد بنسبة ≤ ٥٪ دون استبعاد أمراض الكبد الأخرى بما في ذلك مرض الكبد الكحولي. إلي جانب التعب، قد يعاني مرضى الكبد الدهني المرتبط بالتمثيل الغذائي من والقلق والاكتئاب وضعف الإدراك وانخفاض احترام الذات، تؤثر هذه الأعراض بشكل كبير على جودة حياتهم المتعلقة بالصحة والأداء البدني. لذا **هدفت هذه الدراسة** إلى تقييم المعرفة وجودة الحياة بين مرضى مرض الكبد الدهني المرتبط بالتمثيل الغذائي. **تصميم البحث**: تم استخدام تصميم بحث استكشافي وصفي. **مكان البحث**: أجريت هذه الدراسة في عيادات الباطنة الخارجية وأمراض الكبد والجهاز الهضمي بمستشفى جامعة بنها، في محافظة القليوبية، مصر. **عينة الدراسة**: عينة غرضية مكونة من ٨١ مريضًا بالغًا مصابًا بمرض الكبد الدهني المرتبط بالتمثيل الغذائي. **أدوات جمع البيانات**: تم جمع البيانات باستخدام أداتين أساسيتين؛ استبيان مقابلة منظم واستبيان أمراض الكبد المزمنة لمرض الكبد الدهني غير الكحولي. **النتائج**: وقد أظهرت الدراسة أن ٨٦,٤٪ من المرضى الخاضعين في الدراسة لديهم معرفة ضعيفة بمرض الكبد الدهني المرتبط بالتمثيل الغذائي. بالإضافة إلى ذلك، عانى ٦٤,٢٪ من المرضى من انخفاض جودة الحياة. ومن بين من عانوا من التعب وقلة النشاط، عانى ٦٩,١٪ و٦٤,٢٪ على التوالي من انخفاض جودة الحياة. **الاستنتاج:** ولوحظ وجود ارتباط إيجابي بين معرفة المرضى وجودة حياة المرضى لديهم. **التوصيات:** أوصت الدراسة بأهمية إعداد برامج تعليمية وتدريبية مستمرة لتعزيز معرفة المرضى، ودعم اتخاذ القرارات المستنيرة، وتحسين النتائج الصحية وجودة الحياة لدى مرضى الكبد الدهني المرتبط بالتمثيل الغذائي.