ORIGINAL ARTICLE

EVALUATING THE IMPACT OF AN AWARENESS CAMPAIGN ON NON-ALCOHOLIC FATTY LIVER DISEASE KNOWLEDGE AMONG NON-GASTROENTEROLOGY PHYSICIANS: A QUASI-EXPERIMENTAL STUDY

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Background: Non-alcoholic fatty liver disease (NAFLD) has become a global pandemic, and Asian countries, including Pakistan, are under its dominion for the last two decades. Despite its steep rise, there is a gap in Pakistani physicians' knowledge regarding this disease. The aim of the study was to assess the effect of awareness campaign on knowledge about NAFLD among non-gastroenterology physicians. **Methods:** A Quasi-experimental study was conducted at POF Hospital Wah Cantt. After the ethical approval, a meticulously designed proforma was used containing three domains: risk factors, diagnostics and treatment of NAFLD. The questionnaire comprised of 12 questions including multiple choice questions & questions with yes or no with a total 25 parameters. The first part of the questionnaire comprised demographic information of the participants. The second part of the questionnaire was about the knowledge of the doctors regarding NAFLD. The maximum achievable score was 25. The primary outcome was the frequencies of different categories of knowledge scores before and after creating awareness. **Results:** At the baseline nine non-gastroenterology (22.5%) physicians had good knowledge, seventeen (42.5%) had fair knowledge and twelve (30.0%) had poor knowledge. After the awareness campaign, ten (25.0%) participants had excellent knowledge, nine (22.0%) had very good knowledge, eighteen (45.0) had fair knowledge and only one participant (2.5%) had poor knowledge with *p*-value less than 0.05. **Conclusion:** Primary care physicians underestimate the frequency of NAFLD and fail to recognize its risk factors, diagnostics and treatment. The adequate use of awareness campaigns improved their knowledge effectively.

Keywords: Awareness; Liver; Non-alcoholic fatty liver disease (NAFLD); Metabolic dysfunction-associated Steatotic liver disease (MASLD); Prevalence

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INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD), now also known as Metabolic dysfunction-associated steatotic liver disease (MASLD), refers to a group of conditions where there is an accumulation of excess fat in the liver of people who drink little or no alcohol.[1] NAFLD affects approximately 25% of the global population, with the highest rates reported in the Middle East (32%), followed by Latin America (27%) and Europe (23%), while Africa reports the lowest prevalence at 13%. Notably, Asia has witnessed a sharp surge over the last two decades, with rates escalating from 22–30%.[2] The increased global burden of NAFLD/MASLD is driven primarily by the obesity epidemic.[3] Despite its growing burden, it is estimated that less than 20% of patients with MASLD have been diagnosed.[4] Moreover, thirty percent of patients with NAFLD/MASLD can develop hepatocellular carcinoma even without developing cirrhosis.[5] Because of its high prevalence, NAFLD/MASLD has become a major cause of liver-related mortality and morbidity.[6] In addition, gaps in physicians' understanding of NAFLD/MASLD, varying significantly, across specialties often hinder early identification, causing many patients to present only once the disease has progressed to advanced stages.[7]

This lack of awareness and gaps in the knowledge about NAFLD may lead to suboptimal identification and management of these patients, which may be responsible for an increasing number of patients presenting with advanced disease.[8] It would be beneficial not only to identify these patients early, but also to optimize their liver health and as well as managing their cardiometabolic risks. Therefore, the rationale of this study is to provide awareness among the

physician community about NAFLD. In developing countries like Pakistan, where healthcare services are already very minimal this type of study will reduce the burden on the healthcare system.

MATERIAL AND METHODS

This Quasi-experimental study was conducted at Pakistan Ordinance Factory (POF) Hospital Wah Cantt after approval from ethical committee of the hospital. The study population was doctors (primary physicians, specialists and general practitioners) working in POF Hospital Wah Cantt. Non-probability convenient sampling was used to select the required number of physicians as determined by the sample size. Sample size was estimated with help of WHO sample size calculator keeping the level of significance 5%, Power of study 90%, the level of knowledge before awareness through reading material to be 26%[9] and the level of knowledge after awareness to be 62%[9]. The minimum sample came out to be 28. We were able to collect data from 40 physicians. All Male/female doctors (MBBS & post-graduates) were included, all gastroenterology Specialists were excluded from the study.

The NAFLD knowledge survey proforma containing various NAFLD related questions covering three domains including risk factors, diagnostics and treatment, was utilized. The proformas were given to all participants involved in the study. Data was collected using these structured questionnaires before and after sharing reading material. The first part of the questionnaire comprised demographic information of the participants including age, gender, designation and specialty. The second part of the questionnaire was about the knowledge of the doctors regarding NAFLD which comprised of 12 multiple choice questions & some questions with yes or no responses with a total 25 parameters in total. Maximum achievable score was 25. The primary outcome was the frequency of different categories of knowledge scores before and after creating awareness. Five categories were improvised on basis of knowledge score (excellent, very good, good, fair and poor) as shown in Table-I. The secondary outcome was the frequency of different responses given to questions asked. Phases of study are shown in Figure-1.

The data was statistically analyzed using SPSS version 26. Quantitative variables were analyzed using means and standard deviation. Frequencies were calculated for qualitative variables. Crosstabs were used to assess the difference in the knowledge scores before and after sharing of reading material. P value less than 0.05 was considered significant.

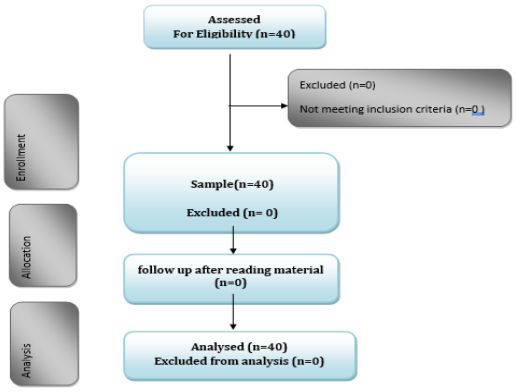

Figure-1: Phases of study

RESULTS

The majority participants belonged to internal medicine, with a total of 23(57.5%) and minimum number of participants were from ophthalmology (1%), psychiatry (1%), cardiology (1%) and radiology (1%). Table-3 shows details related to participants. When the score of knowledge about NAFLD was compared between all participants before and after the dissemination of reading material there was significant difference. Before the awareness campaign, only one participant (2.5%) had excellent knowledge, and one participant (2.5%) had very good knowledge about NAFLD. Nine (22.5%) had good knowledge, 17 (42.5%) had fair knowledge and 12 (30.0%) had poor knowledge. After the awareness campaign, 10 (25.0%) participants had excellent knowledge, 9 (22.0%) had very good knowledge, 18(45.0%) had fair knowledge and only one participant (2.5%) had poor knowledge with p value less than 0.05. (Table-4). Most of the participants (92.5%) were familiar with the term NAFLD and this improved to 100 percent after the awareness campaign. The participants develop a better understanding regarding the prevalence, diagnosis, complications and treatment options of NAFLD after the campaign. Thirty-nine (97.5%) participants became aware that NAFLD is reversible and 37 (92.0%) realized that family screening is recommended in NAFDL. Table-5 shows the responses to different questions by participants

Table-1: Different categories based on knowledge score

Grading (Max Score 25)	
1. Excellent	21-25
2. Very Good	16-20
3. Good	11-15
4. Fair	06-10
5. Poor	01-05

Table-2: The Questions asked from the participants of study

1. What do you understand by the term NAFLD?
2. What is the prevalence of NAFLD in Asia?
3. What can be the causes of NAFLD?
4. Select the initial methods that can be used to diagnose NAFLD?
5. Select the medications which can cause NAFLD?
6. What could be the indications of liver biopsy?
7. Is family screening recommended in NAFLD?
8. What can be the complications of NAFLD?
9. What can be the treatment options for managing NAFLD?
10. Is NAFLD reversible?
11. Do you see patients with NAFLD if Yes than how many patients per year
12. Do you refer patients with NAFLD to gastroenterologist?

Table-3: The demographic features of the study sample (n=40)

	Types	Frequency n (%)
Specialty	Internal Medicine	23(57.5)
	Gynaecology & Obstetrics	5(12.5)
	Surgery	5(12.5)
	Ophthalmology	1(2.5)
	Psychiatry	1(2.5)
	Cardiology	1(2.5)
	Neurology	2(5.0)
	Radiology	1(2.5)
Designation	House officer	6(15.0)
	Medical officer	5(12.5)
	Consultant	15(12.5)
	Post graduate trainee	14(35.0)
Frequency of Gender	Male	20(50.0)
	Female	20(50.0)
Frequency of Age (years)	<26	6(15.0)
	27-30	14(35.0)
	31-35	9(22.5)
	36-40	6(15.0)
	41-45	1(2.5)
	45-50	2(5.0)
	>50	2(5.0)

Table-4: The comparison of frequency of different grades of knowledge score before and after awareness (n=40)

Categories on basis of knowledge score	Frequency Before Awareness Campaign n (%)	Frequency After Awareness Campaign n (%)	*p*-value
Excellent	1(2.5)	10(25.0)	<0.01
Very Good	1(2.5)	9(22.5)	
Good	9(22.5)	18(45.0)	
Fair	17(42.5)	2(5.0)	
Poor	12(30.0)	1(2.5)	

Table-5: The Frequencies of different responses in the study group (n=40) before and after the awareness

		Before N (%)	After N (%)
What do you understand by the term NAFLD?	Correct	37(92.5)	40(100.0)
	False	3(7.5)	0(0)
What is the prevalence of NAFLD in Asia?	14-40%	10(25.0)	34(85.0)
	9-40%	8(20.0)	1(2.5)
	5-20%	9(22.5)	5(12.5)
	10-30%	13(32.5)	0(0)
What can be the causes of NAFLD?	Diabetes	27(67.5)	40(100.0)
	Hypertriglyceridemia	34(85.0)	40(100.0)
	Obesity	36(90.0)	40(100.0)
	Viral hepatitis	25(62.5)	40(100.0)
	Medications	22(55.0)	40(100.0)
	Smoking	9(22.5)	34(85.0)
Initial methods that can be used to diagnose NAFLD?	Ultrasound	27(67.5)	37(92.5)
	CT Scan Abdomen	16(40)	37(92.5)
	MRI Abdomen	18(45.0)	37(92.5)
	Liver biopsy	8(20.0)	35(87.5)
	AST/ALT	8(20.0)	35(87.5)
	Fibroscan	3(8.0)	34(85.0)
Select the medications which can cause NAFLD?	Amiodarone	13(32.5)	32(80.0)
	Corticosteroids	21(52.5)	36(90.0)
	NSAIDS	10(25.0)	39(97.50
	Tamoxifen	13 (32.5)	36(90.0)
	Valproic acid	11(27.5)	38(95.0)
What could be the indications of liver biopsy?	Steatohepatitis	4(10.0)	37(92.5)
	Other conditions than steatohepatitis excluded	9(22.5)	1 (2.50
	Other conditions than steatohepatitis co-exist	2(5.0)	0(0)
	Presence of metabolic syndrome	2(5.0)	1 (2.50
	High NAFLD score	8(20.0)	1 (2.50
	Before starting pharmacological therapy	5(12.5)	0(0)
Is family screening recommended in NAFLD?	Yes	30(75.0)	37(92.0)
	No	10(25.0)	3(7.5)
What can be the complications of NAFLD?	Cirrhosis	24(60.0)	40(100.0)
	Hepatocellular carcinoma	10(25.0)	0(0)
	Cardiovascular diseases	1(2.5)	0(0)
	Gastroesophageal reflux disease	5(12.5)	0(0)
	Psychological dysfunction	0(0)	0(0)
What can be the treatment options for managing NAFLD?	Dietary modifications	18(45.0)	40(100.0)
	Exercise	11(27.5)	0(0)
	Vitamin E	3(7.5)	0(0)
	Statins	3(7.5)	0(0)
	Antioxidants	4(10.0)	0(0)
	Pioglitazone	1(2.5)	0(0)
Is NAFLD reversible?	Yes	28(70.0)	39(97.5)
	No	12(30.0)	1(2.5)

DISCUSSION

Our study showed that the awareness of NAFLD among doctors other than gastroenterologist is limited although prevalence of NAFLD in Pakistan is approaching 47%.[10] However the knowledge of doctors improved drastically after simple awareness campaign that is sharing of reading material. According to a study done in Saudi Arabia[11] regarding awareness of NAFLD among general population, fifty three percent participants were aware of NAFLD in 2024. In a similar study in 2021,[12] only 33% of people were aware of NAFLD. They attributed this improvement to the enhancement of health system capabilities and use of smartphones.[13] There is a possible source of bias in their study as two different samples were compared from two different time frames. In our study we compared the knowledge of the same group of physicians before and after sharing of reading material which addressed any such bias in our study.

According to Saleh A Alqahtani[13] *et al*, almost 95 percent of adult population in United States is unaware of NAFLD even though they are suffering from it. They have suggested that there is unawareness of NAFLD in American population and they emphasized on the need of wide range of awareness campaigns so that the high-risk patients can be identified. They even pointed out that the non-liver specialists also had below average understanding of NAFLD. In our study we found out that almost 80

percent doctors who were not gastroenterologists had inadequate understanding of NAFLD. It is evident that the general public likely has a lower level of understanding and there is a need of large-scale surveys and awareness campaigns to address this growing problem.

According to study conducted in Malaysia,[14] the public had awareness of hepatitis C and B but they were unaware of NAFLD. Thirty percent of people were aware of hepatitis C and 30 percent were aware of hepatitis B but less than 10 percent were aware of NAFLD. They highlighted the need for robust efforts to create awareness of NAFLD in community. We only surveyed doctors, but we are of the view that the public should also be enlightened regarding NAFLD.

C J Bergqvist *et al*[15] improvised a questionnaire where face to face questions were asked from hospital specialists to measure their knowledge. They included cardiologists, rheumatologists, nephrologists, cardiac surgeons, endocrinologists and internal medicine specialists. They found that majority of these specialists recognized the grimness of NAFLD but they had inadequate knowledge regarding the prevalence and risk factors. Their patients had risk factors of NAFLD but they were oblivious to it. We surveyed physicians like them, but we utilized a questionnaire to check knowledge in detail. They advocated that need of awareness to identify the patients at risk and facilitate their timely referral to hepatologists and we came to similar conclusion.

According to David Hemanus Wessels *et al*,[16] forty-two percent primary care physicians and forty-six percent endocrinologists were reluctant to get biopsy of NASH patients to avoid patients inconvenience which shows there is substantial barrier in knowledge of health professionals as well. They suggested the development of screening algorithm to guide management of NAFLD patients. We established that sharing reading material seems to be a good source of creating awareness and it showed substantial improvement.

Polanco-Briceno *et al*[17] surveyed 305 physicians including primary care physicians and specialists including hepatologists and gastroenterologists. They found that almost half of the physicians were unfamiliar with NAFLD and they were treating patients as NASH. They also established that many hepatologists (>50%) deviated from currents guidelines in treatment of NAFLD. Nazish Butt *et al*[18] performed an observational study with patients diagnosed with NAFLD. They presented data that many patients suffering from NAFLD did not know about the nature of their disease and risk factors. This means that NAFLD is a disease which has bewildered both physicians and alike. The use of awareness campaigns can bridge the gaps in knowledge and improve understanding about NAFLD.

CONCLUSION

Our study found that many primary care physicians' tend to underestimate the prevalence of NAFLD/MASLD and often lack awareness of its key risk factors, diagnostic approaches and treatment options. However, we also observed that even a simple intervention, such as providing targeted reading material, can significantly enhance their knowledge and understanding of the disease.

Recommendations: To bridge this knowledge gap, we strongly recommend large-scale awareness campaigns and medical education programmes to improve understanding of NAFLD/MASLD among doctors.

Limitations of Study: This was a single centre survey

Conflict of Interest: None

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AUTHORS' CONTRIBUTION

NA, AA: Conceptualization of the study design, proof reading MG, AA: Data collection, analysis, interpretation.

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