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NUTRITION KNOWLEDGE DIETARY PRACTICE AND NUTRITION STATUS AMONG ADULT GYM USERS IN MOGADISHU- SOMALIA

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Abstract

As gym attendance increases in Somalia, many individuals are aiming to improve their exercise routines and diets to achieve better health and fitness. However, research on nutrition knowledge, dietary habits, and nutritional status among the Somali population remains limited. This study aimed to assess the nutrition knowledge, dietary practices, and nutritional status of adult gym users in Mogadishu. A cross-sectional study was conducted with 114 male and female adults aged 18–59 who attended various gyms in the city. Data collection involved a semi-structured questionnaire and an individual dietary diversity questionnaire administered via Google Forms. Nutritional status was determined using Body Mass Index (BMI) and Waist-Hip Ratio (WHR), based on measurements of weight, height, and waist and hip circumferences. Analysis was conducted using SPSS version 26, with descriptive statistics used for proportions, frequencies, means, and standard deviations, and chi-square tests applied to identify associations between variables. A p-value < 0.05 was considered statistically significant. The majority of participants were male, aged 26–35, with university education and salaried employment. A significant association was found between nutritional status and occupation ($p=0.012$), but no significant associations were found with sex, age, or education level. Most participants understood that a balanced diet is important, with common food groups consumed being cereals (93%), fruits (88%), vegetables (84%), and beverages (54%). While dietary diversity showed no significant relationship with nutritional status overall, beverage consumption did show a link. Most respondents also believed in the importance of drinking eight to ten glasses of water per day. Nutrition knowledge was generally not significantly associated with nutritional status, except in the practice of checking food labels. The findings showed that 71% of gym users were in good health, with 8% classified as obese and most having a low health risk. The study effectively captured the socio-demographic profile of gym users and identified gaps in nutrition knowledge and dietary practices, emphasizing the need for improved awareness and guidance. It is recommended that gyms in Mogadishu provide tailored fitness programs that consider users' age, gender, and education level, and collaborate with nutritionists to deliver regular educational workshops and personalized dietary advice. Encouraging balanced eating habits and incorporating routine health assessments, such as body composition analysis, can enhance users' nutritional status and support their fitness goals.

Keywords: *Nutrition Knowledge, Dietary Practice, Nutrition Status*

INTRODUCTION

Fitness centers are vital urban facilities that support physical activity and promote public health, with national fitness often seen as a reflection of a nation's strength (Zhu & Liang, 2019). Urbanization has raised living standards and increased demand for leisure, fitness, and recreational services (Zhang, 2021). Gyms, as major fitness hubs, offer various services such as cardio, group exercises, and personal training (Global Wellness Institute, 2020). Globally, gym usage has grown significantly, with over 205,000 gyms and 184 million members in 2020, led by the U.S. with 64.19 million members. While Sweden and Norway have the highest membership rates (22%), countries like India lag with only 0.15% (IHRSA, 2023).

In Africa, gym use is rising, though at a slower pace. In Nigeria, awareness of fitness benefits has led to an increase in gym facilities (Adeogun & Adeyeye, 2019). Nairobi alone hosts over 280 gyms serving 100,000 members annually (Kenya Business Directory, 2018), with growing investment due to health advocacy efforts (Kinuthia et al., 2021). South Africa and Egypt lead the continent in gym memberships (Statista, 2020).

Despite challenges in infrastructure and security, Mogadishu is seeing a budding fitness culture, with locally run gyms offering diverse services (Mohamed et al., 2022). Gym-goers often use dietary supplements, although many lack proper nutritional knowledge (El Khoury & Antoine-Jonville, 2012; Ruano et al., 2020). Balanced diets and nutrition education are essential for performance and health (Finamore et al., 2022; Ha & Caine-Bish, 2011). Regular exercise is increasingly critical in combating sedentary lifestyles and preventing non-communicable diseases linked to poor habits like inactivity and poor diet (Jeong et al., 2021; Natalucci et al., 2023).

Statement of the Problem

The establishment idea of gym centers is relatively new in the Somalia. Despite the recognized importance of nutrition for overall health and fitness, there is a lack of comprehensive data regarding the nutrition knowledge, dietary practices, and nutritional status of adult gym users in Mogadishu. Lack of nutrition advice at the gym centers has led to, the majority of gym users being unaware of the connection between diet and exercise, and occasionally, despite having lost weight, they gain it again due to improper nutrition.

Due to lack of channels to give gym goers nutrition and health information, gym-users may face challenges in achieving their weight management objectives due to: limited dietary knowledge, traditional dietary habits, time constraints, a lack of access to healthy foods, and nutrition misinformation. Understanding the unique challenges facing gym goers and needs of this population is essential for developing targeted interventions to support their health and well-being. The nutrition status, dietary practice and knowledge of adult gym users in Mogadishu was studied.

Research questions

i. Does the socio-demographic characteristics of adult gym users affect the nutritional status of respondents in Mogadishu?
ii. Does the level of nutrition knowledge influence the dietary diversity of the diet among adult gym users in Mogadishu?
iii. How does the dietary diversity of the diet affect the nutritional status of respondents who are gym users in Mogadishu?
iv. What is the relationship between nutrition knowledge, dietary practices, and nutrition

status among adult gym users in Mogadishu?

MATERIALS AND METHODS

This study employed a cross-sectional design to assess socio-demographic characteristics, nutrition knowledge, dietary practices, and nutritional status among adult gym users in Mogadishu. Conducted from June to August 2024, the research was carried out across 17 randomly selected gyms, one from each district of Mogadishu. Adults aged 18–59 who met the inclusion criteria participated, with a final sample size of 114 gym users.

Data collection involved structured questionnaires and anthropometric measurements, including BMI and waist-to-hip ratio, and used a 24-hour dietary recall to assess dietary diversity. Nutrition knowledge was evaluated using adapted validated tools, while data quality was ensured through pilot testing, standardized training of research assistants, and continuous oversight. Ethical approval was obtained from relevant authorities, and informed consent was secured. Data was analyzed using SPSS version 26, employing descriptive statistics and chi-square tests for associations. A key limitation was the study's restriction to Mogadishu, limiting generalizability to other regions in Somalia.

RESULTS, ANALYSIS, DISCUSSIONS AND CONCLUSIONS

The study was carried out to include 152 adult gym users in Mogadishu, aged between 18-59 years old. A hundred and fourteen questionnaires were completed and submitted, giving a response rate of 75%.

Socio-demographic characteristics of adult gym users in Mogadishu

The data reveals that the majority of gym users are aged 26-35 years (51%) and predominantly male (54%). In terms of education, the highest attainment is a bachelor's degree (49%), followed by 43% of respondents being salaried employees and most have joined the gym recently, with 81% becoming members in less than one year. This indicates a young, well- educated demographic with a strong inclination toward recent gym participation (Table 1).

Table 1: Socio demographic characteristics of adult gym users in Mogadishu

Sex	Category	Frequency	Percentages	Asymptotic Significance (2-sided)
	Male	62	54	
	Female	52	46	0.196
Age	18-25	43	38	
	26-35	58	51	0.681
Education	36-45	13	11	
	High school	25	22	
	Bachelor degree	56	49	0.380
	Masters	32	28	
	PhD	1	1	
Occupation	Salaried employee	49	43	
	Self employed	5	4	0.012
	Student	13	11	
	Unemployed	47	41	
Joining duration	less than 1 year	92	81	
	1-2 years	18	15	
	3-4 years	2	2	

	Above 4 years	2	2

Nutritional knowledge of adult gym users in Mogadishu

Table 2 indicates that out of 114 respondents, the highest category for balanced nutrition indicates that 56% of respondents prioritize food with appropriate nutrients. For energy sources, 54% favor carbohydrates, while protein is the top choice for body tissue health, with 57% selecting it. In terms of vitamins, 54% emphasize the importance of fruits and vegetables. Regarding water intake, 44% of respondents aim for 8-10 glasses daily. The data highlights the essential components of a balanced diet, focusing on nutrient-dense foods, adequate energy sources, and sufficient hydration, all of which contribute to overall health and well-being.

Table 2: Nutritional knowledge of adult gym users in Mogadishu

	Category	Frequency	Percentage
Balanced	A nutritious meal	50	44
	Food with appropriate nutrients	64	56
Energy	Protein	35	31
	Carbohydrates	62	54
	Fats	12	11
	Vitamins	5	4
Body tissues	Calcium	19	17
	Iron	14	12
	Vitamin C	16	14
	Protein	65	57
Vitamins	Fruits and vegetables	62	54
	Dairy products	22	19
	Meat and poultry	24	21
	Grains and cereals	6	5
Water intake	1-2 glass	10	9
	4-6 glass	39	34
	8-10 glass	50	44
	More than 10 glass	15	13

Respondents' dietary intake based on food frequency in Mogadishu

The findings show that cereals play a major role in the respondents' diets, with 82% reporting frequent consumption. The statistical analysis confirms that there is no significant difference in proportions, underscoring the prominence of cereals in daily dietary habits, table 3. This high prevalence suggests that cereals are likely favored due to their accessibility, affordability, and nutritional benefits, which may be further reinforced by cultural preferences. The strong agreement on cereal intake could also reflect broader dietary trends, where grains serve as staple foods in various communities.

Table 3: Dietary intake

Cereals	Response	Frequency	Percentage
	Yes	93	82
	No	21	18
Vegetables	Yes	84	74
	No	30	26

Fruits	Yes	88	77
	No	26	23
Animal products	Yes	82	72
	No	32	28
Beverages intake	Yes	61	54
	No	53	46
Sweets intake	Yes	57	50
	No	57	50

Nutrition status of adult gym users in Mogadishu

Waist 84.46± 12.642 cm and hip circumference 106.46±10.633 cm (Table 4).

Table 4: Anthropometric Measurements

Measure	Weight (kg)	Height(cm)	Waist(cm)	Hip(cm)
Mean	71.41	168.09	84.46	106.46
Std. Deviation	11.577	28.007	12.642	10.633

Nutrition status

Table 5 shows that about 71% of the respondents were healthy, 18% were overweight followed by 8% obese respondents and only 3% were underweight. There was not a significant difference in the proportions for nutrition status of gym users in Mogadishu. The low health risk study respondents were 73%, while 17% had moderate health risk and 11% had high health risk (Table 5).

Table 5: Nutrition status

Nutrition status	Response	Frequency	Percent
	Underweight	3	3
	Healthy	81	71
	Overweight	21	18
	Obese	9	8
Health risk	Low	83	73
	Moderate	19	17
	High	12	11

Effect of dietary diversity of adult gym users on the nutritional status

Table 6 indicates the values of the test statistic for meals consumed, food preferences, supplements consumption, cereals consumption, vegetables, fruits, animal products, beverages and sweets consumption to be 2.575, 2.654,2.875,6.786,0.824,1.854,1.746,3.618 and 4.861 respectively all below 5, and above 0.05, ($p > 0.05$); hence no cells had an expected count less than 5, so this assumption was met. Accordingly, the significance levels of the association with nutrition status were all above 0.05, except for beverages consumption where ($p<0.05$). It indicates that there was no statistically significant association between dietary diversity and nutritional status except for beverages consumption which had a statistically significant association with respondents' nutritional status. The Chi-square statistic was used to test the association between dietary diversity and nutritional status. Results are presented in Table 6:

Table 6: Association between dietary diversity and nutritional status of gym users in Mogadishu

Indicator	Pearson Chi-Square	Asymptotic Significance (2-sided)
Consumption	2. 575[a]	0.183

Preferences	2. 654[a]	0.448
Supplement	2. 875[a]	0.411
Cereals	6. 786[a]	0.079
Vegetables	0. 824[a]	0.844
Fruits	1. 854[a]	0.603
Animal Products	1. 746[a]	0.627
Beverages	3. 618[a]	0.022
Sweets	4. 861[a]	0.182

Effect of nutrition knowledge and nutritional status of study respondents in Mogadishu

Table 7 indicates the values of the test statistic for balanced diet, energy foods, body tissues, vitamins foods, water intake, snacks intake, food labels, label reasons and most important meal were 1.766,3.720,4.866,4.855,3.613,2.799,3.128,1.251 and 2.060 respectively all below 5, hence no cells had an expected count less than 5, so this assumption was met. In the same vein, the p values for the indicators were ($p>0.05$). Accordingly, the significance levels of the association of nutrition knowledge with nutrition status were all above 0.05, except for food labels check ($p<0.05$). It indicates that there was no statistically significant association between nutrition knowledge and nutritional status except for food labels check which had a statistically significant association with respondents' nutritional status. The Chi-square statistic was used to test the association between nutrition knowledge and nutritional status. Results are presented in Table 7:

Table 7: Association between nutrition knowledge and nutritional status of study respondents in Mogadishu

Indicator	Pearson Chi-Square	Asymptotic Significance (2-sided)
Balanced diet	1. 766a	0.622
Energy foods	3. 720[a]	0.666
Body tissues	4. 866[a]	0.361
Vitamins foods	4. 855[a]	0.362
Water intake	3. 613[a]	0.303
Snacks intake	2. 799[a]	0.555
Food label	3. 128[a]	0.002
Why labels	1. 251[a]	0.508
Most important meal	2. 060[a]	0.432

Discussions

Most of the respondents in this study were male. This finding agrees with those of Nieto et al. (2023) and García, Suzovic and Pérez (2021), who noted that more men than women were involved in physical exercises. Female participants across all demographic categories reported less physical activity than did the male participants (Saleh, 2021). Some studies reveal that men preferred intense strength training at a higher rate than women (17.3% vs 0.9%) (Reading et al., 2022) Most of the respondents were aged 26-35 years and had undergraduate degrees. Indeed, individuals with higher levels of education tend to have better nutrition knowledge and dietary habits than those with lower levels of education (Scalvedi et al., 2021). It was found that most of the respondents were salaried employees and their gym location was urban. This finding corroborates that of Qiu et al. (2021), who noted that people with higher incomes and social status generally possess better nutrition knowledge and dietary practice compared to those with lower incomes and social status.

Fifty-six percent of the respondents indicated that a balanced diet is related to food with appropriate and adequate amounts of each nutrient. A study of gym goers by Jain and Sarla in (2022) found that lack of knowledge regarding diet and dietary supplements led to men taking dietary supplements iron, calcium and energy above the standard recommended intakes. Two thirds of the study respondents indicated that they read the label when choosing a diet. Reasons for reading the label ranged from: to determine the nutritional content and ingredients, to identify the country of origin, to find cooking instructions and to know the price. About have of the respondents stated that they read the label to determine the nutritional content and ingredients. This finding agrees with that of Giró et al. (2022), who found that consumers read labels to ascertain the nutritional elements in foods. Indeed, nutrient warning labels show if a food item is high in calories or key nutrients (Caballero et al., 2023). These labels can boost the buying of nutritious food, reduce the buying of unhealthy food, and decrease the total energy content purchased. According to Caballero et al. (2023), the effectiveness of nutritional labels in encouraging healthy food choices is higher in a setting where healthy eating is encouraged, while they are not as effective in normal or unrestricted eating environments. Well 52% of the respondents indicated their most important meal of the day to be breakfast. This finding corroborates that of Smith (2024), who indicates that Breakfast is a crucial meal for maintaining overall health and well-being. It contains essential nutrients. Consuming a nutritious breakfast helps boost energy levels and kick-starts metabolism, setting a positive tone for the rest of the day.

It was indicated that less than half of the respondents had 3 meals a day. Majority of the respondents had no dietary restriction or preferences. Nazni and Vimala (2010) note that adequate nutritional diet is essential not only for proper growth and performance but also as part of any physical fitness regimen. Inadequate food intake can impair growth, impede muscular development, interrupt puberty, and reduce overall athletic performance (Ali et al., 2015).

Most respondents were healthy, with only a few being classified as obese. Just under three-quarters of the participants were at low health risk, while a small number were at high risk. There was no statistically significant relationship between sex, age, or education and the nutritional status of adult gym-goers in Mogadishu. However, there was a significant association between participants' occupations and their nutritional status. Dietary diversity did not show a significant association with nutritional status, except for beverage consumption, which was significantly linked to nutritional status. Additionally, there was no significant relationship between nutrition knowledge and nutritional status, except for checking food labels, which had a significant association with participants' nutritional status. In a comparable Kenyan study by Wachira, (2011), more than three-quarters of gym users had either normal BMI or were overweight, and over half of the male participants had body fat percentages within the healthy range.

Conclusion

Most gym-goers in Mogadishu held a bachelor’s degree, and the majority were male. The study found that adults joined gyms primarily to improve their fitness and overall health. Gym users demonstrated adequate nutrition knowledge. Most correctly defined a balanced diet as one with appropriate nutrients, recognized carbohydrates as the main energy source, and proteins as essential for body building and tissue repair. Fruits and vegetables were commonly identified as key vitamin sources. A majority recommended drinking 8–10 glasses of water daily and considered fruits like apples or bananas as healthy snacks. Food labels were read mainly for nutritional content, ingredients, origin, instructions, and price.

Most adults ate three meals per day and had no dietary restrictions. Few used dietary supplements. Their diets included cereals, vegetables, fruits, animal products, and beverages. While most gym users were healthy, some were obese. A majority had low health risk, with fewer at high risk. There was no significant association between sex, age, or education and nutritional status. However, occupation significantly influenced nutritional status. Dietary diversity generally showed no significant link to nutritional status, except for beverage consumption. Nutrition knowledge was not significantly associated with nutritional status.

Recommendations

Gyms should develop targeted health programs tailored to the demographic profiles of their users, with a particular focus on newcomers. These programs should address specific fitness goals and overall health improvement through beginner-friendly routines, educational materials on proper exercise techniques, and personalized support to build confidence and consistency.

Enhancing nutritional education is equally important. Programs should highlight the significance of a balanced diet and clearly explain the roles of carbohydrates, proteins, fruits, and vegetables in achieving fitness outcomes. They should also provide guidance on daily water intake and encourage healthy snacking, such as incorporating fruits, to promote better dietary habits. Given that most respondents do not use dietary supplements, gyms and nutritionists should offer information on their potential benefits. This includes when and why supplements may be necessary, especially for individuals with specific fitness or health goals. Educating users on how supplements can support diet and training can enhance health outcomes and performance.

Since beverage consumption showed a significant association with nutritional status, nutritionists should educate gym users on selecting beverages that support hydration and nutrition. Clear guidance should be provided on the benefits of options like water, herbal teas, and fortified drinks, as opposed to those high in sugar or caffeine. Understanding the impact of beverage choices can help individuals make informed decisions that align with their health and fitness goals. Finally, gym instructors should design individualized fitness plans that take into account users' occupational lifestyles. Customizing programs to fit diverse work routines ensures exercise and nutrition goals are practical and sustainable. For example, desk-bound workers may benefit from efficient workouts and balanced meals to counteract sedentary behavior, while shift workers may require flexible training schedules and strategies to manage irregular eating patterns.

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