Evaluation of General and Sport Nutrition Knowledge of Nairobi County Fitness Instructors

[1]Wanjira Janet Kamenju, [2]Muhalia Janet Chumba & [3]Edna Katiwa Thangu

[1,2] University of Nairobi,

[3]Kenyatta University

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ABSTRACT

Physical training and nutrition are inseparable, given their shared effects on health, fitness, and performance outcome. This relationship makes gym trainers a de facto player in nutritional counseling despite evidence of their low proficiency on the subject. In developed countries, gym trainers are highly regulated, and their roles, particularly in dietary practice, are dictated by the scope of their training. In Kenya (a developing country), gym trainers are hardly regulated, and their nutrition knowledge is unknown and undocumented, yet anecdotal evidence shows they are practicing it. Therefore, the overall aim of the study was to evaluate the general and sports nutrition knowledge of Gym instructors in Kenya. An invitation to participate in a survey was done with gym instructors participating in fitness course at the University of Nairobi. Twenty gym instructors (10 males and 10 females) nutritional knowledge was assessed using Fuber Robert's general and sports nutrition knowledge questionnaires. The general and sports nutrition knowledge of Nairobi gym instructors was found to be inadequate 36.8% (95% CI: 7.4, 66.6), but they showed moderate knowledge in proteins (53.3%; 10.7) and fats (48.5%; 9.7). Poor sporting performance and supplementation knowledge were recorded (32.1%; 6.4). Nairobi female gym instructors demonstrated a consistently low general and sports nutrition knowledge in all the nutrition domains compared to their male counterparts, 33.6% (95% CI: 0.0, 75.1) and 39.6% (95% CI: 0.0, 82.5), respectively. Conscious efforts, including availing nutrition education resources, are needed to enhance the nutritional knowledge of Kenya gym instructors.

Keywords: Evaluation, General and Sport Nutrition, Knowledge, Nairobi, Fitness

INTRODUCTION

Fitness instructors are known to provide nutritional advice besides physical training. Supposedly most fitness trainers offer nutritional counseling to their clients, yet available evidence indicates this might be beyond their professional scope (Kiss et al., 2020). Nonetheless, physical fitness trainers encounter clients with various health needs, including gym enthusiasts, which can make it difficult to avoid conversations about nutrition. Therefore, the question arises about the qualification and competence of the trainers to advise, sell, and prescribe nutrition products (Miragaia et al., 2023). The viability of fitness instructors to extend dietary advice to clients is a compelling concern in countries such as Kenya, where there are little to no regulations on the scope of service of the professional trainers or set requirements for regular refresher courses to keep them current with regularly updated sport and general nutritional information.

Yet the fitness trainers are instrumental entourage not only for people looking to lead a healthy lifestyle but also for professional athletes who depend on their acumen for their fitness goals that impact their success. Regrettably, empirical studies show Gym trainers have insufficient general nutritional knowledge (Maxwell et al., 2017) and depict gaps in knowledge on specific nutrition, such as supplementation, the role of proteins, and sports nutrition (Trakman et al., 2016). This inconsistency in nutrition knowledge has made some studies link physical fitness trainers to persons of interest in athlete inadvertent doping because of providing misleading advice about sports nutrition, such as supplements (Savino et al., 2019). The nutrition

knowledge of gym trainers is hardly evaluated, particularly in Kenya, yet they frequently encounter people seeking nutritional advice, pushing them to extend their services beyond their grasp. A critical look at gym trainers' efficacy in general and sports nutrition knowledge is required to present valid and reliable evidence upon which appropriate interpretation, measures, and recommendations to address the situation can be suggested.

The general and sports nutrition knowledge varies considerably by trainers' specialization (Weissman et al., 2013), experience, and gender (Trakman et al., 2016). For example trainers specializing in athletic training and strength and conditioning specialists may demonstrate a high sports nutritional knowledge because of their frequent involvement with athletes (Torres et al., 2012). Researchers recommend an integrative approach that involves an ideal nutrition program to enhance the nutritional understanding of gym trainers. Although there is a consensus that specialized trainers are likely to have higher sports nutrition knowledge than general fitness trainers, the literature reveals that general fitness trainers are more frequently consulted on dietary regimens (Maxwell et al., 2017). These assertions underscore the importance of gym trainers' nutritional knowledge in providing accurate, safe, and reliable dietary advice to their clients, but first, we need to understand their knowledge level on the subject in order to present substantiated insight, which is the core purpose of this study.

METHODS

Study Site and Population

An invitation to attend a gym instructor's fitness short course at the University of Nairobi was sent via emails and social media to the gymnasium in Nairobi county and its environs. The targets were the active gym instructors or owners within or around Nairobi. Twenty (10 males and 10 females) gym fitness instructors responded to the invitation.

Research Instruments

The study adapted Furber et al., (2017) structured questionnaire with 62 items to examined gym instructors' general and nutrition knowledge from various dimensions: carbohydrate, protein, fat, vitamins and minerals, general nutrition, fluid, sports performance, and supplementation.

The appropriateness and relevance of all the items in the questionnaire were evaluated by previous researchers (Furber et al., 2017), and their relevance was also verified for this study. Furthermore, the original questionnaire was evaluated for all psychometric measures of the instrument, and it proved reliable and valid for measuring participants' general and sports nutrition knowledge. The questionnaire had an acceptable overall internal reliability of ($\alpha > 0.7$) with each subsection range of ($\alpha = 0.78$-0.92) and a construct validity of a t-test ($p < 0.05$).

Sample and Data Collection

All the 20 gym instructors who attended the fitness training were issued with the questionnaire after voluntarily signed an informed consent form an informed consent form. The sample comprised ten male and female gym instructors of different ages and education backgrounds.

The participants were issued with the questionnaire in one of the course instructions classroom which they filled and returned immediately to the researcher upon completion.

Ethical Considerations

The study adhered to all protocols for scientific research involving human subjects as outlined by the University of Nairobi and the Kenya National Commission for Science, Technology, and Innovation (NACOSTI). All respondents were informed of their rights to withdraw participation and signed informed

consent before being approved to participate.

Statistical Analysis

A descriptive analysis of frequency and percentage was performed to explore and summarize fitness instructors' general and sports nutrition knowledge. The confidence interval (95%) was calculated alongside percentage scores to estimate the general level of accuracy of the results. The frequency and percentage estimates were performed for the overall gym instructors, male versus female gym instructors, and for each of the seven domains established essential in estimating the general and sports nutrition knowledge of gym instructors, specifically, carbohydrate, protein, fat, vitamins and minerals, fluid, general nutrition, and sports performance and supplementation.

RESULTS

Characteristics of the Participants

The questionnaire was completed by 20 gym instructors, of which 50% (10) were males, and 50% (10) were females. The mean age was 20.9 ± 2.64 for males and 22.1 ± 2.42 for females. The majority of the gym instructors, 35% (7), had a sixth-form level of education and were closely followed by instructors with secondary education, 25% (5). The gym instructors with college and university education each constituted 20% (4) of the study participants.

Table1: Gym Instructors Demographic Characteristics

Category		**Frequency**	**%**
Gender	Male	10	50
	Female	10	50
Education	secondary school	5	25
	Sixth form	7	35
	College	4	20
	University	4	20
Age	Male	**Mean**	**Stds.**
		20.9	2.64
	Female	22.1	2.42

Overall General and Sport Nutrition Knowledge of Nairobi Gymnasium Instructors

Figure 1 presents the overall general and sport nutrition knowledge of Nairobi County and its environs gym instructors.

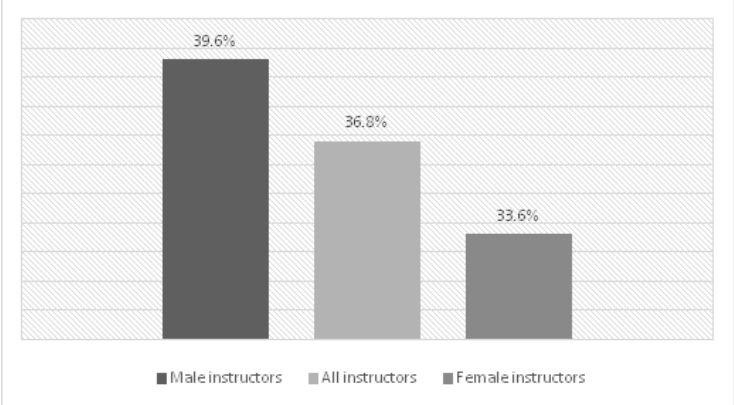

Figure 1: Overall general and sport nutrition knowledge of Nairobi gym instructors

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Figure 1 shows that Nairobi gym instructors have below average (less than 50%) general and sports nutrition knowledge of 36.8% (95% CI: 7.4, 66.6), with male instructors reporting a higher knowledge of 39.6% (95% CI: 0.0, 82.5) than female instructors 33.6% (95% CI: 0.0, 75.1).

Primarily, Nairobi gym instructors showed more knowledge of proteins (53.3%; 10.7) than any other six areas investigated in this study (Figure 2). The instructors also showed nearly average (48.5%; 9.7) knowledge about fats. However, the gym instructors exhibited a poor understanding of fluids (29.3%; 5.9) and sporting performance and supplementation (32.1%; 6.4).

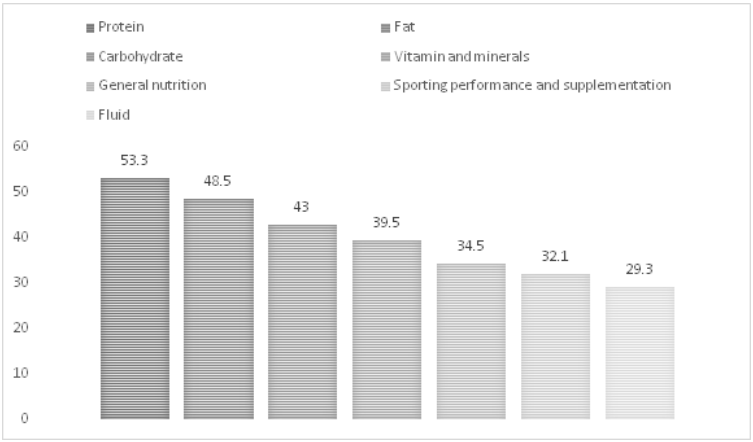

Figure 2: Nairobi County Gym Instructors General and Sport Nutrition Knowledge based on Seven Domains

Knowledge about Carbohydrate

Instructors' carbohydrate knowledge was examined from various angles, including the type of foods with high or low carbohydrates, the percentage of athlete diet that should be made up of carbohydrates, and their knowledge of glycemic index. A summary of the gym instructors' knowledge of carbohydrates is shown in Table 2.

Table 2: A Summary of Gym Instructors Knowledge about Carbohydrate

	Frequency	%	95% Lower CI	95% Upper CI
All Participants	8.6	43.0	12.6	73.4
Males	4.3	43.6	0.0	86.0
Females	3.7	37.1	0.0	78.9
Foods high or low in carbohydrate: Beef: Low	18	90	71.6	100.0
Chocolate spread: Low	6	30	1.9	58.1
Lentils: High	4	20	0.0	44.5
Percentage diet of athlete should be made up from carbohydrate: 50-65%	12	60	29.9	90.1
Is it best to eat a diet rich in High or Low glycemic index carbohydrates: Low	4	20	0.0	44.5

Note: Only the correct scores shown in the table CI: Confidence Interval

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Table 2 demonstrates gym instructors have inadequate knowledge of carbohydrates 43.0% (95% CI: 12.6, 73.4). The study also noted that male and female gym instructors had slightly different levels of carbohydrate knowledge, 43.6% (95% CI: 0.0, 86.0) and 37.1% (95% CI: 0.0, 78.9), respectively.

The study established that most gym instructors knew beef has low carbohydrates 90.0% (95% CI: 71.6, 100.0). However, only a few gym instructors knew that chocolate spread has low carbohydrates 30.0% (95% CI: 1.9, 58.1) and lentils have high carbohydrate levels of 20.0% (95% CI: 0.0, 44.5). Results (Table 2) reveal that over half of the gym instructors, 60.0% (95% CI: 29.9, 90.1), were aware that athlete diets should comprise 50-65% carbohydrates. Furthermore, only a few gym instructors 20.0% (95% CI: 0.0, 44.5) were aware that it is best to eat a diet low in glycemic index carbohydrates.

Knowledge about Protein

The gym instructors' knowledge of protein was measured using several indicators, such as when the body uses protein as a source of energy, foods high in protein, the primary use of protein in the body, the number of proteins present in various food items, and how much protein an average male athlete should consume per day. Summary results are shown in Table 3.

Table 3: A Summary of Gym Instructors Knowledge about Protein

	Frequency	%	95% Lower CI	95% Upper CI
All Participants	10.7	53.3	22.9	84.1
Males	5.4	53.9	10.8	97.2
Females	5.3	52.8	9.7	96.3
When lifting heavy weights, the body uses protein asits main energy source: Disagree	10	50	19.3	80.7
Chicken is a very good protein to help during highintensity exercise. Agree	6	30	1.9	58.1
Are the following foods High or Low in protein?Spinach: High	3	15	0	36.9
How much protein is there in the following fooditems? 1 pint of skimmed milk: 12 grams	3	15	0	36.9
250 g of tuna: 50 grams	1	5	0	18.4
1 slice of white bread: 2 grams	3	15	0	36.9

Note: Only the correct scores are shown in the table

From Table 3, Nairobi gym instructors have slightly above average protein-related knowledge 53.3% (95% CI: 22.9, 84.1). In addition, male and female gym instructors have a slightly varying level of protein knowledge, 53.9% (95% CI: 10.8, 97.2) and 52.8% (95% CI: 9.7, 96.3), respectively.

Specifically, half of the gym instructors 50.0% (95% CI: 19.3, 80.7) correctly disagreed with the statement that when lifting heavy weights, the body uses protein as its main energy source. However, only 30.0% (95% CI: 1.9, 58.1) of gym instructors knew chicken is a good source of protein to help high-intensity

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exercises. The study also established that less than a third of gym instructors 15.0% (95% CI: 0.0, 36.9) identified spinach as high in protein. Gym instructors also showed limited knowledge in identifying the specific amount of protein in various food items. For example, 1 pint of skimmed milk 12 grams, 15.0% (95% CI: 0.0, 36.9), 250 g of tuna 50 grams, 5.0% (95% CI: 0.0, 18.4), and 1 slice of white bread 2 grams, 15.0% (95% CI: 0.0, 36.9).

Knowledge about Fats

When responding to various statements evaluating their level of knowledge on fats, the study established that the gym instructors need more knowledge on the same, 48.5% (95% CI: 17.8, 79.2). Table 4 further reveals that male gym instructors maintained a relatively high knowledge about fats compared to their female counterparts, 51.7% (95% CI: 8.6, 95.4) and 44.8% (95% CI: 1.8, 88.2), respectively.

Table 4: A Summary of Gym Instructors Knowledge about Fats

	Frequency	%	95% Lower CI	95% Upper CI
All Participants	9.7	48.5	17.8	79.2
Males	5.2	51.7	8.6	95.4
Females	4.5	44.8	1.8	88.2
For improvements in health, what type of fat do experts recommend should be reduced in the diet? Saturated fat	9	45	14.5	75.5
Mackerel: poly-unsaturated	6	30	1.9	58.1
Packet of crisps: poly-unsaturated	6	30	1.9	58.1
Which lipoproteins increase cholesterol? HDL or LDL: LDL's	5	25	0	51.6
Foods high in cholesterol: Eggs: False	4	20	0	44.5
Whole milk: True	5	25	0	51.6

Note: Only the correct scores shown in the table

Less than half, 45.0% (95% CI: 14.5, 75.5) of the gym instructors were correct that for health improvement, experts recommend reduced use of saturated fat in diets (Table 4). It was also established that only a few gym instructors recognized mackerel 30.0% (95% CI: 1.9, 58.1) and a packet of crisps 30.0% (95% CI: 1.9, 58.1) as high in poly-unsaturated fat, Table 7a. Furthermore, only a third, 25.0% (95% CI: 0.0, 51.6) of the Nairobi gym instructors knew LDL increases cholesterol. Table 4 further indicates gym instructors knowledge about foods that are high in cholesterol, for example, eggs, correct response FALSE 20.0% (95% CI: 0.0, 44.5) and whole milk TRUE, 25.0% (95% CI: 0.0, 51.6).

Knowledge about Vitamin and Minerals

The results (Table 5) imply that gym instructors need to improve knowledge about vitamins and minerals 39.5% (95% CI: 9.5, 69.5). Male gym instructors had more knowledge about vitamins and minerals, 41.6% (95% CI: 0.0, 84.8), than their female counterparts, 36.8% (95% CI: 0.0, 78.9).

A small number of gym instructors, 20.0% (95% CI: 0.0, 44.5), were aware that 500 ml of orange juice has

the same number of calories as 500 ml of orange squash. Equally, a few gym instructors 20.0% (95% CI: 0.0, 44.5) knew antioxidants help prevent cell damage. Results (Table 5) assert a considerably limited understanding of foods naturally rich in antioxidants among gym instructors. For example, the correct response for red meat is True 5.0% (95% CI: 0.0, 18.4) and Daily- True 20.0% (95% CI: 0.0, 44.5). The gym instructors also demonstrated inadequate knowledge about foods rich in Vitamin C, red pepper 20.0% (95% CI: 0.0, 44.5), and whitebait 30.0% (95% CI: 1.9, 58.1).

Table 5: A Summary of Gym Instructors Knowledge about Vitamin and Minerals

	Frequency	%	95% Lower CI	95% Upper CI
All Participants	7.9	39.5	9.5	69.5
Males	4.2	41.6	0	84.8
Females	3.7	36.8	0	78.9
500 ml of orange juice has the same number of calories as 500ml of orange squash: Agree	4	20	0	44.5
Role of antioxidants in the body: help prevent against cell damage	4	20	0	44.5
Food naturally rich in antioxidant: Read meat: True	1	5	0	18.4
Dairy: True	4	20	0	44.5
Food rich in vitamin C: Red pepper	4	20	0	44.5
Whitebait	6	30	1.9	58.1

Note: Only the correct scores shown in the table

Knowledge about General Nutrition

Table 6 proves a considerably low knowledge about general nutrition among gym instructors, 34.5% (95% CI: 5.3, 63.7). Also, male gym instructors have a high knowledge of general nutrition 37.3% (95% CI: 0.0, 78.9) compared to females 31.8% (95% CI: 0.0, 72.5).

A good number of gym instructors 70.0% (95% CI: 41.9, 98.1) knew that cutting out 10 grams of carbohydrates from the diet would lead to more significant weight loss than cutting out 10 grams of fat. However, only 25.0% (95% CI: 0.0, 51.6) of the gym instructors knew vegetables were classified as carbohydrates. Table 6 also reveals that a few gym instructors 15.0% (95% CI: 0.0, 36.9) were familiar with the fact that fat is the body's predominant energy source during resting conditions. Similarly, gym instructors had poor knowledge about the number of calories in 1 gram of various micronutrients. For example, carbohydrate, correct response 4 kcal, 15.0% (95% CI: 0.0, 36.9), protein 4 kcal 5.0% (95% CI: 0.0, 18.4), and alcohol 7 kcal 20.0% (95% CI: 0.0, 44.5).

Table 6: A Summary of Gym Instructors Knowledge about General Nutrition

	Frequency	%	95% Lower CI	95% Upper CI
All Participants	6.9	34.5	5.3	63.7
Males	3.7	37.3	0	78.9
Females	3.2	31.8	0	72.5

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Cutting out 10 grams of carbohydrate from your diet will result in greater weight loss than cutting out 10 grams of fat. True	14	70	41.9	98.1
What food category are vegetables classified in? Carbohydrates	5	25	0	51.6
During resting conditions, which is the predominant energy source the body uses? Fat	3	15	0	36.9
How many calories are there in 1 gram of carbohydrate: 4 kcal	3	15	0	36.9
Protein: 4 kcal	1	5	0	18.4
Fat: 9 kcal	0	0	0	0
Alcohol: 7 kcal	4	20	0	44.5

Knowledge about Fluid

Gym instructors demonstrate a substantially low knowledge about fluid, 29.3% (95% CI: 11.7, 72.3) (Table 7). Female instructors displayed much lower knowledge in fluid 20.0% (95% CI: 0.0, 54.7) than male instructors 38.6% (95% CI: 0.0, 81.3).

The study established inadequate knowledge about fluid among the gym instructors throughout the various statements used to examine this facet. For instance, only 10.0% (95% CI: 0.0, 28.4) of instructors knew that one should drink 3-3.99 liters of fluid on average daily. Results (Table 7) reveal that 35.0% (95% CI: 5.7, 64.3) of gym instructors knew the current guidelines recommend consuming 400-800 ml fluid for exercises exceeding one hour. Likewise, 10.0% (95% CI: 0.0, 28.4) of instructors correctly answered that 2% is the percentage of body dehydration one would start seeing a decrease in exercise performance. Table 7 displays a scarcity of knowledge about fluids among the gym instructors, such as the type of drink best to consume in exercise lasting 45-90 minutes, correct response hypertonic, 20.0% (95% CI: 0.0, 44.5), number of carbohydrates in isotonic drinks (4-8%) 30.0% (95% CI: 1.9, 58.1), and identifying isotonic drinks, Red Bull (True) 20.0% (95% CI: 0.0, 44.5).

Table 7: A Summary of Gym Instructors Knowledge about Fluid

	Frequency	%	95% Lower CI	95% Upper CI
All Participants	5.9	29.3	11.7	72.3
Males	3.9	38.6	0	81.3
Females	2	20	0	54.7
How much fluid should you drink on average per day? 3-3.99 liters	2	10	0	28.4
During exercise greater than one hour, what are the current guidelines for fluid consumption? 400-800 ml	7	35	5.7	64.3
At what percentage of body dehydration would you start to see a decrease in exercise performance? 2%	2	10	0	28.4
Type of drink to consume in an event lasting 45-90 minutes: Hypertonic	4	20	0	44.5
Carbohydrate is there in an isotonic sports drink: 4-8%	6	30	1.9	58.1
The following drink is isotonic Red bull: True	4	20	0	44.5

Note: Only the correct scores shown in the table

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Knowledge about Sporting Performance and Supplementation

This study revealed inadequate knowledge about sporting performance and supplementation among the gym instructors 32.1% (95% CI: 3.4, 33.9). Table 8 also shows that male instructors have a higher sporting performance and supplementation knowledge than females, 34.4% (95% CI: 0.0, 75.1) and 28.1% (95% CI: , 67.0), respectively.

Table 8 demonstrates that only 35.0% (95% CI: 5.7, 64.3) knew it was FALSE that a high protein meal 1 hour before competing in a power event is recommended to enhance performance. However, over half of the instructors, 60.0% (95% CI: 29.9, 90.1), understood that a high carbohydrate meal 2 – 4 hours pre-exercise could improve endurance performance. Results also indicate poor knowledge about drinks containing the highest amount of carbohydrates among the gym instructors, 500 ml orange squash 10.0% (95% CI: 0.0, 28.4).

Gym instructors also did not understand the recommended amount of protein athletes in different sports should consume. For example, power athletes, correct response 1.0-1.4g.kg BM, 5.0% (95% CI: 0.0, 18.4). Table 8 suggests gym instructors' poor knowledge of sporting performance and supplementation on various aspects, such as the percentage of body fat elite athletes would have from different sports like sprinting- correct response 11-14%, 5.0% (95% CI: 0.0, 18.4). Likewise, over a third, 30.0% (95% CI: 1.9, 58.1) of the gym instructors knew that it is best to eat high glycemic index carbohydrates immediately after exercise to support muscle glycogen recovery.

Table 8: A Summary of Gym Instructors Knowledge about Sporting Performance and Supplementation

	Frequency	%	95% Lower CI	95% Upper CI
All Participants	6.4	32.1	3.4	60.6
Males	3.4	34.4	0	75.1
Females	2.8	28.1	0	67
A high protein meal 1 hour before competing in a power event is recommended to enhance performance. False	7	35	5.7	64.3
A high carbohydrate meal 2 – 4 hours pre-exercise can lead to improvements in endurance performance: True	12	60	29.9	90.1
Drinks containing the highest amount of carbohydrate? 500 ml orange squash	2	10	0	28.4
For a power athlete trying to increase muscle mass how much protein should they be eating per day (g/kg BM= grams per kilogram of body mass) 1.0-1.4g.kg BM	1	5	0	18.4
Percentage body fat would a world-class sprinter have: 11-14%	1	5	0	18.4
Immediately post exercise is it best to consume high or low glycemic index carbohydrates to support muscle glycogen recovery? High GI	6	30	1.9	58.1

Note: Only the correct scores shown in the table

DISCUSSION

Nutrition competency is a crucial complement for any professional in the health and sports industry. Gym instructors particularly encounter physically active clients, including professional athletes seeking dietary counseling to optimize their health or performance, hence their need to be adept at the subject (Battalwar & Sahijwani, 2016). The present study's findings reveal that Nairobi County gym instructors are inadequately prepared on matters concerning overall general and sports nutrition. The results are consistent with previous studies that found physical trainers' inadequate understanding of nutrition (Apriantono et al., 2021; Kiss et al., 2020; Maxwell et al., 2017). The low general and sports nutrition among Nairobi gym instructors can be attributed to a lack of involvement or interest in nutritional programs, the absence of nutritional units in most fitness education programs, and the unregulated sector where anyone can become a gym instructor because credentials are hardly evaluated. To ensure valid and safe dissemination of nutrition advice, gym trainers who fail to satisfy certain minimum standards are prohibited from providing nutritional advice to clients in most countries, especially in the West (Weissman et al., 2013). No local evidence is available to show stipulated guidelines that dictate the minimum threshold for gym trainers in Kenya.

On the seven domains of nutrition assessed in this study, Nairobi gym instructors showed a varied levels of knowledge from one domain to another, but good knowledge was recorded in the domain of proteins and fats, and considerably low knowledge in fluids and sporting performance and supplementation was evident (Figure 2). The inconsistency in specific nutrition knowledge among Nairobi Gym instructors was congruent with Trakman et al. (2016) study, which identified that physical trainers have gaps in knowledge on supplements, protein, and specific sports nutrition. The notable knowledge of proteins and fats is from their experience in strength and conditioning, where these macronutrients are highly utilized in the fitness sector, which also explains the poor knowledge of sporting performance and supplementation.

Throughout the study, Nairobi female gym instructors displayed a low nutrition knowledge in all the domains compared to their male gym instructor peers. This was contrary to Battalwar and Sahijwani (2016) findings that male trainers scored lower than female trainers on nutrition knowledge though the difference was insignificant. The difference in findings may be due to variation between the two study research methods (unstructured self-reported questionnaire compared to a structured questionnaire- used in present study) and the difference in the sample size of 76 males and 34 females compared to 10 males and 10 females in the present study. Nonetheless, male gym trainers have been established to show more interest in nutrition information, especially supplements from nutritional professionals (Battalwar & Sahijwani, 2016), which support the present findings; Nairobi male gym instructors have relatively higher general and sports nutrition knowledge.

The findings on the specific areas of the seven nutrition domains evaluated in the study only prove the urgency of nutrition knowledge needs for Nairobi gym instructors. For example, on fluids, only 10% of gym instructors knew how much fluid they should drink daily (Table 7). Likewise, on sporting performance and supplementation, only one gym instructor was aware of how much protein a power athlete trying to increase muscle mass should consume daily (Table 8). Although only a few studies have assessed the phenomenon, and conspicuously none from Kenya, these findings suggest gym trainers are unprepared to provide nutritional advice. Nutrition and training are closely linked, and dietary counseling is becoming a significant part of gym trainers' practice (Kiss et al.,2020), but evidence-based nutrition is fundamental for the safety of the clients. Providing nutrition education platforms, encouraging collaboration with nutrition professionals, and fostering up-to-date nutritional resources are some of the few ways the low general and sports nutrition knowledge can be turned around.

LIMITATIONS

The study's small sample size influenced the ability to perform rigorous analytical analysis and decreased the generalization ability of the findings because of the high margin of error. However, the study intends to

prompt curiosity for interested researchers to conduct a robust evaluation into general and sports nutrition knowledge of gym fitness instructors in Kenya. Despite limited studies on the subject and especially in Kenya, restricted wide-ranging comparison of literature and increased overreliance on foreign insight, however, the study, maintained focus to the study objective throughout.

CONCLUSIONS

Nairobi gym fitness instructors presented below-average general and sports nutrition knowledge, with females demonstrating relatively low knowledge in all nutrition domains (carbohydrate, protein, fat, vitamins and minerals, fluids, general nutrition, sporting performance, and supplement). The instructors showed a relatively good knowledge of proteins and fats, which was linked to the idea that most gym instructors use these macronutrients. Urgent interventions to educate gym instructors are necessary to address the poor nutrition knowledge among Nairobi fitness instructors. Future research should use different approaches, such as sending emails to gym instructors to access enough study participants which meet the threshold for comprehensive analysis and support the generalization of the findings.

The researchers declare no conflict of interest

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