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Original article

Nutritional knowledge among coaches and personal trainers in Kuwait: a cross sectional study

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Summary. Personal Trainers (PT's) or Coaches are becoming the new trend in Kuwait and taking the role of dietitians and nutritionists in terms of providing nutritional advice. No research has been done in the past to gauge the knowledge of coaches and trainers in Kuwait. The aim of this cross-sectional study was to examine the nutrition knowledge among coaches and PT's for both genders within all groups. Data were collected from independent personal trainers and coaches across different gyms from different areas in Kuwait. The 100 participants consisted of males (n=50) and females (n=50) engaged in different types of sports. Participants answered questions testing their nutritional knowledge and scientific background. Adequate nutrition knowledge was defined as an overall score of 75% in all domains (highest achievable score was 100%). Participants averaged 56% in all domains. Male participants averaged 55% and female participants averaged 56.8%. Overall, we demonstrated that personal trainers and coaches have inadequate nutrition knowledge. When comparing genders, female participants had slightly more nutrition knowledge than male participants. Therefore, proper nutrition education is integral for both male and female personal trainers. Proper nutrition courses and workshops should be provided for coaches and personal trainers in order to improve their nutrition knowledge, as it is important to help them provide adequate nutrition advice for their clients. Moreover, follow-up exams or certifications are recommended every two years to ensure that personal trainers and coaches' nutrition knowledge are maintained and up to date.

Keywords: Nutritional Knowledge, Coaches, Personal Trainers, Kuwait

Introduction

Personal trainers and coaches are authorized to give physical activity advice on the grounds that they are experts in exercise in the public's eye. However, there is an expanding demand set on personal trainers from clients to provide nutritional advice and clients expect that PT's have sufficient nutritional background. Personal trainers and coaches are not only becoming the new trend in Kuwait, but also taking the role of dietitians and nutritionists in terms of providing nutritional advice that is sometimes misleading or inaccurate. Most athletes trust their PT's when it comes to giving nutritional advice, as they believe that they are experts in nutrition without checking into their credentials. This could be a serious problem especially with the increasing number of Kuwaitis participating in different sports leisurely. In 2015, Kuwait Nutrition Surveillance System estimated that the proportion of Kuwaiti adults (>19 years old) who practice any sport is 67.34% (1).

Inaccurate or misinterpreted information provided by PT's may lead to many adverse physical and mental problems including eating disorders. Clients who are participating in weight-restricted sports have a higher probability of being most negatively affected by following the advice of PT's who have insufficient nutrition knowledge. Examples of common weight

restricted sports are: body building, wrestling, Cross-Fit and gymnastics. Since athletes have limited access to nutrition resources, their coaches may be the only source that provides them with information essential to maximize both performance and health, in order to prevent the risks of having musculoskeletal injuries, psychological problems, medical complications and suboptimal energy availability (2-6). No research exists about nutrition knowledge for coaches and PT's in Kuwait. The aim of the study was to examine the nutrition knowledge among coaches and PT's for both genders within different sports.

Methods

A cross sectional study was conducted among coaches and PT's in different gyms around Kuwait. Data were collected through convenient sampling method Through an Excel sheet that includes all the gyms in Kuwait, their locations, contact numbers and approval of distributing the questionnaires in their gyms. Phone calls were made to discuss the content of the study and get the gym managers' approval. Following the approval, random visits to various gyms at different working hours were done until the number of the sample size was reached. Visits to all the gyms in our list were made, including those who did not respond. Moreover, a post containing a brief description of the study and contact numbers was published in social media applications to ask for freelancing personal trainers' participation in the study. Afterwards, a meeting was arranged to meet with each independent personal trainer separately to fill the survey. A verbal consent was obtained from all participants and they were given the opportunity to accept or reject to participate in the study. Twenty-seven gyms were contacted and only 19 allowed us to distribute the questionnaire. Eighteen independent personal trainers/ coaches were contacted and only 14 of them accepted to take the questionnaire.

Difficulties were encountered in estimating the sample size because there was neither previous similar study done in Kuwait to help estimate the prevalence, nor a preliminary pilot study was conducted due to the short duration of this study, as it was restricted to two months only. However, the sample size was calculated using a significance level of $\alpha = 0.05$, a statistical power at 80%, and on the basis of a 2% difference in total percentage score of nutrition knowledge between male and female coaches and personal trainers. An estimated standard deviation of the total percentage score of nutrition knowledge was 2.74%. The effect size was calculated using Cohen's effect size measure (d) for comparing differences in two independent groups. To detect this difference with a power of 80% at the 5% significance level (two-sided), each of the two groups (males and females) required thirty-one subjects. The sample size was increased to 100 participants (50 males and 50 females).

Instruments

The survey consisted of demographic and general nutrition knowledge questions. Two surveys were approved, one in English and the other in Arabic to ease communication with participants who speak only English or only Arabic. Demographic questions included gender, age, height, level of education, main sport, formal nutritional education, and occupation. At this section participants were also asked to choose their top choices of nutrition information sources, and who do they feel most comfortable discussing their nutritional needs with.

The nutrition knowledge questionnaire included 16 validated questions taken and modified from a previous study (4). The questionnaire was divided into three different sections; the first section included demographic questions. The second section of the questionnaire consisted of 16 general nutrition questions about fat, protein, carbohydrates, vitamins, minerals, and dietary recommendations. The third and last section in the questionnaire is where nutritional knowledge of personal trainers and coaches was evaluated. Participants who scored 75% or more (which is 12 out of 16 or more) in the nutrition related questions appeared to have adequate nutrition knowledge. Participants who scored less than 75% have inadequate nutrition knowledge. For PT's/ coaches to provide reliable nutrition information, they must have sufficient knowledge in the different domains.

Data Analysis

After assessing the consequences of type I and type II errors, the largest that is tolerable was and it is used to calculate the sample size and the power. The level of 0.05 was also used for all analysis. An independent sample *t*-test analysis was used to examine percentages of correct answers to the nutrition knowledge questions, overall, according to gender and certification among personal trainers and coaches. To determine adequate nutrition knowledge a criterion score of 75% was established. The basic descriptive statistics was computed for all data, individual test scores, confidence levels for correct and incorrect responses and percentages of correct answers for each gender based on self-rated nutrition knowledge. One-way analysis of variance (ANOVA) was used to determine whether there is a statistical difference between percentages of correct answers to the nutrition knowledge questions and nutrition information sources. SPSS (version XXI) statistical software was used for data analysis.

Results

The study recruited a convenience sample of 100 participants including female personal trainers (n = 50) and male personal trainers (n = 50). As shown in Table 1, from the 100 respondents, nine were students, six were in the medical field, fourteen worked in an office, eight were in the educational field, eight were in the industrial fields and fifty-five worked in other fields.

The percentages of correct responses to the sixteen questions from the questionnaire are presented for the overall sample and according to gender in Table 2. The average score for correctly answered questions in the overall sample was 56 %, with males and females averaging 55 % and 56.8 % respectively (P=0.642). There was no significant difference between genders on most of the questions (P=0.642) except for questions 5 (P=0.043) and 6 (P=0.012). Differences in nutrition knowledge scores by certification (certified; non-certified) are shown in Table 3. There was no significant difference between certified and non-certified personal trainers except in question sixteen (P = 0.005). Differences in nutritional knowledge scores by sources of nutritional information are shown in Table 4. There was no significant difference between the chosen sources of nutritional information by personal trainers (P=0.719). Table 5 shows that 12%, 82%, 6% of male personal trainers rated their nutritional knowledge as poor, moderate and Excellent with average scores of 42.70%, 56.25% and 62.50% respectively. On the other hand, 10%, 72%, 18% of female personal trainers rated their nutritional knowledge as poor, moderate and Excellent with average scores of 36.25%, 57.11% and 67.36% respectively.

Discussion

The average score of correctly answered questions in the study (56%) was lower than that observed in a survey of an evaluation of general nutrition knowledge of registered exercises professionals in Australia (78.4%) (7) and slightly lower than in a survey of nutrition knowledge of physicians in Kuwait (60%) (4).

Results of the present study in Table 2 indicate that coaches/personal trainers showed poor knowledge in all 16 questions. Male participants showed poor knowledge in all questions while female participants showed poor knowledge in all questions except question number 6. When compared to a survey of nutrition knowledge of physicians, male physicians showed adequate knowledge in 5 questions and female physicians showed adequate knowledge in 5 questions and poor knowledge in question number 6.

Table 3 showed results of percentages of correct answers to the nutrition knowledge questions, according to certification. Results indicated that both certified and non-certified coaches/personal trainers have inadequate nutrition knowledge in all questions and there is no significant difference between certified and non-certified coached/personal trainers except for question number 16. The reason could be that some may claim they're certified when they're not in fear of affecting the gym or their own reputation. It can also be caused by lack of set rules or requirements regarding nutrition knowledge for hiring personal trainers/coaches in Kuwait.

As shown in Table 5, the average score for both males and females who rated themselves as hav-

Table 1 Demographic questions

Characteristics		Frequency	Percentage % (N = 100)
Gender	Male	50	100
	Female	50	100
	Total	100	100
Age	17 – 25	25	25
	26 – 35	59	59
	36 - 45	14	14
	46 – 55	2	2
	56-65	0	0
	Total	100	100
Highest level of education	Primary school	2	2
	High school	8	8
	Vocational education or another diploma	19	19
	Bachelor or undergrad degree	56	56
	Master or Doctorate	15	15
	Total	100	100
Certified personal trainer/coach	Yes	72	72
	No	28	28
	Total	100	100
Main sport played	Basket Ball	7	7
	Cricket	1	1
	Cycling	3	3
	Distance running	8	8
	Net ball	1	1
	Soccer/ Foot ball	3	3
	Swimming	6	6
	Rowing	3	3
	CrossFit	27	27
	Other	41	41
	Total	100	100
Formal nutritional certificates	Yes	33	33
	No	67	67
	Total	100	100
Occupation	Student	9	9
	Medical field	6	6
	Office work	14	14
	Education	8	8
	Industrial field	8	8
	Other	55	55
	Total	100	100
Top choices of nutritional knowledge	Social media	28	28
	Doctor	16	16
	Dietitians	22	22
	Journals/ books	34	34
	Total	100	100
Comfortable discussing nutritional needs with	Dietitian	49	49
	Doctor	12	12
	Other coaches/ trainers	32	32
	Friends	4	4
	Family member	3	3
	Total	100	100

Table 2 Percentages of correct answers to the nutrition knowledge questions, overall and according to gender, among personal trainers and coaches (fifty males; fifty females) working in Kuwait.

	% of correct answers				
Question	Overall	Male PT/coaches	Female PT/Coaches	*P* Value*	SED (%)
1. Dietary fiber helpful in lowering blood cholesterol level	71	68	74	0.533	9.5
2. Excess of which nutrient may increase body calcium loss	44	38	50	0.231	9.9
3. Which of the following is not a nutrient.	46	54	38	0.111	9.9
4. Adequate intake level of calcium for adult aged 51–70 years	67	62	72	0.292	9.4
5. Major type of fat in olive oil	58	48	68	0.043	9.7
6. Hydrogenated fats contain	64	52	76	0.012	9.3
7. Nutrient protective against hypertension	62	68	56	0.220	9.7
8. Vitamin likely to be toxic if consumed in excess amount	42	38	46	0.423	9.9
9. Most concentrated source of vitamin B12	68	70	66	0.672	9.4
10. Substance raising blood HDL-cholesterol level	30	28	32	0.666	9.2
11. In general, dietary recommendations are intended to	62	60	64	0.684	9.7
12. Foods having preventive effect on various types of cancer	71	72	70	0.828	9.1
13. Number of kilocalories in one gram of fat	66	70	62	0.404	9.5
14. Nutrient is not an antioxidant	49	48	50	0.843	10
15. Nutrient for prolonged exercise	40	48	32	0.105	9.7
16. 'Diet' plans are usually successful at achieving weight loss because they	55	56	54	0.843	10
Mean Score for correctly answered questions	56	55	56.8	0.642	4

*Based on independent samples *t*-test with df= 98.

Table 3 Percentages of correct answers to the nutrition knowledge questions, according to certification, among coaches and personal trainers in Kuwait (fifty males; fifty females) working in Kuwait.

% correct answers				
Question	Certified PT/coaches	Non-certified PT/coaches	*P* value*	SED (%)
1. Dietary fiber helpful in lowering blood cholesterol level	72	67	0.684	10
2. Excess of which nutrient may increase body calcium loss	40	53	0.233	11
3. Which of the following is not a nutrient.	45	46	0.958	11
4. Adequate intake level of calcium for adult aged 51–70 years	68	64	0.722	10
5. Major type of fat in olive oil	59	53	0.580	11
6. Hydrogenated fats contain	62	67	0.621	10
7. Nutrient protective against hypertension	59	67	0.457	10
8. Vitamin likely to be toxic if consumed in excess amount	43	39	0.735	11
9. Most concentrated source of vitamin B12	68	67	0.985	10
10. Substance raising blood HDL-cholesterol level	25	42	0.082	10
11. In general, dietary recommendations are intended to	61	64	0.772	10
12. Foods having preventive effect on various types of cancer	69	75	0.587	10
13. Number of kilocalories in one gram of fat	66	64	0.824	10
14. Nutrient is not an antioxidant	47	53	0.573	11
15. Nutrient for prolonged exercise	37	46	0.418	10
16. 'Diet' plans are usually successful at achieving weight loss because they	63	32	0.005	10
Mean Score for correctly answered questions	56	57	0.815	4

*Based on independent samples *t*-test with df= 98.

Table 4: Percentages of correct answers to the nutrition knowledge questions according to nutrition information sources among coaches and personal trainers in Kuwait (fifty males; fifty females) working in Kuwait

Question		N	Mean	SEDn (%)	P Value*
1. Dietary fiber helpful in lowering blood cholesterol level	Social medial	28	78	7.8	
	Doctor	16	56	12.8	
	Dietitian	22	77	11.2	
	Journals/Books	34	67	8.1	
	Total	100	71	4.7	0.0433
2. Excess of which nutrient may increase body calcium loss	Social medial	28	35	9.3	
	Doctor	16	56	12.8	
	Dietitian	22	54	10.8	
	Journals/Books	34	38	8.4	
	Total	100	44	4.9	0.370
3. Which of the following is not a nutrient	Social medial	28	57	9.5	
	Doctor	16	37	12.5	
	Dietitian	22	27	9.7	
	Journals/Books	34	52	8.6	
	Total	100	46	5	0.133
4. Adequate intake level of calcium for adult aged 51-70 years	Social medial	28	57	9.5	
	Doctor	16	68	11.9	
	Dietitian	22	77	9.1	
	Journals/Books	34	67	8.1	
	Total	100	67	4.7	0.521
5. Major type of fat in olive oil	Social medial	28	50	9.6	
	Doctor	16	56	12.8	
	Dietitian	22	72	9.7	
	Journals/Books	34	55	8.6	
	Total	100	58	4.9	0.437
6. Hydrogenated fats contain	Social medial	28	57	9.5	
	Doctor	16	50	12.9	
	Dietitian	22	77	9.1	
	Journals/Books	34	67	8.1	
	Total	100	64	4.8	0.290
7. Nutrient protective against hypertension	Social medial	28	67	8.9	
	Doctor	16	37	12.5	
	Dietitian	22	59	10.7	
	Journals/Books	34	70	7.9	
	Total	100	62	4.8	0.133
8. Vitamin likely to be toxic if consumed in excess amount	Social medial	28	39	9.3	
	Doctor	16	37	12.5	
	Dietitian	22	45	10.8	
	Journals/Books	34	44	8.6	
	Total	100	42	4.9	0.945
9. Most concentrated source of vitamin B12	Social medial	28	67	5.9	
	Doctor	16	62	12.5	
	Dietitian	22	63	10.4	
	Journals/Books	34	73	7.6	
	Total	100	68	4.6	0.934

Continued...

Table 4: Percentages of correct answers to the nutrition knowledge questions according to nutrition information sources among coaches and personal trainers in Kuwait (fifty males; fifty females) working in Kuwait

Question		N	Mean	SEDn (%)	P Value*
10. Substance raising blood HDL-cholesterol level	Social medial	28	42	9.5	
	Doctor	16	18	10	
	Dietitian	22	31	10.1	
	Journals/Books	34	23	7.3	
	Total	100	30	4.6	0.282
11. In general, dietary recommendations are intended to	Social medial	28	64	9.2	
	Doctor	16	56	12.8	
	Dietitian	22	72	9.7	
	Journals/Books	34	55	8.6	
	Total	100	62	4.8	0.604
12. Foods having preventive effect on various types of cancer	Social medial	28	71	8.6	
	Doctor	16	56	12.8	
	Dietitian	22	63	10.4	
	Journals/Books	34	82	6.6	
	Total	100	71	4.5	0.227
13. Number of kilocalories in one gram of fat	Social medial	28	67	8.9	
	Doctor	16	50	12.9	
	Dietitian	22	63	10.4	
	Journals/Books	34	73	6.7	
	Total	100	66	4.7	0.436
14. Nutrient is not an antioxidant	Social medial	28	32	8.9	
	Doctor	16	56	12.8	
	Dietitian	22	54	10.8	
	Journals/Books	34	55	8.6	
	Total	100	49	5.0	0.223
15. Nutrient for prolonged exercise	Social medial	28	46	9.5	
	Doctor	16	50	12.9	
	Dietitian	22	18	8.4	
	Journals/Books	34	44	8.6	
	Total	100	40	4.9	0.126
16. 'Diet' plans are usually successful at achieving weight loss because they	Social medial	28	60	9.3	
	Doctor	16	68	11.9	
	Dietitian	22	31	10.1	
	Journals/Books	34	58	8.5	
	Total	100	55	5.0	0.087
Average	Social medial	28	56	3.67	
	Doctor	16	51	5.50	
	Dietitian	22	55	4.40	
	Journals/Books	34	58	3.37	
	Total	100	55	2.00	0.719

*Based on One-way ANOVA

Table 5. Average of correct answers to the nutrition knowledge questions, according to gender and self-rated nutrition knowledge, among personal trainers and coaches (fifty males, fifty females) working in Kuwait.

		% correct answers		
Gender	Self-rated Nutrition Knowledge	Mean	Std. Deviation	N
Male	Poor	42.70	16.49	6
	Moderate	56.25	18.85	41
	Excellent	62.50	27.24	3
	Total	55.00	19.27	50
Female	Poor	36.25	22.27	5
	Moderate	57.11	19.48	36
	Excellent	67.36	19.70	9
	Total	56.87	20.94	50
Total	Poor	39.77	18.59	11
	Moderate	56.65	19.03	77
	Excellent	66.14	20.54	12
	Total	55.93	20.04	100

ing poor, moderate or excellent nutrition knowledge were less than 75% meaning they all have inadequate knowledge. However, the scores of participants who rated themselves as having excellent nutrition knowledge had higher score than those who rated themselves as having moderate nutrition knowledge, and moderate nutrition knowledge had higher score than participants who rated themselves as poor.

Question 1 was the highest correctly answered question. Around 71 participants correctly answered the first question, and this could be explained by the fact that the topic regarding soluble fibers was a trendy topic in social media in the past 6 months. In question 3, the majority of participants chose the correct answer (46 participants). However, 28 participants chose vitamins and minerals and 21 participants chose fats as "not nutrients", which may be related to the lack of information regarding the importance of vitamins and minerals in social media and health promotion campaigns and to the widely spread myths regarding adverse effects of fats. In question 8, 39 participants chose vitamin D instead of vitamin A as most likely to be toxic if consumed in an excessive amount for a long period of time. The reason could be that vitamin D is the most talked about vitamin by doctors and in social media, due to increased prevalence of vitamin D deficiency in Kuwait (4,8).

Regarding question 10, 45 participants chose animal protein as the substance that raises blood HDL-cholesterol level, and only 29 participants chose the right answer which is alcohol. This can be due to alcohol being illegal in Kuwait and prohibited in Islam, which leads to the belief that there is no benefit from alcohol and they might not be interested in learning about it. Out of the 16 questions, question 15 was the question mostly related to sports nutrition. The majority chose carbohydrates instead of fats as the nutrient that helped to sustain prolonged exercise and is a source of stored energy. There is a possibility that many participants didn't read this question till the end and did not understand it well. Also, it could be due to common knowledge of eating carbohydrates containing snacks for energy before exercise (9,10).

Conclusions

Since gym members often reach out to personal trainers and coaches for nutrition advice, nutrition knowledge among personal trainers and coaches is critical. This study showed that coaches and personal trainers don't have adequate nutrition knowledge to advise gym goers. Therefore, proper nutrition education is integral for both male and female personal trainers. Proper nutrition courses and workshops should be provided for coaches and personal trainers in order to improve their nutrition knowledge, as it is important

to help them provide adequate nutrition knowledge for their clients. Moreover, follow-up exams are recommended every two years to ensure that personal trainers and coaches' nutrition knowledge are maintained and up to date. Lastly, it is recommended that gyms hire a dietitian specialized in sports-nutrition to provide nutrition advice.

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References

1. Kuwait Nutrition Surveillance System. Ministry of Health. 2015 Annual Report.
2. Toni M. Torres-McGehee, Kelly L. Pritchett, Deborah Zippel, Dawn M. Minton, Adam Cellamare, and Mike Sibilia. Sports Nutrition Knowledge Among Collegiate Athletes, Coaches, Athletic Trainers, and Strength and Conditioning Specialists. Journal of Athletic Training: 2012. 47 2:205-211.
3. American College of Sports Medicine, American Dietetic Association, Dietitians of Canada Nutrition and athletic performance: joint position statement. *Med Sci Sports Exerc.* 2009. 41 3:709–731.
4. Allafi, A. R., Alajmi, F., & Al-Haifi, A. Survey of nutrition knowledge of physicians in Kuwait. Public Health Nutrition. 2013. 16(7):1332-6.
5. Maxwell, C., Ruth, K., & Friesen, C. Sports Nutrition Knowledge, Perceptions, Resources, and Advice Given by Certified CrossFit Trainers. *Sports*, 2017 *5*(2), 21.
6. Weissman J, Magnus M, Niyonsenga T, Sattlethight AR (2013) Sports Nutrition Knowledge and Practices of Personal Trainers. J Community Med Health Educ. 2013. 3:254.
7. Jacobson, BH, C Sobonya, and J. Ransone. Nutrition practices and knowledge of college varsity athletes: a follow-up. *J Strength Cond Res.* 2001. 15 1:63–68.
8. Zhang, F. F., Al Hooti, S., Al Zenki, S., Alomirah, H., Jamil, K. M., Rao, A., Al Jahmah, N., Saltzman, E., Ausman, L. M. Vitamin D deficiency is associated with high prevalence of diabetes in Kuwaiti adults: results from a national survey. BMC public health, 2016, 100.
9. Froiland, K , W Koszewski , J Hingst , and L. Kopecky . Nutritional supplement use among college athletes and their sources of information. *Int J Sport Nutr Exerc Metab.* 2004. 14 1:104–120.
10. Rosenbloom, CA , SS Jonnalagadda , and R. Skinner . Nutrition knowledge of collegiate athletes in a Division I National Collegiate Athletic Association institution. *J Am Diet Assoc.* 2002. 102 3:418–420.

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