Acta Biomed 2020; Vol. 91, N. 4: e2020100 DOI: 10.23750/abm.v91i4.8252

Original article

Survey of nutrition knowledge of Kuwaiti health influencers in social media

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Summary. *Objective:* The aim of this study was to determine whether nutrition knowledge differs between male and female Kuwaiti health influencers in social media (Instagram). *Design:* A cross-sectional study was conducted to determine the nutrition knowledge of male and female Kuwaiti health influencers in social media (Instagram) utilizing a multiple-choice questionnaire with sixteen questions. *Setting:* Kuwaiti health influencers in social media (Instagram). *Subjects:* One hundred Kuwaiti health influencers (fifty males; fifty females) in social media (Instagram). *Results:* A response rate of 70% was accomplished (thirty-two males; thirty-eight females). The correctly answered questions had a mean percentage of 60% with averages of 65% and 60% for correct responses by males and females, respectively (P=0.039). Only, two questions demonstrated significantly different scores for male and female groups (P<0.05). The two age groups (<30 years; ≥30 years) displayed mean percentage scores of 61% and 63%, respectively (P=0.081). *Conclusions:* Kuwaiti health influencers in social media were unable to provide accurate information concerning common health problems including obesity, hypertension, and osteoporosis. (www.actabiomedica.it)

Key words: social media, Instagram, nutrition knowledge, influencers

Introduction

Out of all the risk factors affecting long-term health, lack of nutrition is considered to be the most amenable. A number of ailments including CVD, Type-2 diabetes, hypertension, and a variety of cancers are completely or partially related to poor diet. Improved diet and nutrition status have a significant positive impact on the final outcome of treatments and interventions used to deal with these types of diseases.

The use of searchable electronic information in the medical field by practioners has been a common place for more than a decade now (1). Consumers and patients are also using electronic mediums with the help of the internet to find the health information they seek. Research in social media trends showed the increasing importance of internet searching to the consumer and patient. The impact on the consumer of cyber information is strong enough to warrant a change in the dynamics of health practioner/patient relationship (2).

Since digital information can be published by anyone, it was evident that consumers of nutritional information from digital social media are negatively affected by the confusing messages provided by unreliable sources (3). A study investigating online health information quality in the US and the UK detected a frequent underestimation of risks and overestimation of benefits in 161 articles (4).

With the widespread of health information online, a lot of people resorted to social media to answer their health questions. Social media is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated content" (5).

A study showed that parents looked on social networks and the web to decide if they should vaccinate

their children or not. Though The quality of information a person could obtain from internet sources about child vaccination can be misleading, most parents are depending on the information they get from the internet hoping this information will help improve their children's health (6). Even chronic disease patients used the internet as a source of information for them. A study compared information on the internet related to type2 diabetes and how they matched the recommendations given by the American Diabetes Association; they found that the information on the internet is not as recommended by medical professionals (7).

In a recent study exploring the benefits and interest in social media (Facebook) to reach the parents of children with acute respiratory infections, researchers found that highly educated parents were interested in participating and using Facebook as a medium to discuss the medical aspects of the disease. Establishing a personal connection with the parent was also emphasized in the study for a successful communication (8).

Engagement of target populations by a social media outlet like Facebook was proven to be successful (9). However, the accuracy of posted information is sometimes questionable (10). In a study examining the accuracy of information posted in 2000 websites regarding effective methods of contraception, researchers found that the quality of information on so-called medical websites was variable and accurate information was mixed with inaccurate information. Readers were exposed to myths more than accurate medical information, which prompted the authors to recommend that clinicians be educated on which websites to use (10). With many people having trouble getting insurance coverage or access to legitimate health care providers, using the internet and social media may prove detrimental to health if the public was not educated on the criteria to choose the appropriate site of information (11).

The quality of nutritional information posted on the internet is questionable. Monitoring the accuracy of information is an important public health service. Even highly regarded medical websites scored poorly when it comes to credibility and accuracy (12). Dietitians and researchers have a role in providing consumers with the latest statistics and methods of finding the appropriate and accurate internet channels.

Although the social media have proven to be successful in reaching the public, the accuracy of the information it presents is still questionable at best (13). One of the best ways to enhance the accuracy of the information among Kuwaiti health influencers in social media is to identify their weaknesses and insufficiencies in their understanding first. Thus, this particular study was conducted with the intention of recognizing whether dissimilarities prevail or not in the nutrition knowledge among male and female Kuwaiti health influencers in social media.

Materials and methods

A cross-sectional study was carried out on arbitrarily chosen male and female Kuwaiti health influencers in social media. The sample size for this study was determined by ascertaining a 2% difference in the total percentage score of nutrition knowledge among participants of the two separate genders. Based on former studies (13, 14), a standard deviation of the total percentage score of nutrition knowledge of 2.74% was estimated. The effect size was determined by utilizing Cohen's effect size measure (d) for comparing dissimilarities between the two separate groups. Each group had to be comprised of 31 subjects each, for the purpose of identifying the variance with a power of 80% at the two-sided significant level of 5%. With the intention of compensating for non-participation, the sample size was amplified up to 100 participants, 50 for each male and female group.

A questionnaire based on nutritional knowledge was developed and modifications were done from Allafi (15). The first part of the questionnaire basically targeted general areas like gender, age, and area of specialty. In addition, the respondents were asked to rate themselves as to how they perceive their nutrition knowledge to be; poor, moderate, or excellent (15). The second part of the questionnaire comprised of sixteen multiple-choice questions, each having three likely responses. A pre-test was carried out for the questionnaire on eight college students, four males, and four females, for the purpose of evaluating the ability to comprehend the questions. Cognitive interviews (concurrent probes) were utilized in this regard. The ques-

tionnaire was hand-delivered to 100 selected Kuwaiti health influencers in social media. A second questionnaire followed by a reminding telephone call was given for the non-respondents. The finished questionnaires were delivered back in sealed envelopes. The sixteen questions and correct responses are given in Table 1.

The SPSS statistical software package version 24.0 was utilized in analyzing data. Data were displayed in

Table 1. Nutrition knowledge questionnaire

1. What type of dietary fiber is helpful in lowering the blood cholesterol level?
   a. Soluble fiber*
   b. Insoluble fiber
   c. Cellulose
2. Excess of which nutrient may increase body calcium loss?
   a. Protein*
   b. Saturated fat
   c. Sugar
3. A nutrient believed to help prevent thrombosis is:
   a. Omega-3 fat*
   b. Monounsaturated fat
   c. Vitamin C
4. The adequate intake level of calcium for adult aged 51–70 years is:
   a. 500mg/d
   b. 1200 mg/d*
   c. 2000 mg/d
5. The major type of fat in olive oil is:
   a. Saturated fat
   b. Polyunsaturated fat
   c. Monounsaturated fat*
6. Compared with unprocessed vegetable oil, hydrogenated fats contain:
   a. More polyunsaturated fat
   b. More Trans fats*
   c. More cholesterol
7. Which nutrient is protective against hypertension?
   a. Potassium*
   b. Chlorine
   c. Iron
8. Which vitamin is likely to be toxic if consumed in an excess amount for a long period of time?
   a. Vitamin C
   b. Vitamin A*
   c. Vitamin D
9. The most concentrated source of vitamin B12 is:
   a. Fruit
   b. Whole grain cereals
   c. Meat*
10. Which substance raises the blood HDL-cholesterol level?
    a. Animal protein
    b. Riboflavin
    c. Alcohol*
11. In general, dietary recommendations are intended to:
    a. Maximize food efficiency
    b. Maintain public health*
    c. Increase athletic performance

(continued)

Table 1 ***(continued)***. Nutrition knowledge questionnaire

12. Type of food believed to have a preventive effect on various types of cancer is:
    a. Fruit and vegetables*
    b. Milk
    c. None of the above
13. The number of kilocalories in one gram of fat is:
    a. 4
    b. 7
    c. 9*
14. Which of the following is not an antioxidant nutrient?
    a. Vitamin E
    b. b-Carotene
    c. Zinc*
15. The nutrient strongly associated with the prevention of neural tube defects is:
    a. b-Carotene
    b. Folate*
    c. Vitamin C
16. Short-term (diet) plans are usually successful at achieving weight loss because they:
    a. Decrease appetite
    b. Cause the body to lose water*
    c. Burn large amount of stored fat

* indicates the correct answer.

percentages and mean with the help of descriptive statistics and the percentages were rounded-off to the nearest whole value. The differences in nutrition knowledge by gender, age, and specialization were assessed utilizing a Student's t-test.

Results

This particular study revealed a response rate of 70% (thirty-two males; thirty-eight females). Males were in the age range of 22-39 years with a mean of 27 years, whereas females were basically in the age range of 26-33 years with a mean of 30 years of age.

The correct responses to the questions in the entire sample had a mean score of 60% and males and females displayed averages of 65% and 60% respectively (P=0.039). A significant difference between the answers provided by both genders for most of the questions (P>0.05) could not be identified other than in questions 2 (P=0.008) and 8 (P=0.001). Table 2 displays the percentages of correct responses for the 16 questions by the entire sample and separate genders.

Table 3 demonstrates the differences in nutrition knowledge scores by age group (<30 years; ≥30 years). The mean percentage of correctly answered questions for participants younger than thirty years old was 61%, whereas participants who are thirty years old and older had a mean percentage of correctly answered questions of 63%, (P=0.081).

Discussion

This study demonstrated a higher response rate (70%) than reported in previous studies such as the study conducted by Al-Numair (56%) in Saudi Arabia (16) and the study conducted by Hu et al. (17) among primary care physicians in Taiwan (27%). Furthermore, two separate surveys conducted to assess the nutrition knowledge of physicians by Temple (18) in Canada and Mlodinow and Barrett-Connor (19) in California demonstrated response rates of 36% and 40% respectively. In addition, the survey on nutrition knowledge of primary health care physicians in Jeddah, Saudi Arabia which was carried out by Al-Zahrani and Al-Raddadi (20) displayed approximately the same response rate as the current study.

When the mean score for correctly answered questions in this study (60%) was compared with other

Table 2. Percentages of correct answers to the nutrition knowledge questions, overall and according to gender, among Kuwaiti health influencers in social media (thirty-two males; thirty-eight females)

Question	% of correct answers			P value*	SED (%)
	Overall	Males	Females		
1. Dietary fiber helpful in lowering blood cholesterol level	45	46	44	0.914	13
2. Excess of which nutrient may increase body calcium loss	39	54	39	0.008	10
3. Nutrient believed to help prevent thrombosis	76	74	76	0.754	11
4. Adequate intake level of calcium for adult aged 51–70 years	58	63	58	0.351	11
5. Major type of fat in olive oil	41	37	41	0.700	13
6. Hydrogenated fats contain	55	66	55	0.203	12
7. Nutrient protective against hypertension	76	86	76	0.079	11
8. Vitamin likely to be toxic if consumed in excess amount	55	75	55	0.001	10
9. Most concentrated source of vitamin B_{12}	45	40	45	0.382	13
10. Substance raising blood HDL-cholesterol level	31	32	31	0.677	9
11. In general, dietary recommendations are intended to	68	62	68	0.252	8
12. Foods having preventive effect on various types of cancer	87	90	88	0.214	13
13. Number of kilocalories in one gram of fat	85	89	85	0.154	12
14. Nutrient is not an antioxidant	52	63	52	0.551	9
15. Nutrient associated with prevention of neural tube defects	87	89	87	0.480	13
16. 'Diet' plans are usually successful at achieving weight loss because they	57	66	57	0.533	12
Mean score for correctly answered questions	60	65	60	0.039	11

*Based on independent-samples *t* test with df = 68.

Table 3. Percentages of correct answers to the nutrition knowledge questions, according to age group, among Kuwaiti health influencers in social media (thirty-two males; thirty-eight females)

Question	% of correct answers		P value*	SED (%)
	<30 (n 51)	≥30 (n 19)		
1. Dietary fiber helpful in lowering blood cholesterol level	40	46	0.352	12
2. Excess of which nutrient may increase body calcium loss	32	54	0.314	8
3. Nutrient believed to help prevent thrombosis	62	74	0.254	7
4. Adequate intake level of calcium for adult aged 51–70 years	90	63	0.651	12
5. Major type of fat in olive oil	89	37	0.303	11
6. Hydrogenated fats contain	63	66	0.179	8
7. Nutrient protective against hypertension	89	86	0.581	12
8. Vitamin likely to be toxic if consumed in excess amount	66	75	0.633	11
9. Most concentrated source of vitamin B_{12}	44	45	0.139	12
10. Substance raising blood HDL-cholesterol level	39	31	0.101	9
11. In general, dietary recommendations are intended to	76	68	0.482	10
12. Foods having preventive effect on various types of cancer	58	88	0.777	10
13. Number of kilocalories in one gram of fat	41	85	0.108	12
14. Nutrient is not an antioxidant	55	52	0.854	11
15. Nutrient associated with prevention of neural tube defects	76	87	0.451	10
16. 'Diet' plans are usually successful at achieving weight loss because they	55	57	0.825	9
Mean score for correctly answered questions	61	63	0.081	10

*Based on independent-samples *t* test with df = 68.

similar studies, some variations could be identified. The mean score for correct responses in this study was comparatively lower than that of the survey of nutrition knowledge among physicians in Canada (63%) (18) whereas, it was relatively higher than the mean score observed (52%) by Al-Numair among physicians in Saudi Arabia (16). In addition, the same mean score in the California study (21) which was equivalent to 70% was higher than 60% in this study. However, it can be established that the true-false questions used in the California study had contributed to its relatively high mean score. Other studies that used multiple-choice questions such as Kirby et al. (21) and Al-Zahrani and Al-Raddadi (20) also displayed low mean scores of 51% and 52%, respectively, similar to this particular study.

According to the results of this study (Table 2), social media influencers had a good understanding of the information related to nutrition published in media including the role of n-3 fatty acids, foods and nutrients that are protective against cancer, hypertension, neural tube defects, and number of kilocalories in one gram of fat. Quite noticeably, these facts represent the questions 3, 7, 11, 12, 13 and 15 of the nutrition knowledge questionnaire. Similar findings were reported in the studies conducted by Al-Numair (16) and Temple (18). Still, relatively a low number of social media influencers could provide correct responses to the questions comprised of information that have a less tendency to get publicized in the medical press (questions 1, 2, 4, 5, 6, 8, 9, 10, 14 and 16) such as the role of soluble fiber in lowering blood cholesterol level, the effect of consuming too much protein on body calcium, the adequate intake level of calcium, the major type of fat in olive oil and hydrogenated fats, and the functions and sources of different vitamins and minerals.

Conclusions

By and large, the outcomes of this study reveal the inadequacy of nutrition knowledge among Kuwaiti health influencers in social media. Furthermore, educating the public on what to expect and how to seek the correct information becomes a public service that nutrition and medical professionals have to be involved in.

The use of social media and social networking is increasing across all ages and more so in the younger generation. It is becoming more important to study their exposure and how to use it to their benefit. With low medical and health related education in the Middle East, it becomes more important to know how social networking trends are working to improve or demote the health status of the population.

Acknowledgements

The authors would like to thank Kuwait University for making this research possible.

Conflict of interest: None to declare

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Received: 27 February 2019
Accepted: 15 April 2019
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