

Nutrition Content on Twitter: The Public's Acceptability, Use and Trust

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Abstract Objective: To examine people's perceptions and trust in nutrition-related information on Twitter. **Design:** A cross-sectional study using a self-administered electronic survey was conducted from May 2022 to June 2022. **Methods:** Online questionnaire administered through the National Nutrition Committee (NNC) social media platform across Saudi Arabia. Four hundred twenty subjects living in Saudi Arabia aged 18 and above. **Results:** Of the 420 participants, 232 (55.2%) considered Twitter their favourite social media platform. The study found that 104 (24.8%) participants preferred using Twitter to search for nutritional information. However, when asked about their satisfaction levels, 147 (35%) participants were satisfied with using Twitter to find nutritional information. **Conclusion:** Having a clear idea about Twitter use trends may help policymakers and health professionals to make informed decisions, take the proper actions, and set regulations that govern the use of Twitter as a channel to help disseminate reliable nutrition-related information.

Keywords: twitter, nutrition, health information, social media, nutritional information

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1. Introduction

Over the past 20 years, social media platforms have grown exponentially, reaching hundreds of millions of users worldwide. In 1996, just 16 million individuals, or 4% of the world's population, used these platforms, according to the International Data Corporation [1,2]. However, by December 2017, the use of these platforms had increased, and 4.156 billion people, or 54.4% of the world's population, were using them [3]. Social media improve communication, business, promotion, and medical care [3]. People may produce, exchange, and share ideas and information globally via Internet-based networks, making social media popular for communication [3].

Social media are seen to influence the minds of young and adults significantly. Among the many topics posted on social media, dieticians, health organizations, bloggers, and regular users post information on food and nutrition. A recent study reported a link between using social media and exposure of food-related content [4]. Another two studies reported that the food choices and emotional appetite of young adults might be negatively influenced by social media [5,6]. A recent mixed-methods systematic review assessed the use of social media for nutrition outcomes in young adults and reported that this group is willing to obtain healthy eating tips through social media [7].

Numerous studies have been conducted to determine why people use social media to learn about nutrition. Social media's low cost, simple administration and management, wide range, and convenience are among the reasons people use them to find nutritional-related information [8]. Photos, videos, information, tags, and reviews produced by other users can be used to quickly develop, make widely available, and reference nutrition content [8]. The public can be encouraged to participate in health awareness events, counseling, and communication through social media by healthcare professionals to deliver evidence-based health intervention and promotion programs [7].

A recent Finnish study conducted in 2024 included 107 dieticians as participants who reported using social media for passive field monitoring rather than actively sharing content with the public. The study recommended incorporating social media use into the official job description to encourage dieticians to use social media professionally [9]. Using social media to raise public awareness can also increase health inequities, known as variance in health outcomes, that are unfair and avoidable [10]. Difficulties in accessing technology and cultural variations and preferences can impact the use of social media on public health nutrition.

During Covid, much medical misinformation was spread through social media. A study showed an uptrend in disseminating untrustworthy content about other medical topics between 2021 and 2022. Efforts were made

to curb the distribution of misinformation, which seems to have bore positive results. However, the study suggested that these interventions must be constantly applied across established and emergent medical subjects [11]. Another Australian study reported an increase in poor-quality nutrition-related information online especially those posted by brand accounts. It was also noted that the posts by dietitians were associated with higher quality scores [12].

Twitter (This platform has been renamed X but was known as Twitter at the time of the research, and this name is used in this paper) was created in 2006 and has since gained popularity as a social media platform that enables users to post and transmit 140-character messages [13]. Retweeting, a method of quickly disseminating information on Twitter, makes it possible to see how many times a tweet has been liked and retweeted [14]. Healthcare organisations and politicians have started using social media, including Twitter, as a simple tool to communicate with the public and disseminate evidence-based information [15].

Saudi people are among the most frequent social media users, particularly on Twitter [16]. Saudi Arabia reportedly created 40% of the tweets generated by Arab nations, and many users turn to Twitter for health-related information [16]. A study on diabetic patients' use of social media suggested that people favour using these media to increase communication with healthcare professionals and prefer doing so to attending medical consultations as they cost less and are easier to use [16]. In a recent survey of the Saudi public, almost 60% searched Twitter for nutrition and weight loss information, and 25% reported having a better diet due to information accessed through Twitter [17].

However, people's trust in information obtained from social media varies due to cultural differences [18]. There are concerns about the lack of confidentiality in social media health communications [16]. Despite the benefits of using social media as a tool for health information, related challenges, including lack of privacy, misunderstanding, misinformation, and lack of accuracy, may have health consequences [19]. AlNemer et al. [14] reviewed health-related content on Twitter in Saudi Arabia. They reported that more than half of the tweets were not evidence-based, which could lead to inaccurate health information and delays or even failure to seek medical consultation.

Despite the challenges of using social media as a source of health information, these platforms are becoming popular channels for acquiring information related to diet and nutrition [19]. Most studies conducted in Saudi Arabia have focused on using Twitter and social media for general health information or in specific patient populations [16]. However, there has not been much reported on the perception and trust of information from social media among the Saudi population. Thus, the current study examined Saudi people's perceptions of and trust in the available diet/nutrition-related information. Moreover, understanding Saudi people's barriers to and facilitators for using Twitter as a source of diet/nutrition-related information would enable this information dissemination/communication tool to be better used.

2. Materials and Methods

A quantitative cross-sectional study was conducted with 420 subjects aged 18 and above in Saudi Arabia. Although the sample size calculated using the epi calculator and Raosoft with a confidence level of 95% was 385, all those who consented to participate in the study were included. The questionnaire was distributed online through the National Nutrition Committee (NNC) social media platform across Saudi Arabia.

Before they consented to participate, all participants were given a summary of the study, including their roles. A consent form was duly signed electronically before they started the online survey. Participants were assured that their confidentiality and anonymity would be maintained throughout the study. This study was conducted according to the guidelines in the Declaration of Helsinki. All procedures involving research study participants were approved by the College of Medicine Institutional Review Board (IRB) No. E-21-6031, King Saud University. Written informed consent was obtained from all subjects.

The research team designed a self-administered survey in Arabic and English based on a validated survey from previous studies [20,21]. The questionnaire consisted of four sections: sociodemographic data, participants' characteristics as Twitter users, reasons for using Twitter to search for nutrition information, and health-related benefits and harms of seeking information from Twitter. Two pilot tests, namely, an initial pilot survey and a follow-up survey one week later, were conducted on ten randomly selected Twitter users to ensure the questionnaire's internal consistency and test-retest reliability.

The developed survey on the acceptability and use of and trust in nutrition content on Twitter was assessed for its content validity, face validity, and construct validity by two native Arabic-speaking dietician experts. Construct validity was assessed through Spearman's correlations. Items with a correlation coefficient of >0.7 were omitted. Each scale's internal consistency and reliability were tested using Cronbach's alpha reliability test. The homogeneity of the question items in each domain was evaluated using Cronbach's alpha coefficient [22]. A coefficient of ≥ 0.7 showed that the questionnaire was internally consistent [23].

The data were analysed using the Statistical Package for Social Sciences (SPSS version 24). Descriptive statistics were used to examine the proportions for different age, gender, and education groups and presented as means, standard deviations, frequencies, and percentages. The Kolmogorov-Smirnov test was used to assess data normality, and the chi-square test (χ^2) was used to test for the association between categorical variables. A p-value of ≤ 0.05 was considered significant.

3. Results

Four hundred twenty people participated in the online survey, reaching the calculated sample size. The data collection process started on 15 May 2022 and ended on 7 June 2022. The majority of the participants were Saudi (95.7%, $n=402$), 77.1% ($n=324$) lived in the central area of Saudi Arabia, and 74.5% ($n=313$) were females, as shown in Table 1.

Table 1. Demographic characteristics of participants (n =420)

Baseline demographic characteristics		Female		Male		Total	
		Frequency	%	Frequency	%	Frequency	%
Age	20 < Y	28	6.7	20	4.8	48	11.6
	20 – 24 Y	86	20.7	15	3.6	101	24.3
	25 – 29 Y	56	13.5	14	3.4	70	16.9
	30 – 34 Y	35	8.4	11	2.7	46	11.1
	35 – 39 Y	25	6.0	8	1.9	33	8.0
	40 – 44 Y	21	5.1	10	2.4	31	7.5
	> 44 Y	59	14.2	27	6.5	86	20.7
Social status	Single	162	38.6	59	14.0	221	52.6
	Married	136	32.4	47	11.2	183	43.6
	Divorced	8	1.9	0	0.0	8	1.9
	Widower	7	1.7	1	0.2	8	1.9
Monthly income	2000 <	99	23.6	24	5.7	123	29.3
	2000 - 5000	71	16.9	10	2.4	81	19.3
	5000 - 7000	24	5.7	12	2.9	36	8.6
	7000 -10000	35	8.3	10	2.4	45	10.7
	> 10000	84	20.0	51	12.1	135	32.1
Education	Uneducated	3	0.7	0	0.0	3	0.7
	less than high school	9	2.1	2	0.5	11	2.6
	High school & equivalent	60	14.3	30	7.1	90	21.4
	Undergraduate	189	45.0	60	14.3	249	59.3
	Postgraduate	52	12.4	15	3.6	67	16.0
Job	Student	91	21.7	31	7.4	122	29.0
	Employed	131	31.2	50	11.9	181	43.1
	Unemployed	64	15.2	5	1.2	69	16.4
	Freelancer	10	2.4	1	0.2	11	2.6
	Retired	17	4.0	20	4.8	37	8.8
Residential area	Central	232	55.2	92	21.9	324	77.1
	Eastern	49	11.7	3	0.7	11	2.6
	Western	17	4.0	9	2.1	7	1.7
	Southern	6	1.4	1	0.2	26	6.2
	Northern	9	2.1	2	0.5	52	12.4
Speciality	Nutrition	45	10.7	1	0.2	46	11.0
	Food sciences	10	2.4	7	1.7	17	4.0
	Medicine	25	6.0	4	1.0	29	7.0
	Science	24	5.7	21	5.0	45	10.7
	Other health specialities (nursing, pharmacy, etc.)	26	6.2	6	1.4	32	7.6
	liberal arts	49	11.7	12	2.9	61	14.5
	Other	134	31.9	56	13.3	190	45.2
Health status	Cardiovascular diseases and hypertension	10	2.4	6	1.4	16	3.8
	Cancer	1	0.2	2	0.5	3	0.7
	Diabetes	18	4.3	10	2.4	28	6.7
	Kidney diseases	1	0.2	1	0.2	2	0.5
	Gastric ulcers	6	1.4	1	0.2	7	1.7
	Anaemia	23	5.5	1	0.2	24	5.7
	Osteoporosis secondary to vitamin D deficiency	7	1.7	2	0.5	9	2.1
	Was not diagnosed with any illness	217	51.7	74	17.6	291	69.3
	Other	30	7.1	10	2.4	40	9.5
Nationality	Saudi	300	71.4	102	24.3	402	95.7
	Non-Saudi	13	3.1	5	1.2	18	4.3

When asked about their favorite social media platforms, 55.2% (n=232) stated that Twitter was among their favorites, followed by Snapchat (53.8%; n=226) (Table 2).

Furthermore, 7.9% (n=33) of the participants strongly agreed, and 24.8% (n=104) agreed that they prefer using Twitter to search for nutritional information (Table 3).

When asked about their satisfaction levels, 8.8% (n=37) were very satisfied, and 35% (n=147) were satisfied with using Twitter to find nutritional information (Table 3). When asked why people like to use Twitter to find nutritional information, 32.8% (n=138) chose the response "easy to use and find information on Twitter", and 27.4% (n=115) chose "presence of experts and specialists" and "easy access" to this group. Moreover, only 6.7% (n=28) chose "accuracy of the information." Among the most searched nutritional topics on Twitter were healthy eating patterns (30.2%; n=127), sports and nutrition (28.3%; n=119), weight loss (25.9%; n=109), and nutrition and skin health (18.1%; n=76).

Table 2. Preferred social media platforms

What is your favourite social media platform?		
	Frequency	%
Twitter	232	55.2
Snapchat	226	53.8
Instagram	180	42.8
TikTok	130	30.9
Other	55	13.1

Table 3. Questions concerning Twitter and Nutrition information

		Frequency	%
I prefer to use Twitter to search for nutritional information.	Strongly agree	33	7.9
	Agree	104	24.8
	Neutral	148	35.2
	Disagree	90	21.4
	Strongly disagree	45	10.7
How satisfied are you with using Twitter to search for nutritional information?	Very satisfied	37	8.8
	Satisfied	147	35
	Neutral	180	42.9
	Dissatisfied	39	9.3
	Extremely dissatisfied	17	4.0
Why do you like to use Twitter to find nutritional information?	Easy to use and find information	138	32.8
	Presence of experts and specialists and easy access to them	115	27.4
	Free	68	16.2
	Comprehensive information	42	10.0
	Accuracy of information	28	6.7
	Other	21	5.0
What are the nutritional topics that you are most interested in searching about on Twitter	Healthy eating patterns	127	30.2
	Weight loss	109	25.9
	Sports and nutrition	119	28.3
	Nutrition and Diabetes	46	10.9
	Nutrition and skin health	76	18.1
	Nutrition and heart diseases	23	5.4
	Nutrition and gynaecology	54	12.8
	Protection against cancer through nutrition	25	5.9
	Paediatrics nutrition	41	9.7
	Herbs and nutritional supplements	58	13.8
	Food allergies	30	7.1
	Food labels	24	5.7
	Weight gain	22	5.2
	Other	21	5.0

Table 4 demonstrates the costs and benefits of using Twitter as a source of nutritional information. According to the findings, 66.7% (n=276) of participants stated that they or one of their family members or friends had benefited from nutritional information that they found on Twitter. In comparison, 6.4% (n=27) had experienced adverse or side effects. Moreover, another 7.1% (n=30) stated that one of their family members or friends had had adverse effects due to nutritional information that they found on Twitter. Finally, 2.6% (n=11) had attended the hospital due to false nutritional information that they found on Twitter (Table 4).

Table 4. Costs and benefits of using Twitter as a source of nutritional information

Questions	Yes		No	
	Frequency	%	Frequency	%
Have you or one of your family members or friends ever benefited from nutritional information that you found on Twitter?	276	66.7	144	34.3
Have you ever had adverse or side effects due to nutritional information you found on Twitter?	27	6.4	393	93.6
Have you ever gone to the hospital due to false nutritional information that you found on Twitter?	11	2.6	409	97.4
Has one of your family members or friends ever had adverse or side effects due to nutritional information that you found on Twitter?	30	7.1	390	92.9

4. Discussion

The data presented in this cross-sectional study suggest that Twitter is among the favourite social media platforms in Saudi Arabia. Moreover, 95.7% of the participants were Saudis, all living in Saudi Arabia, indicating the study sample's alliance with the high number of Twitter users in Saudi Arabia. Using Twitter to search for and share health- and nutrition-related information is a common practice globally, including in Saudi Arabia. In addition, health professionals use Twitter to disseminate health-related information [24].

A previous cross-sectional study on the Saudi population investigated the public's attitudes toward health information on Twitter and found that respondents are concerned about nutrition and weight loss (229; 59.6%) [17]. This result is consistent with the findings of this study, where healthy eating patterns (30.2%; n=127), sports and nutrition (28.3%; n=119), and weight loss (25.9%; n=109) were among the top nutritional topics searched for on Twitter. Such topics are sensitive and, when taken from the wrong source, could have serious adverse effects or lead to misleading information, at best. The results showed that 6.4% (n=27) of participants had experienced adverse or side effects, and 2.6% had attended hospital due to false nutritional information that they had found on Twitter.

On the other hand, 66.7% reported that they or one of their family members or friends had benefited from the nutritional information they found on Twitter, which may mean that they trusted the source enough to use the information obtained. However, the satisfaction level in relation to using Twitter to find nutritional information was relatively low among the studied population.

The ease of use and finding information were the most likely reasons for people to favour using Twitter to find nutritional information, as the accuracy of the information was not among the top reasons. Recent studies have shown that the overall quality of the content in the nutritional knowledge being shared on social media was extremely low [24,25]. The low level of accuracy may be the reason for the low levels of satisfaction mentioned earlier.

Since low satisfaction levels did not stop people from using the information shared on Twitter, improving the quality of nutrition-related content on social media by regulating such platforms via policies and guidelines is essential. The Academy of Nutrition and Dietetics has developed a guide to help dietitians use social media platforms professionally [26]. Local scientific entities could collaborate to create similar guidelines tailored to the Saudi population. Moreover, general information seekers should be encouraged to verify information on Twitter and other social media platforms.

5. Conclusion

Some limitations of the study are worth mentioning. The questionnaire was distributed across the country through SFDA's social media. However, it did not account for those without access to the SFDA platform. As a result, some specific groups in the Saudi population without regular access to the Internet may have been missed. There was no means of distinguishing between sick and healthy respondents, and one's health conditions may alter the type of information searched and the way one searches for the needed information, making this a valid limitation. The questions were close-ended, restricting the participants from giving further details on their responses.

Despite these limitations, the study also had some strengths. This study is one of the first to examine how social media affects how people manage their health and how messages shared on social media platforms affect self-care behaviours from the Middle East. Another strength was that the studied sample size was more than the calculated sample size, possibly due to the convenience sampling. Moreover, the questionnaire represented the Saudi population as it was not restricted to one area but distributed via social media throughout the country.

The growing number of Twitter users in Saudi Arabia highlights the importance of studying the nutritional information being shared on this platform and monitoring its influence and the public's acceptance, use, and trust. This study saw the increased use of Twitter to gain information on diet and health. Some participants suffered side effects due to the information available, indicating the urgent need to educate the masses to verify all information found on social media. Having a clear idea about Twitter use trends may help policymakers and health professionals make informed decisions, take the necessary actions, and

set regulations that govern the use of Twitter as a channel to help disseminate reliable nutrition-related information.

However, regarding illness and disease, social media cannot substitute for medical consultation, attention to nonverbal signs, physical examination, and patient expectations. Therefore, it is important to raise awareness that professional help should be sought from medical experts when needed and to prevent the misuse of the medical and nutritional information available online. Further mixed methodology studies can be conducted using open-ended questions to gain more insight into the participants' thoughts and circumstances. Studies should also include all those not having access to the SFDA, as it may provide information on a population with a different perspective.

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Authorship

All the authors equally contributed to the conceptualization, validation, data curation, writing, reviewing, and editing of the original draft. Conceptualization, W.F and S.A ; methodology, W.F, S.A; validation, Y.M.; formal analysis, N.A and M.S; investigation, N.A and M.S.; resources, Y.M; data curation, N.A; writing—original draft preparation, W.F and S.A; writing—review and editing, D.A, Y.M, W.F, and S.A; visualization, N.A; supervision, W.F and S.A; project administration, Y.M ; funding acquisition, W.F, S.A and Y.M. All authors have read and agreed to the published version of the manuscript."

Ethical Standards Disclosure

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the College of Medicine Institutional Review Board (IRB) No. E-21-6031, King Saud University. Written informed consent was obtained from all subjects.

Conflicts of Interest

The authors declare no conflict of interest.

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