Food and nutrition information on social media: A scoping review protocol

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ABSTRACT

Introduction: Ubiquitous use of the Internet has created a digital food environment in which online communication about food and nutrition is prevalent through varied platforms. Our understanding about the food and nutrition topics on social media or quality of the information communicated is incomplete. The purpose of this protocol is to outline a comprehensive scoping review that synthesizes peer-reviewed evidence about food and nutrition information communicated via social media. **Methods and analysis:** The scoping review protocol follows Arksey and O'Malley's five-step framework and the Preferred Reporting Items for Systematic reviews and Meta-Analyses-Extension for Scoping Reviews (PRISMA-ScR) for development and reporting. A comprehensive search strategy, that reflects the interdisciplinary nature of food and nutrition communication on social media, was developed in collaboration with a medical librarian/expert searcher and adapted for eight databases: Prospero, Wiley Cochrane Library, Ovid Embase, Ovid Medline, Ovid PsycInfo, Ovid Eric, EBSCO CINAHL and Scopus. To be included, studies must be original peer-reviewed and be published in English from 2003 and onwards. Data on the social media platform, food and nutrition topics communicated, and study details (population, sample, design, methods) will be extracted from each study and charted in a table. Results will be analyzed with descriptive statistics and qualitatively summarized. Findings are expected to identify the types of available evidence, critical knowledge gaps that will inform future research and practice, social media research methodologies. Policymakers and professionals may use these findings to advocate for responsible and ethical communication of food and nutrition information on social media. Nutrition researchers may use these findings to identify the best practices and methodologies to engage in social media research. **Ethics and dissemination:** This study required no ethical approval. Findings will be submitted to an international peer-reviewed journal for publication, presented at international conferences, and posted online.

KEYWORDS

Nutrition; Scoping review, Social media, Communication

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This scoping review will contribute to our understanding of food and nutrition information communicated via social media by identifying the types of available evidence and knowledge gaps.
- A comprehensive search of eight databases ensures that literature from multiple disciplines (e.g., nutrition, psychology, marketing) will be included.
- The focus of this study is limited to food and nutrition information and does not include perceptions about the information or social media use.
- The scoping review is limited to English-language studies; however, there are no geographic or population limitations.

INTRODUCTION

The food environment embodies the determinants of healthy eating that influence food choices and nutrition[1, 2]. Ubiquitous use of the Internet has led to a digital food environment "composed of digital actors (such as governments, academia, food industry) who perform digital activities (such as digital health promotion, digital food marketing, and information sharing) in digital settings (such as social-networking sites, websites, blogs, smartphone apps)" ([3], pp. 115). Digital activities on social media have transformed how health information is communicated and how the public engages with it.[4] Emerging literature suggests that nutrition communication on social media is already impacting eating practices.[5, 6]

There are an estimated 4.6 billion active Internet users of which 3.8 billion users are also active social media users.[7] For many users, social media has become an important part of day-to-day life, with 74% of Facebook and 63% of Instagram users visiting sites on at least a daily basis.[8] Given widespread use and high levels of penetration, social media research is an emerging field that has grown exponentially to examine its impacts on health and well-being.[4, 7] Social media can be described as any internet-based platform that enable users to generate, share, and interact with digital content and other users.[9] Examples of digital platforms include YouTube, Twitter, Facebook, Instagram, blogs, and discussion forums. Content may be shared on various social networking sites (e.g. Facebook), photo-/video-sharing platforms (e.g. Instagram, Snapchat), blogs, and online communities (e.g. Reddit, Yelp, discussion forums). Major activities enabled by social media include: social interaction and social support, generating new or editing existing content, and engaging with content such as clicking a link, viewing, liking, and commenting on posts.[10] One of the distinguishing features of social media is the ability for anyone to create user-generated content and share it, compared to messages that have been traditionally delivered through a limited number of media gatekeepers: production studios, TV networks, and editorial staff.[11, 12] Additionally, individuals can actively seek information by searching and following individuals, topics, and organizations and are able to interact with information, engaging in multi-way communication channels.[13-15]

The unrestricted generation and flow of content can empower vulnerable groups through the creation of supportive communities but it can also lead to the spread of harmful misinformation.[16-18] This open access allows anyone to share their personal views, experiences, recommendations, and information, including about food and nutrition, regardless of their qualifications or the accuracy of the information.[19] Various nutrition-related topics are

shared on social media, which include but are not limited to, nutrition education, digital food and beverage marketing, eating disorders or life-stages (e.g., breastfeeding).[20-23] These online communities and the sharing of nutrition-related information have the potential to be positive or negative. Communities can foster supportive environments in which users can share their experiences,[24] or they can promote unhealthy attitudes and behaviours. [25, 26] Food and nutrition messages are prevalent across multiple social media platforms that have become prominent sources of information, which may be perceived as highly credible.[27-30] Influencers, in particular, have large online audiences with whom they share digital content. Some may use their social media platforms to broadcast messages about eating practices or promote products, influencing dietary choices,[28, 31] both negative and positive.[32]

Previous systematic reviews have examined how social media use impacts eating disorder outcomes, the digital marketing of unhealthy food and drink, and the use of social media interventions in weight management.[33-35] However, these systematic reviews represent a limited number of nutrition-related topics and social media platforms. A barrier to studying the use of social media as a nutrition promotion tool is the scattered nature of the literature across disciplines (e.g., nutrition, psychology, pediatrics, marketing, communications). In addition, given the dynamic and large variety or social media platforms, there is a lack of standardized tools and methods to conduct social media research.[36] These challenges make it difficult to capture the breadth and quality of food and nutrition information present on social media, thus limiting our understanding of its potential to influence eating practices, and nutrition status. Though a large literature base exists and formative research is important to guide behavioral interventions, the scattered literature and diverse methodologies make it challenging to incorporate this evidence into nutrition communication practice. Thus, it is important to map the breadth of available evidence using a systematic scoping review.[37] The objective of the scoping review will be to synthesize peer-reviewed literature about food and nutrition information communicated via social media. Mapping the literature will serve to 1) identify the available evidence on food and nutrition-related social media content, 2) identify and analyze critical knowledge gaps, and 3) examine how social media research on food and nutrition is being conducted.[37] Ultimately, this will improve the understanding of food and nutrition messages translated on social media and how this communication fits into broader digital food environments that are impacting eating practices.

METHODS AND ANALYSIS

This scoping review will follow the reporting guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-Scr) published by Enhancing the QUAlity and Transparency Of health Research (EQUATOR).[38] Following these guidelines will support the development of a reproducible, transparent, and complete scoping review.[39] The protocol will adhere to the 5-step framework outlined by Arksey and O'Malley (2005): 1) defining the research question; 2) identifying relevant studies; 3) selecting studies; 4) charting the data; 5) collating, summarizing and reporting the results.[40] The scoping review protocol follows recommendations outlined in the Joanna Briggs Institute (JBI) systematic review manual to establish inclusion and exclusion criteria.[37]

Ethics and dissemination

This study uses secondary data from published scientific literature. No ethical approval is required as it does not involve any type of participant data or personal information. Findings will be submitted to an international peer-reviewed journal for publication, presented at international conferences, and posted online.

Step 1: Identifying the research question(s)

This scoping review aims to address the following broad research question:

- What is known about food and nutrition information communicated on social media?

Specific research questions that will also be addressed include:

- Which nutrition topics communicated on social media have been subject to investigation?
- Which audiences have nutrition information on social media targeted?
- Which social media platforms have been used to communicate nutrition information?
- Which research methodologies have been used to investigate nutrition information on social media?

Step 2: Identifying relevant studies

Eligibility criteria

In line with JBI's recommendations for scoping reviews, the inclusion/exclusion criteria are structured according to population, concept, and context.[37]

Types of participants: Given that this scoping review aims to identify the types of available evidence and examine how research is being conducted, specifying a type of participant is not relevant. Therefore, no limits will be applied and all types of participants/audiences will be included with no gender, age, or life-stage restrictions.

Concept: The concept investigated is social media and can include but is not limited to blogs, Twitter, Instagram, Facebook, WeChat, Reddit and Pinterest. For the purpose of this review, social media is defined as platforms that allow user-generated content to be posted, shared, or discussed and that allow users to interact with the content or other users. This review will not consider studies that investigate behaviors relating to social media use or the impacts of social media on behaviors.

Context: Food and nutrition information. All information that relates to food (including beverages) and nutrition will be considered. Nutrition information can include all content relating to healthy eating, eating disorders and behaviors, specific nutrients, or nutritional supplements. Food information can include any information related to the processes involved in acquiring and preparing food, feeding practices, food-born allergies and intolerances, food safety and hygiene, and food-related marketing. Content can include text, images, or video. This review will not consider studies that investigate information seeking behaviors or perceptions about information. Any studies related to substance use or the promotion of alcoholic beverages or marijuana edibles will be excluded.

Types of evidence and sources: Study design, year, and language limits will be set. Only published peer-reviewed original research studies with any design will be included. Systematic

reviews will not be included but the reference list will be hand-searched to screen additional records. All other types of publications will be excluded (reviews, conference abstracts, opinions and letters, books and book chapters, protocols, feasibility and pilot studies. Studies published prior to 2003 will be excluded. It has been reported elsewhere that health-related social media research has not been identified prior to 2003.[4] therefore, no relevant nutrition-related research is anticipated prior to this date. In addition, only publications in English will be included; however, no geographic limitations will be set thus allowing for the inclusion of studies from any country. Table 1 outlines the full inclusion and exclusion criteria.

Table 1 Predetermined inclusion and exclusion criteria

Criteria	**Inclusion**	**Exclusion**
Participants	General public	No limits
Concept	Social media platforms (any digital platforms that enables two-way communication allowing users to engage with information posted or other users).	Digital platforms that do not enable users to engage with content or other users (e.g., static websites, games, or apps). Multifaceted interventions that do not isolate social media methods or results. Social media use. Impacts of social media on behaviors.
Context	Information about nutrition (includes food, beverages, processes used to obtain or prepare food, feeding, nutrients, and nutritional supplements)	Substance use and promotion of substances (e.g., alcohol and marijuana edibles). Multicomponent interventions that do not isolate nutrition components or results. Perceptions about nutrition information.
Study design	Peer-reviewed original research	Grey literature, books, book chapters, theses, protocols, feasibility, pilot studies, reviews
Publication date	2003 onwards	Prior to 2003
Language	English	Languages other than English

Search strategy

An initial search in Ovid Medline and Scopus revealed relevant articles and identified appropriate key words to be included in the search strategy that was tested using Ovid Medline by a medical librarian. The initial search strategy was conducted using broad search terms, so that the breadth of the literature can be included. A more detailed search identified key words to be included in a comprehensive search of eight relevant databases developed by a medical

librarian: Ovid Medline, Ovid EMBASE, Ovid PsycInfo, Ovid ERIC, Wiley Cochrane Library, Prospero, SCOPUS, and EBSCO CINAHL. The search strategy will be refined and finalized post-hoc to ensure that all relevant articles are included without collecting copious irrelevant articles.[33] Table 2 outlines the search strategy used for Medline. All articles collected from databases will be pooled and duplicates will be removed. The final search strategy will be reviewed and validated by an expert searcher/medical librarian. Table 2 is the search strategy developed for Ovid Medline. The search strategies for the other seven databases are presented in Supplementary Tables 1-7.

Table 2 Search strategy for Ovid Medline (1946 to December 17, 2019)

#	**Search statement**
1	exp Social Media/ or Social Networking/ or ("web 2.0" or "web2.0" or "web 3.0" or "web3.0" or "social media*" or "social technology" or "social software" or "social web" or "user generated content" or "quora" or weblog or weblogs or vlog* or microblog* or micro-blog* or "tweet" or "retweet" or "hashtag" or "hashtags" or "tumblr" or "tencent" or "weibo" or "online communit*" or "ustream" or Reddit or "online social" or "on line social" or "myspace" or "livejournal" or "orkut" or "message board*" or "digg" or "whatsapp" or "wechat" or "skype" or grubhub or "skip the dishes" or "doordash" or "door dash" or "uber eats" or tweets or tweeting or blog or blogging or blogger or Twitter or Facebook or Foursquare or Qzone or Instagram or Google app or Google apps or WhatsApp or Wechat or Linkedin or Snapchat or "snap chat" or Pinterest or Tik Tok or Tiktok or YouTube or Reddit or Baidu Tieba or Viber or VKontakte).mp. or ((internet or online or "on line" or digital*) adj3 (market* or adverti* or influencer)).mp.
2	Cooking/
3	exp Diet/
4	exp energy intake/ or portion size/ or serving size/
5	feeding behavior/ or carnivory/ or fasting/ or food preferences/ or herbivory/
6	exp "diet, food, and nutrition"/
7	exp nutrition disorders/ or (anorexi* or bulimi* or orthorexi*).ti,ab,kf.
8	exp Food Services/
9	overnutrition/
10	exp overweight/ or thinness/
11	weight gain/ or weight loss/
12	(calor* adj3 (restrict* or reduc* or count* or intake)).ti,ab,kf.
13	((carb* adj3 (restrict* or reduc* or count*)) or (carbs or carbohydrate* or protein* or fat or fats or starch* or sugar* or sweeten* or honey)).ti,ab,kf.
14	(cooking or cookery or cook or cookbook* or menu plan*).ti,ab,kf.
15	diet*.mp. or (Atkins or Mediterranean or Paleo or Slim Fast or Nutrisystem or South Beach or Keto* or Weight Watchers or Jenny Craig).ti,ab,kf.
16	(eating or eaterie or eatery or eat or eats or feeding or meal or meals or carnivor* or herbivor* or locavor* or omnivor*).ti,ab,kf.
17	(food* or nutrient* or micronutrient* or nutraceutical* or nutriceutical* or superfood* or vitamin*).ti,ab,kf.

18	(acai or agave or "apple cider vinegar" or almond* or avocado* or beef or beets or berries or beverage* or blueberr* or bread* or breastmilk* or butter* or cake or cakes or candy or candies or cantaloupe or casserole* or cauliflower or cereal or cereals or cheese or chicken or citrus or chocolate* or cocoa or coffee* or cola or colas or cookies or cookie or cranberr* or cream or dairy or edemame or egg or eggs or fenugreek or fiber or fibre or fish or flour* or french fries or fruit or fruits or garlic* or ginger* or grains or hamburger* or herbs or hoagie* or "hot dog*" or "hotdogs" or hummus or juice* or kale or kefir* or kelp or legume* or muffin* or meat* or milk or molasses or mushroom* or noodle* or nut or nuts or oat or oats or oatmeal or olive oil* or oranges or parsley or pasta* or pie or pies or pineapple* or pizza* or plant based or potato* or pork or poultry or probiotic* or prebiotic* or quinoa or rice or salmon or sandwich* or seaweed* or seed or seeds or shellfish or seafood or "soda pop" or soup or soups or sourdough or spice or spices or spinach or "swiss chard" or taco or tacos or tea or teas or tofu or turkey or tuna or veal or vegetable* or walnut* or wheat or yoghurt or yogurt).ti,ab,kf. [Note: This list includes names of broad food categories, as well as specific foods that are frequently listed in "food trends" or superfoods lists. No attempt has been made to list every food.]
19	fasting.ti,ab,kf.
20	"gluten free".ti,ab,kf.
21	"gluten restrict*".ti,ab,kf.
22	(lactose adj3 (restrict* or intoleran* or free)).ti,ab,kf.
23	nutrition*.ti,ab,kf.
24	(obesity or overnutrition or undernutrition or undernourish* or digestive or digestion).ti,ab,kf.
25	overweight.ti,ab,kf.
26	((portion* or serving*) adj3 size*).ti,ab,kf.
27	(thin or thinness or fitspo* or fatspo* or fitspiration or fatspiration or thinspiration).ti,ab,kf.
28	vegetarian*.ti,ab,kf.
29	vegan*.mp.
30	(weight adj2 (gain* or loss*)).ti,ab,kf.
31	("bar b que*" or barbque* or rotisserie* or grilled or roasted or roasting or snack* or breakfast* or dinner* or lunch* or supper* or pantry or pantries or restaurant* or dining or bistro or gourmet or chef or chefs or recipe* or baking or baker or bakery or kitchen or cuisine* or gastronom*).ti,ab,kf.
32	((organism adj3 "genetically modified") or GMO).ti,ab,kf.
33	or/2-32
34	1 and 33
35	34 not (Animals/ not (Animals/ and Humans/)) [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
36	35 not ("food and drug administration" or drug or drugs or alcohol* or wine* or beer*).mp.
37	remove duplicates from 36

Step 3: Selecting studies

All records obtained from each database will be sent to RefWorks and imported into Covidence (www.covidence.org), an online systematic review management program. Duplicates will be identified and removed by Covidence before records are screened. Pre-determined inclusion and exclusion criteria (Table 1) will be applied on a selection of articles and then used to screen titles and abstracts of each record in Covidence by two independent reviewers. The full texts of all eligible articles will then be retrieved and imported into Covidence. The full-text articles will be screened by two independent reviewers, again applying the pre-determined inclusion and exclusion criteria to assess eligibility for inclusion of each record in the final dataset. General reasons for exclusion of each record will be noted at the full-text screening stage only. Any conflicts between the two independent reviewers throughout the screening process will be resolved by a third reviewer. The study selection process will be piloted with at least 10% of the records at both the title and abstract and full-text screening stages by the leading reviewer who will make modifications to the eligibility criteria, as needed.

Step 4: Charting the data

Data extraction and analysis

A data extraction table will be developed by two reviewers to facilitate charting the data. A detailed summary of categories of data that will be extracted are presented in Table 3. These initial categories will be pilot-tested using at least 25 records that meet the inclusion criteria to determine if the data extraction table is able to capture all relevant information from the full-text articles. If gaps appear in the ability of these categories to collect all relevant information, categories will be modified, or additional categories will be added. These categories will then be finalized before the data extraction table is used to chart data from all the full-text articles identified for inclusion in Step 3. One reviewer will extract relevant data from each article and chart the data into a table in an Excel spreadsheet. All data will be reviewed and validated by a second reviewer.

Table 3 Categories of data that will be extracted from eligible full-texts and charted in a table

Category	**Description**
Citation	Authors and year
Country of origin	Country where the study took place. If not specified, country(s) where the manuscript was prepared will be stated based on authors affiliations
Objective	Purpose of the study specific to nutrition information on social media
Study population/audience	Population included in the study including sample size and characteristics where applicable (e.g. age, sex, ethnicity, socioeconomic status)
Content sampled	Social media content sampled for the study (e.g., Tweets, comments, posts)

Study design	Experimental design used (e.g., experimental/observational, qualitative/quantitative/mixed)
Methods	Main procedures or techniques employed to collect and analyze data
Social media platform(s)	The social media platform(s) that were investigated in the study
Nutrition topic(s)	The nutrition information topic(s) that were addressed in the study
Findings	Key findings that relate to the scoping review protocol

Step 5: Collating, summarizing and reporting the results

Collating the included articles will allow review findings to be summarized with descriptive statistics and qualitative descriptions. The counts and frequency of data will be tabulated for various categories including country, study population/audience, content sampled, methods, study design, social media platform, and nutrition topic. Qualitative descriptions will be used to summarize prevalent themes and common threads amongst the charted articles.

It is anticipated that this review will include a wide range of studies that use a variety of methodologies spanning multiple disciplines. It is expected that by synthesizing the evidence on food and nutrition information on social media, critical knowledge gaps that will be identified can be explored in future research, limitations to the field will be exposed, and best research practices will be made known.

AUTHOR STATEMENT

MAF conceptualized the scoping review, developed the research question, and critically reviewed and edited the manuscript. AC contributed to writing the first draft of the manuscript. NG contributed to writing the first draft of the manuscript. SC developed the search strategies. KDR contributed to the study conception, development of the research question and critically reviewed the manuscript. All members of the research team reviewed the draft of the manuscript.

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PATIENT AND PUBLIC INVOLVEMENT

Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

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COMPETING INTERESTS
The authors have no competing interests to report.

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