

Social media use for public health promotion in the Gulf Cooperation Council

An overview

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ABSTRACT

قد ظهرت منصات وسائل التواصل الاجتماعي مؤخرًا كأدوات قوية لتعزيز الصحة العامة. وقد أظهرت الدراسات والإحصائيات العالمية أن الدول الستة في «مجلس التعاون الخليجي» لديها أعلى معدلات استخدام للإنترنت ووسائل التواصل الاجتماعي في العالم، ووفقًا لمبادرات إدخال نظام واستراتيجيات صحية جديدة تستند إلى طرق غير تقليدية وفقًا لرؤية السعودية ٢٠٣٠، تهدف هذه الدراسة إلى استكشاف استخدام وسائل التواصل المختلفة وتأثيرها على قضايا تعزيز الصحة العامة في دول مجلس التعاون الخليجي. تم مراجعة عدد ٣٠٠٠ مقالة منشورة تحتوي على استخدام وسائل التواصل الاجتماعي كأداة رئيسية لمعالجة القضايا المتعلقة بالصحة في دول مجلس التعاون الخليجي. وقد وجد ان تويتتر من أكثر وسائل التواصل الاجتماعي استخدامًا لغرض تعزيز الصحة العامة، يليه الواتس اب. وكانت أكثر المواضيع الصحية التي تمت مناقشتها معرفة مرض السكري، صحة المرأة وممارسات الرضاعة الطبيعية، وصحة الفم واستخدام المضادات الحيوية المناسبة والنشاط البدني والتوعية بسلامة الطرق والإقلاع عن التدخين والتوعية بسرطان الثدي. ومن استعراض الأبحاث تم استنتاج ان وسائل التواصل الاجتماعي يمكن ان تكون أدوات فعالة لتعزيز الصحة العامة في دول مجلس التعاون الخليجي. ويجب أن تركز البحوث المستقبلية على إمكانية الاستفادة بوسائل التواصل الاجتماعي وبالذات للسكان الذين يعانون من نقص الخدمات الطبية والذين لديهم إمكانية وصول محدودة إلى مرافق الرعاية الصحية. وينصح أيضا بالعديد من البحوث المستقبلية المتعلقة بوسائل التواصل الاجتماعي لتغطية المزيد من البلدان في دول مجلس التعاون الخليجي وإجراء المزيد من الدراسات التدخلية.

Social media platforms (SMPs) have emerged as powerful tools for public health promotion. As the 6 countries of the Gulf Cooperation Council (GCC) have the highest internet and social media usage rates in the world, and according to the initiatives for the introduction of a new health system and strategies based on non-traditional methods according to the Saudi Vision 2030, this review aimed to investigate different SMPs use and impact on public health promotion in the GCC countries. Accumulating evidence indicated that diabetes knowledge, women's health, breast-feeding practices, oral health, appropriate antibiotic use, physical activity, road safety awareness, quitting smoking, and breast cancer awareness, were the most common specified topics. Future research should focus on populations that are

medically underserved and who have no or limited access to health-care facilities. Also, future research, in particular, the intervention type, is required to cover more countries in the GCC.

Keywords: social media, health promotion, Gulf Cooperation Council, Saudi Arabia, Facebook, Twitter, WhatsApp

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In 2019, it was estimated that there were 2.7 billion social media users worldwide, and this figure is speculated to increase to 3 billion by 2021.¹ In light of these figures, it is becoming difficult to ignore the potential role that various online social media platforms (SMPs) could play as powerful channels for public health promotion.² As public media campaigns can be expensive with inconsistent and difficult-to-assess outcomes,³ different online SMPs, including Twitter, Facebook, YouTube, Snapchat, and Instagram, have emerged as frequently utilized platforms addressing health-related issues.⁴⁻⁷ In several geographic places, such as the “Gulf Cooperation Council (GCC)” countries, namely, “Saudi Arabia, United Arab Emirates, Kuwait, Oman, Qatar, and Bahrain”, where over 54 million people live according to population estimates,⁸ these platforms have become increasingly common. The present online data show that the most used SMPs in

the GCC are “Facebook, Twitter, and YouTube” (<http://gs.statcounter.com>). The high socioeconomic status of these countries and the efficient networking and communication infrastructure have enabled the spread of such platforms in the specified area.⁴

Consistent with the steady growth displayed in several sectors, including the health-care sector, several GCC countries have committed to the Saudi Vision 2030, which aims to enhance the efficiency and quality of the preventive and therapeutic health-care services by streamlining processes and diversifying communication channels.⁹ In this sense, a growing focus on patient engagement by reducing the barriers to effective communication through online SMPs is required.¹⁰

The literature on SMPs’ role as a tool for public health communication is still lacking. Accumulating evidence shows that targeted users prefer to engage in interactive multidirectional conversations about health information rather than one-way communication.^{11,12} Social media could be valuable in documenting the range of health-related behaviors, promoting awareness of health-protective strategies, and providing interventions for public health issues.^{3,4,7} However, the quality of health information provided via diverse social media tools can vary, raising some concerns about the putative hazards to social media users who might be exposed to unopposed viewpoints that contradict medical science and public health recommendations.¹³⁻¹⁵

Although previous publications have evaluated the usage of different SMPs in public health, the information collected about the use of different SMPs for health promotion among the GCC countries as a review article is insufficient. In this sense, this study aimed to explore the online peer-reviewed literature to discern the different SMPs use for health promotion among the GCC populations and also to recognize some concerns that need improvement for future health promotion-related research.

The author consulted a software specialist to determine the common terms used to describe SMPs, and then performed a computerized search of Google Scholar, Scopus, Medline (via PubMed), and Web of Science databases up to June 2019, using the following keywords: “Social media OR Social web OR Social software OR Social network OR Web2 OR Web 2.0 OR telemedicine 2 OR SMP OR Facebook OR Twitter OR

Snapchat OR WhatsApp” AND “Health OR Health promotion” AND “Gulf region OR GCC” OR “Saudi Arabia” OR “United Arab Emirates” OR “Kuwait” OR “Oman” OR “Qatar” OR “Bahrain”. The reference list of relevant studies was examined, and some related studies were included.^{16,17} The findings of the retrieved studies were used to synthesize recommendations concerning the use of SMP for health promotion in the Gulf region.

Retrieved articles. The initial search after removal of the duplicates retrieved 1960 unique citations. After title/abstract screening, 85 citations were entered into the full-text screening phase. Fifty-five articles were excluded: 35 articles due to irrelevant content, 18 related articles, but not matching one or more of the eligibility criteria as well as 2 review articles. Finally, 30 studies were enrolled in the current work.^{4,16-44} **Figure 1** summarizes the flow of the included literature during the searching strategy.

Publication dates and study locations. As noted in **Table 1**, the earliest item is from 2013,¹⁸ with more frequent publications in the subsequent years. The “country of origin” revealed that the SMP uses for public health promotion in the GCC countries originated remarkably in Saudi Arabia (23/30; 76.7%).^{18-26,28,29,31-36,38-40,42-44}

Almost all the included studies were published as original research (26/30; 86.7%),^{4,19-36,38-44} and only 2 studies were conference proceedings (2/30; 6.7%).^{16,18} A qualitative (descriptive in nature) cross-sectional study design of the reviewed items using questionnaires or focus groups was predominant (23/30; 76.7%),^{4,16,18,19-34,36,38,39,44} with few interventional studies (3/30; 10%).^{35,40,42} The specified outcomes of each included study are summarized in **Table 1**.

Social media platforms. Of the SMPs used, Twitter was the most commonly used SMP; applied in 11 of the 30 articles (36.7%),^{4,20-22,25,26,29,32,34,36,38} followed by WhatsApp which included in 7 of the 30 articles (23.3%).^{29,33-35,37,38,40} Other popular SMPs included Facebook (n=5; 20%),^{17,27,29,32,34} Instagram (n=7; 23.3%),^{16,17,29,31-33,37} and Snapchat (n=3; 10%).^{29,32,42} Interestingly, many studies applied multiple SMPs in the work methodology (**Table 1**).^{4,17,18,26,29,32-34,37,38,44}

Target populations. Most studies (n=14; 46.7%) focused on the general population within the GCC countries.^{4,16,17,20,23,26,28,29,33,34,36,40-42} On the other hand, others enrolled participants with specified medical entities/risk factors such as smokers,³⁸ patients with diabetes,^{18,24,27,30,43} and obese children.³⁷ Few studies (n=3; 10%) focused on healthcare professionals,^{25,32,44} and other studies (n=6; 20%)^{4,16,20,27,29,36} focused on the

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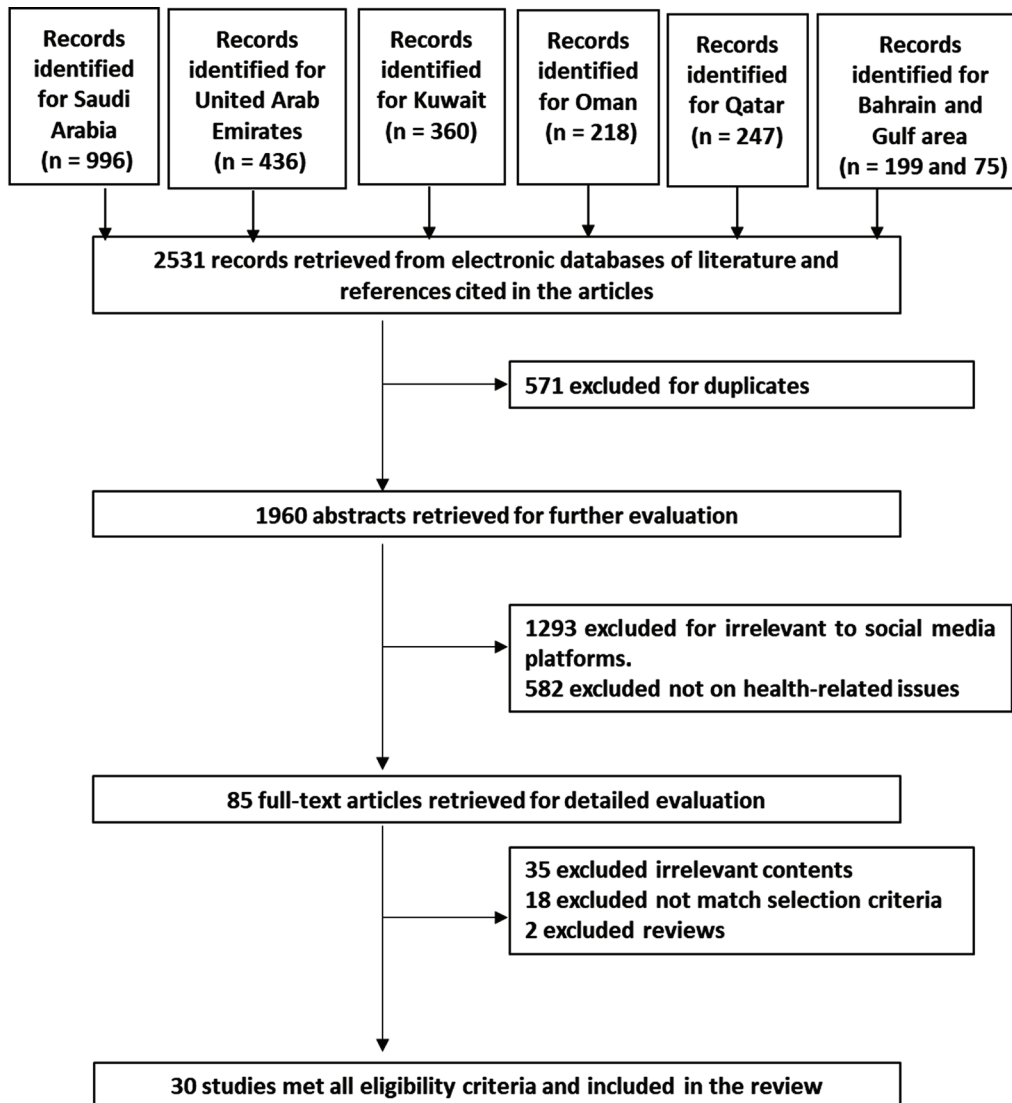


Figure 1 - Flow chart of the included literature during the search strategy.

analysis of public health promotion posts and tweets (Table 1).

Health issues. Of the health issues targeted in the enrolled studies, diabetes-related issues were by far the most highly outlined (6/30; 20.0%).^{18,24,27,30,40,43} Other health issues were women's health (2/30; 6.7%)^{20,22} and oral health promotion (2/30; 6.7%)^{23,26} healthcare delivery and healthcare professional promotion (5/30; 16.6%),^{25,32-34,44} physical activity adherence (3/30; 10.0%),^{17,31,37} and breast-feeding (2/30; 6.7%).^{21,42} Less frequently mentioned areas (namely, each represents 1/30; 3.3%), included antibiotic awareness,⁴ online medication seeking behavior,²⁹ smoking relapse

prevention,³⁸ resuscitations,³⁹ road safety,³⁶ breast cancer awareness,⁴² and organ donation and brain death awareness.²⁸

Efficacy of SMPs in public health promotion.

Awareness to the general population. Overall, the patients/participants expressed a high acceptance of receiving public health promotion messages through SMPs. Mainly, over two-thirds of the study participants were seeking online information about health-related issues. Followers of social media accounts that spread related messages showed better awareness of a range of conditions such as women's health and breast-feeding.

Table 1 - Summary of the survey studies on social media use in the GCC countries.

First author/ year	Study location	Main aim/theme	Study type	Study tool and Sample Size	Outcome(s) summary
Alanzi et al 2013 ¹⁸	KSA	Perception of managing DM through mobile technologies and social networking	Mixed method	Interviews and a survey to DM patients	A high rate of acceptance for smartphone technologies and social networking use among the participants.
Bahkali et al 2014 ¹⁹	KSA	Overview of a web-based health education site created by the King Faisal Specialist Hospital and Research Center (KFSH and RC)	Exploratory study	Interviews with Saudi IT personnel, 3 health educators, and 2 medical consultants	Targeted web-based health education strategies should be improved to reach a high percentage of populations live in rural areas who have limited computer-related skills and internet access
Bahkali et al 2015 ²⁰	KSA	Improving women's health promotion through Twitter use	Exploratory study	5167 tweets analyzed using NVivo NCapture	Twitter followers showed a high rate of health awareness
Bahkali et al 2015 ²¹	KSA	Evaluation of the impacts of Twitter to promote breast-feeding	Exploratory study	A web-based questionnaire among 484 mothers with a new-born child	Twitter followers demonstrated an increment in the knowledge domain and breast-feeding practices awareness and adherence. The integration of social media-based breast-feeding support and public health education programs could be an influential tool in breast-feeding promotion in KSA.
Bahkali et al 2015 ²²	KSA	Improving women's health promotion through Twitter use	Exploratory study	Two meetings in March 2015 to discuss lessons for successful Twitter account	Some observations related to the success of the Twitter platform were defining clear goals, being passionate about the health promotion campaign, being motivated, and developing trust in the health-care provider
AlShahrani et al 2015 ²³	KSA	Self-perceived personal oral health status	Exploratory study	Internet-based Arabic language questionnaire 4618 individuals	SMPs use to increase oral health awareness is highly recommended
Zowawi et al 2015 ⁴	GCC States	Community awareness of antibiotic use	Exploratory study	The Arabic-language pilot campaign short tweets and links to various articles and videos related to superbugs 34000 followers	The authors have successfully used SMP (Twitter and YouTube) as cost-efficient and mass education platforms to increase awareness of appropriate antibiotic use in public and the medical societies of the Gulf countries.
Jamal et al 2015 ²⁴	KSA	Association of online health information-seeking behavior and self-care activities among T2DM	Exploratory study	Cross-sectional survey 344 patients with type 2 diabetes mellitus	Only thirty-nine percent of participants were internet users; 71.6% (96/134) of them were seeking health-related information. The primary topics searched by participants were the therapeutic diet for DM, symptoms of the disease followed by the specified treatment. Several barriers have been identified for the online health-related information-seeking behavior. Younger age, female, marital status, higher education, higher income, and longer duration of internet use were associated with more online health-related information-seeking behaviors. Most online health-related information seekers reported a positive change in their behaviors after seeking online health information

Table 1 - Summary of the survey studies on social media use in the GCC countries (continued).

Almaiman et al 2015 ²⁵	KSA	Using social media among health-care professionals	Exploratory study (web-based survey)	Cross-sectional Twitter-based survey to 253 physicians	<p>The majority of the enrolled physicians reported, Twitter had a significant impact on enhancing their medical knowledge and in improving their clinical practice.</p> <p>The participants depicted their preference for social media health accounts that focus on women's health, non-communicable disease, and psychotherapy.</p> <p>The need for additional work on designing and implementing a national SMP based educational outreach program to provide evidence-based health-care information and improve health-care providers' knowledge and skills was recommended.</p>
Mejova et al 2015 ¹⁶	Qatar	Assessment of the Dietary Habits of the Qatar population	Exploratory study	Analysis of Instagram posts	<p>Analysis of Instagram posts revealed its potential as a source for the native and expat populations study, in particular, their dietary and health activity. It revealed that social media has limitations in precisely reflecting the expats, being drastically under-represented.</p>
Almaiman et al 2016 ²⁶	KSA	Oral health promotion using social media platforms	Exploratory study	Cross-sectional web-based (Twitter) survey to 2652 respondents	<p>More than 2/3 of the participants reported searching the Arabic online oral health-related information (OHRI). Otherwise, nearly forty percent of the enrolled individuals reported no preference for using a specific SMP.</p> <p>It is recommended to support the content of SMP with trusted and high-quality online OHRI resources to raise public awareness</p>
AlQarni et al 2016 ²⁷	Arabic speaking world	Facebook (FB) content analysis to diabetes-related groups	Exploratory study	Retrospective qualitative FB content analysis of 6107 posts related to DM	<p>The retrospective qualitative FB content analysis has shown that the female gender was predominant users.</p> <p>Most of the posts focus on sharing personal experiences, raising awareness, providing spiritual support, sharing the latest research, and providing education on DM.</p> <p>Future research considers health information sharing and designing appropriate interventions to improve social media power in promoting public health is highly recommended.</p>
Hajjar et al 2016 ²⁸	KSA	The knowledge, attitudes, and beliefs of organ donation and brain death among social media users living in Saudi Arabia.	Exploratory study	Web-based questionnaire to 913 participants	<p>Most study participants had sufficient information about organ donation versus brain death.</p> <p>Some participants showed positive attitudes toward organ donation.</p> <p>SMP showed a significant influence on organ donation and brain death knowledge.</p>
Bahkali et al 2016 ²⁹	KSA	The prevalence of Saudi online medication seeking behavior via a web-based survey with Twitter participants	Exploratory study	Retrospective analysis of 445 tweets related to schizophrenia	<p>Approximately 68.3% (3311/4847) were seeking the online medication-related information frequently.</p> <p>Approximately 83.5% of SMP users were females.</p> <p>Most respondents used in decreasing order Google (63.6%), Twitter (28.7%), Snap chat (21%), WhatsApp (13.8%), Instagram (11.4%), Facebook (5.5%), and YouTube (1.3%) to access online medication-related information.</p> <p>Saudi population was active users for the internet and different SMPs to get data about medications.</p>

Table 1 - Summary of the survey studies on social media use in the GCC countries (continued).

Alanzi et al 2016 ³⁰	GCC	Design and usability evaluation of social, mobile diabetes management system in the Gulf Region	Usability study	Questionnaire for User Interaction Satisfaction to 33 users with DM	A higher usability rating in Saudi patients with T2DM for Saudi Arabia Networking for Aiding Diabetes (SANAD) health system The wide deployment of the specified health system in the Gulf region supported by the wide use of mobile phones and social networking media, was recommended
Al-Eisa et al 2016 ³¹	KSA	Effect of motivation by Instagram on adherence to physical activity among female college students	quasi-experimental study	EMI-2: a questionnaire that measures the motivation to engage in physical activity, then divided into Instagram and control groups	The intervention-group showed about 17% more adherence to the activity program versus the controls It is concluded that the use of Instagram with the home exercise program as a motivational modality could be attractive and effective to reinforce adherence and maintain an adequate physical activity level
Alsobayel et al 2016 ³²	KSA	Use of social media for professional development by health care professionals	Exploratory study	Cross-sectional web-based survey to 231 health-care professionals using different types of SMP	Nearly 70.6% of the participants used SMP for their professional development The most frequently used SMPs were Twitter, YouTube, Instagram, Facebook, Snapchat, and LinkedIn, in descending order It is concluded that social media were perceived as being most useful for professional development in terms of their impact on the domains of knowledge and problem-solving and least helpful for clinical skills competency Also, Twitter was perceived as the most suitable type of social media for all listed domains
Alshammari et al 2017 ³³	KSA	Use of social media in health education and health promotion	Exploratory study	Cross-sectional web-based survey	Instagram, WhatsApp, and SMS were the most preferred media among people of Saudi Arabia. There were age and gender differences. It was a successful practice to use these SMPs to send health education-related messages to the target population
Ifrikhar et al 2017 ³⁴	KSA	Health-seeking influence reflected by online health-related messages received on social media	Exploratory study	A questionnaire with closed-ended and multiple-choice questions to 442 patients	The authors concluded that most respondents (89.8%, 397/442) used WhatsApp, followed by Facebook (58.6%, 259/442) and Twitter (42.3%, 187/442). Most cases, respondents received health-related messages from WhatsApp, and about 42.6% (171/401) reported ever stopping treatment as advised on an SMP. Also, a significant proportion of WhatsApp users reported that health-related information received on this platform influenced decisions regarding their family's health care. Interestingly, respondents' decisions regarding family health care were more likely to be influenced when they used two or all 3 types of platforms (Facebook, WhatsApp, or Twitter).
Hemdi et al 2017 ³⁵	KSA	Effectiveness of a psychoeducation intervention delivered via WhatsApp for mothers of children with Autism Spectrum Disorder	Intervention RCT	The intervention is one face-to-face session (60 min), and 4 virtual sessions (30 min each) delivered using WhatsApp. The sample size was 62 mothers of children (26-78 months)	Stress and depression, but not anxiety, showed apparent improvement. Depression showed a change to nearly clinically normal levels.

Table 1 - Summary of the survey studies on social media use in the GCC countries (continued).

Albalawi et al 2017 ³⁶	KSA	Exploring the diffusion of tweets designed to raise the road safety agenda	Exploratory study	70 tweets distributed into two groups (29 intervention tweets and 41 additional supported tweets) extracted from the Tweet reach data set	<p>The authors identified an indicator of successful diffusion and proposed a new way to measure innovation/imitation coefficients.</p> <p>A statistical maneuver for tweet adoption evaluation by influential and imitators was developed.</p> <p>Understanding the health-promoting messages diffusion process in SMP, such as Twitter, is very important for the optimal use of these platforms as a tool for public health promotion.</p>
Fernandez-Luque et al 2017 ³⁷	Qatar	Implementing 360 degrees Quantified Self for childhood obesity	Clinical Trial	Data were collected from 50 children who had wearable devices and Social media accounts, then analyzed using the 360° Quantified Self (360QS) method, which allows for capturing insights on the behavioral patterns of children	<p>The authors concluded that the acquired physical activity and food data via wearable sensors, mobile and social media (WhatsApp and Instagram), and integration with physiological data to gain insights about health habits allowed for capturing insights on the behavioral patterns of the participated children, which served as a mechanism to reinforce the education of their mothers via social media.</p> <p>The authors also reported that human factors, such as sex and cultural acceptability aspects, can affect the implementation of this technology beyond a feasibility study and they recommended that for 360QS technology implementation, careful planning and integration in the health professionals' workflow are needed.</p>
Onezi et al 2018 ³⁸	KSA	The impact of social media-based support groups on smoking relapse prevention	Exploratory study	473 smokers participate in smoking-cessation intervention programs, divided into 3 groups: Twitter (n = 150), and WhatsApp (n = 150), and a control group (n= 173)	<p>Twitter and WhatsApp (as extra-treatment to the official health-care session) users found it easier to quit smoking in the smoking cessation intervention program than individuals who did not participate in these activities.</p> <p>The study findings support that more social media support groups should be developed to help people to cease smoking after abstinence effectively.</p>
Hassounah et al 2018 ³⁹	KSA	The quality and educational use of the Arabic language cardiopulmonary resuscitation videos published on YouTube	Exploratory study	283 YouTube videos on resuscitation were assessed for educational usefulness	The available YouTube videos were not reliable sources of data on how to perform cardiopulmonary resuscitation for the Arabic speaking population at the time of study conduction.
Alanzi et al 2018 ⁴⁰	KSA	Evaluation of a mobile social working application for improving T2DM knowledge	Interventional study	The intervention cohort had educational-messages using WhatsApp weekly, while the controls received the ordinary care	The authors concluded that the WhatsApp application can be effectively used for enhancing diabetes knowledge, self-efficacy, and awareness among the Saudi population.
Alhuwail et al 2018 ⁴¹	Kuwait	Evaluating hospital websites in Kuwait to improve consumer engagement and access to health information	Exploratory study	Nine hospital websites were evaluated for Accessibility, Usability, Presence, and Content.	The authors concluded that overall, most hospitals in Kuwait have a rudimentary online presence, and their websites require careful reassessment concerning design, content, and user experience. Also, the websites focus primarily on promoting services provided by the hospital rather than engaging and communicating with patients or providing evidence-based information.
Alanzi et al 2018 ⁴²	KSA	Evaluation of the Snap Chat mobile social networking application for breast cancer awareness	Interventional study	The intervention group used the Snap Chat mobile application and received breast cancer awareness information on their mobiles	A significant improvement in breast cancer awareness was found in the intervention group who received awareness about breast cancer through Snap Chat using videos, texts, and pictures.

Table 1 - Summary of the survey studies on social media use in the GCC countries (continued).

Alanzi et al 2018 ⁴³	KSA	Evaluation of the effectiveness of mobile diabetes management system with social networking and cognitive behavioral therapy for T2DM.	Randomized controlled trial	The intervention group used Saudi Arabia Networking for Aiding Diabetes (SANAD) system and the controls used the conventional diabetes therapy	The mean diabetes knowledge score has been increased after the intervention using Saudi Arabia Networking for Aiding Diabetes (12.11±2.09 versus 14.56±1.59). Also, the mean self-efficacy score has been increased (5.17 ± 0.45 versus 6.17 ± 0.39). Age, sex, and educational level were not associated with increased knowledge nor the self-efficacy scores in each study cohort.
Alshakhs et al 2018 ⁴⁴	KSA	Role of social media in health-care delivery	Exploratory study	Web-based survey to 120 health-care professionals	The authors concluded that 80% of study participants agreed with the benefits of using social networks in health-care services and considered it a suitable tool for patient education and public health awareness. The rest of participants believed that there are several risks associated with the use of social media, such as ethical or legal challenges, the risk to the patient's health status, or the breaching of the privacy and confidentiality of the patient. The participants were welcome to use SMPs for professional aims.
East-Mediterranean Regional Office, WHO ¹⁷	Bahrain	The promotion of physical activity through the mass media	WHO Report Case studies	Approximately 7212 tips were published via social media, 2315 (32%) of which related to physical activity	Among the main factors which participated in the health promotion campaign success is the use of SMPs such as Instagram and Facebook.

GCC: Gulf Cooperation Council, KSA: Kingdom of Saudi Arabia, RCT: randomized controlled trial, WHO: World health organization

These followers expressed more interest in receiving more similar content and in using organized systems to convey such information, namely, "Saudi Arabia Networking for Aiding Diabetes (SANAD)" system. Some factors were associated with more intense online "health-related information-seeking behavior", including the female gender, younger people, the marital state, higher revenue, higher level of education, and more prolonged time spent for internet navigation.

Healthcare professional promotion. Authors of 3 studies have successfully used SMPs, "Twitter and YouTube", as cost-efficient and "mass education" platforms to increase the awareness of convenient antibiotic usage in the general population and the medical-related staff of the Gulf countries. Almainan et al²⁵ revealed that 79% of the surveyed physicians were seeking online health-related information, and "Twitter" was significantly implicated in improving their medical knowledge and some clinical practice-related issues. Alsobayel et al³² also reported similar findings; as they found SMPs were perceived as being most

influential for the development of several competencies as knowledge and problem-solving skill; however, they were perceived as being least helpful in enhancing clinical skills. In a study by Alshakhs et al,⁴⁴ 20% of the participants expressed some concerns related to the risk associated with the use of different SMPs, like ethical- or legal-related issues, a risk to the patient's health status, or breach of patient's privacy and confidentiality. However, these participants were willing to use different SMPs for their professional development.

Public health promotion content and SMPs. Several studies analyzed the characteristics and content of some SMPs to define goals for success. Bahkali et al,²² reported that the favorable outcome that Twitter achieved brought about by several factors summarized as "defining clear goals, being passionate about the health promotion campaign, being motivated and creative, being knowledgeable about the health promotion area, and developing trust between Twitter users and health-care providers". On the other hand, Mejova et al's¹⁶ analysis of Instagram posts related to the

dietary and health activity of the Qatar expats revealed that this population was drastically underrepresented, highlighting the limitation of social media in representing the expat population accurately. Another study by Alhuwail et al⁴¹ analyzed the websites of 9 Kuwaiti hospitals. It revealed that these hospitals had a rudimentary online presence which focused mainly on reinforcing services supplied by the hospitals as a type of advertisement rather than engaging the patients or supplying evidence-based-related information. These results highlight gaps in SMP performance that can be addressed to optimize SMPs' use in public health promotion.

Studies providing evidence of better efficacy of health promotion versus standard communication/health promotion. The ability of different SMP to promote engagement and interaction can complement traditional programs, increasing their ability to promote awareness and change behavior, as evidenced in some reviewed articles.^{24,31,35,36} Additionally, integrating social media networks into other communication programs outside the SMPs will influence the impact of the health promotion activities.⁴⁵

The included studies revealed that different SMPs could enhance women's health promotion level,^{20,22} breast-feeding practices and adherence knowledge,²¹ oral health self-perception and promotion,^{23,26} appropriate antibiotic use,⁴ adherence to physical activity,³¹ road safety awareness,³⁶ smoking cessation,³⁸ diabetes knowledge, self-efficacy,^{30,40,43} and breast cancer awareness.⁴¹

Although the predominant study design is a qualitative "cross-sectional" type (76.7%) using questionnaires or focus groups, with few interventional studies,^{31,35,40,42,43} which proved to be more effective in health promotion than the standard ones, these qualitative studies are still required to provide the basis of fundamental knowledge on which other future studies could be carried out.

Remarks. Public health promotion is a field that can benefit from social media, through web-based and mobile communication social networks.⁴⁵ Different SMPs were widely used to promote health and endorse online health promotion campaigns. These platforms have unique features for exchanging and taking part in open-access information, supplying a channel for dynamic conversations, and allowing users to follow issues of their interest.⁴ Social media platforms have been employed to increase awareness of DM,³ obesity,⁴⁶ non-communicable diseases,⁴⁷ sexual health,⁶ and cancers⁴⁸ among others. Besides, they can provide support for "community-based" lifestyle interventions

for some people with special conditions like those with mental disorders.⁴⁹

The present review highlights the literature about the current use of different SMPs in public health-related issues within the GCC countries. The findings support that the SMPs application in public health-related research and practice is still in the maturation stage; no articles were found before 2013, and 30 related articles were published in the last 6 years in the GCC countries. Most included articles used descriptive approaches rather than utilization of the SMPs' overall potential in terms of multidirectional communication and networking. Of the 30 articles, most were descriptive research articles, whereas only 5 studies included an interventional approach.^{31,35,40,42,43} This indicates that using different SMPs for health interventions in the GCC countries is not yet a popular approach in public health practice and remains mostly in the descriptive phase of research. More research attempts to specify whether SMPs have an effect on their own or whether the observed outcomes are due to the "non-social media" components or the overall intervention would be important as highlighted by Hamm et al.⁵⁰ Furthermore, a more in-depth analysis of the way the interventions are conducted through different SMPs and the extent to which these interventions are implemented will take part in better understanding of social media use.

Analysis of the country of origin of the studies indicated that the majority of research on the use of SMPs for public health promotion in the GCC countries originated in KSA. The latter country is a fertile one for this sort of research because 75% of the total Saudi population are "active social media users" in 2017. Approximately 52% were reported to be active on "Twitter", and 66% were active on "Facebook".⁵¹ These figures reflect the widespread use of SMPs and their potential use in future social media-based public health promotion interventions. Additionally, from a research point of view, the mass population is easily accessible as stated by AlShahrani et al.²³

By screening the SMPs used in the included studies, "Twitter" was the most common SMP applied in 14 of the 30 articles (46.7%), and followed by "WhatsApp", which appeared in 7 of the 30 articles (23.3%). Interestingly, this finding is in line with Reyaee and Ahmed's analysis of the growth pattern of SMPs use in the Gulf countries.⁵² They reported that "Twitter" was becoming popular among social media users after "Facebook" in almost all GCC countries.

Although few studies included multiple SMPs or highlighted the importance of combining SMPs with other relatively unprecedented kinds of communication,

such as messaging or email,^{4,33,34,38} most of the included studies relied on a single SMP. This trend accords with the earlier observations reported by some review articles and meta-analyses that assess the social media use for public health promotion.⁵³⁻⁵⁵

This work is the first to summarize the role of different SMP in public health promotion in the GCC region. The findings observed in the current study are in agreement with those reported by other studies. For example, Sinnenberg et al⁵⁵ showed that “Twitter” is supported by multiple organizations that participate in its growth and may have several public health implications. Moorhead et al¹² concluded that although SMP is a powerful tool for public health promotion, shared data need to be monitored, and users’ privacy should be maintained. Similar concerns were raised by Taggart et al.⁵⁶

Study limitations. Given the relatively new emerging concept of social media with a constantly changing nature, there is no “universal definition,” adding difficulty to the strategy of establishing study eligibility and keeping the work updated since new reports are in a steady state of influx. Subjective bias could be unintended and included. The lack of quality, rigor, or validity analyses of the studies was evident. No quantitative statistical analysis could be executed due to the limited number of eligible articles all over the GCC region except for Saudi Arabia and the reported study-design heterogeneity in the retrieved literature. Evaluation of effectiveness in the short and long run using a variety of methodologies, as suggested by Moorhead et al¹² is needed, and further evidence synthesis on specific issues, clinical areas, and GCC populations can provide more details.

In conclusion, SMPs have been used for public health promotion for a range of purposes and medical conditions. Moreover, they could improve the professional development of health-care personnel, and their large-scale deployment is highly supported. However, health-care personnel expressed concerns about the quality of disseminated data on these platforms and recommended monitoring data quality.

Social media research has markedly improved in the past decade due to better empirical research and publication of higher quality studies. However, special attention should be directed to populations who are medically underserved and have no or limited access to health-care facilities as potential SMP-targeted groups, among others.

Future SMP-related research is required to cover

more countries in the GCC, to carry out more intervention studies, and to include more systematic analysis of the feeds shared between social media users and health-care practitioners.

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