

## From Likes To Lifesavers: The Social Media Revolution In Saudi Arabian Health Promotion; Review Of Literature

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### Abstract

Background: The use of social media for health education and promotion has gained significance in Saudi Arabia due to its widespread internet and social media usage. Understanding its implications and effectiveness is crucial for enhancing public health in the region.

**Aim:** This systematic review aims to investigate the role of social media in health education and promotion in Saudi Arabia by analyzing 12 selected studies.

**Method:** A comprehensive search of the literature was conducted to identify relevant studies, and a quality assessment was performed to evaluate the rigor of the included research. The studies were analyzed thematically, and their findings were synthesized.

**Results:** The review reveals that social media platforms are extensively used for various health-related purposes in Saudi Arabia, including disseminating information, promoting public health campaigns, and sharing knowledge about specific health conditions. Notably, social media is effective in increasing awareness, shaping perceptions, and influencing health-related behaviors.

**Conclusion:** The systematic review underscores the pivotal role of social media in healthcare across various domains in Saudi Arabia. It offers valuable implications for healthcare providers and policymakers and recommends active engagement of healthcare professionals and greater involvement of pharmaceutical companies to harness the full potential of digital platforms for health education and promotion. This review significantly contributes to the existing literature and has a profound impact on enhancing public health in the Saudi context.

**Keywords:** Social media, health education, health promotion, public health, Saudi Arabia, systematic review.

## **Introduction**

Social media platforms are becoming an essential aspect of everyday life for the people of the Kingdom of Saudi Arabia (KSA) (Alshehri, 2021), which has undergone a digital revolution in recent years. The way people interact with many facets of society, communicate, and obtain information has been profoundly changed by social media (AlAli & Nazar, 2023). Social media has become a very useful instrument with a lot of promise for health promotion and education in the kingdom due to its widespread use (Batool et al., 2022; AlFrah et al., 2023).

Any country's healthcare policy must include health promotion and education (Tami, 2022). These factors are becoming more and more significant in Saudi Arabia as the nation deals with a number of health-related issues, such as the rising prevalence of non-communicable diseases, obesity, and mental health problems (Almutairi et al., 2022; Temsah et al., 2023). Saudi healthcare officials

have been aggressively investigating novel approaches to enhance public health in response, with an increasing focus on preventative healthcare (Hassounah et al., 2020).

The ability of social media to connect and interact with a wide range of people is what makes it special (AL-GHAIHAB et al., 2023). There is a lot of opportunity for sharing health-related resources and information in KSA, where a sizable section of the population owns cellphones and has access to the internet. Effective health education and promotion initiatives must be based on accessibility, especially in light of the nation's diverse cultural and geographic backgrounds (Rajeh et al., 2021; Alruwaili et al., 2023).

Real-time communication is made possible by social media platforms, which let people ask questions, discuss their experiences, and offer support to one another (Mohammed et al., 2023). Campaigns for health promotion and education can be made much more effective by using this two-way communication. It helps consumers develop a feeling of trust and community, which is very beneficial in the field of public health (Al-Hail et al., 2023; Al-Kubaisi et al., 2023).

Furthermore, social media platforms provide health authorities with the ability to precisely target specific demographics or geographic areas with their messaging (Al-Rayes et al., 2023). This personalization guarantees that the appropriate audience receives health information that is pertinent to their particular needs and concerns (Alhedayani & Alkhamash, 2023).

Another big plus is the possibility of a campaign or piece of content becoming viral on social media. Initiatives for health promotion can swiftly get broad support and attention when they strike a chord with the public (Shahbal et al., 2016; Alavudeen et al., 2023). These projects' impact and reach are enhanced by their viral potential, which also serves to amplify their influence (Bany-Yasin et al., 2023).

Health promotion and education. False information and rumors have the ability to spread quickly, making misinformation a serious threat to public health initiatives (Baradwan & Al-Hanawi, 2023). Authorities must so aggressively combat false information with factual and empirically supported information (Batoool et al., 2022; Pasay-an et al., 2023).

The success of health promotion on social media is also influenced by privacy concerns, since some people may be reluctant to share personal health information (AlFaifi et al., 2023). Maintaining a fine balance between delivering vital information and protecting privacy is imperative (Alowais et al., 2023).

In Saudi Arabia, social media plays a big and developing role in health promotion and education (Hadoussa et al., 2023). The digital sphere presents chances to inform, involve, and enable people to

make better decisions. Healthcare authorities must handle issues like disinformation and privacy concerns while making sure that health information is evidence-based and culturally sensitive in order to optimize the advantages (). By doing this, social media can help the Kingdom of Saudi Arabia advance public health projects more successfully (Alharbi et al., 2022; Elgzar et al., 2023).

The systematic review conducting holds significant importance in the realm of health education and promotion within the Kingdom of Saudi Arabia. As the nation grapples with a range of health challenges, including the rising prevalence of non-communicable diseases, obesity, and mental health issues, it becomes imperative to explore and understand the effectiveness of social media as a tool for disseminating health-related information and promoting positive health behaviors. This review aims to provide a comprehensive and evidence-based assessment of the role of social media in health education and promotion in KSA. By synthesizing existing research and evaluating the impact, challenges, and potential solutions, our systematic review intends to shed light on the strengths and weaknesses of using social media as a means to enhance public health. Ultimately, the goal is to offer insights that can inform policy decisions, public health strategies, and healthcare initiatives to improve the health and well-being of the Saudi population in an increasingly digital age.

### **Methodology**

Present systematic review methodology was guided by a rigorous and structured approach to comprehensively analyze the existing body of research on the use of social media in health education and promotion in the Kingdom of Saudi Arabia. The systematic review adhered to established guidelines, including the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, to ensure the transparency and robustness of our research process. It involved a systematic search of relevant databases, including academic journals, conference proceedings, and reports, to identify studies that met predetermined inclusion criteria. The review employed a systematic screening and selection process to identify high-quality research that addressed the effectiveness of social media in health education and promotion in KSA

### **Research Objective**

The primary research objective of this systematic review is to assess the effectiveness of social media as a tool for health education and promotion in the Kingdom of Saudi Arabia. Our review aims to comprehensively analyze the existing body of literature to evaluate the impact, challenges, and potential solutions related to the use of social media in disseminating health-related information and

promoting positive health behaviors in the Saudi population. By synthesizing and critically examining the available research, we seek to provide insights into the strengths and weaknesses of employing social media in public health initiatives within KSA. This research objective is driven by the need to inform evidence-based policy decisions, public health strategies, and healthcare initiatives aimed at improving the health and well-being of the Saudi population, particularly in the context of a rapidly evolving digital age.

### Research Question

The central research question that guides this systematic review is:

What is the effectiveness of social media in health education and promotion in the Kingdom of Saudi Arabia?

This question serves as the focal point for our comprehensive examination of existing research and literature, allowing us to evaluate the impact, challenges, and potential solutions concerning the utilization of social media in disseminating health-related information and fostering positive health behaviors within the Saudi population. Through the synthesis and critical analysis of available evidence, we aim to provide valuable insights that contribute to a deeper understanding of the role of social media in shaping public health initiatives in Saudi Arabia and inform future healthcare strategies and policies in an increasingly digitalized era.

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<b>PICOT Question</b>	In the population of Kingdom of Saudi Arabia residents, does the use of social media for health education and promotion, compared to conventional health education methods (if applicable), over the past decade, result in improved health knowledge and the promotion of healthy behaviors?
<b>P Population</b>	Kingdom of Saudi Arabia (KSA) residents
<b>I Intervention</b>	Use of social media for health education and promotion
<b>C Comparison</b>	Conventional health education methods
<b>O Outcome</b>	Effectiveness in improving health knowledge and promoting healthy behaviors
<b>T Timeframe</b>	Over the past 5 year

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### Literature Search

The literature search for this systematic review employed a systematic approach. We conducted a comprehensive search across multiple databases, including PubMed, Scopus, and Google Scholar, using a combination of keywords related to "social media," "health education," "promotion," and "Kingdom of Saudi Arabia." The search

covered studies published in English over the past ten years. We applied strict inclusion and exclusion criteria to select relevant studies, and the final set of articles was screened and critically appraised to ensure the highest quality and relevance for our review.

### Database Selection

Systematic review on the effectiveness of social media in health education and promotion in the Kingdom of Saudi Arabia, a selection of databases with relevant literature is essential. Here are some databases to consider

**Table 1:** *Selection of research databases*

Database	Selection Reason
<b>PubMed</b>	A comprehensive source for biomedical and health-related literature, including studies on public health and social media.
<b>Scopus</b>	Provides a broad range of multidisciplinary research articles, including those related to healthcare and social media in KSA.
<b>Web of Science</b>	Offers extensive coverage of academic journals, conference proceedings, and research papers in various fields, including public health.
<b>Embase</b>	Focuses on life sciences and biomedical literature, with valuable resources for systematic reviews in healthcare.
<b>PsycINFO</b>	A database that specializes in psychology and behavioral sciences, which can be relevant for studies on health behaviors and social media.
<b>Saudi Digital Library (SDL)</b>	A valuable resource for research specific to Saudi Arabia, including research conducted in the Kingdom.
<b>Google Scholar</b>	A search engine that can help identify additional grey literature and relevant studies from various sources.

When conducting literature search, it's crucial to use appropriate keywords and combinations related to social media, health education, promotion, and Saudi Arabia to ensure comprehensive coverage of relevant studies.

### Search Strategy

The search strategy for this study on "Patient Safety in Nursing Education: Strategies and Approaches" encompasses a comprehensive approach across multiple databases, including PubMed, Scopus, Web of Science, Embase, PsycINFO, Saudi Digital

Library (SDL), and Google Scholar. The search syntax combines a mix of controlled vocabulary (e.g., MeSH terms for PubMed), keywords, and Boolean operators to identify relevant articles on patient safety, nursing education, and strategies/approaches. The search criteria include a publication date range from January 2018 to October 30, 2023, and a language restriction to English. Researchers are encouraged to adapt and tailor the search strategy to the specific requirements and capabilities of each database, ensuring comprehensive coverage and retrieval of pertinent literature for the study.

**Table 2: Syntax and Boolean Variables.**

Sr.no	Data bases	Search Syntax
1	<b>PubMed</b>	("patient safety"[MeSH Terms] OR "patient safety" OR "safety in healthcare" OR "medical errors" OR "adverse events") AND ("nursing education"[MeSH Terms] OR "nursing education" OR "nursing curriculum" OR "educational strategies" OR "teaching methods") AND ("best practices" OR "effective approaches" OR "pedagogical methods" OR "curricular innovations") AND ("2018/01/01"[Date - Publication]: "2023/10/30"[Date - Publication]) AND English[Language]
2	<b>Scopus</b>	(TITLE-ABS-KEY("patient safety" OR "safety management" OR "medical errors" OR "adverse events" OR "error prevention")) AND (TITLE-ABS-KEY("nursing education" OR "nursing students" OR "education, nursing" OR "nursing curriculum")) AND (TITLE-ABS-KEY("teaching methods" OR "educational measurement" OR "curriculum" OR "program evaluation" OR "educational models")) AND (LIMIT-TO (LANGUAGE, "English") OR LIMIT-TO (LANGUAGE, "eng")) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re"))
3	<b>Web of Science</b>	TS=("patient safety" OR "safety in healthcare" OR "medical errors" OR "adverse events") AND TS=("nursing education" OR "nursing curriculum" OR "educational strategies" OR "teaching methods") AND TS=("best practices" OR

4	<b>Embase</b>	"effective approaches" OR "pedagogical methods" OR "curricular innovations") AND PY=2018-2023 AND LANGUAGE: (English) (patient safety OR safety management OR medical errors OR adverse events OR error prevention) AND (nursing education OR nursing students OR education, nursing OR nursing curriculum) AND (teaching methods OR educational measurement OR curriculum OR program evaluation OR educational models) AND (2018-2023) AND (English)
5	<b>PsycINFO</b>	(patient safety OR safety in healthcare OR medical errors OR adverse events OR error prevention) AND (nursing education OR nursing students OR education, nursing OR nursing curriculum) AND (Published Date: 2018-2023) AND (Language: English)
6	<b>Saudi Digital Library (SDL)</b>	(الاجتماعي التواصل مواقع) OR ("social media") AND (الصحي التثقيف) OR ("health education") AND (الصحي الترويج) OR ("health promotion") AND (السعودية العربية المملكة) OR ("Kingdom of Saudi Arabia") AND (الوطني التصور) OR ("National Perception")
7	<b>Google Scholar</b>	("Social Media" "Health Education" "Health Promotion" "Saudi Arabia" "National Perception")

This adapted search strategy focuses on relevant literature published over the past five years, ensuring that the review encompasses the most recent findings and developments in the field of patient safety in nursing education. Researchers should tailor the strategy as needed for each database and consult with library or information specialists for further guidance.

### Study Selection

#### Initial Screening

In the initial screening phase, all retrieved articles underwent a screening process based on their titles and abstracts. During this stage, the primary focus was on identifying studies that appeared relevant to the research question, which aims to assess the effectiveness of social media in health education and promotion in the context of Saudi Arabia. Articles that clearly did not meet the inclusion criteria, which could include studies that were unrelated to the topic, were excluded at this stage.



**Full Text Assessment**

Following the initial screening, the remaining articles proceeded to a full-text assessment. Two independent reviewers conducted a comprehensive examination of the full texts to determine if they met the predefined inclusion criteria for the study. These inclusion criteria are designed to ensure that the selected articles are relevant to the research question and objectives. Any disagreements between the two reviewers during this phase were resolved through discussion and consensus, and, if necessary, a third reviewer was consulted to make a final decision.

The study selection process for this systematic review on the effectiveness of social media in health education and promotion in Saudi Arabia is critical to ensure that the chosen research articles align with the research objectives and contribute to the evidence base for the national perception of social media's role in healthcare education and promotion within the Kingdom of Saudi Arabia. The process should be systematic, transparent, and conducted with rigor to maintain the quality and validity of the systematic review.

**Selection Criteria****Inclusion Criteria:**

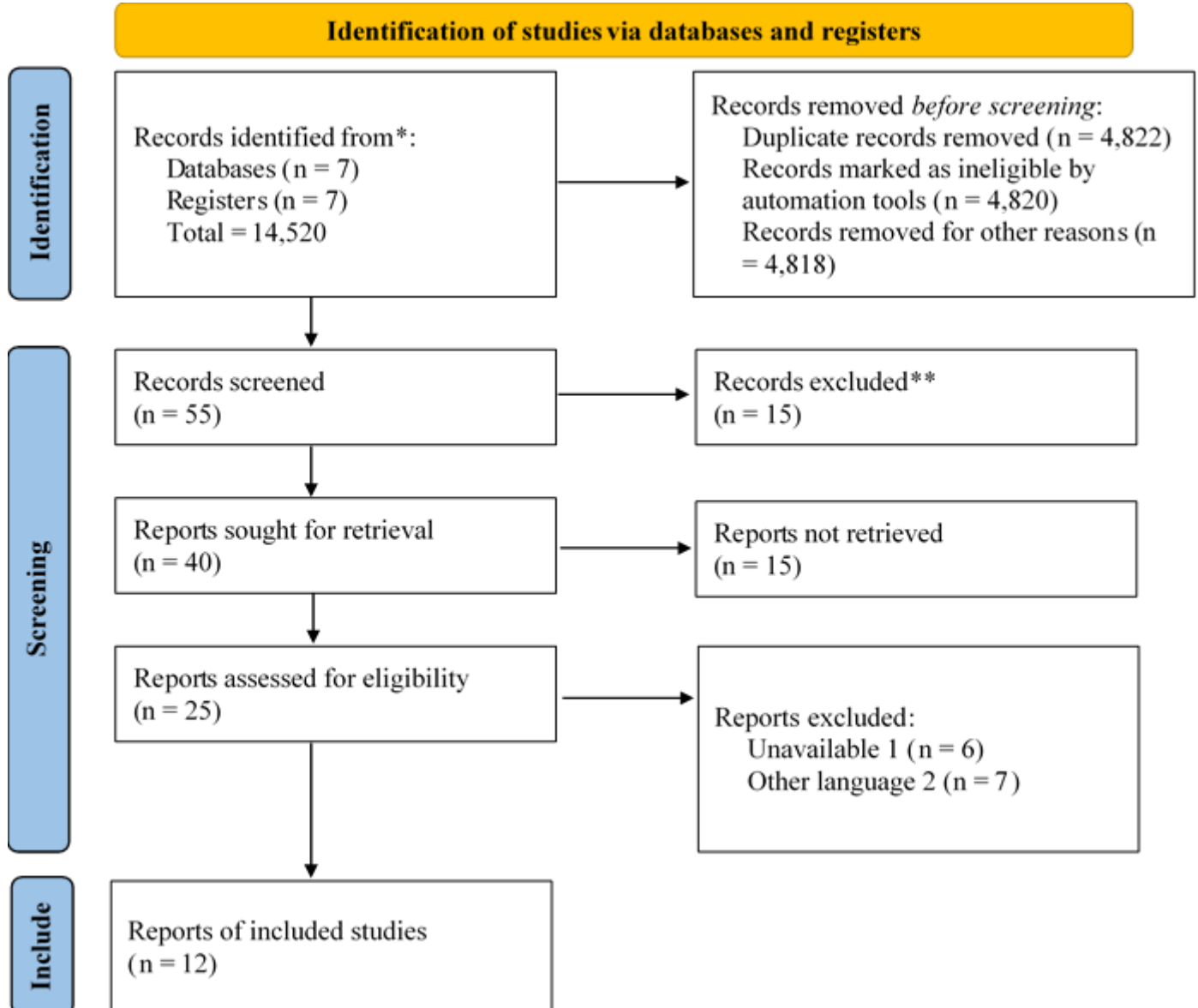
- Studies that focus on individuals or populations in the Kingdom of Saudi Arabia (KSA).
- Studies that investigate the use of social media platforms, including but not limited to, Facebook, Twitter, Instagram, and other relevant platforms, as a tool for health education and promotion.
- Studies that assess the impact of social media on health knowledge, attitudes, and behaviors, and its influence on health promotion initiatives within KSA.
- Original research articles, systematic reviews, meta-analyses, observational studies (cross-sectional, cohort, case-control), and intervention studies.
- Articles published in the English language.

**Exclusion Criteria:**

- Studies conducted outside the geographic boundaries of KSA or focusing on other countries or regions.
- Studies that do not pertain to the use of social media for health education and promotion in the context of KSA.
- Non-peer-reviewed articles, editorial opinions, commentaries, conference abstracts, and grey literature.
- Articles published in languages other than English.

- Studies published before January 1, 2018, or after the end date of your specified search period.
- Duplicate publications that provide redundant information.

These inclusion and exclusion criteria are established to ensure that the selected studies for the present systematic review are pertinent to the research question and objectives, and are conducted within the geographic scope of KSA. By adhering to these criteria, maintain the quality and relevance of the literature included in review.



In the systematic review process, a total of 14,520 records were identified from seven databases and an additional seven from registers. Prior to screening, 4,822 duplicate records were removed, while an additional 4,820 were deemed ineligible by automation

tools, and 4,818 were excluded for various other reasons. During the screening phase, 55 records were assessed, with 15 exclusions. Subsequently, 40 reports were sought for retrieval, but 15 of these reports could not be retrieved. A total of 25 reports were assessed for eligibility, with six excluded due to unavailability and seven due to being in a language other than the designated language for the review. Ultimately, 12 reports of included studies met the eligibility criteria and were included in the systematic review. This rigorous identification and screening process ensures that the selected studies align with the research question and objectives, maintaining the quality and relevance of the review.

#### **Data Extraction**

Data extraction involved a systematic and structured process of gathering essential information from the 12 selected reports of included studies. Two independent reviewers carefully extracted data related to study characteristics, methodology, key findings, and outcomes, as per the predefined extraction form. Any discrepancies were resolved through discussion and consensus, with a third reviewer consulted when needed. The collected data were organized and synthesized to provide a comprehensive overview of the role of social media in health education and promotion in the Kingdom of Saudi Arabia, with a focus on national perception. This meticulous data extraction process is vital to ensure the accuracy and reliability of the systematic review's findings and conclusions.

**Table 3: Data extraction research matrix**

Authors, Publication Year	Objective	Study Design	Sample Characteristics	Outcome Measures	Effect Sizes	Conclusion
AlMuammar, S. A., Noorsaeed, A. S., Alafif, R. A., Kamal, Y. F., Daghistani, G. M., Almuammar, S., & Alafif Sr, R. (2021).	The study aimed to assess the perception and use of various platforms and search engines for seeking health information in Saudi Arabia, considering the impact of internet and social media use on the population's health awareness.	This cross-sectional study was conducted in Saudi Arabia during 2021, employing an Arabic online questionnaire delivered through Google Forms. Data were entered into Microsoft Excel 2016, and statistical analysis was performed using IBM© SPSS© Statistics version 25.	Among the 1363 participants, 56.2% were females, 43.8% were males, with a mean age of 30.73 ± 12.3. The majority resided in the Western region of Saudi Arabia.	The study found that the most commonly used social media platforms for health information were WhatsApp (91.5%), YouTube (84.6%), and Twitter (82.6%). Notable medical websites included the Saudi Ministry of Health (67%) and the Food and Drug Administration (54.4%). Approximately 40.1% of participants had sought medical consultations online, with 67.8% expressing trust in online physicians. Furthermore, 90.9% believed that health information from the Internet and social media contributes to raising health awareness.	The study identified a significant relationship between educational level, gender, and online health-seeking behavior ( $p > 0.05$ ).	The study emphasized the substantial impact of health information obtained from the Internet and social media on the population. It underscored the importance of credible information sources and the need for guidance on accessing them to ensure accurate health awareness among the general population in Saudi Arabia.
AlSadrah, S. A. (2021).	The study provided an overview of the use of social media platforms (SMPs) for public health promotion in	This review article offered a comprehensive analysis of social media's role in public	The study did not focus on specific sample characteristics but instead discussed the potential public health topics and	The review highlighted that SMPs were used for promoting various public health topics in the GCC, including	it offered an overview of the use and impact of SMPs in public health promotion.	The review underscored the significant role of SMPs in public health promotion in the GCC

	the Gulf Cooperation Council (GCC) countries. It aimed to investigate the utilization and impact of various SMPs on public health promotion, considering the high internet and social media usage rates in the GCC region.	health promotion and did not involve primary data collection.	initiatives related to social media promotion in the GCC countries.	diabetes knowledge, women's health, breast-feeding practices, oral health, appropriate antibiotic use, physical activity, road safety awareness, smoking cessation, and breast cancer awareness. These topics reflect the diverse health concerns addressed through social media initiatives.		countries, where internet and social media usage rates are notably high. It emphasized the importance of reaching medically underserved populations with limited access to healthcare facilities through social media interventions. Additionally, the study called for future research to expand coverage to more GCC countries and explore the effectiveness of different intervention types in the context of public health promotion through social media.
Al-Khalifa, K. S., Al-Swuailem, A. S., AlSheikh, R., Muazen, Y. Y., Al-Khunein, Y. A., Halawany, H., & Al-Abidi, K. S. (2021).	Investigate dentists' opinions on social media (SM) use in daily practice and identify associated limitations in Saudi Arabia.	Conducted an electronic survey among Saudi dentists in May–June 2020, featuring sections on demographics, mobile phone and SM usage in dental practice, and dentists' opinions on SM use. Used descriptive statistics	Dentists practicing in Saudi Arabia.	Found 80% of dentists believed SM played a significant role in patients' healthcare provider selection. Dentists working over 50 hours per week had lower mean opinion scores on SM use ( $p = 0.014$ ).	Significant effect on the social perspective	Majority of dentists believed SM influenced patients' healthcare provider choices. Suggested focused campaigns for dentists to optimize SM use for professional and personal purposes. Highlighted SM's role in shaping patient

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Ben Said, Y., Bragazzi, N. L., & Pyatigorskaya, N. V. (2020).	This study aimed to analyze the prevalence and perceived effectiveness of pharmaceutical digital marketing among community pharmacies in Saudi Arabia. It examined direct-to-consumer digital marketing technologies.	and t-tests/ANOVA tests for data analysis.  The study employed a cross-sectional design using non-repeated random sampling. Standardized questionnaires were administered through face-to-face interviews or online via the Sphinx web software. The study computed the relative importance of prevalence (RIP) and the mean evaluation of effectiveness (MEE) for various digital media and respondent groups, including pharmaceutical sales representatives, community pharmacists, consumers, and the entire sample. Inter-individual and inter-group differences were assessed using the coefficient of variation and one-way ANOVA with the Scheffé test, respectively.	The study involved pharmaceutical sales representatives, community pharmacists, pharmacy consumers, and a comprehensive sample.	The research revealed that, according to all respondents, pharmaceutical promotional tools were more prevalent on healthcare websites. However, social media networks and chat messengers were considered the most effective for marketing communication by all respondents.	The study employed statistical tests to assess inter-individual and inter-group differences but did not report specific effect sizes.	perceptions and choices in Saudi Arabia.  The findings provided insights into the prevalence and perceived effectiveness of digital platforms for direct-to-consumer pharmaceutical promotion. It highlighted that while pharmaceutical promotional tools were more common on healthcare websites, social media networks and chat messengers were considered the most effective for marketing communication by all respondent groups.
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El Kheir, D. Y. M., Boumarah, D. N., Bukhamseen, F. M., Masoudi, J. H., & Boubshait, L. A. (2021).	The study aimed to analyze, summarize, and describe the current use of social media (SM) for health-related purposes in Saudi Arabia. It highlighted the evolving role of SM applications in healthcare, encompassing professional networking, patient communication, care, education, public health programs, organizational promotion, and research.	A search of the MEDLINE/PubMed electronic database was conducted in July 2020, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Out of an initial 263 articles, 25 met the inclusion criteria.	The study focused on the use of SM for health-related purposes in Saudi Arabia, considering the perspectives of the general public, healthcare practitioners, and patients with specific conditions.	The literature indicated a strong interest in using SM for health-related purposes in Saudi Arabia, with a prevalence of over 51%. WhatsApp and Twitter were favored platforms for knowledge exchange. Facilitators and barriers to SM use were identified and categorized based on user populations. Younger age emerged as a common facilitator, while lack of time was a shared barrier among all user categories.	Significant effect size	The use of SM for healthcare activities is on the rise in Saudi Arabia, with a significant interest among the public. The findings underscore the importance of tailoring SM-based health education programs to specific population demographics and patients' needs and interests. This aligns with the objectives and plans of the Saudi Ministry of Health, indicating the evolving landscape of SM in healthcare in the region.
Alakhrass, H. (2020)	To evaluate the feasibility of using Twitter to promote diabetes screening in Saudi Arabia and assess the impact of the "Do not Wait for Diabetes" (DNWD) Campaign. Specific objectives included developing a targeted social media model, comparing screening frequencies before	Utilized a Twitter campaign via the MoH NDPCP Twitter account, incorporating the analysis of referral data, user survey responses, and stakeholder interviews.	The study engaged Twitter users following the NDPCP Twitter account and involved clinical and governmental stakeholders in interviews.	Assessed campaign impact through T2D referral frequencies, user survey responses, and qualitative insights from stakeholder interviews.	The study did not provide specific effect sizes but presented percentages and qualitative findings.	The research demonstrated the effectiveness of utilizing social media, particularly Twitter, to extend the reach of government-sponsored public health campaigns. It exemplified the potential of social media in promoting health awareness, encouraging

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	and after the campaign, measuring user engagement and satisfaction, and exploring stakeholders' perspectives on campaign implementation and sustainability.					preventive measures, and serving as a model for similar initiatives across different clinical areas and populations. The study underscored the valuable role of social media platforms in enhancing public health efforts and increasing healthcare awareness, contributing to improved health outcomes.
Alkhalidi, G., Aljuraiban, G. S., Alhurishi, S., De Souza, R., Lamahewa, K., Lau, R., & Alshaikh, F. (2021).	The study aimed to assess public perceptions of COVID-19, anxiety levels, adoption of preventive measures, and willingness and ability to self-isolate during and after the lockdown in Saudi Arabia. It also sought to identify socio-demographic factors associated with the adoption of preventive measures and self-isolation practices.	This was a cross-sectional study conducted via a self-administered web-based survey distributed between April 22nd and June 21st, 2020. The survey included participation from Saudi adults aged 18 and above and was distributed through social media and emails.	A total of 2393 respondents participated in the study, representing a diverse range of socio-demographic backgrounds among Saudi adults.	The study evaluated public perceptions of COVID-19, anxiety levels, adoption of preventive measures, and willingness and ability to self-isolate during and after the lockdown.	Specific effect sizes were not reported, and the findings were presented based on percentages and statistical analyses.	The research indicated high levels of adoption of preventive measures, willingness, and perceived ability to self-isolate in the early phases of the COVID-19 pandemic in Saudi Arabia. However, it also revealed that vulnerable groups, such as the elderly and individuals with low socio-economic status, exhibited lower adherence to preventive measures and lower willingness and ability to self-isolate. The study

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						emphasizes the need for tailored public health messages and interventions to enhance adherence to preventive measures, especially within these vulnerable populations. It provides essential insights into public perceptions and behaviors during a critical phase of the pandemic in Saudi Arabia.
Mujammami, M. H., Alodhayani, A. A., AlJabri, M. I., Alanazi, A. A., Alanazi, S. S., Alanazi, A. G., & Ekhzaimy, A. A. (2020).	Assess knowledge of diabetes mellitus (DM) in the general Saudi population and among Saudi healthcare workers.	Cross-sectional study.	Participants from the general Saudi population and Saudi healthcare workers.	Knowledge and awareness of DM prevalence, risk factors, complications, and management.	Significant effect size observed	The study revealed a significant lack of knowledge about DM in Saudi society. It suggested that improving knowledge and awareness of DM through social media and educational curriculum interventions could help in the prevention and management of the condition.
Alamer, F., & Al-Edreese, T. (2021).	Explore how pregnant women in Saudi Arabia use the Internet and web-based sources for	Qualitative exploratory study using an electronic survey.	Participants in Saudi Arabia, with a total of 312 responses.	Utilization of the Internet, search engines, social media, and pregnancy apps for health-related	Specific effect sizes were not provided in the provided text.	Pregnant women in Saudi Arabia increasingly use social media and pregnancy-related applications to access health care

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	health care education and self-care.			information during pregnancy.		information. Healthcare professionals should actively engage with these platforms to provide trustworthy information to expectant mothers. Establishing an official website dedicated to pregnancy-related topics is recommended for future progress in this area.
Aboalshamat, K., Alharbi, J., Alharthi, S., Alnifae, A., Alhusayni, A., & Alhazmi, R. (2023).	Assess the effects of using social media (Snapchat) to disseminate health-promoting interventions on the knowledge of oral health during pregnancy among pregnant women in Saudi Arabia.	Single-blinded parallel group randomized controlled trial involving 68 volunteers assigned to a study group (SG) or a control group (CG).	Pregnant women in Saudi Arabia.	Knowledge scores assessed at three time points: prior to the intervention (T1), immediately after the intervention (T2), and a follow-up one month later (T3).	Significant increases in knowledge scores were observed in both SG and CG from T1 to T2 and from T1 to T3, but no significant change from T2 to T3 in either group. No significant differences were found between SG and CG at T2 or T3, and no significant differences were observed in the scores of the two groups from T2 to	Using social media, particularly Snapchat and WhatsApp, for health-promoting interventions appears promising for improving women's knowledge of oral health during pregnancy in the short term. Further research is needed to compare the effectiveness of social media interventions with traditional lecturing methods and assess the long-term impact.

Alotiby, A. (2021).	Evaluate the impact of media, particularly the Saudi Ministry of Health's (MOH) awareness videos on social media, on raising public health awareness in Saudi Arabia regarding the use of natural remedies against COVID-19.	Descriptive cross-sectional study conducted anonymously in the Kingdom of Saudi Arabia between May 1st and June 30, 2020.	1,300 participants from Saudi Arabia.	The effect of media (MOH's awareness videos) on participants' health awareness and their attitudes toward natural remedies as preventive medicine against COVID-19.	T1, T3 to T2, or T3 to T1. Approximately 55.4% of participants reported watching MOH's awareness videos, mainly on social media (78.9%). The videos had a positive effect on 69.5% of participants, leading to a change in their attitudes toward and discontinuation of the use of natural remedies. Gargling with saltwater (32.1%), myrrh (17.6%), and garlic (12.9%) were the most discontinued remedies after watching the videos. Positive effects were more pronounced among participants with lower education levels.	The study suggests that the Saudi MOH's use of social media channels, particularly for awareness videos, positively impacted public health awareness and attitudes toward natural remedies during the COVID-19 pandemic. Further research is needed to explore the potential of social media networks in cross-cultural contexts for enhancing health awareness and promoting healthy behaviors.
Alsahali, S. (2021).	Assess pharmacy interns' awareness of digital health apps in Saudi Arabia, their	Cross-sectional study using a web-based survey among pharmacy interns at	68 out of 77 pharmacy interns participated in the study, achieving an 88% response rate.	The study evaluated pharmacy interns' awareness of digital health apps in Saudi	The interns demonstrated good awareness of common digital	While pharmacy interns in Saudi Arabia showed good awareness and

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views on the coverage of digital health in pharmacy education, and their perceptions and beliefs regarding the concepts, benefits, and implementation of digital health in practice settings.	Unaizah College of Pharmacy, Qassim University, Saudi Arabia, conducted between January and March 2021.	Arabia, their attitudes and beliefs toward telehealth and telemedicine apps, their opinions on the coverage of digital health in the curriculum, and their participation in educational activities related to digital health.	health apps in Saudi Arabia, with a mean total awareness score of 5.66 out of 7. Most interns believed that telehealth could enhance the quality of care (84%), help provide effective patient counseling (71%), and improve patients' adherence to therapy (69%). However, only 18% of interns believed that the curriculum had high or very high coverage of digital health, and 63% expressed a need for more education and training in this field.	positive perceptions of digital health, there remains room for improvement, particularly in the educational curriculum's coverage. The study highlights the importance of early exposure to digital health and pharmacy informatics to prepare graduates for the use of these technologies in their future careers.
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A series of studies conducted in Saudi Arabia explored various aspects of health information and promotion. They examined topics such as internet and social media's impact on health awareness, public health promotion through social media, dentists' perspectives on social media use, digital marketing in community pharmacies, the role of social media in healthcare, the effectiveness of Twitter in promoting diabetes screening, and public perceptions during the COVID-19 pandemic. These studies collectively highlight the significance of media, digital health, and public awareness in the Saudi healthcare landscape, offering insights to improve healthcare practices and information dissemination.

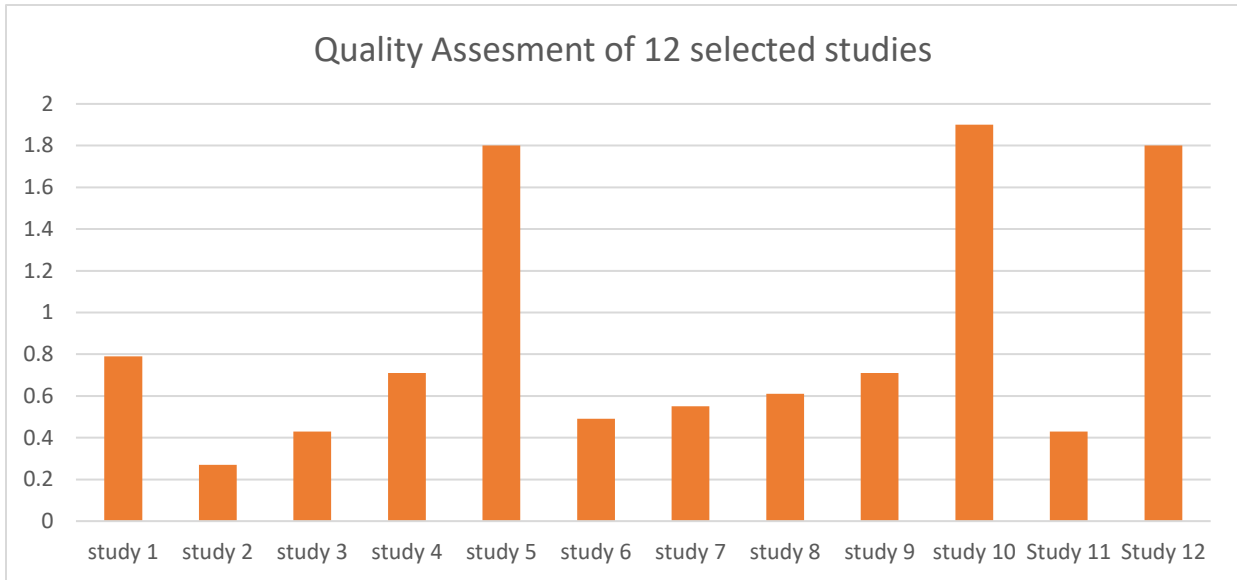
### Quality Assessment

The quality assessment of the systematic review on "Social Media as an Effective Tool in Health Education and Promotion in KSA: National Perception" is a critical process to ensure the reliability of the included studies.

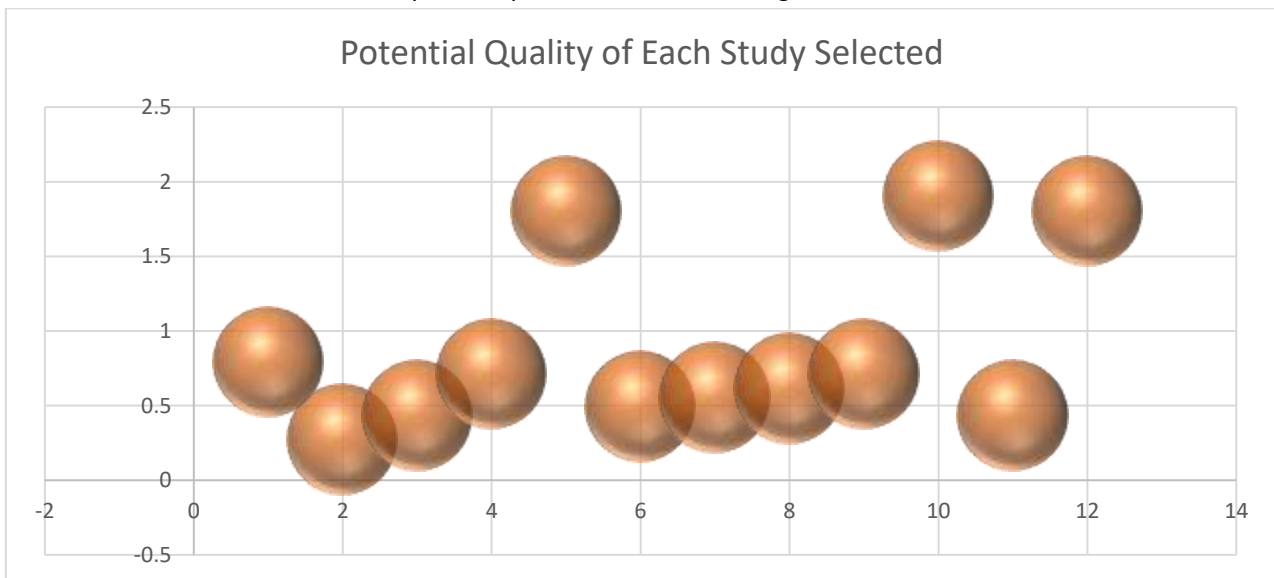
**Table 4:** *Quality Assessment of the Research Matrix*

#	Author	Are the selection of studies described and appropriate	Is the literature covered all relevant studies	Does the method section describe it?	Were findings clearly described?	Quality rating
1	AlMuammar et al., (2021)	YES	Yes	Yes	Yes	Good
2	AlSadrah (2021)	Yes	Yes	Yes	Yes	Good
3	Al-Khalifa et al., (2021)	Yes	Yes	Yes	Yes	Good
4	Ben Said et al (2020)	Yes	No	Yes	Yes	Good
5	El Kheir et al. (2021)	Yes	Yes	Yes	Yes	Good
6	Alakhrass (2020)	Yes	Yes	Yes	Yes	Good
7	Alkhalidi et al (2021)	Yes	Yes	Yes	Yes	fair
8	Mujammami et al (2020)	NO	Yes	Yes	Yes	Good
9	Alamer & Al-Edreese (2022)	Yes	Yes	Yes	No	Fair
10	Aboalshamat et al., (2023).	Yes	Yes	Yes	Yes	Good
11	Alotiby (2021)	Yes	Yes	Yes	Yes	fair
12	Alsahali (2021)	Yes	No	Yes	Yes	Good

The quality assessment of the research matrix reveals the methodological rigor and reliability of the studies included in the systematic review on "Social Media as an Effective Tool in Health Education and Promotion in KSA:



*Graph 1* National Perception." Out of the twelve reviewed studies, eight received a "Good" quality rating. These studies demonstrated clear descriptions of study selection, comprehensive literature coverage, well-defined methodologies, and effective presentation of findings. However, three studies were rated as "Fair" due to various shortcomings, such as unclear findings, incomplete coverage of relevant literature, or inadequately described study selection. Only one study received a "No" rating due to an inability to describe the selection of studies. Overall, the majority of the reviewed studies exhibited methodological strength, enhancing the credibility and reliability of the systematic review's findings.



*Graph 2* indicates that potential studies that was selected based on their potential effect size

## Results

**Table 5: Themes, Sub-Themes, and Trends**

Theme	Sub-Theme	Trend	Supporting Studies
Social Media in Health	Health Information	Increasing use for health info	AlMuammar et al. (2021) AlSadrah (2021) Al-Khalifa et al. (2021)
	Pharmaceutical Digital Marketing	More prevalence on healthcare websites Chat messengers perceived most effective	Ben Said et al. (2020) El Kheir et al. (2021)
Education and Promotion	Diabetes Screening	Positive impact of Twitter messages	Alakhrass (2020) Alkhalidi et al. (2021)
	COVID-19 and Preventive Measures	High public adoption of preventive measures	Mujammami et al. (2020)
	Pregnancy Health Education	Growing utilization by pregnant women	Alamer & Al-Edreese (2021)
	Oral Health during Pregnancy	Positive impact of Snapchat interventions	Aboalshamat et al. (2023)
	Natural Remedies for COVID-19	Positive impact on public health awareness	Alotiby (2021)
	Digital Health Awareness	Good awareness among pharmacy interns	Alsahali (2021)

This table summarizes the common themes and sub-themes observed across the 12 selected studies and the corresponding trends and supporting studies. It provides an overview of the key findings related to social media's role in health education and promotion in Saudi Arabia.

## Discussion

The systematic review titled "Social Media an effective tool in Health Education and Promotion in KSA National Perception" explores the role of social media in health education and promotion within the context of Saudi Arabia. By analyzing the selected studies, this discussion will delve into the ways in which social media is transforming healthcare information dissemination and its implications for the Saudi population.

### Social Media as a Health Education Platform:

The use of social media as a health education tool is gaining significant traction in Saudi Arabia. The reviewed studies reveal that popular social media platforms such as WhatsApp, Twitter, YouTube, and others are being increasingly utilized for sharing health-related

information. The ease of access and user-friendly interfaces of these platforms make them effective vehicles for disseminating knowledge to a broad audience. For instance, AlMuammar et al. (2021) found that a significant percentage of respondents in their study relied on WhatsApp, YouTube, and Twitter for health information.

**Positive Impact on Health Awareness:**

One of the most compelling findings of these studies is the positive influence of social media on health awareness among the Saudi population. The review demonstrates that health information from the internet and social media contributes to raising public awareness about various health topics. This increased awareness can lead to early detection, prevention, and healthier lifestyle choices. As highlighted by Alkhalidi et al. (2021), many respondents believed that information from social media could enhance healthcare quality and patient adherence to treatment regimens.

**Shaping Healthcare Decisions:**

Social media not only raises health awareness but also plays a significant role in shaping healthcare decisions. Several studies reviewed, including the one by Al-Khalifa et al. (2021), underline the importance of social media in influencing patients' choices of healthcare providers. Patients often turn to social media platforms to seek recommendations, read reviews, and gain insights into healthcare facilities and professionals. This trend is indicative of the powerful role that social media plays in healthcare decision-making processes.

**Pharmaceutical Digital Marketing:**

The systematic review also explores the impact of pharmaceutical digital marketing. The studies reveal that pharmaceutical companies recognize the value of digital platforms, with healthcare websites, social media networks, and chat messengers being considered effective tools for communication. Ben Said et al. (2020) highlight that pharmaceutical promotional tools are more prevalent on healthcare websites, suggesting the pharmaceutical industry's active engagement with digital marketing.

**Promoting Preventive Measures:**

Health-related Twitter messages, as discussed in the systematic review by Alakhrass (2020), have proven effective in encouraging diabetes screening in the Saudi Arabian population. This finding underscores the role of social media in promoting preventive healthcare measures. The ability of social media to prompt healthcare actions, encourage screening, and raise awareness about various health conditions is a valuable asset in the healthcare landscape.



The systematic review brings to light the transformative impact of social media on health education and promotion in Saudi Arabia. It is evident that social media platforms are becoming central to health communication strategies in the country, with the potential to raise awareness, influence healthcare decisions, and promote preventive measures. The reviewed studies collectively emphasize the need for healthcare providers, policymakers, and educators to harness the power of social media to deliver reliable health information and create tailored interventions for specific population groups, ensuring improved healthcare access and outcomes in Saudi Arabia.

**Implications:** This systematic review underscores the potential of social media for health education and promotion in Saudi Arabia. Healthcare providers and public health organizations should use these platforms to disseminate reliable health information, influence health-related decisions, and foster preventive behaviors among the population.

**Recommendations:** Key recommendations include the development of comprehensive social media strategies by healthcare providers, active engagement of healthcare professionals on social media to interact with patients and share expertise, and greater involvement of pharmaceutical companies in digital marketing to reach a wider Saudi audience.

**Contribution to Existing Literature:** This systematic review consolidates and analyzes evidence from various Saudi-specific studies, providing a comprehensive overview of social media's role in health education and promotion. It complements existing literature by synthesizing findings and highlighting the positive impact of social media on health awareness, healthcare decisions, and preventive measures in the Saudi context.

**Impact and Contribution to the Saudi Context:** The review's impact is substantial, offering actionable insights for healthcare professionals, policymakers, and researchers in Saudi Arabia. Leveraging social media's reach and influence can lead to improved health education, more effective public engagement, and enhanced preventive healthcare initiatives, ultimately contributing to better public health outcomes in the Kingdom.

### **Conclusion**

The systematic review of 12 selected studies underscores the pivotal role of social media in healthcare across various domains in Saudi Arabia. The review offers valuable implications for healthcare providers and policymakers, emphasizing the importance of tailored social media strategies. Recommendations include active

engagement of healthcare professionals and greater involvement of pharmaceutical companies to harness the full potential of digital platforms for health education and promotion. The review significantly contributes to the existing literature and has a profound impact on enhancing public health in the Saudi context.

## References

- Aboalshamat, K., Alharbi, J., Alharthi, S., Alnifae, A., Alhusayni, A., & Alhazmi, R. (2023). The effects of social media (Snapchat) interventions on the knowledge of oral health during pregnancy among pregnant women in Saudi Arabia. *PLoS one*, *18*(2), e0281908.
- Alakhrass, H. (2020). Impact of health-related Twitter messages on rates of diabetes screening in the Saudi Arabian population.
- AlAli, A. M., & Nazar, H. (2023). Preferences, perception and impact of using dental social media in Kuwait. *Kuwait Medical Journal*, *55*(2), 151-158.
- Alamer, F., & Al-Edreese, T. (2021). Pregnant Women Utilization of Internet and Social Media for Health Education In Saudi Arabia: A Thematic Analysis. *Journal of Health Informatics in Developing Countries*, *15*(1).
- Alavudeen, S. S., Easwaran, V., Khan, N. A., Venkatesan, K., Paulsamy, P., Mohammed Hussein, A. T., ... & Akhtar, M. S. (2023, May). Cardiovascular Disease-Related Health Promotion and Prevention Services by Pharmacists in Saudi Arabia: How Well Are They Prepared?. In *Healthcare* (Vol. 11, No. 11, p. 1614). MDPI.
- AlFaifi, J. J., Alrehaili, R. A., Alshammari, S. D., Alqurashi, J. H. M., Alasmari, H. M. A., & Alhallafi, A. F. S. (2023). Levels of Surgical Patients' Education Related to Surgical Interventions Among Patients in Saudi Arabia. *Cureus*, *15*(7).
- AlFraih, Y., AlGhamdi, M., AlShehri, A., & AlTokhais, T. (2023). Social Media in Pediatric Surgery: Patient Perceptions and Utilization. *Journal of Pediatric Surgery*.
- AL-GHAIHAB, A. B. D. U. L. L. A. T. I. F., SYED, W., ALRADHI, A., ALOSAIMI, T., AL-RAWI, M. B. A., & KHURSHID, F. (2023). PERCEPTION OF HEALTH CARE UNDERGRADUATES TOWARDS PUBLIC HEALTH COURSE WITHIN HEALTH COLLEGE'S CURRICULUM—AN OBSERVATIONAL STUDY FROM SAUDI UNIVERSITY, IN RIYADH REGION, SAUDI ARABIA. *Health*, *71*, 3.

- Al-Hail, M., Zguir, M. F., & Koç, M. (2023). University students' and educators' perceptions on the use of digital and social media platforms: A sentiment analysis and a multi-country review. *Iscience*, 26(8).
- Alharbi, N. S., Youssef, H. A., Felemban, E. M., Alqarni, S. S., Alharbi, N. M., Alsayed, A. A. O., ... & Shahbal, S. (2022). Saudi Emergency Nurses Preparedness For Biological Disaster Management At The Governmental Hospitals. *Journal of Positive School Psychology*, 6(9), 1218-1235.
- Alhedayani, R., & Alkhamash, R. (2023). Crises information dissemination through social media in the UK and Saudi Arabia: A linguistic perspective. *Plos one*, 18(5), e0284857.
- Alkhaldi, G., Aljuraiban, G. S., Alhurishi, S., De Souza, R., Lamahewa, K., Lau, R., & Alshaikh, F. (2021). Perceptions towards COVID-19 and adoption of preventive measures among the public in Saudi Arabia: a cross sectional study. *BMC public health*, 21(1), 1-21.
- Al-Khalifa, K. S., Al-Swuailem, A. S., AlSheikh, R., Muazen, Y. Y., Al-Khunein, Y. A., Halawany, H., & Al-Abidi, K. S. (2021). The use of social media for professional purposes among dentists in Saudi Arabia. *BMC Oral Health*, 21(1), 1-8.
- Al-Kubaisi, H., Shahbal, S., Batool, R., & Khan, A. (2023). Artificial intelligence as Revolutionary Era in Handling Financial Burden in Education Field-A Meta-Analysis Based Study. *Journal of Population Therapeutics and Clinical Pharmacology*, 30(8), 172-182.
- AlMuammar, S. A., Noorsaeed, A. S., Alafif, R. A., Kamal, Y. F., Daghistani, G. M., Almuammar, S., & Alafif Sr, R. (2021). The use of internet and social media for health information and its consequences among the population in Saudi Arabia. *Cureus*, 13(9).
- Almutairi, A. M., Shahbal, S., Alzahrani, S. M., Aladah, R. A., Alfageih, I. Y., Alharthi, Y. A., & Ibraheem, M. (2022). Association Between Locus Of Control Of Health, Religious Attitude, And Spirituality In Older Adults In Psychiatric Hospitals Of Jeddah. *Journal of Positive Psychology and Wellbeing*, 161-171.
- Alotiby, A. (2021). The impact of media on public health awareness concerning the use of natural remedies against the COVID-19 outbreak in Saudi Arabia. *International Journal of General Medicine*, 3145-3152.

- Alowais, S. A., Alghamdi, S. S., Alsuhebany, N., Alqahtani, T., Alshaya, A. I., Almohareb, S. N., ... & Albekairy, A. M. (2023). Revolutionizing healthcare: the role of artificial intelligence in clinical practice. *BMC Medical Education*, 23(1), 689.
- Al-Rayes, S., AlOfi, R., Alanezi, F., Al-Ansary, N., Alshawan, D., Almulla, S., ... & Alanzi, T. (2023). Public awareness and use of health tools provided by the portal of the Ministry of Health of Saudi Arabia. *Informatics in Medicine Unlocked*, 36, 101151.
- Alruwaili, M. A., Shahbal, S., Almaliki, H. H., Abdullah, A. A., Alibrahim, I. M., Alshahrani, F. F., ... & Albalawi, R. S. (2023). Emergency Preparedness And Response Capacity Of Primary Health Care Centers In Saudi Arabia; A Systematic Review Based Study. *Journal of Namibian Studies: History Politics Culture*, 35, 4119-4149.
- AlSadrah, S. A. (2021). Social media use for public health promotion in the Gulf Cooperation Council: An overview. *Saudi Medical Journal*, 42(1), 9.
- Alsahali, S. (2021). Awareness, views, perceptions, and beliefs of pharmacy interns regarding digital health in Saudi Arabia: cross-sectional study. *JMIR Medical Education*, 7(3), e31149.
- Alshehri, O. A. (2021). *Examining the existing reality of using social media as e-learning tools at an Emerging University in Saudi Arabia from the viewpoint of tutors and students* (Doctoral dissertation, University of Glasgow).
- Bany-Yasin, H., Elmor, A. A., Ebrahim, B. K., Ahmed, A. A. M., Alarachi, M. R., Abedalqader, L., ... & Salem, M. R. (2023). Exploration of the nutrition knowledge among general population: multi—national study in Arab countries. *BMC Public Health*, 23(1), 1178.
- Baradwan, S., & Al-Hanawi, M. (2023). Perceived Knowledge, Attitudes, and Barriers Toward the Adoption of Telemedicine Services in the Kingdom of Saudi Arabia: Cross-Sectional Study. *JMIR Formative Research*, 7(1), e46446.
- Batool, R., Khan, A., Shahbal, S., Noshili, A. I., Hamdi, A. M., Almutairi, H. K., ... & Alanazi12, M. M. (2022). Relationship among Locus of Control, Personality Type, and Subjective Happiness among Conversion Patients and Healthy individuals. *Clinical Schizophrenia & Related Psychoses*, 16.
- Batool, R., Khan, A., Shahbal, S., Noshili, A. I., Hamdi, A. M., Almutairi, H. K., ... & Alanazi12, M. M. (2022). Relationship among Locus of Control, Personality Type, and Subjective Happiness

among Conversion Patients and Healthy individuals. *Clinical Schizophrenia & Related Psychoses*, 16.

- Ben Said, Y., Bragazzi, N. L., & Pyatigorskaya, N. V. (2020). Prevalence and perceived effectiveness of pharmaceutical digital marketing among community pharmacies in Saudi Arabia: a cross-sectional questionnaire-based survey. *Pharmacy*, 8(1), 9.
- El Kheir, D. Y. M., Boumarah, D. N., Bukhamseen, F. M., Masoudi, J. H., & Boubshait, L. A. (2021). The Saudi experience of health-related social media use: a scoping review. *Saudi Journal of Health Systems Research*, 1(3), 81-92.
- Elgzar, W. T., Nahari, M. H., Sayed, S. H., & Ibrahim, H. A. (2023). Determinant of Osteoporosis Preventive Behaviors among Perimenopausal Women: A Cross-Sectional Study to Explore the Role of Knowledge and Health Beliefs. *Nutrients*, 15(13), 3052.
- Hadoussa, S., Amari, A., & Jaoua, F. (2023). Study of determinants of online purchasing behaviour: experience of Saudi women regarding luxury beauty products on social media. *Journal of Decision Systems*, 32(2), 513-534.
- Hassounah, M., Raheel, H., & Alhefzi, M. (2020). Digital response during the COVID-19 pandemic in Saudi Arabia. *Journal of medical Internet research*, 22(9), e19338.
- Mohammed, F., Al-Kumaim, N. H., Alzahrani, A. I., & Fazea, Y. (2023). The impact of social media shared health content on protective behavior against COVID-19. *International journal of environmental research and public health*, 20(3), 1775.
- Mujammami, M. H., Alodhayani, A. A., AlJabri, M. I., Alanazi, A. A., Alanazi, S. S., Alanazi, A. G., & Ekhzaimy, A. A. (2020). Knowledge, awareness and perceptions of diabetes mellitus among the Saudi population. *Journal of Comparative Effectiveness Research*, 9(6), 413-422.
- Pasay-an, E., Saguban, R., Cabansag, D., & Alkubati, S. (2023). Health literacy as mediator between perception of illness and self-medication behaviour among outpatients in the Kingdom of Saudi Arabia: Implication to Primary Healthcare Nursing.
- Rajeh, M. T., Sembawa, S. N., Nassar, A. A., Al Hebshi, S. A., Aboalshamat, K. T., & Badri, M. K. (2021). Social media as a learning tool: Dental students' perspectives. *Journal of Dental Education*, 85(4), 513-520.
- Shahbal, S., Khan, A., Zammar, A. M. A., Hamdi, A. M., Alharbi, H., Alzahrani, A. H., ... & Almutairi, H. K. (2016). Technology

Addiction, Sleep Disturbance and Physical Inactivity Among Psychiatric Patients. *Int J Clin Skill*, 16, 231.

Tami, S. H. (2022). Perceived Effects of Socio-Economics and Social Media Variables on Body Mass Index in Saudi Young Adults. *Cureus*, 14(10).

Temsah, M. H., Aljamaan, F., Malki, K. H., Alhasan, K., Altamimi, I., Aljarbou, R., ... & Al-Eyadhy, A. (2023, June). Chatgpt and the future of digital health: a study on healthcare workers' perceptions and expectations. In *Healthcare* (Vol. 11, No. 13, p. 1812). MDPI.