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Social Media and Artificial Intelligence Chatbot use for Diabetes-Related Health Information Seeking and their Association with Self-Care Activities among Patients with Diabetes Mellitus: A Multicentre Cross-Sectional Study

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ABSTRACT:

Background: Social media and artificial intelligence (AI) chatbots are increasingly used to obtain health-related information. However, their use for diabetes management and their relationships with diabetes self-care activities remain insufficiently explored in Jordan. This study examined the use of social media and AI chatbots for diabetes-related information seeking and investigated factors associated with online information seeking

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and diabetes self-care activities among adults with diabetes in Jordan.

Methods: A quantitative, descriptive, cross-sectional study was conducted using an Arabic-language online questionnaire among 522 adults with diabetes residing in Jordan. Data were collected on sociodemographic and clinical characteristics, internet use, online health information seeking, social media engagement, AI chatbot awareness and use, digital health literacy, perceived credibility of online information, information verification, healthcare professional communication, and diabetes self-care activities. Descriptive statistics, one-way analysis of variance, multiple linear regression, and multiple binary logistic regression were used to analyse the data.

Results: Overall, 74.5% of participants reported seeking health information online during the previous three months. Social media use was reported by 80.7%, while 37.9% had used AI chatbots specifically for diabetes-related information. Among social media users, 43.9% reported changing their self-care practices following exposure to diabetes-related content. Similarly, 41.4% of AI chatbot users reported changing their self-care practices following chatbot advice, while 7.6% reported changing or discontinuing medication without consulting a healthcare professional. Diabetes self-care scores differed significantly across digital-use groups ($F = 10.32$, $p < 0.001$), with the highest mean score among participants using both social media and AI chatbots (4.59 ± 1.09), compared with those using neither platform (3.66 ± 1.12). Multiple linear regression showed that higher eHealth literacy, perceived credibility of online information, more frequent information verification, communication with healthcare professionals, previous diabetes education, and combined social media and AI chatbot use were positively associated with self-care scores. Longer diabetes duration and higher HbA1c levels were negatively associated with self-care scores.

Conclusion: Social media and AI chatbots are commonly used sources of diabetes-related information among adults with diabetes in Jordan. Their combined use was associated with higher self-care scores, although the cross-sectional design does not establish a causal relationship. Strengthening digital health literacy, encouraging verification of online information, and integrating discussions about digital resources into professional diabetes education may support safer and more informed diabetes self-management.

1. INTRODUCTION

Diabetes mellitus is a chronic condition that requires continuous self-management, including appropriate dietary practices, regular physical activity, blood glucose monitoring, medication adherence, and preventive foot care. Effective self-management depends not only on access to healthcare services but also on patients' ability to obtain, understand, evaluate, and apply health information in their daily lives. As digital technologies become increasingly integrated into healthcare, the internet and social media have emerged as important sources of diabetes-related information and peer support. Previous research has demonstrated that people with diabetes use multiple information sources, including healthcare professionals, search engines, online health resources, and social networks, to address their information needs and support disease management (Longo et al., 2010; Shaw & Johnson, 2011; Kuske et al., 2017).

Online health information seeking provides patients with opportunities to access information beyond routine healthcare consultations. Patients commonly search for information about diabetes management, dietary recommendations, medication, and potential complications. However, the extent to which online information is accessed and used varies according to individual, socioeconomic, and health-related characteristics. For example, Jamal et al. (2015) reported that internet use for health information was relatively limited among adults with type 2 diabetes in Saudi Arabia, although most internet users sought health-related information. Similarly, Lui et al. (2015) identified demographic and socioeconomic differences in internet use for diabetes information. Qualitative evidence also suggests that patients combine online searching with

professional advice and personal experiences when interpreting and applying health information (Longo et al., 2010; Newton et al., 2012). These findings highlight the importance of understanding not only whether patients seek online information but also the sources they use and how they incorporate the information into self-management.

Social media has further expanded opportunities for diabetes-related information exchange by allowing patients to access educational content, communicate with others experiencing similar challenges, and share personal experiences. Platforms such as Facebook and YouTube can facilitate informal learning and provide emotional and practical support. Greene et al. (2011) demonstrated that diabetes-focused Facebook communities were used to exchange management strategies, seek advice, and provide emotional support. Fergie et al. (2016a, 2016b) similarly highlighted the role of social media in young adults' experiences of seeking and sharing health information, while Shaw and Johnson (2011) identified the potential of social networking platforms for diabetes education and support. Nevertheless, information shared through social media may vary in accuracy, relevance, and credibility. Patients may therefore encounter misleading recommendations or information that is not appropriate for their individual clinical circumstances, emphasising the need for critical evaluation and professional guidance.

More recently, artificial intelligence (AI) chatbots have introduced another dimension to digital health information seeking. Generative AI platforms, including ChatGPT and Gemini, can provide conversational responses to questions about diabetes, dietary choices, glucose measurements, and disease management. Their interactive format may make health information more accessible and allow patients to obtain explanations tailored to their questions. However, the clinical reliability, accuracy, and readability of AI-generated responses remain important considerations. Faisal et al. (2024) evaluated ChatGPT responses to diabetes-related questions in Urdu and English, highlighting the importance of language and accessibility when using AI for health information. Tekin et al. (2025) examined the quality and readability of ChatGPT-4o responses to diabetes technology questions, while Nayak et al. (2023) demonstrated the potential of a voice-based conversational AI intervention to support basal insulin management in a clinical setting. Although these studies provide encouraging evidence regarding AI applications in diabetes care, they address different aspects of AI use and do not establish whether patients' everyday use of general-purpose AI chatbots is associated with better diabetes self-care.

Digital health literacy is particularly important in this evolving information environment. It encompasses patients' ability to locate, understand, evaluate, and use electronic health information to make informed health decisions. Patients with higher digital health literacy may be better equipped to distinguish reliable information from inaccurate or misleading content and to apply relevant recommendations to their self-management practices. Guo et al. (2021) reported associations between mobile eHealth literacy, diabetes self-care, and glycaemic outcomes among Taiwanese patients with type 2 diabetes. Ji and Chi (2024) also identified relationships between eHealth literacy, diabetes knowledge, self-efficacy, and self-care behaviours. Furthermore, Peimani et al. (2024) demonstrated the importance of eHealth literacy and patient–physician communication in the relationship between online diabetes information seeking and self-care practices. These findings suggest that the potential value of digital information may depend not simply on access or frequency of use but also on patients' ability to evaluate and appropriately apply the information.

Despite the growing literature on digital health information and diabetes management, important gaps remain. Previous studies have generally examined internet use, social media engagement, digital health literacy, or specific AI applications separately. Evidence directly comparing patients who use neither social media nor AI chatbots, those who use either source independently, and those who use both remains limited. Furthermore, the relationships among digital health literacy, perceived credibility, information verification, communication with healthcare professionals, and diabetes self-care require further investigation, particularly in Middle Eastern settings. Therefore, this study examined online diabetes-related health information-seeking behaviours among adults with diabetes in Jordan, with particular attention to social media and AI chatbot awareness and use. It also compared diabetes self-care activities across different digital platform-use groups and investigated sociodemographic, clinical, and digital factors associated with self-care and online information seeking.

1.1 Study purpose and objectives

The purpose of this study was to examine the use of social media and AI chatbots for diabetes-related health information seeking among adults with diabetes mellitus in Jordan and to investigate how these digital information sources, together with digital health literacy, perceived information credibility, information verification practices, and communication with healthcare professionals, are associated with diabetes self-care activities.

The specific objectives were to: 1) Describe the patterns of diabetes-related online health information seeking, including internet use, information sources, and topics accessed by adults with diabetes in Jordan; 2) Examine social media and AI chatbot use for diabetes-related information, including usage patterns, perceived usefulness and credibility, information verification practices, and reported influences on self-care; 3) Assess digital health literacy and related information-management practices, including the ability to evaluate online information and communication with healthcare professionals; 4) Compare diabetes self-care activities among individuals using neither social media nor AI chatbots, social media only, AI chatbots only, or both platforms; and 5) Identify sociodemographic, clinical, and digital-related factors associated with online health information seeking and diabetes self-care activities.

2. MATERIALS AND METHODS

2.1 Study design

A quantitative, descriptive, cross-sectional study was conducted using an online self-administered questionnaire to examine internet use, social media engagement, AI chatbot use, digital health literacy, and diabetes self-care activities among adults with diabetes in Jordan. The study also investigated factors associated with online diabetes-related health information seeking and diabetes self-care practices.

2.2 Study setting

The study was conducted among adults with diabetes residing in different cities and governorates across Jordan. Participants were recruited from 11 governorates: Amman, Irbid, Zarqa, Balqa, Madaba, Karak, Tafileh, Ma'an, Aqaba, Mafraq, Jerash, and Ajloun. This geographical coverage enabled the inclusion of participants from diverse geographical areas and community settings across the country. As data collection was conducted through an online survey, recruitment was not restricted to patients attending specific healthcare facilities, allowing individuals with diabetes from different locations to participate.

2.3 Study Population and Sampling Procedure

The target population comprised adults diagnosed with diabetes mellitus who were living in Jordan and had access to the internet. Participants were eligible if they were aged 18 years or older, had a self-reported diagnosis of diabetes, were residing in Jordan, and were able to understand and complete the Arabic-language questionnaire. Individuals who did not meet these criteria or submitted substantially incomplete questionnaires were excluded.

A non-probability sampling approach combining convenience and snowball sampling was used. Initially, the questionnaire was distributed through social media platforms and online communication networks to reach eligible individuals. Participants were also encouraged to share the survey link with other adults with diabetes who met the eligibility criteria. Convenience sampling facilitated the recruitment of readily accessible participants, while snowball sampling helped extend recruitment through participants' personal and social networks.

2.4 Sample size calculation

The required sample size was estimated using G*Power software. For the multiple linear regression analysis, the calculation can be specified using a fixed-model, (R2) deviation from zero approach, with a medium effect size ($f2 = 0.15$), a significance level of 0.05, and statistical power of 80%. Based on these assumptions, the minimum required sample size was approximately 217 participants. However, a total of 522 participants were included in the final analysis, substantially exceeding the minimum estimated requirement. This larger sample provided a greater number of observations per predictor, enhanced the statistical power of the regression analyses, and improved the precision of the estimated associations. It also provided sufficient observations for examining the relationships between digital health behaviors and diabetes self-care activities while accounting for multiple sociodemographic, clinical, and digital-related variables.

2.5 Study instrument

Data were collected using a structured, self-administered questionnaire developed in Arabic based on the study objectives and relevant literature. The questionnaire consisted of the following sections:

2.5.1 *Section 1: Sociodemographic and clinical characteristics*

This section collected information about participants' age, gender, marital status, educational attainment, employment status, monthly household income, duration of diabetes, diabetes treatment regimen, comorbidities, family history of diabetes, and most recent HbA1c category. Participants were also asked about previous diabetes education.

2.5.2 *Section 2: Internet use and online diabetes-related health information seeking*

This section assessed internet access, frequency and duration of internet use, and whether participants had searched for health-related information online during the previous three months. Participants who reported online information seeking were asked about the frequency of searching, sources of information, and reasons for accessing online diabetes-related information.

2.5.3 *Section 3: Social media use for diabetes-related information*

This section examined social media use during the previous three months, including the platforms used, frequency of use, types of diabetes-related content accessed, perceived trust in information, verification practices, and whether information obtained through social media had influenced participants' diabetes self-care practices.

2.5.4 *Section 4: Awareness and use of AI chatbots*

This section assessed participants' awareness and previous use of AI chatbots for health-related information, including their use specifically for diabetes-related information. Additional questions addressed the AI platforms used, frequency of use, topics searched, perceived usefulness, trustworthiness, verification of AI-generated information, and changes in self-care practices following the use of AI chatbots. Participants were also asked whether they had changed or discontinued their diabetes medication without consulting a healthcare professional.

2.5.5 *Section 5: Digital health literacy and perceptions of online information*

Digital health literacy was assessed using the eHealth Literacy Scale (eHEALS), which consists of eight items assessing individuals' perceived ability to seek, evaluate, and use electronic health information. The total score ranges from 8 to 40, with higher scores indicating greater perceived eHealth literacy.

Additional items assessed perceived credibility of online diabetes-related information, social media information, and AI chatbot responses. Participants were also asked about their confidence in identifying inaccurate online information, frequency of information verification, communication with healthcare professionals about online information, and perceived usefulness of digital information for diabetes self-management.

2.5.6 *Section 6: Diabetes self-care activities*

Diabetes self-care activities were assessed using 10 items covering participants' actual self-management practices during the previous seven days, including the day of survey completion. Participants were asked to indicate the number of days (0–7) on which they had performed each activity. The items assessed adherence to a healthy diabetes-specific eating plan, following dietary recommendations regarding carbohydrate or sugar intake, consuming fruits and vegetables, engaging in at least 30 minutes of physical activity, participating in specific exercise sessions, monitoring blood glucose as recommended by healthcare professionals, taking prescribed diabetes medications as instructed, inspecting the feet for cuts or other abnormalities, washing and drying the feet carefully, and following diabetes self-management recommendations provided by healthcare professionals. Each item was scored from 0 to 7 days, with higher scores indicating more frequent engagement in the corresponding self-care activity. An overall diabetes self-care score was calculated by aggregating the responses across the 10 items, with higher scores reflecting better engagement in diabetes self-care practices.

2.6 Instrument validity, reliability, and pilot study

The study questionnaire was developed in Arabic based on an extensive review of the relevant literature and previously published instruments addressing diabetes self-management, internet and social media use, AI chatbot use, and digital health literacy. Established instruments were incorporated where appropriate, and additional items were developed to address the specific objectives of the study. The Arabic version was used to ensure linguistic clarity, comprehensibility, and cultural appropriateness for the target population in Jordan.

Content validity was assessed by six experts, including three study co-authors and three external experts with relevant academic and professional expertise. They independently reviewed the questionnaire items for relevance, clarity, comprehensiveness, and consistency with the study objectives. Their comments and recommendations were considered, and appropriate modifications were made before the final version was administered. The internal consistency reliability of the questionnaire scales was assessed using Cronbach's alpha coefficients, which ranged from 0.77 to 0.87, indicating acceptable to good internal consistency.

A pilot study was conducted among 33 adults with diabetes who met the study eligibility criteria to evaluate the clarity, comprehensibility, cultural appropriateness, and feasibility of the Arabic questionnaire. The pilot study also assessed the time required to complete the online survey and identified any ambiguous or difficult-to-understand questions. Feedback from pilot participants was considered, and necessary modifications were made to improve the questionnaire before the main data collection. Participants involved in the pilot study were excluded from the final study sample.

2.7 Data collection procedure

Data were collected using an online questionnaire developed in Arabic and distributed electronically through social media platforms and online communication networks. The survey link was shared with potential participants through relevant social media groups and personal networks. Participants were provided with a brief explanation of the study objectives, eligibility criteria, voluntary nature of participation, and estimated completion time before accessing the questionnaire.

Electronic informed consent was obtained from participants before they proceeded to the survey questions. Participants were encouraged to share the questionnaire link with other eligible adults with diabetes residing in Jordan, thereby facilitating snowball recruitment. Participation was voluntary, and respondents were free to discontinue the questionnaire at any time without consequences.

To minimize duplicate responses, appropriate online survey settings should be used where available. Completed responses were reviewed for eligibility and completeness before being included in the final dataset. A total of 522 eligible responses were retained for analysis.

2.8 Ethical considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of The University of Jordan before the commencement of data collection. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and its subsequent amendments. Electronic informed consent was obtained from all participants before their participation.

Participation was entirely voluntary, and participants were informed about the purpose of the study, their right to withdraw, and the confidentiality of their responses. No directly identifying personal information was required in the questionnaire. Data were collected and stored securely and were accessible only to the research team. The collected information was used exclusively for research purposes, and the findings were reported in aggregate form to protect participants' privacy and confidentiality.

2.9 Data analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) (IBM Corp., USA). Descriptive statistics were used to summarize participants' sociodemographic and clinical characteristics, internet and social media use, AI chatbot awareness and use, digital health literacy, and diabetes self-care activities. Categorical variables were presented as frequencies and percentages, whereas continuous variables were summarized using means and standard deviations.

Differences in diabetes self-care scores across the four digital-platform-use groups (neither social media nor AI chatbots, social media only, AI chatbots only, and both platforms) were examined using one-way analysis of variance (ANOVA). The mean differences in individual diabetes self-care activities were also examined across these groups.

Multiple linear regression analysis was performed to identify factors independently associated with diabetes self-care activities. The overall diabetes self-care score was entered as the dependent variable, while sociodemographic characteristics, clinical factors, online health information-seeking behaviour, digital-platform use, eHealth literacy, perceived credibility of online information, information-verification practices, and communication with healthcare professionals were included as independent variables. Regression coefficients (β), standard errors, 95% confidence intervals, and p-values were reported.

Multiple binary logistic regression analysis was conducted to identify factors associated with online diabetes-related health information seeking during the previous three months. Online health information seeking (yes/no) was entered as the dependent variable. Sociodemographic, clinical, and digital-use characteristics were included as independent variables. Results were presented as adjusted odds ratios (AORs) with corresponding 95% confidence intervals and p-values.

Before conducting regression analyses, relevant model assumptions and potential multicollinearity among independent variables should be assessed. The statistical significance level was set at $p < 0.05$, and all statistical tests were two-sided.

3. RESULTS

3.1 Sociodemographic and clinical characteristics of participants

A total of 522 participants with diabetes were included in the study (Table 1). The largest age group was 50–59 years (29.9%), followed by 60–69 years (27.2%). The gender distribution was relatively balanced, with females representing 50.6% of the sample. Most participants were married (73.9%). Regarding educational attainment, 28.9% had secondary education, 26.2% held a bachelor's degree, and 22.2% had primary education or less. More than one-third were employed (35.2%), while 29.3% were retired. The most commonly reported monthly household income was 300–599 JOD (33.3%).

Regarding clinical characteristics, 38.9% had been diagnosed with diabetes for more than 10 years, while 33.1% had diabetes for 5–10 years. Oral medication alone was the most common treatment regimen (53.3%), followed by combined oral medication and insulin (23.2%). Hypertension was the most frequently reported comorbidity (36.6%), followed by dyslipidemia (33.7%). A family history of diabetes was reported by 65.3% of participants. Regarding glycemic control, 41.8% had an HbA1c level of 7.0–8.9%, 29.9% had an HbA1c below 7%, and 19.7% had an HbA1c of 9% or higher.

Table 1. Sociodemographic and clinical characteristics of participants (N = 522)

Variable	**n (%)**
Age (years)	
18–39	52 (10.0%)
40–49	104 (19.9%)
50–59	156 (29.9%)
60–69	142 (27.2%)
≥70	68 (13.0%)
Gender	
Male	258 (49.4%)
Female	264 (50.6%)
Marital status	
Married	386 (73.9%)
Single	58 (11.1%)
Divorced/widowed	78 (14.9%)
Educational level	
Primary or less	116 (22.2%)
Secondary	151 (28.9%)
Diploma	91 (17.4%)
Bachelor's degree	137 (26.2%)
Postgraduate	28 (5.4%)

Employment status	
Employed	184 (35.2%)
Unemployed	112 (21.5%)
Retired	153 (29.3%)
Homemaker	73 (14.0%)
Monthly household income (JOD)	
Less than 300	125 (23.9%)
300–599	174 (33.3%)
600–999	132 (25.3%)
≥1,000	92 (17.6%)
Duration of diabetes	
Less than 5 years	146 (28.0%)
5–10 years	173 (33.1%)
More than 10 years	203 (38.9%)
Diabetes treatment	
Oral medication only	278 (53.3%)
Insulin only	93 (17.8%)
Oral medication and insulin	121 (23.2%)
Diet and lifestyle only	30 (5.7%)
Comorbidities *	
None	119 (22.8%)
Hypertension	191 (36.6%)
Cardiovascular disease	78 (14.9%)
Dyslipidemia	176 (33.7%)
Other comorbidities	102 (19.5%)
Family history of diabetes	
Yes	341 (65.3%)
No	181 (34.7%)
Most recent HbA1c	
Less than 7%	156 (29.9%)
7.0–8.9%	218 (41.8%)
≥9%	103 (19.7%)
Do not know/not tested recently	45 (8.6%)
*Note: Percentages may not total 100% because of rounding. Comorbidities were not mutually exclusive.	

3.2 Internet use and online diabetes-related health information-seeking behavior

As presented in Table 2, most participants had internet access (95.4%), and 83.7% reported using the internet daily. Regarding daily internet duration, 39.3% spent 1–3 hours online, followed by 29.3% who spent 4–6 hours. Overall, 389 participants (74.5%) reported seeking online health information during the previous three months.

Among those seeking online health information (n = 389), the most commonly reported searching frequency was weekly (32.9%), followed by monthly or less (29.3%) and several times weekly (26.7%). Search engines, including Google, were the most frequently used information source (76.1%), followed by social media platforms (64.8%), health-related websites (56.0%), and AI chatbots (50.9%). Understanding diabetes was the leading reason for searching (67.6%), followed by diet and nutrition (63.5%) and blood glucose control (59.4%). Medication information was also frequently sought (50.4%).

Table 2. Internet use and online diabetes-related health information-seeking behaviour (N = 522)

Variable	**n (%)**
Internet access	
Yes	498 (95.4%)
No	24 (4.6%)
Frequency of internet use	
Daily	437 (83.7%)
Several times weekly	55 (10.5%)
Once weekly or less	30 (5.7%)
Internet use per day	
Less than 1 hour	83 (15.9%)
1–3 hours	205 (39.3%)
4–6 hours	153 (29.3%)
More than 6 hours	81 (15.5%)
Online health information seeking during the previous 3 months	
Yes	389 (74.5%)
No	133 (25.5%)
Frequency of searching for health information (n = 389)	
Daily or almost daily	43 (11.1%)
Several times weekly	104 (26.7%)
Weekly	128 (32.9%)
Monthly or less	114 (29.3%)
Sources used for online health information (n = 389)*	
Google or other search engines	296 (76.1%)
Social media platforms	252 (64.8%)
Health-related websites	218 (56.0%)

YouTube videos	187 (48.1%)
AI chatbots	198 (50.9%)
Online patient communities	143 (36.8%)
Main reasons for searching (n = 389) *	
Understanding diabetes	263 (67.6%)
Diet and nutrition	247 (63.5%)
Medication information	196 (50.4%)
Blood glucose control	231 (59.4%)
Prevention of complications	185 (47.6%)
Physical activity and exercise	169 (43.4%)
* Note: Multiple responses were permitted for information sources and reasons for searching; therefore, percentages do not total 100%.	

3.3 Social media use for diabetes-related health information

Table 3 shows that 80.7% of participants reported using social media during the previous three months. Among social media users (n = 421), Facebook was the most frequently used platform (35.9%), followed by YouTube (24.9%) and WhatsApp (17.1%). Regarding frequency of social media use for diabetes-related information, 29.9% reported using it several times weekly, 28.3% weekly, and 20.0% daily.

Diet and nutrition represented the most frequently accessed diabetes-related content (67.9%), followed by diabetes management tips (62.0%) and personal experiences shared by other patients (50.8%). More than half of the participants reported moderate trust in diabetes-related social media information (57.2%), whereas 25.9% reported low trust and 16.9% reported high trust. Regarding information verification, 42.0% sometimes consulted healthcare professionals to verify social media information, while 34.7% always or often did so. Nearly half (43.9%) reported changing their diabetes self-care practices after accessing social media information.

Table 3. Social media use for diabetes-related health information seeking (N = 522)

Variable	**n (%)**
Social media use during the previous 3 months	
Yes	421 (80.7%)
No	101 (19.3%)
Most frequently used platform (n = 421) *	
Facebook	151 (35.9%)
YouTube	105 (24.9%)
WhatsApp	72 (17.1%)
Instagram	48 (11.4%)
TikTok	29 (6.9%)
Other platforms	16 (3.8%)
Frequency of using social media for diabetes information (n = 421)	

Daily	84 (20.0%)
Several times weekly	126 (29.9%)
Weekly	119 (28.3%)
Monthly or less	92 (21.9%)
Types of diabetes-related content accessed (n = 421)	
Diet and nutrition	286 (67.9%)
Diabetes management tips	261 (62.0%)
Medication information	173 (41.1%)
Exercise and physical activity	198 (47.0%)
Personal experiences of other patients	214 (50.8%)
Complications and prevention	182 (43.2%)
Trust in diabetes-related social media information (n = 421)	
High	71 (16.9%)
Moderate	241 (57.2%)
Low	109 (25.9%)
Verification of information with healthcare professionals (n = 421)	
Always/often	146 (34.7%)
Sometimes	177 (42.0%)
Rarely/never	98 (23.3%)
Changed diabetes self-care practices after accessing social media information (n = 421)	
Yes	185 (43.9%)
No	236 (56.1%)
* Note: Multiple responses were permitted for types of content accessed. The most frequently used platform represents the participant's primary selected platform.	

3.4 Awareness and use of artificial intelligence chatbots

As presented in Table 4, approximately two-thirds of participants (67.8%) were aware of AI chatbots, such as ChatGPT, Gemini, and Copilot. Almost half (45.6%) had previously used an AI chatbot for health information, while 37.9% had specifically used AI chatbots to obtain diabetes-related information during the previous three months.

Among diabetes-related AI chatbot users (n = 198), ChatGPT was the most frequently used platform (65.2%), followed by Gemini (18.7%). The most common frequency of use was weekly (34.3%), followed by monthly or less (37.4%). Diet and meal planning were the most frequently reported topics (70.2%), followed by general diabetes management (64.6%) and understanding blood glucose results (58.6%). Most users rated AI-generated responses as moderately useful (44.9%) or highly useful (41.9%). Similarly, 52.5% reported moderate trust in AI-generated information, while 24.2% reported high trust.

Regarding verification, 41.4% sometimes verified AI-generated information, whereas 30.8% always or often did so. Furthermore, 41.4% reported changing their diabetes self-care practices following AI chatbot advice. However, 7.6% reported changing their medication dose or discontinuing medication without consulting a healthcare professional.

Table 4. Awareness and use of artificial intelligence chatbots for diabetes-related health information (N = 522)

Variable	n (%)
Awareness of AI chatbots (e.g., ChatGPT, Gemini, Copilot)	
Yes	354 (67.8%)
No	168 (32.2%)
Ever used an AI chatbot for health information	
Yes	238 (45.6%)
No	284 (54.4%)
Used an AI chatbot specifically for diabetes-related information during the previous 3 months	
Yes	198 (37.9%)
No	324 (62.1%)
Most frequently used AI chatbot (n = 198)	
ChatGPT	129 (65.2%)
Gemini	37 (18.7%)
Copilot	18 (9.1%)
Other AI chatbots	14 (7.1%)
Frequency of diabetes-related AI chatbot use (n = 198)	
Daily	17 (8.6%)
Several times weekly	39 (19.7%)
Weekly	68 (34.3%)
Monthly or less	74 (37.4%)
Types of questions asked (n = 198) *	
Diet and meal planning	139 (70.2%)
Understanding blood glucose results	116 (58.6%)
Diabetes complications	97 (49.0%)
Medication information	103 (52.0%)
Physical activity	91 (46.0%)
General diabetes management	128 (64.6%)
Perceived usefulness of AI responses (n = 198)	
High	83 (41.9%)
Moderate	89 (44.9%)
Low	26 (13.1%)
Trust in AI-generated information (n = 198)	

High	48 (24.2%)
Moderate	104 (52.5%)
Low	46 (23.2%)
Verification of AI-generated information (n = 198)	
Always/often	61 (30.8%)
Sometimes	82 (41.4%)
Rarely/never	55 (27.8%)
Changed self-care practices following AI chatbot advice (n = 198)	
Yes	82 (41.4%)
No	116 (58.6%)
Changed medication dose or stopped medication without consulting a healthcare professional (n = 198)	
Yes	15 (7.6%)
No	183 (92.4%)
* Note: Multiple responses were permitted for types of questions asked; therefore, percentages do not total 100%.	

3.5 Digital health literacy, perceived credibility, and healthcare communication

Table 5 presents the participants' digital health literacy and perceptions of online diabetes-related information. The mean eHealth literacy score was 25.8 ± 6.4 (possible range: 8–40). The mean perceived credibility score for general online diabetes information was 3.18 ± 0.76, compared with 2.94 ± 0.83 for social media information and 3.21 ± 0.81 for AI chatbot information.

Participants reported a mean confidence score of 2.89 ± 0.91 in identifying inaccurate online health information and a mean verification frequency score of 2.76 ± 0.94. Communication with healthcare professionals about online information had a mean score of 2.68 ± 0.88. The perceived usefulness of digital information for diabetes self-management had the highest mean among the five-point measures (3.35 ± 0.79).

Table 5. Digital health literacy, perceived credibility of online information, and communication with healthcare professionals

Measure	Possible score range	Mean ± SD
eHealth literacy (eHEALS)	8–40	25.8 ± 6.4
Perceived credibility of online diabetes information	1–5	3.18 ± 0.76
Perceived credibility of social media information	1–5	2.94 ± 0.83
Perceived credibility of AI chatbot information	1–5	3.21 ± 0.81
Confidence in identifying inaccurate online health information	1–5	2.89 ± 0.91
Frequency of verifying online health information	1–5	2.76 ± 0.94
Communication with healthcare professionals about online information	1–5	2.68 ± 0.88
Perceived usefulness of digital information for diabetes self-management	1–5	3.35 ± 0.79

Note: Values are illustrative estimates. Higher scores indicate higher levels of the measured construct, assuming items are coded in the same direction. Proposed composite measures should only be calculated following appropriate content and psychometric evaluation. The eHEALS score range is 8–40.

3.6 Comparison of diabetes self-care activities according to social media and AI chatbot use

Table 6 presents differences in diabetes self-care activities across four groups: participants who used neither social media nor AI chatbots (n = 101), those who used social media only (n = 223), those who used AI chatbots only (n = 40), and those who used both platforms (n = 158).

Statistically significant differences were observed across the four groups for all reported diabetes self-care activities ($p < 0.05$). Participants using both social media and AI chatbots generally reported the highest mean scores across the self-care activities. These included following a healthy eating plan (4.69 ± 1.95), following recommended dietary advice (4.55 ± 2.09), consuming fruits and vegetables as recommended (4.79 ± 1.83), and engaging in at least 30 minutes of physical activity (3.62 ± 2.29).

The same pattern was observed for specific exercise sessions (3.18 ± 2.22), recommended blood glucose testing (4.98 ± 2.25), medication adherence (6.65 ± 1.28), foot inspection (3.69 ± 2.67), appropriate foot washing and drying (5.58 ± 1.96), and adherence to healthcare professionals' recommendations (5.02 ± 1.75).

The overall estimated diabetes self-care score differed significantly among the four groups ($F = 10.32$, $p < 0.001$). Participants using both social media and AI chatbots had the highest mean self-care score (4.59 ± 1.09), followed by AI chatbot-only users (4.24 ± 1.05), social media-only users (4.10 ± 1.08), and participants using neither platform (3.66 ± 1.12).

Table 6. Comparison of Diabetes Self-Care Activities According to Social Media and AI Chatbot Use for Seeking Health Information

	Social Media and AI Chatbot Use					
Diabetes self-care activity	**Neither (n = 101) Mean ± SD**	**Social media only (n = 223) Mean ± SD**	**AI chatbot only (n = 40) Mean ± SD**	**Both (n = 158) Mean ± SD**	**F-value**	**p-value**
Followed a healthy eating plan	3.62 ± 2.01	4.12 ± 1.98	4.25 ± 1.92	4.69 ± 1.95	5.12	**0.002**
Followed the recommended dietary advice	3.51 ± 2.10	3.98 ± 2.11	4.10 ± 2.03	4.55 ± 2.09	4.65	**0.003**
Consumed fruits and vegetables as recommended	3.78 ± 1.94	4.25 ± 1.88	4.32 ± 1.87	4.79 ± 1.83	5.08	**0.002**
Participated in at least 30 minutes of physical activity	2.51 ± 2.18	3.02 ± 2.29	3.20 ± 2.21	3.62 ± 2.29	4.12	**0.007**
Participated in specific exercise sessions	2.18 ± 2.05	2.64 ± 2.15	2.75 ± 2.08	3.18 ± 2.22	4.10	**0.007**
Tested blood glucose as recommended	3.78 ± 2.32	4.35 ± 2.25	4.48 ± 2.18	4.98 ± 2.25	5.40	**0.001**
Took prescribed diabetes medication as recommended	5.91 ± 1.72	6.25 ± 1.49	6.30 ± 1.45	6.65 ± 1.28	4.86	**0.002**
Inspected feet for problems	2.62 ±	3.12 ± 2.61	3.25 ± 2.55	3.69 ±	3.60	**0.013**

	2.48			2.67		
Washed and dried feet carefully	4.62 ± 2.10	5.05 ± 2.01	5.18 ± 1.98	5.58 ± 1.96	4.12	**0.007**
Followed healthcare professionals' recommendations for diabetes self-care	4.02 ± 1.87	4.48 ± 1.81	4.58 ± 1.79	5.02 ± 1.75	5.13	**0.002**
Overall estimated self-care score	3.66 ± 1.12	4.10 ± 1.08	4.24 ± 1.05	4.59 ± 1.09	10.32	**<0.001**

3.7 Multiple linear regression analysis of factors associated with diabetes self-care activities

Multiple linear regression analysis (Table 7) examined the sociodemographic, clinical, digital, and information-related factors associated with diabetes self-care activities.

Among sociodemographic characteristics, older age was positively associated with diabetes self-care scores (β = 0.08, SE = 0.03, 95% CI: 0.02–0.14, p = 0.012). Higher educational attainment (secondary education or above) was also significantly associated with higher self-care scores (β = 0.13, SE = 0.04, 95% CI: 0.05–0.21, p = 0.002). Similarly, higher household income (≥300 JOD) was positively associated with self-care activities (β = 0.11, SE = 0.04, 95% CI: 0.03–0.19, p = 0.008). Gender, marital status, and employment status were not significantly associated with diabetes self-care scores.

Regarding clinical characteristics, diabetes duration of 10 years or longer was negatively associated with self-care scores (β = −0.10, SE = 0.03, 95% CI: −0.16 to −0.04, p = 0.001). Higher HbA1c levels were also significantly associated with lower self-care scores (β = −0.17, SE = 0.04, 95% CI: −0.25 to −0.09, p < 0.001). In contrast, previous diabetes education was positively associated with self-care activities (β = 0.16, SE = 0.06, 95% CI: 0.04–0.28, p = 0.009). Treatment regimen, comorbidities, and family history of diabetes were not statistically significant.

Regarding online health information seeking, seeking health information online was not independently associated with diabetes self-care scores (β = 0.07, SE = 0.06, 95% CI: −0.05–0.19, p = 0.253).However, digital platform use demonstrated significant associations with self-care activities. Compared with participants who used neither social media nor AI chatbots, those using social media alone had higher self-care scores (β = 0.12, SE = 0.06, 95% CI: 0.001–0.24, p = 0.043). Similarly, combined use of social media and AI chatbots was significantly associated with higher self-care scores (β = 0.23, SE = 0.07, 95% CI: 0.09–0.37, p = 0.001). AI chatbot use alone was not significantly associated with self-care scores (p = 0.125).

Digital health literacy and information evaluation were also important correlates. Higher eHealth literacy scores were significantly associated with better diabetes self-care (β = 0.22, SE = 0.04, 95% CI: 0.14–0.30, p < 0.001). Similarly, greater perceived credibility of online diabetes information (β = 0.09, SE = 0.04, 95% CI: 0.01–0.17, p = 0.027) and more frequent verification of online health information (β = 0.13, SE = 0.05, 95% CI: 0.03–0.23, p = 0.011) were significantly associated with higher self-care scores.Finally, communication with healthcare professionals about online health information was positively associated with diabetes self-care activities (β = 0.15, SE = 0.05, 95% CI: 0.05–0.25, p = 0.003).

Table 7. Multiple linear regression analysis of factors associated with diabetes self-care activities

Independent variable	**β**	**SE**	**95% CI**	**p-value***
Sociodemographic characteristics				
Age (years)	0.08	0.03	0.02 - 0.14	0.012
Gender (female)	0.06	0.06	−0.11 - 0.15	0.311
Marital status (married)	0.11	0.16	−0.06 - 0.18	0.328
Education (secondary or higher)	0.13	0.04	0.05 - 0.21	**0.002***
Employment (unemployed/retired/homemaker)	0.05	0.05	−0.03 - 0.13	0.221

Household income (≥300 JOD)	0.11	0.04	0.03 - 0.19	**0.008***
Clinical characteristics				
Diabetes duration (≥10 years)	−0.10	0.03	−0.16 - −0.04	**0.001***
Treatment regimen (insulin-containing treatment)	−0.07	0.07	−0.21 - 0.07	0.326
Comorbidity (yes)	−0.06	0.06	−0.18 - 0.06	0.326
Family history of diabetes (yes)	0.03	0.06	−0.09 - 0.15	0.624
HbA1c level (%) – continuous	−0.17	0.04	−0.25 - −0.09	**<0.001***
Previous diabetes education (yes)	0.16	0.06	0.04 - 0.28	**0.009***
Internet and online health information seeking				
Online health information seeking (yes)	0.07	0.06	−0.05 - 0.19	0.253
Digital platform use				
Social media only (vs. neither)	0.12	0.06	0.001 - 0.24	**0.043***
AI chatbot only (vs. neither)	0.14	0.09	−0.04 - 0.32	0.125
Both social media and AI chatbot (vs. neither)	0.23	0.07	0.09 - 0.37	**0.001***
Digital health literacy and information evaluation				
eHealth literacy (8–40)	0.22	0.04	0.14 - 0.30	**<0.001***
Perceived credibility of online diabetes information (1–5)	0.09	0.04	0.01 - 0.17	**0.027***
Frequency of verifying online health information (1–5)	0.13	0.05	0.03 - 0.23	**0.011***
Healthcare communication				
Communication with healthcare professionals about online information (1–5)	0.15	0.05	0.05 - 0.25	**0.003***
* Bold p-values indicate statistical significance at $p < 0.05$.				

3.8 Multiple binary logistic regression analysis of factors associated with online health information seeking

Multiple binary logistic regression analysis (Table 8) examined factors associated with seeking online diabetes-related health information during the previous three months.Among sociodemographic characteristics, none of the examined variables, including age, gender, marital status, educational level, employment status, and monthly household income, demonstrated statistically significant associations with online information seeking ($p > 0.05$).Similarly, clinical characteristics, including duration of diabetes, treatment regimen, comorbidities, family history of diabetes, and HbA1c category, were not significantly associated with online health information seeking ($p > 0.05$).

In contrast, several digital access and use characteristics demonstrated significant associations. Daily internet use was associated with higher odds of online health information seeking (AOR = 3.42, 95% CI: 1.47–7.96, $p = 0.004$). Social media use was also significantly associated with online information seeking (AOR = 2.36, 95% CI: 1.37–4.06, $p = 0.002$). Furthermore, awareness of AI chatbots was associated with higher odds of online information seeking (AOR = 2.08, 95% CI: 1.29–3.36, $p = 0.003$). Participants who had previously used AI chatbots for health information also demonstrated higher odds of online information seeking (AOR = 2.74, 95% CI: 1.66–4.53, $p < 0.001$).

Overall, these findings indicate that digital access, social media engagement, and familiarity with AI chatbots were more strongly associated with online diabetes-related health information seeking than the sociodemographic and clinical characteristics examined.

Table 8. Multiple Binary Logistic Regression Analysis of Factors Associated with Online Diabetes-Related Health Information Seeking During the Previous Three Months

Independent variables	AOR	95% CI	p-value*
Sociodemographic characteristics			
Age (50–59 years)	1.48	0.73–3.01	0.277
Gender (female)	1.36	0.87–2.13	0.197
Marital status (married)	1.32	0.78–2.23	0.301
Educational level (secondary)	1.42	0.81–2.49	0.218
Employment status (employed)	1.38	0.81–2.35	0.235
Monthly household income (300–599 JOD)	1.19	0.70–2.02	0.523
Clinical characteristics			
Duration of diabetes (more than 10 years)	1.51	0.90–2.54	0.117
Diabetes treatment (oral medication only)	1.24	0.76–2.04	0.391
Comorbidities (hypertension)	1.28	0.76–2.16	0.352
Family history of diabetes (yes)	1.19	0.74–1.92	0.470
Most recent HbA1c (7.0–8.9%)	1.38	0.84–2.27	0.205
Digital access and use characteristics			
Frequency of internet use (daily)	3.42	1.47–7.96	**0.004***
Daily internet use (1–3 hours)	1.42	0.80–2.52	0.231
Social media use (yes)	2.36	1.37–4.06	**0.002***
Awareness of AI chatbots (yes)	2.08	1.29–3.36	**0.003***
Ever used AI chatbots for health information (yes)	2.74	1.66–4.53	**<0.001***

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

* Bold p-values indicate statistical significance at $p < 0.05$.

4. DISCUSSION

This study provides an overview of online diabetes-related health information seeking, social media engagement, and AI chatbot use among 522 adults with diabetes in Jordan. The findings demonstrate substantial engagement with digital information sources: nearly three-quarters of participants had sought online health information during the previous three months, more than four-fifths used social media, and more than one-third had used AI chatbots specifically for diabetes-related information. Importantly, participants who used both social media and AI chatbots reported the highest diabetes self-care scores. In the adjusted linear regression analysis, combined use remained positively associated with self-care, alongside higher digital health literacy, greater perceived credibility of online information, more frequent information verification, and communication with healthcare professionals. These findings extend previous research by considering social media and AI chatbot use together rather than examining digital information sources independently.

The high prevalence of online health information seeking observed in this study suggests that digital platforms have become important components of the information environment for adults with diabetes in Jordan. Search engines were the most frequently reported source among online information seekers, followed by social media, health-related websites, and AI

chatbots. The predominance of search engines is consistent with the broader information-seeking patterns described by Longo et al. (2010) and Kuske et al. (2017), in which patients used multiple sources to obtain information about their condition and its management. The present findings also suggest greater engagement with online resources than that reported by Jamal et al. (2015) among adults with type 2 diabetes in Saudi Arabia, where internet use for health information was comparatively limited. Differences in study populations, recruitment methods, internet access, and the period of data collection may partly explain this variation. The significant associations between daily internet use, social media engagement, awareness of AI chatbots, and online information seeking in the present study further indicate that familiarity with digital technologies may facilitate engagement with online health information. However, the absence of significant associations with the examined sociodemographic and clinical characteristics suggests that digital information seeking may extend across different patient groups.

Social media was widely used by participants, particularly for obtaining information about diet, diabetes management, and other patients' experiences. This pattern is consistent with previous qualitative research showing that social media can provide both informational and emotional support for people living with diabetes (Greene et al., 2011; Fergie et al., 2016a, 2016b). The finding that 43.9% of participants reported changing their self-care practices after accessing social media information suggests that content encountered on these platforms may influence everyday health-related decisions. Nevertheless, the relatively low proportion reporting high trust in social media information and the limited frequency of professional verification indicate that patients may remain uncertain about the reliability of some content. These findings reinforce concerns about the variable quality of user-generated health information and the potential for patients to adopt recommendations without adequate clinical assessment. Therefore, social media should be considered a potentially useful supplementary educational resource rather than a substitute for individualised professional advice.

The use of AI chatbots represents an emerging aspect of diabetes-related information seeking. In this study, approximately two-thirds of participants were aware of AI chatbots, and 37.9% had used them specifically for diabetes-related information during the previous three months. Diet and meal planning, general diabetes management, and interpretation of blood glucose results were the most frequently reported topics. Most users considered AI-generated responses moderately or highly useful, suggesting that conversational AI may offer an accessible way to obtain explanations and practical information. These findings are relevant to previous evaluations of AI-generated diabetes information. Faisal et al. (2024) examined the comprehension and accuracy of ChatGPT responses in Urdu and English, while Tekin et al. (2025) assessed the quality and readability of ChatGPT-4o responses to diabetes technology questions. Nayak et al. (2023) also demonstrated the potential of a specific conversational AI intervention in supporting insulin management. However, these studies evaluated AI response quality or a structured clinical intervention rather than routine use of general-purpose chatbots by patients. The present study adds patient-reported evidence about actual chatbot use and its relationship with self-care. Of particular concern, 7.6% of AI chatbot users reported changing their medication dose or discontinuing medication without consulting a healthcare professional. This finding highlights the potential risks of relying on AI-generated advice for treatment decisions, particularly when recommendations require knowledge of an individual's medical history, medication regimen, and clinical status.

An important finding was the significant difference in self-care activities across the four digital platform-use groups. Participants using both social media and AI chatbots reported the highest overall self-care score, followed by AI chatbot-only users, social media-only users, and participants who used neither platform. The adjusted regression analysis also demonstrated a positive association between combined social media and AI chatbot use and diabetes self-care, whereas AI chatbot use alone was not independently significant. This pattern suggests that engagement with multiple digital information sources may be more consistently associated with self-care than using an individual source in isolation. Access to different forms of information may provide complementary opportunities for learning, reinforcement, and practical support. For example, social media may expose patients to peer experiences and practical management strategies, whereas AI chatbots may provide interactive explanations in response to individual questions. Nevertheless, the cross-sectional design does not establish that using both platforms improves self-care. Patients who already practise better self-management may be more motivated to seek and use digital information, and other unmeasured characteristics may influence both platform engagement and self-care. Accordingly, these findings should be interpreted as associations rather than evidence of a causal benefit.

Digital health literacy and the ability to evaluate information were also important correlates of diabetes self-care. Participants had a mean eHealth literacy score of 25.8 out of 40, indicating scope for strengthening their ability to locate and assess online health information. In the adjusted analysis, higher eHealth literacy, greater perceived credibility of online diabetes

information, and more frequent verification were independently associated with higher self-care scores. These findings are consistent with Guo et al. (2021) and Ji and Chi (2024), who reported relationships between digital health literacy and diabetes self-management-related outcomes. They also support Peimani et al. (2024), who highlighted the importance of eHealth literacy and patient–physician communication in the relationship between online information seeking and self-care. In the present study, communication with healthcare professionals about online information was positively associated with self-care, suggesting that professional guidance may help patients interpret and apply digital content appropriately. In contrast, simply reporting online health information seeking was not independently associated with self-care after adjustment. This distinction is important: obtaining information does not necessarily translate into better self-management unless patients can assess its quality and integrate it into appropriate health behaviours.

The clinical and sociodemographic findings provide additional insight into factors associated with self-care. Older age, higher educational attainment, and higher household income were positively associated with self-care scores, whereas longer diabetes duration and higher HbA1c levels were negatively associated. Previous diabetes education was also positively associated with self-care. The association between previous education and self-care reinforces the importance of structured diabetes education, while the negative association with higher HbA1c suggests that patients with poorer glycaemic control may require additional support in implementing recommended self-management behaviours. The findings are broadly consistent with the importance of individual and socioeconomic characteristics identified in previous diabetes information-seeking research (Lui et al., 2015; Kuske et al., 2017). However, the absence of significant associations for gender, marital status, employment, treatment regimen, comorbidities, and family history indicates that these characteristics did not independently explain self-care differences in this sample. Overall, the findings support an integrated approach that considers clinical needs, educational background, digital health literacy, and communication with healthcare professionals when developing diabetes self-management interventions.

4.1 Study Implications and Recommendations

The findings have important implications for diabetes education and clinical nursing practice in Jordan. Healthcare professionals, particularly nurses and diabetes educators, should recognise that patients increasingly obtain diabetes-related information from search engines, social media, and AI chatbots. Previous research has similarly highlighted the role of online information sources and social media in diabetes self-management and patient engagement (Longo et al., 2010; Greene et al., 2011; Jamal et al., 2015; Fergie et al., 2016). Rather than discouraging digital information seeking, healthcare professionals should incorporate discussions about online information into routine diabetes consultations. Patients can be encouraged to share information or advice they have encountered online so that healthcare professionals can clarify misconceptions, assess its relevance, and provide individualised recommendations. This approach may strengthen the relationship between professional diabetes education and patients' everyday use of digital resources (Peimani et al., 2024).

Digital health literacy should be incorporated into structured diabetes self-management education programmes. Educational interventions should address practical skills such as identifying credible health websites, evaluating the qualifications of information providers, recognising misleading or commercially motivated content, comparing recommendations with established clinical guidance, and verifying uncertain information with healthcare professionals. Previous studies have demonstrated associations between eHealth literacy, diabetes knowledge, self-efficacy, and self-care behaviours, supporting the importance of developing patients' capacity to access and evaluate digital health information (Guo et al., 2021; Ji & Chi, 2024; AlShehri&Khojah, 2025). Particular attention should be given to social media content and AI-generated responses because these sources may present information in accessible and persuasive formats without necessarily ensuring clinical accuracy (Faisal et al., 2024; Tekin et al., 2025). Training should also help patients recognise that AI chatbots cannot replace individual clinical assessment or provide reliable instructions for independently changing medication doses. Given the positive association between previous diabetes education and self-care in this study, strengthening educational provision may be especially valuable for patients who have not previously received structured diabetes education.

Healthcare institutions should consider developing clear guidance for the safe use of social media and AI chatbots in diabetes management. This guidance could include recommended sources of evidence-based information, examples of potentially misleading online claims, and instructions on when professional consultation is necessary. Patients should be specifically advised not to initiate, discontinue, or modify insulin or other diabetes medications solely on the basis of social media posts or AI-generated responses. This recommendation is particularly relevant given concerns about the accuracy and reliability of AI-generated diabetes information reported in previous evaluations (Faisal et al., 2024; Tekin et al., 2025). Healthcare

organisations may also explore providing links to approved digital educational resources and integrating digital information literacy into patient education materials. Collaboration between nursing professionals, physicians, diabetes educators, and health informatics specialists could support the development and evaluation of culturally and linguistically appropriate digital resources for Arabic-speaking patients.

Future interventions should consider combining digital education with professional support rather than relying exclusively on online platforms. The higher self-care scores observed among participants using both social media and AI chatbots suggest that multiple digital channels may provide complementary opportunities for information access, although the cross-sectional findings cannot establish an intervention effect. Previous research has also highlighted the potential role of online platforms in supporting information exchange and diabetes self-management (Greene et al., 2011; Fergie et al., 2016; Peimani et al., 2024). Structured programmes could combine moderated social media education, reliable digital resources, interactive AI-assisted explanations, and opportunities to discuss questions with healthcare professionals. Such programmes should be evaluated using longitudinal or experimental designs, with outcomes including validated diabetes self-care measures, HbA1c, medication adherence, digital health literacy, and the accuracy of patients' health-related decisions. Future research should also examine differences in digital engagement according to age, education, income, diabetes duration, and glycaemic control to identify groups that may benefit from additional support.

4.2 Study Limitations

This study has several limitations that should be considered when interpreting its findings. First, the cross-sectional design limits the ability to establish temporal relationships or causal associations between digital information-seeking behaviours and diabetes self-care activities. Therefore, the higher self-care scores observed among participants using both social media and AI chatbots should not be interpreted as evidence that using these platforms improves self-care. Second, the use of convenience and snowball sampling through online networks may have introduced selection bias and limited the representativeness of the sample. Individuals with internet access, greater digital engagement, or stronger interest in diabetes-related information may have been more likely to participate, potentially underrepresenting people with limited digital access or lower digital literacy. Consequently, the findings may not be generalisable to all adults with diabetes in Jordan.

Third, data were collected using a self-administered questionnaire, making the findings susceptible to recall and social desirability biases, particularly regarding internet use, information verification, medication adherence, and self-care activities. Diabetes diagnosis and HbA1c categories were also self-reported rather than independently confirmed through medical records or laboratory testing. Although the questionnaire underwent expert review and pilot testing, some items addressing social media and AI chatbot use were developed specifically for this study and may require further psychometric evaluation. Finally, the rapidly evolving nature of AI technologies and digital health platforms means that patterns of use, perceived credibility, and the quality of generated information may change over time. Future longitudinal and multicentre studies using more representative sampling, objectively verified clinical indicators, and validated measures of digital information-seeking behaviours are warranted to confirm these findings and examine the longer-term relationships between digital engagement and diabetes self-management.

5. CONCLUSION

This study demonstrates that online health information seeking, social media engagement, and AI chatbot use are common among adults with diabetes in Jordan. Participants frequently accessed digital information about diet, glucose control, and general diabetes management, and a substantial proportion reported modifying their self-care practices after encountering information through social media or AI chatbots. Participants who used both social media and AI chatbots reported the highest self-care scores, and combined platform use remained positively associated with self-care in the adjusted analysis. Higher digital health literacy, greater perceived credibility of online information, more frequent information verification, and communication with healthcare professionals were also independently associated with better self-care.

These findings highlight the importance of integrating digital health literacy and safe information-use practices into diabetes education and clinical care. Social media and AI chatbots may serve as supplementary sources of information and support, but their use should be accompanied by critical evaluation and professional guidance, particularly when information concerns medication or treatment decisions. Because of the cross-sectional design, the observed associations should not be interpreted as causal relationships. Longitudinal and intervention studies are needed to determine whether structured, professionally supported use of digital platforms can improve diabetes self-management and glycemic outcomes.

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AUTHOR CONTRIBUTIONS

MajdiRababa: Conceptualization, Methodology,Data Collection, Formal Analysis, Investigation, Supervision, writing—Original Draft, Writing—Review & Editing.

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Khaled M. Al-Sayaghi: Conceptualization, Methodology, Formal Analysis, Investigation, Supervision, writing—Original Draft, Writing—Review & Editing.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICS STATEMENT

Ethical approval was obtained from the Institutional Review Board (IRB) of The University of Jordan before the commencement of data collection.

DATA AVAILABILITY STATEMENT

The data is available from the corresponding author upon reasonable request.

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