Journal of Nutrition Explorations
Vol. 4, No. 4, November 2026, pp. 703~722
e-ISSN: 2987-761X
DOI: 10.36568/jone.v4i4.808
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Social and Digital Environments and Dietary Behavior among Adults with Type 2 Diabetes Mellitus: A Narrative Review

Wahyu Aulia Hasibuan[1*], Beatrice Wolker[1], Mona Fathia[2], Khristine Saputri[3]
[1]Department of Nutrition, Universitas Internasional Batam, Indonesia
[2]Department of Biology, Universitas Internasional Batam, Indonesia
[3]Department of Nutrition, Poltekkes Surabaya, Indonesia
*Email Corespondence: wahyu.hasibuan@uib.ac.id

ARTICLE INFO

Article History:
Received September 29, 2026
Accepted November 4, 2026
Published online November 7, 2026

Keywords:
Diabetes Mellitus;
Dietary behaviour;
Social support;
Social media;
Digital health

ABSTRACT

This narrative review synthesizes evidence on the relationships between social and digital environments and dietary behavior among adults with type 2 diabetes mellitus (T2DM). Fifteen publications identified through a reported search of ScienceDirect and SpringerLink were mapped, comprising 11 reviews and four primary studies. Evidence directly addressing dietary outcomes in adults with established T2DM was distinguished from contextual evidence involving diabetes prevention, mixed diabetes populations, and general adult populations. A review of 10 social-network interventions among adults with T2DM found that five reported improvements in dietary adherence. A mixed-methods study involving 42 adults found no significant correlation between nutrition knowledge and diet quality but identified social support as a facilitator of dietary behavior. Nutrition-related topics appeared in 107 of 300 diabetes-related Facebook posts, reflecting online discussions rather than demonstrated dietary behavior change. Similarly, six of 10 studies included in a mobile-health review reported improvements in diet quality, although most involved populations without T2DM. Across the reviewed publications, online communities primarily provided information and peer support, while structured digital interventions incorporated self-monitoring, goal setting, and feedback. Overall, social support may facilitate dietary adherence, but the available evidence does not establish a consistent causal effect of unstructured social media exposure on dietary behavior among adults with T2DM. These findings suggest that nutrition care should consider interpersonal and digital contexts while accounting for information quality and individual patient circumstances. However, interpretations remain limited by heterogeneous outcomes, potential overlap across reviews, searches restricted to two platforms, exclusion of inaccessible full texts, and the absence of formal quality appraisal.

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder that requires sustained self-management, with dietary behaviour representing one of the central components of long-term glycaemic management. Contemporary diabetes guidance emphasizes individualized eating patterns, nutritional quality, energy balance, and practical strategies that can be maintained within patients' preferences, cultural contexts, and socioeconomic circumstances rather than a single universal diet[1-3]. Dietary adherence nevertheless remains difficult to sustain because food choices are shaped not only by knowledge and motivation but also by social support, health literacy, access to food, work demands, family routines, and the wider food environment[4–6].

The social environment is particularly important in T2DM because eating is embedded in family, household, workplace, and community practices. Social networks can influence food availability, meal routines, perceived norms, emotional support, and the reinforcement of healthy or unhealthy behaviours. Evidence synthesized by Schram et al. indicates that social relationships are relevant to diabetes-related behaviours and outcomes, while dietary adherence studies suggest that support from family, peers, and health professionals can facilitate sustained dietary change[6,7.] Thus, dietary behaviour in T2DM should be understood not only as an individual decision but also as a behaviour shaped by interpersonal and environmental contexts [8] .Family involvement should be described in terms of what relatives actually do, such as assisting with shopping, meal preparation, or problem solving. Baig et al. reviewed family-based diabetes interventions and emphasized clearer reporting of the role and extent of family participation. This supports examining supportive practices rather than treating the presence of family members as evidence that useful dietary support has been provided [9].

Traditionally, nutrition counselling for T2DM has been delivered through face-to-face interaction with dietitians, physicians, diabetes educators, and other health professionals. The rapid expansion of digital health has broadened this environment. Patients can search for diabetes information online, communicate with peers through social media and online communities, receive tailored educational content, and use mobile applications to record food intake, physical activity, glucose levels, and treatment-related behaviours[7,10] . Evidence from digital interventions indicates that technology can support self-management and, in selected settings, improve glycaemic and behavioural outcomes, although effectiveness varies according to intervention design, engagement, professional support, and implementation context [11].

Social media is particularly relevant because it combines information exposure with interpersonal interaction. Unlike conventional health education, social platforms allow patients to encounter dietary messages while simultaneously observing peer experiences, comments, recommendations, recipes, food images, and social norms. Diabetes online communities may provide emotional support, practical information, social comparison, encouragement, and opportunities for peer learning. Reviews of diabetes online communities have identified clinical, behavioural, psychosocial, and community-related benefits, while also emphasizing risks related to information quality, privacy, misinformation, and potentially unsafe self-management practices[12,13]. Content analysis of public diabetes Facebook groups has further shown that nutrition is a prominent topic of peer communication, suggesting that social platforms may function as informal spaces for dietary discussion and self-management support[14].

The potential influence of social media on dietary behaviour can operate through several interconnected pathways, namely information exposure and appraisal, social support, social comparison and norms, and self-regulation. First, patients may encounter food-related information that reinforces or conflicts with their dietary goals [4] . Second, peer interaction and social comparison may

normalize specific eating behaviours and make them appear achievable or socially desirable. Third, digital platforms can facilitate social support and self-regulation through goal setting, feedback, and self-monitoring when they are incorporated into structured behaviour-change interventions [15,16]. These pathways suggest that social media should not be viewed as uniformly beneficial or harmful rather, its effect depends on the type of content encountered, the social context in which it is interpreted, and whether patients have the skills to evaluate and apply that information[17] .

Conversely, patients may encounter inaccurate or overly restrictive dietary advice, commercial food content, algorithmically amplified information, and social norms that encourage less healthy choices. In the study by Han et al., unhealthy food-related social media content was identified as an environmental barrier to healthy eating among adults with T2DM [4] .

These pathways are not independent: social support may improve the appraisal of online information, whereas social comparison may either strengthen or undermine self-regulation. Observed associations between digital exposure and dietary behaviour may also reflect confounding by socioeconomic circumstances, baseline motivation, disease duration, or concurrent clinical care, or reverse causation, in which patients who already pursue dietary change seek out online communities. The pathways described here are therefore hypotheses to be examined, not established causal mechanisms[18] .

This concern is important because digital exposure occurs continuously and may operate alongside, rather than under the direct supervision of, formal clinical nutrition counselling. Social media may therefore function simultaneously as a source of support and as part of the broader food and media environment that can complicate dietary self-management [17] . Digital health literacy may shape whether patients can evaluate and use online dietary information. General health literacy and digital health literacy are related but distinct constructs and should not be treated interchangeably [19] .

Because these concepts overlap in the literature, their boundaries are defined here. Social support and social networks refer to interpersonal resources, such as family, peers, and health professionals, which may operate offline or online. Unstructured social-media exposure refers to incidental or self-directed encounters with platform content that is not delivered as part of a designed intervention. Online diabetes community participation refers to active exchange with peers in diabetes-specific groups or forums. Structured digital interventions are researcher- or clinician-designed programs, including mobile applications and online platforms, with defined components such as goal setting, feedback, or self-monitoring [20] . eHealth literacy is treated as a skill that may modify how any digital exposure is interpreted, not as an exposure in itself. In the conceptual framework used in this review, these exposures act on dietary behaviour through the mechanisms described above, with eHealth literacy, socioeconomic circumstances, motivation, and concurrent clinical care as potential modifiers or confounders. Dietary behaviour is the primary outcome, whereas HbA1c, body weight, knowledge, and general self-care are treated as complementary outcomes [21 22] .

Norman and Skinner conceptualized eHealth literacy as the combination of skills needed to locate, interpret, critically assess, and use electronic health information[23] . Their eight-item eHEALS assesses perceived capability rather than directly observed information-appraisal performance; its original validation involved young people, so its measurement properties should be checked before application to older adults with T2DM [24] .

This distinction matters when interpreting associations between confidence in using digital tools and actual dietary decisions. Although evidence concerning digital diabetes management is growing, an important gap remains. Much of the literature evaluates broad digital health interventions, online communities, social networks, or mobile applications rather than isolating exposure to specific social media platforms as the principal determinant of dietary patterns [7,13] . In addition, intervention studies often combine multiple behaviour-change components, making it difficult to determine whether social interaction itself, the digital delivery channel, or the underlying behavioural technique is responsible for observed improvements. Consequently, the direct relationship between social-media exposure and dietary patterns among adults with established T2DM has not been consistently synthesized [13] .

Previous reviews have addressed parts of this question, but each has limitations for the present purpose. Reviews of diabetes online communities and social-media use [12,16]. mainly reported informational, psychosocial, and general self-management or clinical outcomes; diet-specific outcomes were not consistently isolated, and several reviews included mixed diabetes populations. The systematic review by Alaofè et al.[6] examined dietary adherence in adults with T2DM but was restricted to social-network interventions delivered through family, peers, and significant others, and it did not address unstructured social media, online communities, or eHealth literacy [10] . Reviews of digital dietary and mobile-health interventions concerned diabetes prevention or general adult populations. The present review addresses these limitations by, first, integrating social networks, social media, online communities, structured digital interventions, and eHealth literacy within one framework centred on adults with established T2DM second, distinguishing direct dietary outcomes from complementary clinical and behavioural outcomes; and third, separating direct evidence from contextual evidence derived from prevention, mixed diabetes, and general adult populations. This contribution is interpretive and does not claim that the present review is the first synthesis of these topics[15,25] .

A narrative review was chosen because the question concerns heterogeneous exposures, study designs, and outcomes that cannot be pooled, and because the aim is to interpret mechanisms and the directness of the evidence rather than to estimate an effect size. It complements existing systematic and scoping reviews, which have mostly addressed one exposure at a time, by organizing the evidence across exposures, mechanisms, and outcomes [2] .

This review examines how social relationships and digital environments relate to dietary behaviour among adults with established T2DM. It distinguishes interpersonal support, unstructured social-media exposure, online-community participation, and structured digital interventions, with

attention to the directness of the evidence and the specificity of dietary outcomes. Specifically, the review asks how social support, social-media exposure, online-community participation, structured digital interventions, and eHealth literacy (exposures) relate to dietary adherence, food selection, eating patterns, and diet quality (primary outcomes) among adults with established T2DM (population), and how direct and certain the available evidence is. The review does not address digital food marketing directed at children and adolescents[26].

METHODS

This study employed a narrative literature review to examine the relationship between social and digital environments and dietary behaviour among adults with type 2 diabetes mellitus (T2DM). A narrative review approach was selected because the available literature was heterogeneous with respect to study design, population characteristics, social and digital exposures, intervention components, and dietary outcome measures. The review primarily focused on studies directly addressing dietary behaviour among adults with established T2DM. Studies related to diabetes self-management, diabetes prevention, online communities, and digital nutrition support were also considered when they provided relevant contextual evidence for interpreting the findings.

The original manuscript reported searches of ScienceDirect and SpringerLink using concepts for T2DM, social and digital environments, and dietary behavior. Its stated Boolean strategy was: ("type 2 diabetes" OR T2DM OR T2D) AND ("social support" OR "social network" OR "social media" OR "online community" OR "digital health" OR mHealth OR "eHealth literacy") AND (diet OR dietary OR nutrition OR "eating behavior" OR "dietary adherence"). The search date, database-specific query adaptations, year and language filters, and archived search exports were not supplied; accordingly, the completeness or reproducibility of the historical search cannot be independently established. Subsequent checks against publicly available publisher and indexing records were used to verify selected cited publications and clarify evidence characteristics; these checks were not a new systematic search and were not added to the historical study-selection counts.

For interpretive purposes, evidence was classified as DIRECT when it examined adults with established T2DM and assessed a specified dietary outcome; INDIRECT when it examined people with T2DM but only broader self-care, online engagement, or glycemic outcomes and CONTEXTUAL when it involved prevention, mixed diabetes populations, or general adults. These are post hoc evidence-directness labels for the retained 15 publications, not retrospectively invented historical eligibility rules. The originally reported eligibility and exclusion information appears in Table 1.

Table 1. Eligibility Criteria of the Narrative Review

Domain	Inclusion criteria	Exclusion criteria
Population	Adults with established T2DM (direct evidence). Diabetes-prevention, mixed diabetes, or general adult nutrition populations, used as contextual evidence and	Populations not relevant to diabetes or dietary self-management.

	interpreted separately.	
Exposure	Social support or social networks; social-media exposure; online diabetes communities; structured digital interventions (e.g., mobile applications, online platforms); health or eHealth literacy.	Exposures unrelated to social or digital factors.
Outcomes	Direct dietary outcomes: dietary adherence, food selection, eating patterns, diet quality, diet-specific self-care. Complementary outcomes (HbA1c, body weight, diabetes knowledge, general self-management) were extracted but not interpreted as dietary improvement unless an explicit dietary measure was reported.	No dietary, self-management, or closely related behavioral outcome.
Study design	Primary studies (randomized, observational, qualitative, mixed-methods, content analysis) and secondary studies (systematic, scoping, and narrative reviews) meeting the predefined design criteria.	4,982 records were historically labeled as excluded for design/year; precise criteria were not available.
Publication period	Publication-year eligibility window NOT RECOVERABLE from original search record; included publication years must not be presented as search filters.	Not ascertainable until the original publication-year filter (if any) is verified.
Language	Language eligibility NOT RECOVERABLE from original search record; the language of selected papers does not prove that the search was English-only.	Not ascertainable until the original language eligibility rule (if any) is verified.
Full-text access	Freely accessible full text was required in the reported search (an access restriction rather than a scientific eligibility criterion).	34,785 records excluded on access grounds, subject to verification against original search records.
Scope	Records addressing the objectives of the review.	Outside the scope of the review (7,516 records excluded at title and abstract screening).

The original manuscript reported 47,298 search records (ScienceDirect n = 31,320; SpringerLink n = 15,978), followed by exclusions for lack of freely accessible full text (n = 34,785), study design or publication year (n = 4,982), and title/abstract relevance (n = 7,516), yielding 15 mapped publications. These values are retained as the historical reported pathway (Figure 1), not as independently verified unique records or a PRISMA-compliant de-duplicated dataset. The removal of duplicates, the number of screeners, the criteria used at each exclusion stage, and the origin of individual papers were not documented in the materials provided.

The reported exclusion of 34,785 records (73.5%) because freely accessible full texts were unavailable introduces a substantial selection mechanism unrelated to scientific relevance. Furthermore, the reported flow omits reproducible search dates, duplicate handling, independent screening, and individual reasons for full-text exclusion. These limitations preclude claims that the 15 mapped reports constitute a comprehensive or systematically identified evidence base. The reported counts are descriptive and require reconstruction against original exports before publication.

An evidence-charting matrix was compiled for the 15 listed publications covering citation, publication type, population, exposure, and whether dietary behavior was directly measured. The journal or proceedings title was kept separate from the database of retrieval, which cannot be reconstructed from a publisher name. Public original-article pages were cross-checked selectively for

article identity and review-study counts; where those checks supported a change, the evidence table was updated. This retrospective bibliographic verification must not be described as independent screening, full-text dual extraction, or systematic quality appraisal. The evidence-directness designation was applied to each mapped item. A citation appearing in a secondary review does not represent independent replication of its underlying primary studies; overlap could not be quantified without a primary-study-level overlap matrix. Consequently, the synthesis does not tally individual review conclusions as independent evidence of benefit.

The extracted evidence was synthesized narratively and organized into major thematic domains, including interpersonal and social support, exposure to online health information, participation in digital communities, digitally supported behaviour change, and health-information literacy. Findings across studies were compared by considering study design, population characteristics, type of social or digital exposure, specificity of dietary outcomes, and applicability to adults with established T2DM. Studies involving diabetes prevention or mixed populations, as well as relevant review articles, were primarily used to provide contextual evidence and were interpreted separately from direct evidence derived from adults with established T2DM. Potential overlap between review articles and primary studies was also considered during the interpretation of the findings.

Given the substantial heterogeneity in study designs, exposures, interventions, population characteristics, and outcome measurements, a quantitative meta-analysis was not performed. Instead, the findings were synthesized descriptively to identify recurring patterns, consistencies and discrepancies across studies, and gaps in the existing evidence. Interpretation of the findings also considered methodological limitations, including reliance on self-reported dietary measures, potential confounding, differences in population characteristics, and variation in the components and intensity of digital interventions. In addition, restricting study selection to publications with freely accessible full texts was recognized as a potential source of selection bias.

The 15 mapped publications are the author-reported synthesis corpus. Additional references cited in the Discussion provide contextual or methodological comparison only; they were not retroactively counted among the 15 selected publications. No independent re-execution of the historical search or re-screening of its records was performed for this manuscript revision. No formal review-level or study-level methodological-quality appraisal has been completed for all 15 publications. This is a material limitation, not evidence that the publications are of equivalent quality. An appropriate future appraisal would use AMSTAR 2 for systematic reviews of interventions where applicable, JBI or comparable review-specific criteria for scoping reviews, and design-appropriate tools for observational, qualitative, mixed-methods, and content-analysis studies. SANRA may be used as a reporting-quality aid for narrative reviews; it does not substitute for a risk-of-bias assessment. No quality scores or certainty grades are assigned here. Figure 1 retains the original search-selection numbers to document the published manuscript pathway. It is labeled as a reported

flowchart rather than a newly validated PRISMA flow diagram. A revised diagram requires the original search export and deduplication log or a new reproducible search with complete screening records.

For narrative-review reporting, SANRA addresses the rationale, review aims, description of the search, referencing, evidence level, and presentation of relevant endpoint data [27] .It can guide transparent reporting, but it does not reconstruct missing search records or replace design-specific risk-of-bias appraisal.

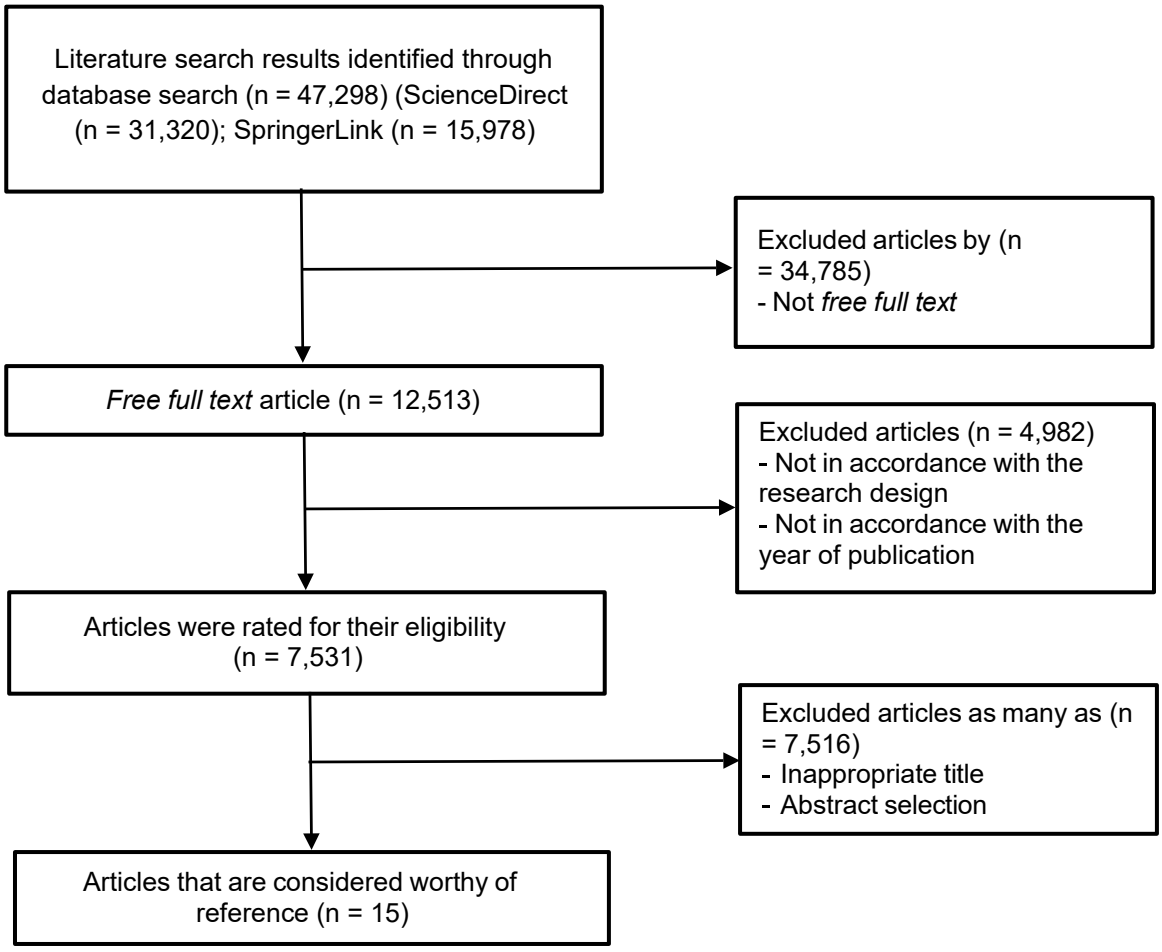


Figure 1. Literature Search Flowchart.

RESULTS

After undergoing a literature screening process, articles that met the inclusion criteria were then mapped to provide a structured overview of their characteristics and the available evidence. This mapping was conducted to facilitate comparisons of findings across studies and to identify patterns, similarities, and differences in research results, which were subsequently synthesized narratively. The results of the article mapping, which form the basis for the synthesis in this review, are presented in Table1.

Table 2. Article Data Mapping Results

No.	Researcher nd Year	Article Title	Publication venue (retrieval route requires verification)	Study Design	Conclusion
1	Han, C.Y., Chan, C.G.B., Lim, S.L., Zheng, X., Woon, Z.W., Chan, Y.T., Bhaskaran, K., Tan, K.F., Mangaikarasu, K., & Chong, M.F.F. (2020) [4]	Diabetes-related nutrition knowledge and dietary adherence in patients with Type 2 diabetes mellitus: A mixed-methods exploratory study	Proceedings of Singapore Healthcare	A mixed-methods exploratory study involving 42 patients recruited from a tertiary hospital. Diabetes-related nutrition knowledge and diet quality were assessed quantitatively, and 21 semi-structured interviews were conducted to explore perceived barriers and enablers to dietary adherence.	Diabetes-related nutrition knowledge was not significantly correlated with diet quality. Qualitative findings identified barriers including an obesogenic environment, limited time, external stress, low motivation, and knowledge gaps, while personal motivation, fear of complications, adequate nutrition knowledge, and social support were identified as facilitators. Nutrition knowledge alone was therefore insufficient to explain dietary adherence in T2DM.
2	Alaofè, H., et al. (2026) [6]	Social Network Interventions for Improving Dietary Adherence Among Adults With Type 2 Diabetes: A Systematic Review	Nutrition Reviews	A systematic review of 10 intervention studies, including nine randomized controlled trials and one quasi-randomized trial. Interventions involved family networks, peers, and significant others and assessed dietary adherence and related diabetes outcomes.	Five of the 10 studies reported improvements in dietary adherence (dietary outcome). Separately, six studies reported reductions in HbA1c (clinical outcome); the review does not establish that improved dietary adherence explains the HbA1c changes. Social-network interventions involving family members, peers, and significant others may support dietary adherence among adults with T2DM; however, methodological heterogeneity and risk of bias limit the certainty and generalizability of the evidence.

3	Schram, M.T., Assendelft, W.J.J., van Tilburg, T.G., & Dukers-Muijrers, N.H.T.M. [28]	Social networks and type 2 diabetes: A narrative review	Diabetologia	A narrative review synthesizing evidence on structural and functional characteristics of social networks in relation to T2DM development, complications, prevention, and self-management, with attention to living arrangements, network size, and social support.	Living alone and insufficient social support were associated with increased T2DM risk and adverse diabetes-related outcomes. Smaller social networks and lower social support were also associated with complications, whereas social support appeared beneficial for diabetes self-management. Lifestyle factors, including unhealthy dietary habits, may partly contribute to these relationships.
4	Oser, T.K., Oser, S.M., Parascando, J.A., Hessler-Jones, D., Sciamanna, C.N., Sparling, K., Nease, D.E., & Litchman, M.L. (2020)	Social Media in the Diabetes Community: A Novel Way to Assess Psychosocial Needs in People with Diabetes and Their Caregivers	Current Diabetes Reports	A narrative review examining social-media use and diabetes online communities among people living with diabetes and their caregivers, with emphasis on psychosocial needs, information exchange, peer interaction, and self-management support.	Diabetes-related social media and online communities provide opportunities for informational exchange, experiential knowledge sharing, emotional support, and self-management support. However, diet-specific outcomes were not consistently isolated, limiting conclusions regarding direct effects on dietary behavior.
5	Van Rhoon, L., Byrne, M., Morrissey, E., Murphy, J., & McSharry, J. (2020) [15]	A systematic review of the behaviour change techniques and digital features in technology-driven type 2 diabetes prevention interventions	Digital Health	A systematic review examining technology-driven interventions designed to prevent T2DM through dietary and physical-activity modification. Behaviour-change techniques and digital features, including self-monitoring, goal setting, feedback, health education, and social support, were mapped.	Technology-driven lifestyle interventions commonly incorporated multiple behavior-change strategies. Self-monitoring, goal setting, feedback, social support, and health education were prominent components associated with favorable lifestyle outcomes. The evidence primarily concerns T2DM prevention rather than adults with established T2DM.

6	Masood et al. (2025)	Predicting type 2 diabetes among social media users in Saudi Arabia using machine learning	Information Discovery and Delivery	A machine-learning observational study examining food- and lifestyle-related information contained in Instagram activity and its relationship with indicators of T2DM risk. Digital content and behavioral signals were analyzed computationally to identify patterns potentially associated with diabetes risk.	Instagram activity contained identifiable food- and lifestyle-related signals associated with T2DM risk, suggesting that social-media data may provide insight into health-related behaviors. However, the study focused on risk prediction rather than dietary behavior change and therefore does not establish that exposure to social-media content directly influences dietary practices.
7	Guo, S.H.M., Hsing, H.C., Lin, J.L., & Lee, C.C. (2021) [29]	Relationships Between Mobile eHealth Literacy, Diabetes Self-care, and Glycemic Outcomes in Taiwanese Patients With Type 2 Diabetes: Cross-sectional Study	JMIR mHealth and uHealth	A cross-sectional study among Taiwanese adults with T2DM examining relationships among mobile eHealth literacy, diabetes self-care behaviors, and glycemic outcomes.	Mobile eHealth literacy was associated with dimensions of diabetes self-care and the ability to obtain and use digital health information, highlighting its potential importance in diabetes management. The cross-sectional design, however, does not permit causal conclusions regarding digital literacy, dietary self-care, and clinical outcomes.
8	Abeltino, A., Riente, A., Bianchetti, G., Serantoni, C., De Spirito, M., Capezzone, S., Esposito, R., & Maulucci, G. (2025) [10]	Digital applications for diet monitoring, planning, and precision nutrition for citizens and professionals: A state of the art	Nutrition Reviews	A state-of-the-art narrative review examining digital technologies for dietary assessment, food-intake monitoring, meal planning, personalized dietary recommendations, and precision nutrition for individuals and healthcare professionals.	Digital nutrition applications can facilitate food-intake monitoring, dietary assessment, personalized meal planning, and precision-nutrition approaches. These technologies may support healthier food choices; however, much of the evidence concerns general nutrition settings, and T2DM-specific effectiveness remains insufficiently characterized.

9	Scarry, A., Rice, J., O'Connor, E.M., & Tierney, A.C. (2022) [25]	Usage of Mobile Applications or Mobile Health Technology to Improve Diet Quality in Adults	Nutrients	A systematic review of 10 randomized and non-randomized controlled studies involving approximately 1,638 adults. The studies evaluated mobile applications or mHealth technologies designed to modify dietary behavior and improve diet quality.	Six of the 10 included studies reported improvements in diet quality following the use of mobile applications or mHealth technologies. Digital dietary interventions therefore show potential to promote healthier eating patterns, although the evidence was derived mainly from general adult populations rather than exclusively from adults with established T2DM.
10	Salvia, M.G., & Quatromoni, P.A. (2023) [30]	Behavioral approaches to nutrition and eating patterns for managing type 2 diabetes: A review	American Journal of Medicine Open	A narrative review examining behavioral and nutritional approaches to eating-pattern management among adults with T2DM, including individualized nutrition therapy, behavioral strategies, goal setting, and social and cultural influences.	Dietary management is a central component of T2DM care and should be individualized according to patients' clinical needs, preferences, social determinants, and cultural context. Behavioral strategies, including collaborative goal setting and approaches that strengthen self-efficacy, may support sustained dietary modification.
11	Elnaggar, A., Park, V.T., Lee, S.J., Bender, M., Siegmund, L.A., & Park, L.G. (2020) [7]	Patients' Use of Social Media for Diabetes Self-Care: Systematic Review	Journal of Medical Internet Research	A systematic review examining peer-to-peer social-media use for diabetes self-care in relation to behavioral and clinical outcomes, self-efficacy, quality of life, information exchange, and social support.	Individuals with diabetes used social media to obtain and exchange diabetes-related information, communicate with peers, receive social support, and facilitate self-management. Although some studies reported favorable behavioral or clinical outcomes, findings were heterogeneous, and diet-specific improvements cannot be inferred when only general self-care outcomes were assessed.

12	Litchman, M.L., Walker, H.R., Ng, A.H., Wawrzynski, S.E., Oser, S.M., Greenwood, D.A., Gee, P.M., Lackey, M., & Oser, T.K. (2019) [12]	State of the Science: A Scoping Review and Gap Analysis of Diabetes Online Communities	Journal of Diabetes Science and Technology	A scoping review and gap analysis of 47 publications examining diabetes online communities. Outcomes were mapped across clinical, behavioral, psychosocial, and community domains, including types of support exchanged within online communities.	Diabetes online communities provided informational, emotional, instrumental, and appraisal support and enabled users to exchange experiential knowledge about diabetes management. Behavioral and psychosocial benefits were frequently described, but methodological heterogeneity and evidence gaps limit conclusions regarding direct improvements in dietary behavior.
13	Gabarron, E., Årsand, E., & Wynn, R. (2018)[16]	Social Media Use in Interventions for Diabetes: Rapid Evidence-Based Review	Journal of Medical Internet Research	A rapid evidence-based review examining diabetes interventions incorporating social-media platforms and their effects on diabetes-related education, self-management, behavioral, and clinical outcomes.	Social media demonstrated potential as a platform for diabetes education, communication, peer interaction, and behavioral support. However, intervention characteristics and methodological quality varied considerably, making it difficult to isolate the independent contribution of social media to dietary behavior.
14	Bujanda-Sainz de Murieta, A., Soto-Ruiz, N., García-Vivar, C., San Martín-Rodríguez, L., & Escalada-Hernández, P. (2024) [13]	Use of Online Communities among People with Type 2 Diabetes: A Scoping Review	Current Diabetes Reports	A scoping review conducted according to Joanna Briggs Institute guidance. Five databases were searched, 1,821 records were identified, and six primary studies were included. Clinical, psychosocial, and experiential outcomes of online-community participation among people with T2DM were synthesized.	Online communities facilitated information exchange, peer interaction, emotional support, experiential learning, and diabetes self-management among people with T2DM. Clinical findings were inconsistent, and the small number and heterogeneity of primary studies limit conclusions regarding sustained clinical benefits and specific effects on dietary behavior.

15	Stellefson, M., Paige, S., Apperson, A., & Spratt, S. (2019) [14]	Social Media Content Analysis of Public Diabetes Facebook Groups	Journal of Diabetes Science and Technology	A social-media content analysis. Thirty-four public diabetes Facebook groups were identified, and the 20 most recent posts from 15 of the largest groups were examined (n = 300 posts). Posts were systematically coded and classified to characterize diabetes self-management topics and types of social support.	Public diabetes Facebook groups contained informational and emotional support related to diabetes management. Nutrition appeared in 107 of the 300 analyzed posts and was the only diabetes self-management topic represented in more than 30% of posts, demonstrating that food and nutrition are prominent topics in diabetes-related online communication. Content frequency, however, does not demonstrate actual dietary behavior change.

DISCUSSION

1. Interpersonal support and dietary adherence

Interpersonal support may influence food purchasing, household meals, perceived norms, and the practical feasibility of dietary recommendations. A systematic review of 10 social-network interventions in adults with T2DM reported improvements in dietary adherence in five studies, but six of its included studies were rated at high risk of bias and two at unclear risk, limiting confidence in a generalized effect [6] . Schram et al. likewise characterized favorable relationships between social support and diabetes self-management, while emphasizing variability in measures of network structure and function [28] . In Han et al.'s mixed-methods study, 42 participants contributed quantitative data, and 21 completed qualitative interviews; nutrition knowledge was not significantly associated with diet quality ($r = -0.29$, $p = 0.065$), while participants described social support as an enabler [4,31] .

This observational evidence supports contextual interpretation, not a causal claim that social support independently improves diet. Indonesian contextual evidence also illustrates the need to measure eating practices directly. Kinasih, Hasibuan, Jannah, and Zetta described eating behavior among 14 first-semester nutrition students at Universitas Internasional Batam; no participant met their questionnaire-based non-risk category [32]. This small descriptive study concerns students rather than adults with T2DM and did not test social-media effects. It therefore offers local context for behavior-focused nutrition education, without establishing either the causes of dietary practices or the effectiveness of diabetes interventions.[33]

2. Unstructured social media versus structured digital interventions

The distinction between digital exposure and behavioral change is central. An analysis of 300 posts from public diabetes Facebook groups found 107 nutrition-related posts; this describes topic

frequency, not dietary intake, adherence, or the effect of viewing posts on users [14] .Engagement indicators such as likes, comments, and shares measure attention or interaction and cannot serve as validated surrogates for dietary improvement. Observational social-media research likewise describes patterns of engagement rather than patient-level nutrition outcomes [16] .

Reviews of online diabetes communities report informational and psychosocial support but often combine diabetes types and non-dietary endpoints[7,12,13] . Consequently, unstructured social-media participation must not be conflated with a tested nutrition intervention. Structured digital care differs from informal social-media use because it may include dietary assessment, self-monitoring, clinical feedback, and individualized coaching. Zheng et al. found 15 mHealth dietary self-management studies among adults with T2DM, but only three were larger, two-arm trials of 12 months; the remainder were primarily pilot investigations and the overall diet-related evidence remained inconclusive [34]

Intervention content should also be distinguished from the technology used to deliver it. The behavior change technique taxonomy developed by Michie et al. provides a framework for specifying components such as goal setting, self-monitoring, feedback, and social support [35] . Coding these components separately from app use or online-group membership could improve comparisons across future T2DM studies. The taxonomy is a reporting and classification resource; it does not itself demonstrate that any particular component improves diet in this population.

3. Health literacy, equity, and implementation considerations

Digital health literacy is a potential moderator rather than a demonstrated mediator of the relationship between social-media exposure and diet. Butayeva et al.'s systematic review found beneficial glycemic and self-management outcomes in some health-literacy interventions, but did not isolate social-media dietary content [36] . Zaghloul et al. reported variation in digital health literacy by sociodemographic factors across chronic-disease populations, not solely adults with T2DM. Accordingly, statements about inequitable digital benefit should be framed as implementation considerations rather than confirmed effect modification in the mapped studies. Person-centered clinical guidance supports attention to patients' social circumstances, access, preferences, and shared decision-making [37] .

For nutrition practice, the synthesis supports integrating assessment of household support, preferred information channels, and digital literacy into individualized dietary counseling. A practical approach is to help patients verify online advice, set feasible diet-specific goals, and use tracking or feedback tools when accessible and acceptable. However, digital support should complement not replacequalified nutrition care. Any implementation should also consider privacy, internet access, affordability, language, and the burden of continual self-monitoring. Evidence on service use and costs remains mixed, so economic benefits should not be assumed[38] .

Implementation can be aligned with diabetes self-management education and support. Powers et al. recommend reassessing education and support needs at diagnosis, annually or when treatment targets are unmet, when complicating factors arise, and during transitions in life or care [39]. These contacts

provide opportunities to review online dietary advice with patients and coordinate it with individualized nutrition therapy. Whether this approach improves diet-specific outcomes when delivered digitally still requires direct evaluation.

4. Strengths, limitations, and research priorities

The synthesis is strengthened by its explicit distinction between direct dietary outcomes and proxy measures. Nevertheless, five major threats to interpretation remain: (1) the search was confined to two reported platforms without reproducible dates or database-specific strategies (2) freely accessible full text was used as a selection filter (3) duplicate removal and screening decisions cannot be audited (4) no formal study-level risk-of-bias appraisal was completed for the 15 mapped publications and (5) most evidence items are secondary reviews, with likely overlap of primary studies and inclusion of populations outside established T2DM. Publication counts should therefore not be used as a measure of evidentiary weight. Because methods cannot be reconstructed from the manuscript alone, post hoc rewriting does not remedy these limitations.

Future work should prospectively specify databases, dates, reproducible queries, eligibility rules, and duplicate handling; perform independent screening and design-appropriate critical appraisal; identify overlapping primary studies; and differentiate adults with established T2DM from prevention and mixed-diabetes samples. Patient-level studies should measure validated diet-quality scores, dietary adherence, intake or purchasing outcomes, alongside clinically relevant secondary outcomes. Interventions should separately evaluate passive social-media exposure, moderated peer groups, and professionally supported digital nutrition care, and report engagement, adverse information exposure, equity, and sustained follow-up.

CONCLUSION

This narrative review mapped 15 publications and found that interpersonal social support, participation in online diabetes communities, and structured digital health programs represent different exposures with different levels of relevance to dietary behavior in adults with type 2 diabetes. The most direct evidence suggests that supportive relationships may facilitate adherence to dietary recommendations, although findings are inconsistent and study limitations reduce certainty. Online communities provide avenues for discussion and peer support, but the frequency of dietary posts or engagement with content cannot demonstrate changes in food intake. Structured digital interventions show promise for general diabetes management and glycemic outcomes, yet their dietary-specific effects and the contribution of individual intervention components remain uncertain.

Available findings do not support a causal conclusion that unstructured social-media exposure independently improves dietary behavior among adults with established T2DM. Nutrition practitioners may consider social support, household constraints, digital access, information quality, and health literacy when tailoring care; digital tools should complement evidence-based nutrition counseling. Confidence in

this synthesis is restricted by a two-platform historical search, selection based partly on free full-text access, insufficiently documented screening, absence of formal appraisal across all 15 mapped items, and probable overlap among reviews. Future investigations require transparent and reproducible searches, validated diet-specific outcomes, explicit definitions of digital exposure, and careful separation of dietary from metabolic endpoints.

BIBLIOGRAFI

1. Evert AB, Dennison M, Gardner CD, et al. Nutrition Therapy for Adults With Diabetes or Prediabetes : A Consensus Report. 2019;42(May):731–754; doi: 10.2337/dci19-0014.
2. Elsayed NA, Aleppo G, Aroda VR, et al. 5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: Standards of Care in Diabetes—2023. Diabetes Care 2023;46(January):S68–S96; doi: 10.2337/dc23-S005.
3. Davies MJ, Aroda VR, Collins BS, et al. Management of Hyperglycemia in Type 2 Diabetes, 2022. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetes Care 2022;45(11):2753–2786; doi: 10.2337/dci22-0034.
4. Han CY, Geok C, Chan B, et al. Diabetes-related nutrition knowledge and dietary adherence in patients with Type 2 diabetes mellitus : A mixed-methods exploratory study. 2020; doi: 10.1177/2010105820901742.
5. Kurnia AD, Masruroh NL, Melizza N, et al. Factors Associated with Dietary Behaviour among Patients with Type 2 Diabetes Mellitus in Rural Indonesia. J ASEAN Fed Endocr Soc 2022;37(2):1–5; doi: 10.15605/jafes.037.02.02.
6. Alaofè H, Ph D, Okechukwu A, et al. Social Network Interventions for Improving Dietary Adherence among Adults with Type 2 Diabetes: A Systematic Review. 2026;84(8):1648–1672; doi: 10.1093/nutrit/nuaf139.Social.
7. Elnaggar A, Park VT, Lee SJ, et al. Patients ' Use of Social Media for Diabetes Self-Care : Systematic Review Corresponding Author : n.d.;22; doi: 10.2196/14209.
8. Singh B, Ahmed M, Staiano AE, et al. A systematic umbrella review and meta-meta-analysis of eHealth and mHealth interventions for improving lifestyle behaviours. NPJ Digit Med 2024;7(1):10–13; doi: 10.1038/s41746-024-01172-y.
9. Liu K, Xia Y. Effective behavioral change techniques in m-health app supported interventions for glycemic control among patients with type 2 diabetes: A meta-analysis and meta-regression analysis of randomized controlled trials. Digit Health 2025;11; doi: 10.1177/20552076251326126.
10. Abeltino A, Riente A, Bianchetti G, et al. Digital applications for diet monitoring , planning , and precision nutrition for citizens and professionals : a state of the art. 2024;83(2).
11. Chen J, Lv L, Zhao X, et al. The effectiveness of a community - based online low - glycaemic index

diet and lifestyle recommendations intervention for people with type 2 diabetes : a randomized controlled trial. 2025; doi: 10.1186/s13690-025-01552-0.

12. Litchman ML, Walker HR, Ng AH, et al. State of the Science : A Scoping Review and Gap Analysis of Diabetes Online Communities. 2019; doi: 10.1177/1932296819831042.
13. Bujanda A, Murieta S De, Ruiz NS, et al. Use of Online Communities among People with Type 2 Diabetes : A Scoping Review. Curr Diab Rep 2024;24(5):96–107; doi: 10.1007/s11892-024-01538-2.
14. Stellefson M, Paige S, Apperson A, et al. Social Media Content Analysis of Public Diabetes Facebook Groups. 2019; doi: 10.1177/1932296819839099.
15. Rhoon L Van, Byrne M, Morrissey E, et al. A systematic review of the behaviour change techniques and digital features in technology- driven type 2 diabetes prevention interventions. 2020;6:1–27; doi: 10.1177/2055207620914427.
16. Review E, Gabarron E, Årsand E, et al. Social Media Use in Interventions for Diabetes : Rapid Corresponding Author : 2018;20; doi: 10.2196/10303.
17. Gabarron E, Larbi D, Dorronzoro E, et al. Factors engaging users of diabetes social media channels on facebook, twitter, and instagram: Observational study. J Med Internet Res 2020;22(9); doi: 10.2196/21204.
18. McClinchy J, Dickinson A, Wills W. Do Peer Support Groups Facilitate Nutrition Information Practice and Nutritional Self-Management in People Living With Type 2 Diabetes? Journal of Human Nutrition and Dietetics 2025;38(6); doi: 10.1111/jhn.70158.
19. Dahal PK, Hosseinzadeh H. Association of health literacy and diabetes self-management : a systematic review. 2019;526–533.
20. Zaghloul H, Fanous K, Ahmed L, et al. Digital Health Literacy in Patients With Common Chronic Diseases: Systematic Review and Meta-Analysis. J Med Internet Res 2025;27:1–12; doi: 10.2196/56231.
21. WA. Hasibuan, B.Wiboworini TS. Analysis Of Secondary Metabolite Levels And Antioxidant Activity Of The Combined Extract Of Raja Banana Peel And Pontianak Sweet Orange Peel. Media Penelitian dan Pengembangan Kesehatan 2025;35(2):589–598.
22. Baig AA, Benitez A, Quinn MT, et al. Family interventions to improve diabetes outcomes for adults. Ann N Y Acad Sci 2015;1353(1):89–112; doi: 10.1111/nyas.12844.
23. Karimi N, Opie R, Crawford D, et al. Digitally Delivered Interventions to Improve Nutrition Behaviors Among Resource-Poor and Ethnic Minority Groups With Type 2 Diabetes: Systematic Review. J Med Internet Res 2024;26(1):1–27; doi: 10.2196/42595.
24. Hazime D, Burner E. Social support via Internet communication technology for diabetes self-

management: a scoping review. Mhealth 2024;10:0–3; doi: 10.21037/mhealth-23-34.

25. Scarry A, Rice J, Connor MO. Usage of Mobile Applications or Mobile Health Technology to Improve Diet Quality in Adults. 2022;1–19.
26. Of M, Individual THE, Obesity OOR. 8 . Obesity and Weight Management for the Prevention and Treatment of Diabetes : Standards of Care in Diabetes – 2026. 2026;49(January):166–182.
27. Baethge C, Goldbeck-wood S, Mertens S. SANRA — a scale for the quality assessment of narrative review articles. 2019;8:2–8.
28. Schram MT, Assendelft WJJ, van Tilburg TG, et al. Social networks and type 2 diabetes: a narrative review. Diabetologia 2021;64(9):1905–1916; doi: 10.1007/s00125-021-05496-2.
29. Guo W, Zgambo M, Chen S, et al. Prevalence and trends of coexisting forms of malnutrition and its associated factors among children aged 6 – 59 months in South and Southeast Asia , 1996 – 2022 : a cross- sectional time series study. 2025.
30. Salvia MG, Quatromoni PA. American Journal of Medicine Open Behavioral approaches to nutrition and eating patterns for managing type 2 diabetes : A review. 2023;9(November 2022); doi: 10.1016/j.ajmo.2023.100034.
31. Hasibuan WA, Kinasih P, Jannah M, et al. Changes in nutritional status among children aged 11 – 59 months participating in a local food-based supplementary feeding program in Sebangki Subdistrict Perubahan status gizi balita usia 11 – 59 bulan penerima program pemberian makanan tambahan berbasis. 2026;11(3):1014–1023.
32. Kinasih P, Hasibuan WA, Jannah M, et al. Overview of Eating Behavior among First-Semester Nutrition Students at Universitas Internasional Batam. 2025;1(5):45–52.
33. Guo SH, Hsing H, Lin J, et al. Relationships Between Mobile eHealth Literacy , Diabetes Self-care , and Glycemic Outcomes in Taiwanese Patients With Type 2 Diabetes : Cross-sectional Study Corresponding Author : n.d.;9:1–13; doi: 10.2196/18404.
34. Zheng Y, Campbell Rice B, Melkus GD, et al. Dietary Self-Management Using Mobile Health Technology for Adults With Type 2 Diabetes: A Scoping Review. J Diabetes Sci Technol 2023;17(5):1212–1225; doi: 10.1177/19322968231174038.
35. Ma Y, Hassan L, van der Veer SN, et al. Investigating Social Media Use by Young People to Self-Manage Type 1 Diabetes Mellitus: Large-Scale Analysis of Social Media Discussions Using Topic Modeling. J Med Internet Res 2025;27(1):1–15; doi: 10.2196/78632.
36. Butayeva J, Ahmed Z, Hosseinzadeh H. The impact of health literacy interventions on glycemic control and self-management outcomes among type 2 diabetes mellitus : A systematic review. J Diabetes 2023;15(May):724–735; doi: 10.1111/1753-0407.13436.
37. Care D, Suppl SS. 1. Improving Care and Promoting Health in Populations: Standards of Care in Diabetes—2025. Diabetes Care 2025;48(January):S14–S26; doi: 10.2337/dc25-S001.
38. Morris T, Aspinal F, Ledger J, et al. The Impact of Digital Health Interventions for the Management

of Type 2 Diabetes on Health and Social Care Utilisation and Costs: A Systematic Review. Pharmacoecon Open 2023;7(2):163–173; doi: 10.1007/s41669-022-00377-9.

39. Powers MA, Bardsley JK, Cypress M, et al. Diabetes Self-management Education and Support in Adults with Type 2 Diabetes: A Consensus Report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy . Diabetes Care 2020;43(7):1636–1649; doi: 10.2337/dci20-0023.