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GREEN TICK: EVALUATING DIGITAL HEALTH, DIET AND SPORTS INTERVENTIONS: SYSTEMATIC REVIEW ON THE COMPLEX NATURE OF YOUNG PEOPLE'S INTERACTIONS WITH DIGITAL TECHNOLOGIES

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[A]Study Design; [B]Data Collection; [C]Statistical Analysis; [D]Manuscript Preparation; [E]Funds Collection

Abstract Systematically, this study assessed the impact of digital technologies, including social media, on health, diet, and sports, amid rising concerns and acknowledged benefits. We performed a comprehensive review of literature spanning 20 years, up to June 2024, focusing on interventions targeted at youth aged 14–29. Our initial database search identified 8,278 articles. After removing duplicates and those that failed to meet inclusion criteria, 307 articles underwent a rigorous blinded peer review process, ultimately resulted in 29 studies for synthesis.

Our analysis concludes the dual impact of digital technologies on youth: although they highlight the positive potential in colouring youth health behaviors, often linked to sports, nutrition, and active lifestyles, they also pose risks due to the unregulated and misleading content, emphasizing the necessity for enhanced digital literacy and critical engagement with content. In this context, five major theme highlight this paradoxical impact together: 1) Increasing awareness, knowledge and self-efficacy, 2) Hazards, misinformation, and credibility, 3) Attitudes and behavior change, 4) Social comparison, and 5) Product promotion. Eventually, we draw attention to the urgent need for regulations and systematic content verification to protect youth from misinformation and to strengthen the credibility, trustworthiness and effectiveness of health, diet and sport related content on these technologies.

Key words: digital health interventions, youth health promotion, social media, diet, healthy lifestyles

Introduction

A recent study covering 38 countries and regions in Europe and North America showed that 98% of adolescents fail to exhibit healthy lifestyle behaviours (Marques et al., 2020). To response this, they consistently and seamlessly use digital tools, allowing them to access information, communicate, and manage their daily activities in this regard (Tan et al., 2024). This reveals that digital literacy in promoting healthy lifestyles, healthy diets, and active participation in sports is crucial (Ekinci et al., 2021; Bayram & Kızıltan, 2022; Arias López et al., 2023). However, the swift development of social media, initially designed as an entertainment medium, along with its substantial potential to reach large audiences, has transformed these platforms from simple social networks into multifaceted structures used for various purposes, including as sources of information (Shaikh, 2024). This has resulted in specific ethical concerns related to social media applications, as numerous uncontrolled contents can be circulated in minutes and reach billions of people (Bopp & Stellefson, 2020). Given that a recent study found that almost half of young people change their health-related behaviours by directly accessing social media content, the importance of these ethical concerns and the urgent need to regulate and systematize social media content is multiplied (Goodyear et al., 2018).

On the other hand, numerous digital technologies specifically designed to increase knowledge related to health, diet, and sports, thereby assisting users in achieving a healthy lifestyle, idealized body image, and high physical fitness levels, are available (Toll & Norman, 2021; Ahraz et al., 2021). These digital apps have raised similar ethical concerns and can lead to significant health, nutrition and injury issues due to their uncontrolled and unverifiable content. Indeed, O'Connor and Murphy (2020) found that misinformation about COVID-19 vaccines spread on social media negatively affected public health, while Pila et al. (2021) showed that unverified nutrition and exercise recommendations on fitness apps can increase the risk of eating disorders. Similarly, the repeated promotion of unverified and potentially hazardous health, diet, and sports-related products, serving as a key revenue stream for these social media accounts and digital applications, could exacerbate these issues. While these digital apps are advised and used to promote well-being, a healthy diet, and a physically active lifestyle, their lack of regulation and verification, coupled with easy accessibility, poses substantial risks (Szinay et al., 2020). Therefore, it is crucial to establish regulations and systematise content related to health, diet, and sports on social media and digital apps. Although the number of studies exploring the impact of social media and digital technologies on participation in physical activity is gradually increasing, no research has systematically synthesized these studies to reveal:

1. The nature of current digital interventions aimed at improving health, diet, and sports-related lifestyles, as reported by the scientific literature.

2. The potential benefits and risks associated with these digital interventions according to recent studies.
3. The gaps in aligning existing mobile apps and social media aimed at health, diet, and sports-related lifestyle improvement with scientific evidence and user health protection.

Consequently, the general aim of this systematic review is to critically evaluate and synthesize the current scientific literature on the implementation of mobile applications and social media aimed at improving health, diet, and sports-related lifestyles. It aims to lay the foundation for creating guidelines, interventions, and training programs to foster young people's digital media literacy and awareness, protect them from harmful, uncontrolled, and unverifiable content, and consequently promote healthy lifestyles.

Materials and Methods

Study design

A systematic review was deemed more applicable and meaningful than a meta-analysis due to the methodological diversity in the published studies, the variability in social factors influencing young people's interaction with social media and digital app content related to diet, health, and sports, and the fact that it was executed within the scope of Erasmus+ Sports projects to develop guidelines. The methodology for this review was predetermined and registered in the PROSPERO database (registration number: CRD42024055976). This study followed the guidelines set forth in the Cochrane Handbook for Systematic Reviews of Interventions and the PRISMA Statement (Tricco et al., 2018).

Data sources and searches

A comprehensive search strategy was developed to identify peer-reviewed journal articles up to June 15, 2024. Potentially eligible studies were identified through systematic searches in PubMed, MEDLINE, CINAHL, SPORTDiscus, Web of Science, PsycINFO, and Scopus. This review followed the PICOS framework. The search strategy included terms and keywords derived from preliminary searches and expert assistance (see supplementary document 1 for the detailed search strategy). The study population consisted of young people aged 14 to 29 years. All social media and digital applications were included (intervention). Studies needed either an intervention group with sports, health, and diet-related activities and a control group without targeted sports interventions (e.g., treatment as usual) or only one intervention group (e.g., observational designs). Therefore, the primary subset of studies included randomized controlled trials (RCTs), randomized trials (RTs), and observational studies. No language limitations were applied in this study.

Study selection

Inclusion criteria comprised peer-reviewed journal articles published by reputable diet, health, sports, or technology organizations. Studies or best practices for developing mobile applications or social media aimed at improving diet behavior, participation in physical activity, and a healthy lifestyle were considered. Exclusion criteria included non-peer-reviewed materials, incorrect study type or topic, reviews, incomplete studies (such as abstracts, study protocols, or ongoing research), studies not published in the selected languages (Italian, Turkish, Greek, Portuguese, Spanish, Slovenian, and English), studies older than 20 years, and studies not targeting the youth population aged 14–29. More details about the inclusion and exclusion criteria can be found in supplementary document 1.

Search and selection process

The selection process flowchart is depicted in Figure 1. Initially, 8,278 records were identified across the seven databases. Following the removal of 3,567 duplicates, the titles and abstracts of the remaining 4,711 records were screened, resulting in the exclusion of 4,404 records. During the inclusion phase, the full text of 307 records was meticulously reviewed to assess their eligibility. Ultimately, 29 studies were identified that met the inclusion criteria (see supplementary document 1 and 3).

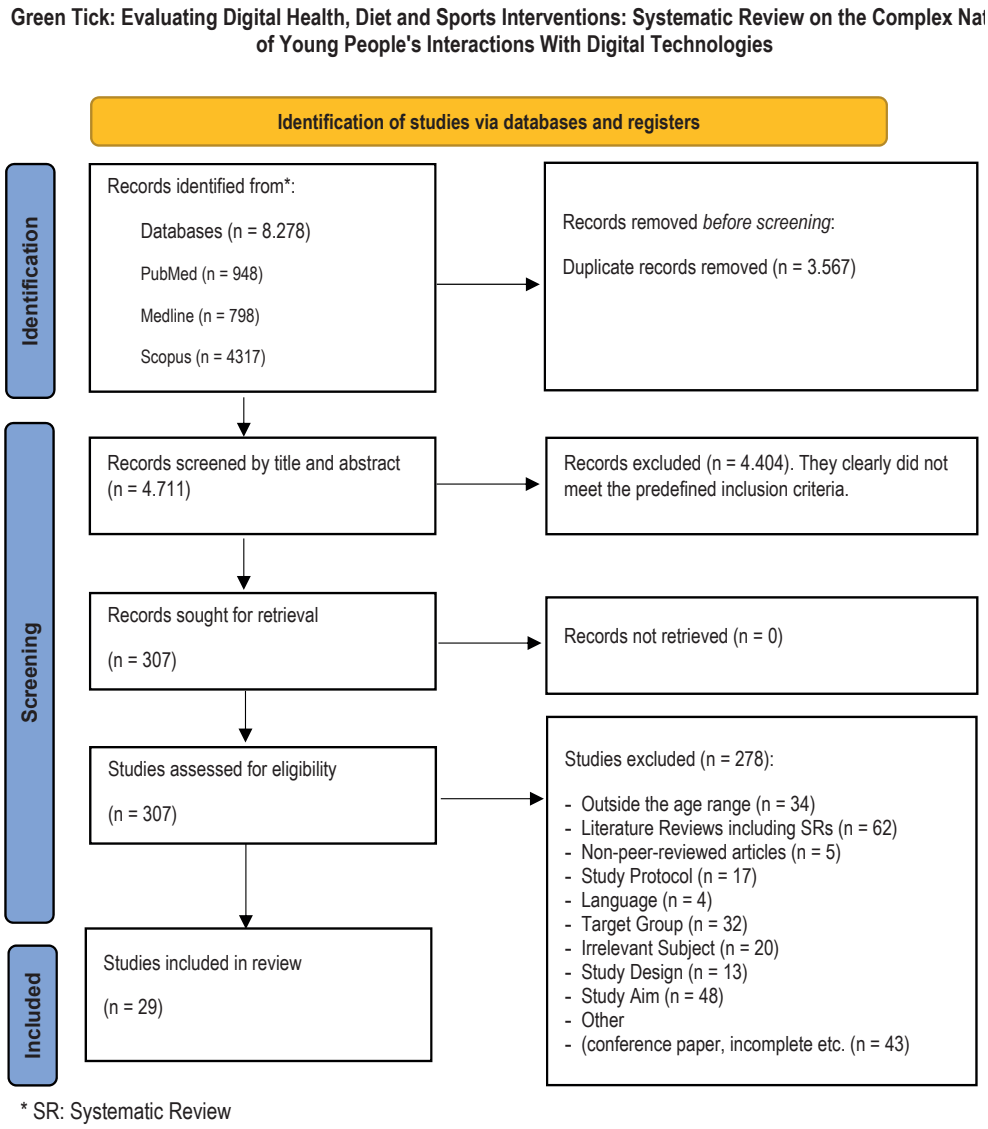

Figure 1. PRISMA Flow Diagram of Literature Search and Selection Process, * SR: Systematic Review

Data extraction

For each study included in the review, data were extracted on general characteristics of the study (author, year of publication, type of document, country, Category (diet, health or sports), sample size (in controlled studies, the number of participants receiving control and intervention); sociodemographic characteristics (sex, age); digital technology type (details); description of the intervention (sport, duration, frequency, main results, behavior change strategies, adherence). Outcomes and methods of assessment were also retrieved.

Methodological quality

Following the detailed screening of the primary studies' titles, abstracts, and full texts, a critical assessment of the included studies was undertaken. A dual-phase article selection methodology was employed. Initially, titles and abstracts of the articles were screened to identify potential candidates. Subsequently, in the inclusion phase, the full text of all articles meeting the inclusion criteria was thoroughly reviewed. Both the primary screening and inclusion phases were conducted independently by two reviewers (BSC and MAOC), each unaware of the other's assessments. Following this, ten reviewers were randomly allocated to groups for full-text screening. Articles failing to meet the eligibility criteria were documented along with the reasons, utilizing an eligibility checklist. Any discrepancies between the two reviewers were resolved through consultation with a third reviewer (AA).

Having said that, a thorough quality and relevance appraisal of each study is crucial in systematic reviews to evaluate the rigor and credibility of the included studies by reflecting on their strengths and weaknesses (Booth, 2016). Papaioannou et al. (2016) emphasized the necessity for researchers to conduct thorough evaluations of individual studies to assess the relevance and quality of the evidence, as well as to ascertain the impact of the studies on the systematic review. Conversely, Siddaway et al. (2019) pointed out that the evaluative process was not intended to filter studies based on their strengths or weaknesses but rather to assess the quality of the reports. In alignment with Siddaway's suggestion, this review implemented an adapted version of the "Critical Appraisal Skills Programme" (CASP, 2018), using a traffic light system to report the quality assessments of included studies, not to exclude them based on quality. In this context, each article was scored (1 = No, 2 = Cannot Tell, 3 = Yes) across 14 criteria. The overall rating of each article was then calculated based on its total score (21–27 = Low/Red, 28–35 = Moderate/Yellow, 36–42 = High/Green).

Results

In this chapter, we presented descriptive findings and subsequently discussed five categories that emerged to organize the findings of systematic reviews. These categories were as follows: 1) Increase awareness and/or knowledge, 2) Hazards, misinformation and credibility, 3) Attitudes and behaviour change, 4) Social Comparison, and 5) Production promotion.

Table 1. Summary of Included Studies

Publication Details	Methods Details	Study Aim	Identified impact on Youth	Key Findings	Summary
2. Triptow et al., 2024	**Topic:** Health **Type of DT:** Social Media **Type of Study:** Qualitative/ Quantitati **Participants**: 1. N = 39 2. Age:18–29 years old	To discover the different attitudes, opinions, and beliefs of young adults who enjoy accessing health information through social media in the United States.	While understanding young people's use of social media for health can lead to better interventions, it also risks promoting unrealistic standards and misinformation.	The study's identification of four social media behavior types advances the uses and gratifications theory by showing how health and media literacy influence content credibility perception, though not enjoyment.	The study used Q methodology with 39 social media-active young adults to identify four key profiles—Health Connoisseurs, Health Enthusiasts, Loyalists, and Virtual Friends—based on their motives for seeking health information.
7. Pfender & Bleakley, 2024	**Topic:** Health **Type of DT**: Social media networks (influencers) **Type of Study:** Qualitative **Duration:** 2 months **Participants**: n = 31 Age: 18–22 years	The main objective of the study is to investigate the attitudes, normative and control beliefs of young people towards seeking health information from social media influencers.	While influencers make health information more engaging and accessible, they can also harm self-esteem, spread misleading content, and erode trust due to lack of transparency.	Young people have mixed feelings about health information from influencers, valuing its convenience and personalization but wary of authenticity issues, lack of interactivity, and potential for negative social comparison.	The study highlights young people's mixed perceptions of health information from influencers, stressing the need for credibility and authenticity while noting that convenience and accessibility are key factors.
10. Tobin et al., 2023	**Topic:** Health **Type of DT:** Digital apps **Type of Study:** Qualitative **Duration:** 2 weeks **Participants:** n = 32 Age N/A	The study explores young women's experiences with behavior change strategies in mobile physical activity apps, focusing on their impact on activity participation and well-being.	While tracking physical activity and using reminders and training resources increased motivation and confidence, technical issues and app limitations caused frustration, guilt, and reduced commitment.	Of 124 respondents, 32 completed the study, showing that while some behavior change strategies like activity tracking and reminders motivated participants, technical issues and inaccessible features led to frustration and mixed results.	The study found that while mobile physical activity apps and their behavior change strategies had mixed effects on motivation, technical and comprehension issues limited their effectiveness, highlighting the need for more diverse future research.
11. Lilo, MeIntosh White, Weiss, 2023	**Topic:** Health **Type of DT:** Social Media **Type of Study:** Qualitative **Participants:** N = 32 Age: N/A	The study explores how young women's use of behavior change strategies in fitness apps impacts their activity levels, well-being, and behavior change factors.	Recording activities and using reminders and guides enhanced achievement and motivation, but technical issues and unmet expectations caused frustration and reduced commitment.	Participants using FitOn and Map My Fitness faced mixed effects from behavior change strategies, with some features boosting motivation and others causing frustration and inadequacy.	The study examined young women's use of mobile fitness apps, finding that while behavior change strategies had mixed effects on motivation, technical and comprehension issues, along with a biased sample, highlighted the need for more diverse research.

16. Bosworth et al., 2023	**Topic:** Health **Type of DT:** Specific mobile application development **Type of Study:** Quantitative/ qualitati **Duration:** N/A **Participants:** n = 10 Age: N/A	The study describes co-developing the CommitFit mHealth app with adolescents, focusing on visual design, functional requirements, gamification for healthy goals, and their expectations.	The study found that teenagers responded positively to the CommitFit app's colorful, user-friendly design and effective gamification, with their feedback being essential for the app's development.	The study found that adolescents preferred the CommitFit app's vibrant design, easy navigation, and gamification, valuing personalization, social competition, and goal-setting, while emphasizing the need for ergonomic design and usability.	Researchers found that adolescents favored colorful, user-friendly interfaces with gamification in the CommitFit app, highlighting the need for visual appeal, tutorials, reminders, personalized features, and user-centered design for success.
36. Clark et al., 2023	**Topic:** Health/diet (obesity) **Type of DT:** Social Media (Youtube) **Type of Study:** Qualitative **Duration:** 7 months **Participants:** n = 68 Age: 18-49 years	The study aimed to analyze health and nutrition information shared in YouTube vlogs by English-speaking Latinos aged 18 to 49.	Vlogs offered accessible health information and community support but could spread inaccurate advice and unrealistic health ideals.	The study reviewed nutrition vlogs from 2017–2020, finding varied accuracy and philosophies, with some promotions lacking scientific backing, and emphasized the need to address misinformation and promote healthy practices.	The study of 68 YouTube vlogs by English-speaking Latinos found themes of nutrition philosophies, misinformation, product promotion, and varying recommendations, highlighting vloggers' influence on health behaviors and the need for educational interventions.
43. König, L., & Suhr, R. 2023	**Topic:** Health **Type of DT:** Digital Apps **Type of Study**: Quasi-experimental study with a pre-post design **Duration:** N/A **Participants:** n = 365 Age: N/A	This study aimed to evaluate the effectiveness of the free and widely used web-based intervention, The APPocalypse?.	The interventions greatly boosted digital health literacy, app usage, and media literacy, leading to positive behavioral changes and high overall satisfaction among participants.	The interventions improved health literacy and app engagement, led to healthier choices, and were highly rated for their effectiveness in promoting youth health literacy.	The study aimed to assess whether the free web-based intervention The APPocalypse? would improve participants' knowledge, digital health literacy, and media literacy.
64. Wong et al., 2023	**Topic:** Health **Type of DT:** Social media **Type of Study:** Secondary analysis **Participants**: 196 young Hongkongers	The study aimed to explore how social media celebrities impact youths' dietary behaviors, with a focus on gender differences, using the AIDA model.	The study found that social media celebrities increase youths' interest in diet information, with males more likely to follow tips, though they distrust sponsored content and rarely share it, with the AIDA model explaining the influence from awareness to action.	Social media celebrities increase youths' diet awareness and interest, with males more likely to follow tips, though they distrust sponsored content, adopt suggested behaviors, and rarely share information, with the AIDA model explaining the influence from attention to action.	The study examines how social media celebrities affect youths' diet behaviors in Hong Kong, finding that while males are more likely to follow diet tips, vendor sponsorship reduces trust in these messages.

83. J. Leu et al., 2022	**Topic:** Diet **Type of DT:** Social Media **Type of Study:** qualitative, **Duration:** N/A **Participants:** NA	The study explored the impact of social environments, including peer influence and social norms, on young adults' dietary and physical activity behaviors, and the interaction between real-life and digital social influences.	The study focused on adults with major depressive disorder and did not address the impacts on youth.	The intervention effectively reduced depressive symptoms, improved daily functioning and quality of life, and was successful due to its personalized, remote delivery via a smartphone app.	A U.S. trial showed that an eight-week mobile app providing cognitive-behavioral therapy significantly reduced depressive symptoms in adolescents, though it faced issues with self-reported data and selection bias, indicating a need for further research.
84. Slazus et al., 2022	**Topic:** health and nutrition research **Type of DT:** digital app myfitnesspal **Type of Study:** observational study **Participants:** South African university students **Age: N/A**	MyFitnessPal app: Can it help college students lose weight? This study explores its impact on diet, weight, and user experience.	Pros include reduced sugary intake and weight loss success, while cons involve concerns about obsession with tracking, limited food options, and potential loss of interest over time.	Participants using MyFitnessPal met weight goals with varying success, found the app user-friendly and helpful, though concerns about tracking obsession and limitations like focus on university students and self-reported data were noted.	MyFitnessPal helped users meet diet and weight goals and reduce sugary intake, though overall weight change was limited, the community feature was underused, and the study had limitations due to its focus on university students and self-reported data.Formun Üstü Formun Altı
103. Stasinaki et al., 2021	**Topic:** Health, sports **Type of DT:** Digital apps **Type of Study:** randomized controlled trial **Duration:** 12 months **Participants:** n = 41 age: 10–18	The primary outcome was reduced BMI-SDS, with secondary outcomes including changes in body fat, muscle mass, waist-to-height ratio, physical capacities, blood pressure, pulse, and stress parameters.	The study found that the mobile health intervention effectively reduced BMI, improved physical capacities, and decreased stress levels in adolescents with obesity, demonstrating comprehensive health benefits.	The study found that lack of motivation and reward-seeking affected participation, but the PathMate2 app with standardized counseling was effective, suggesting more healthcare contact would help, and chronic stress was not a major factor in adolescent obesity.	The study by Stasinaki et al. (2021) showed that a mobile health intervention effectively reduced BMI, improved physical capacities, and decreased stress in adolescents with obesity, supporting mobile health solutions for overall health improvements.
115. Januraga et al., 2020	**Topic:** Diet **Type of DT:** Social Media **Type of Study:** Qualitative **Duration:** 2 months **Participants:** Adolescent girls aged 16–19 years	The study aimed to evaluate the effectiveness and acceptance of the #prettyandpicky social media campaign in promoting healthy eating among Indonesian urban adolescent females.	The campaign improved knowledge of unhealthy food risks, dietary choices, and perceptions of healthy food, led to dietary changes, and encouraged participants to promote healthier eating among peers and parents.	The study emphasized using multiple social media platforms, particularly Instagram, and increasing posting frequency to enhance campaign engagement and effectively reach the target audience.	The #theprettyandpicky campaign successfully promoted healthier eating habits among Indonesian urban adolescent females by increasing awareness, shifting perceptions, and leading to concrete dietary changes.

125. Grant, Wolff, Clark, 2020	**Topic:** Health **Type of DT:** Digital Apps **Type of Study:** Qualitative **Duration:** N/A **Participants:** 16–18 years	The study aimed to understand London secondary school students' views on mental health, e-platforms for wellbeing monitoring, and barriers to using e-health technologies.	Involving youth in developing e-health technologies for mental health could boost engagement and support access, but raises concerns about privacy, data security, and usability.	Participants found the program easy to use and motivating but engaged less over time, sought more workout variety, and showed increased motivation without significant fitness or strength gains.	Successful e-health technologies for mental health should build trust, ensure accessibility, offer support, be engaging, protect data privacy, safeguard at-risk users, and involve young people in the design process.
147. Sousa et al., 2020	**Topic:** Health **Type of DT:** Mobile app (TeenPower) **Type of Study:** Quantitative **Duration:** 6 months **Participants:** N=353 Adolescents aged 12–16,	Evaluate effectiveness of TeenPower in promoting healthy behaviors in adolescents	The intervention enhanced nutrition, lifestyle, and stress management in adolescents, especially older ones, showing mHealth's value as a supplement to traditional health programs despite a high dropout rate.	The TeenPower intervention significantly enhanced adolescents' nutrition, lifestyle, and stress management, proving mHealth tools' effectiveness despite a 62.1% dropout rate.	The TeenPower mHealth intervention effectively improved adolescents' nutrition, lifestyle, and stress management, showing potential as a valuable addition to traditional health programs despite a high dropout rate.
148. Plaisime et al., 2020	**Topic:** Health **Type of DT:** Social Media **Type of Study:** Quantitative **Duration:** N/A **Participants:** N=152 Teens aged 13–18 years	Explore the role of social media in health communication among teens	The study found that although most teens use social media, few actively seek health information unless prompted, indicating that tailored, attractive, and reliable content could effectively promote health.	Despite high social media use among teens, few seek health information unless it's specific, with a preference for attractive, tailored content and challenges in finding reliable sources.	The study found that teens rarely seek health information on social media but show increased interest in specific topics like fitness and nutrition, suggesting that tailored, engaging, and reliable messages could effectively promote health.
164. Nikolaou et al., 2019	**Topic:** Health **Type of DT:** Mobile health apps and social media **Type of Study:** Exploratory, Qualitative **Duration:** 2 weeks (duration of focus group discussions) **Participants:** N = 2285, young people aged 13–24 years, mixed gender	To explore preferences and usage of lifestyle apps among young people in 6 countries	Personalized feedback, social support, and gamification in health apps boosted youth engagement, driven by desires to improve appearance and fitness, while addressing privacy and usability concerns was key for ongoing use.	Young people are more engaged with health apps that provide personalized feedback, social support, and gamification, motivated by appearance and fitness goals, while preferring user-friendly, attractive, evidence-based apps and facing barriers like privacy concerns and time constraints.	Personalized feedback, social support, and gamification enhance young people's engagement with weight control apps, driven by appearance and fitness goals, while privacy concerns, time constraints, and preferences for user-friendly, attractive, evidence-based design need to be addressed.
166. Jensen et al., 2019	**Topic:** Health **Type of DT:** Adaptive text messaging intervention for weight control **Type of Study:** Quantitative **Duration:** 6 months **Participants**: aged 13–18	To assess the feasibility, acceptability, and preliminary effectiveness of a text messaging intervention for weight control in adolescents	The intervention, using personalized text messaging integrated into primary care, was feasible, well-received, and showed promise in improving weight-related behaviors among adolescents.	The adaptive text messaging intervention was effective and well-received, improving weight-related behaviors and showing potential for successful integration into primary care.	The study found that combining adaptive text messaging with motivational interviewing improved self-monitoring adherence and moderately reduced zBMI in adolescents.

173. Zeeni et al., 2018	**Topic:** Health **Type of DT:** Mobile phones, social media, Internet **Type of Study:** Cross-sectional **Duration:** N/A **Participants:** 244 university students, ages 16–21	To explore the impact of different types of media and technology on physical and mental well-being	High media use among youth is linked to lower physical activity, higher anxiety and depression, poor sleep quality, and increased sedentary behaviors, raising obesity risk and related health issues.	High media consumption correlates with reduced physical activity, increased anxiety and depression, poor sleep quality, and greater sedentary behavior.	The study explores how media and technology use among Lebanese university students affects their mental and physical well-being, uncovering significant psychological issues.
174. Goodyear et al., 2018	**Topic:** Health, Sports, Diet **Type of DT**: Social media and digtal apps, **Type of Study:** Cross-sectional study **Duration:** N/A (observational) **Participants:** aged 13–18	To explore young people's engagement with digital health technologies and how these influence their health-related behaviors.	Both positive and negative impacts noted, including motivation for fitness and potential for body image issues.	Young people access diverse health information online, influencing their physical and mental health, body image, and behaviors, and they call for improved adult support in using digital health technologies.	The study explores how young people in the UK engage with digital health technologies, noting their mixed impacts on health behaviors and perceptions, and calls for better adult support and understanding.
183. Lee et al., 2017	**Topic:** Health **Type of DT:** Mobile apps **Type of Study:** Academic research **Duration:** Not applicable **Participants:** „142 sophomores (26.8%), juniors (40.8%), and seniors (32.4%)"	To explore motivations behind continued use of diet and fitness apps	Not directly targeted	The study found that recordability, networkability, credibility, comprehensibility, and trendiness are key factors driving continued use of diet and fitness apps, while accuracy and entertainment are less significant, suggesting developers should prioritize usability, social features, and reliability.	The study found that recordability, networkability, credibility, comprehensibility, and trendiness are key motivators for continued use of diet and fitness apps, while accuracy and entertainment are less important, highlighting the need for developers to focus on usability, social connectivity, and reliability.
184. Napolitano et al., 2017	**Topic:** Health **Type of DT**: Social media (Facebook), SMS Text Messaging **Type of Study**: Clinical Trial **Duration:** 18 months **Participants:** aged 18–35	To assess the efficacy of social media and text messaging in promoting weight loss among college students	Not directly targeted; focuses on college students	Social media platforms engage young adults in weight loss programs through online challenges, personalized feedback, and supportive communities, showing preliminary effectiveness in enhancing motivation and adherence.	The study explores social media's effectiveness in weight loss interventions for young adults, finding that combining social media with online challenges and personalized feedback engages participants and supports weight loss efforts.
189. Partridge et al., 2006	**Topic:** Health **Type of DT:** Digital Apps **Type of Study:** Qualitative **Duration:** 3–9 Months **Participants:** aged 18–35 years	The study aimed to assess whether improvements in knowledge, self-efficacy, and stages of change for nutrition and physical activity could mediate behavioral changes in young adults.	The study concludes that mHealth interventions like TXT2BFiT can effectively improve young adults' dietary and physical activity behaviors by enhancing self-efficacy and knowledge.	The intervention group demonstrated better fruit knowledge and improved dietary behaviors, with self-efficacy mediating improvements in nutrition and physical activity over time.	The study found that the mHealth intervention TXT2BFiT significantly improved young adults' fruit knowledge, dietary behaviors, and physical activity by enhancing self-efficacy.

194. Kessel et al., 2016	**Topic:** Sports **Type of DT:** Online Social Network **Type of Study:** Qualitative **Duration:** N\A **Participants:** ages 13 to 18 years	The study aimed to explore teenage girls' perceptions of physical activity and their receptivity to receiving interventions through online social networks.	Barriers to the intervention's effectiveness included viewing physical activity as a chore and losing interest over time, though teenage girls favored friendly competition, goal-setting, and group elements.	Teenage girls, who are heavy Facebook users on smartphones, prefer health interventions that can be done with friends but should not require them to lead within their social group.	The study found that Australian teenage girls prefer physical activity interventions via Facebook that emphasize sports, fitness, and socialization, while avoiding „uncool" elements like walking and cartoon imagery, and highlights the need for parental support when not framed as weight loss.
197. Wang et al., 2016	**Topic:** Diet and Physical Activity **Type of DT:** Digital Apps **Type of Study:** Qualitative **Duration:** N\A **Participants:** 500 Norwegians with an average age of 25.8 years	This study examined the effects of diet and PA apps on users and investigated whether these apps contributed to changes in dietary habits and physical activity levels.	Users found diet and PA apps effective for promoting health and enhancing knowledge, but desired more personalized, less time-consuming options.	Users of both diet and PA apps found them effective for maintaining healthy habits, with frequent and long-term use leading to greater effectiveness compared to single-app use.	The study found that frequent use of diet and PA apps significantly improved dietary habits and physical activity among users, with positive impacts on health awareness and social integration, although users desired more customization due to the apps being time-consuming.
201. Belmon et al., 2015	**Topic:** Health **Type of DT:** Digital Apps BC: Multiple behavior change techniques (BCTs) **Type of Study:** Quantitative **Duration:** n/A **Participants:** aged 18–30 years	The study investigated young adults' preferences for behavior change techniques in fitness apps and their relationship with personality traits and exercise self-efficacy.	The study explores young adults' preferences for behavior change techniques in fitness apps, highlighting their potential to boost physical activity, establish healthy habits, promote health, and enhance self-efficacy, while also noting concerns like overreliance on technology and privacy issues.	The study found that young adults highly rated self-regulation techniques in fitness apps but were less enthusiastic about social support features, with individual traits influencing these preferences, while physical activity levels showed no significant link to behavior change technique ratings.	The study revealed that young adults prefer self-regulation techniques like goal setting and feedback in physical activity apps, while social support features are less favored, with personality traits influencing BCT ratings but no significant link between BCT ratings and physical activity levels, highlighting the need for tailored interventions.
217. Li et al., 2013	**Topic:** health **Type of DT:** digitall Apps **Type of Study:** quantitative **Duration:** 3 week **Participants:** 17 and 25	The study evaluated how a fully automated, Web-based social network game improved mental health knowledge and problem-solving skills in young people, examining motivational factors and gender differences in learning outcomes.	The study found that the gaming approach significantly improved mental health literacy, reduced test anxiety, fostered high intrinsic motivation, and showed no gender differences in learning outcomes.	The study showed that the game effectively enhanced mental health literacy, increased intrinsic motivation, reduced test anxiety, had no gender differences in outcomes, and highlighted intrinsic goal orientation and self-efficacy as key factors in learning.	The study found that the Web-based social network game effectively improved mental health literacy, boosted intrinsic motivation, reduced test anxiety, and had no gender differences, though it had limitations like a lack of a control group and a small, biased sample.

251. Quante et al., 2018	**Topic:** Health **Type of DT:** Digital Apps **Type of Study:** Qualitative **Duration:** 2 weeks **Participants:** „n = 27 () 14–18 years old	The study aimed to evaluate the acceptability and effectiveness of sleep improvement apps among low-income and minority adolescents, focusing on their perceptions, barriers, motivators, and readiness for mobile health interventions.	The study found that while sleep improvement apps increased awareness and helped regularize sleep schedules, issues like dependency on electronics and challenges with consistent use, especially on weekends, raised concerns about long-term adherence.	Participants liked sleep apps for their features but faced barriers like reluctance to change habits and maintaining consistent use, highlighting the need for personalized content and incentives to sustain long-term engagement.	The study explored the use of sleep apps among adolescents from low-income and minority backgrounds, finding interest in the technology but significant barriers like reluctance to change habits and electronic addiction, highlighting the need for culturally sensitive intervention programs.
285. Lin, & Mâsse et al., 2021	**Topic:** Health **Type of DT:** modification app **Type of Study:** Quantitative: Factor mixture analysis **Duration:** Data were collected from March to October 2018. Teens used the app for 4.5 months	The study aimed to analyze how teens use the Aim2Be app, identify engagement profiles, and determine which profiles are associated with improvements in diet, physical activity, screen time, sleep, and targeted mediators.	Parental engagement supported teen engagement of the Aim2Be app and high engagement was needed to support behavior change among teens. Teens with very high engagement rates improved on most mediators of behaviour change and increased fruit and vegetable intake.	The study found that high engagement with the Aim2Be app led to more positive changes in health outcomes, with parental support being crucial, and highly engaged users showed improved nutrition knowledge, motivation, self-efficacy, and increased fruit and vegetable intake compared to less engaged users.	The study found that teens' engagement with the Aim2Be app varied from minimal to high, with higher engagement, supported by parental involvement, leading to better behavior changes and increased fruit and vegetable intake.
289. Parker, Gould et al., 2022	**Topic:** Health **Type of DT:** Social media and online platforms used for healthy lifestyle purposes **Type of Study:** Mixed Methods Study **Duration:** N/A **Participants:** Older adolescent girls in Australia.	To investigate how Australian adolescent girls use social media and online platforms for healthy lifestyles	Positive: Active use for healthy lifestyle purposes, lack of research on health promotion	Adolescent girls use social media for healthy lifestyles, need for research on health promotion	The article examines Australian older adolescent girls' use of social media for healthy lifestyles, emphasizing the need for customizable, credible digital tools and further research on promoting health behaviors through these platforms.

Descriptive Findings

This systematic review extracted data on various study characteristics, including author, publication year, study type and methodology, intervention details, sociodemographic characteristics, digital technology type, study aim, and identified impacts on youth. The review encompassed 29 studies, with the USA contributing the most (n = 10), followed by Australia (n = 4), the UK (n = 2), and other countries each contributing one study. One study involved a multi-country dataset. The distribution indicates significant contributions from the USA and European countries, including the UK, despite the global research scope.

The review included seven mixed-methods studies, eight qualitative studies, and fourteen quantitative studies. Nearly half the studies addressed diet, health, and sports simultaneously, while others focused on any two of these interrelated topics. Health-related studies often included interventions related to diet and/or sports.

Specifically, nine studies focused on social media, fifteen on digital apps, and five on both. Methodologically, seven studies used mixed methods, ten used qualitative methodologies, and twelve used quantitative methodologies. The fifteen studies focused on digital apps included various types such as smartphone apps (n = 13), text-based interventions (n = 3), web-based interventions (n = 4), and one study on exergames. Among the social media-focused studies, only one specifically examined YouTube, two focused on Facebook, and the remaining eleven analysed multiple platforms together. This highlights the need for research focusing on individual social media platforms due to their distinct characteristics.

The studies involved data from nineteen countries, predominantly from the USA, with only seven conducted in continental Europe. Most studies were recent, reflecting the increasing interest in social media and digital apps in diet, health, and sport domains.

Narrative Findings

This systematic review focused on young people's reactions to social media and various digital technologies, such as smartphone apps, web-based interventions, wearable devices, exergames, and video games, evaluating both their positive and negative influences, as well as the potential benefits and risks of these platforms. The included studies were categorized into five distinct areas: 1) Increasing awareness, knowledge, and self-efficacy, 2) Hazards, misinformation, and credibility, 3) Attitudes and behaviour change, 4) Social comparison, and 5) Product promotion. The first category examines how social media and digital applications can enhance young people's awareness, knowledge, and self-efficacy regarding specific subjects. The second category explores the dangers of social media and digital applications, including the spread of misleading or harmful information and the challenges young people face in distinguishing reliable sources. The third category analyses the broad impact of these technologies on youth attitudes and behaviours related to diet, health, and sports, highlighting both negative and positive changes. The fourth category addresses the frequency of physical appearance comparisons among youth, particularly those featured in social media content, and the resulting impact on self-confidence and body (dis)satisfaction. The final category investigates the influence of sports, health, and nutrition-related content designed to promote and market products to youth.

***Increase awareness, knowledge and/or* self-efficacy**

The impact of social media and various digital technologies (e.g., smartphone apps, web-based interventions, wearable devices, exergames, video games) on young people's knowledge, awareness, and self-efficacy related

to diet, health, and sports has been a long-discussed topic (European Commission, 2014; Núñez et al., 2015). In this systematic review, the most prominent theme was "increasing awareness, knowledge, and/or self-efficacy," addressed by seventeen studies. Specifically, studies 2, 7, 10, 36, 43, 64, 84, 115, 148, 166, 189, 197, 217, 251, and 285 indicated that social media platforms and digital technologies are vital for enhancing awareness, knowledge, and self-efficacy about diet, health, and sports. The remaining fourteen studies focused on other themes such as hazards, misinformation, attitudes and behaviour change, social comparison, and product promotion. Nine studies focused on digital apps, while six examined social media. A recent study on adults (Goodyear et al., 2021) aligns with these findings, showing increased awareness of the benefits of social media content. Studies 2, 10, 43, 64, 166, 189, 197, 217, 251, and 285 found that young people are similarly improving their understanding, awareness, and confidence in using social media for health information. Additionally, such platforms enhance media literacy, helping youths critically evaluate the quality and credibility of online health information (studies 36, 43, 115). Social media is increasingly displacing traditional sources for health, diet, and sports information, as confirmed by studies 7, 84, 115, and 148, which show young people seeking novel insights through these platforms.

Hazards, misinformation and credibility

A recent systematic review by Chen and Wang (2021) highlighted the growing number of studies addressing the rapid and uncontrolled circulation of misinformation on social media and proposing strategies to combat it. In this context, studies 7, 16, 36, 43, 64, 84, 125, 148, 164, 174, 183, 194, and 289 examine hazards, misinformation, and credibility issues on these platforms. These studies reveal that diet trends, unreliable influencer content, and unscientific health recommendations can lead to harmful health outcomes, with young people influenced by the authenticity of information, expert presence, and transparency in product promotion. Studies 84, 164, and 174 emphasize the risks of accepting information from trusted sources without scrutiny due to the abundance and conflicting nature of online content. Consistent with Goodyear et al. (2018), over half of the participants are likely to adopt information from perceived reliable sources, highlighting the need for caution. De Regt et al. (2020) note that trust is often built through verifiable facts and relationships with experts, which can lead to the spread of risky information for commercial gain. Studies 64, 174, and 289 indicate user awareness of the promotion of harmful products under beneficial guises, stressing the need for confidence in health information accuracy and security. Studies 43, 125, 174, 183, and 194 found that participants trust interventions from reputable sources like universities and public institutions, but evaluating the reliability of content from numerous apps and influencers remains complex. Ekinci et al. (2021) suggest that implementing protective mechanisms tailored to users' literacy levels, such as verified accounts for health-related information, could reduce hazards and promote healthy behaviours.

Attitudes and Behaviour Change

Young people should be encouraged to change attitudes and behaviours through social media and digital app content and be equipped to critically evaluate health, diet, and sports-related content, as the psychological and physiological consequences may be severe (Diviani et al., 2015; Karaduman, 2019; Duplaga, 2020; Jong & Drummond, 2020). Studies 2, 7, 10, 11, 16, 36, 64, 84, 103, 115, 147, 166, 197, 201, 251, and 285 focus on such attitudes and address the extent and ways behaviour change occurs. For example, study 2 categorizes attitudes toward using social media for health information into four types: connoisseurs, enthusiasts, loyalists, and virtual friends, providing valuable insights into young people's digital media literacy and interpretation of health content. Studies 7, 10, 11, 147, and 166 identify a range of attitudes among young people, helping them discern the

advantages and disadvantages of obtaining health information from social media and digital apps, noting generational differences in perceiving social norms related to health information from influencers. Study 251 highlights young participants' reluctance to change ingrained habits, while studies 217 and 285 emphasize intrinsic motivations to change lifestyle and eating behaviours. Social media accounts, especially influencers, can encourage positive behaviours like incorporating nutritious foods and regular exercise, but can also contribute to unrealistic or extreme attitudes (studies 36, 64, 83, 115). Studies 84, 115, and 194 report concrete changes in physical activity and dietary patterns, concluding that social media and digital apps can affect young users' attitudes towards a healthy diet and physical activity. Motivational elements like reminders, prompts, gamification, goal setting, competition, and training videos are effective, particularly for adolescents (studies 10, 16, 84, 103, 201; Stasinaki et al., 2021). Lastly, study 64 finds individuals seldom share diet advice from social media, whereas studies 11 and 115 note young people often try to persuade peers and parents to adopt healthier habits.

Social Comparison

The issue of social comparison on social media, particularly concerning health, diet, and sports topics such as body image and body positivity, has recently gained prominence and has elicited both criticism and support (Cohen et al., 2021). A significant number of the studies included (studies 2, 7, 16, 125, 147, 173, 174, 184, 194, 201, 289) highlight that social media and digital app content promoting unrealistic health standards and physical portrayals create social comparison risks and pressures on young people, potentially leading to low self-esteem and body dissatisfaction. Young people feel significant pressure to meet unrealistic physical portrayals and standards of health, diet, and sports (studies 2, 7, 125, 147, 174, 184). Competition and social comparison with friends become more dangerous for young people, particularly those with lower digital media literacy (studies 16, 173, 201). These findings align with two systematic reviews concluding that interaction with social media negatively affects body image perception among young people due to their exposure to idealized images on these platforms (Holland & Tiggemann, 2016; Fioravanti et al., 2022).

Product Promotion

Given that many brands continue to invest in digital technologies, particularly social media content producers, to promote their products, it is vital to understand how young people perceive these recommendations, when they begin to trust them, and at what point they follow the advice. In this context, only a few studies (studies 7, 11, 36, 43, and 289) address that product promotion is a significant issue negatively affecting young people's nutrition, health, and sports behaviours. Studies 11 and 289 emphasize that young people are increasingly aware of manipulative product promotion on social media accounts related to health, diet, or sports, and thus approach such content with greater caution. The promotion of unhealthy products, fitness supplements, and diet products for weight loss is central to marketing to youth in the digital age (Dunlop et al., 2016). Transparency and verification of product promotion and app funding, which may lead to an erosion of trust, have been addressed in studies 7, 36, and 43. These studies underline that a lack of transparency about sponsored content and potential conflicts of interest can make young people sceptical of all health, diet, and sports information on social media and digital apps. Nevertheless, due to the limited number of studies exploring this, we do not fully understand the extent of young people's awareness and their ability to critically evaluate whether health, diet, and sports-related content is deliberately manipulated to sell products.

Discussion

This systematic review offers an in-depth examination of young people's interactions with digital health, diet, and sports interventions via digital technologies, including social media. The results reveal the multifaceted nature of these technology-based interventions, showcasing both well-known potential benefits and less-known but notable risks associated with promoting healthy lifestyles among youth. The key findings of this study were categorized into five areas: 1) Increased Awareness, Knowledge, 2) Hazards, Misinformation, and Credibility, 3) Attitudes and Behaviour Change, 4) Social Comparison, and 5) Product Promotion. Each of these categories has been discussed in light of the data presented in the relevant results section above.

Increased awareness, knowledge and/or self-efficacy

This review highlights that, as expected and consistent with other systematic reviews, social media and digital technologies have been utilized by young people to enhance their awareness, knowledge, and self-efficacy regarding health, diet, and sports (Freeman et al., 2023; Raeside et al., 2024). These technologies are replacing traditional methods and serve as significant mediums for information. However, the included studies do not sufficiently clarify whether this increased awareness, knowledge, and self-efficacy are genuinely substantial or merely superficial perceptions and buzzwords expressed by participants. Additionally, these studies often lack detailed insights into the longevity and sustainability of these positive impacts over time. Neglecting any of the interconnected areas of sport, health, or nutrition may result in an inadequate understanding of the impact of digital technologies and social media, as a healthy lifestyle requires a balanced diet and physical activity. Future research should address these three areas together for more reliable and accurate results. A recent study on TikTok (Dimitroyannis et al., 2024) found that 56% of Generation Z in the United States use the platform for health and wellness advice, with TikTok being the main source of information for one in three people. Alarmingly, one in eleven users reported health problems after following advice from TikTok. This underscores the need for users to enhance their knowledge, awareness, and self-efficacy, as the uncontrolled spread of misinformation on social media and digital technologies poses significant health risks, including injuries and malnutrition.

Hazards, misinformation and credibility

In 2023, a systematic review by Freeman et al. (2023) highlighted that "social media involves a complex interplay between trust in social media platforms, other users, and health content" (p. 703). Another systematic review by Ho et al. (2024) focused on issues of anonymity, privacy, and confidentiality rather than the trustworthiness and credibility of digital content. However, the current study reveals a significant increase in research questioning the trustworthiness and credibility of such content. Key findings to consider in designing future studies, guidelines, training, and policies include the prevalence of misinformation, its sources, factors provoking misinformation from both producers and users, perceptions of users and content producers, the promotion of unreliable and misleading products for commercial purposes, and perceived reliable sources. Although digital platforms, including social media, offer significant opportunities for promoting a healthy lifestyle, physical activity, and a healthy diet, they also pose substantial risks due to the proliferation of misinformation. To combat the uncontrolled circulation of unreliable information, it is vital to foster users' knowledge, awareness, and self-efficacy—that is, digital health, diet, and sports literacy. While the included studies identify the volume of misinformation and suggest educating users, they do not adequately address how users can become digitally literate to critically interpret such information or propose user-friendly protective mechanisms tailored to the characteristics of today's young generation.

Attitudes and Behaviour Change

In light of the findings discussed, several studies have identified the significant impact of influencers on users' health, diet, and sports recommendations. It is well-documented that celebrities, influencers, and elite athletes can serve as role models and profoundly influence society. However, the mechanisms of this influence through digital technologies, especially social media, within the context of health, diet, and sports information, remain under-researched. A groundbreaking study by Pope and Rose (2024), published after this review's database search, found that celebrities like Taylor Swift can help reduce body dissatisfaction and promote recovery from eating disorders, thereby encouraging a healthy lifestyle. Conscious and systematic expressions, attitudes, and behaviours of individuals capable of attracting large audiences can significantly contribute to these positive outcomes. Conversely, careless, self-indulgent actions or the assumption that personal experiences are universally applicable can have negative effects. Therefore, influencers should receive professional education or support in these areas if they wish to share their opinions publicly or must act cautiously with their followers.

The findings of a systematic review by Afshin et al. (2016) concluded that social media and digital technologies are more effective than traditional interventions in triggering behaviour changes related to a physically active lifestyle, healthy diet, and healthy behaviours. The use of motivational elements such as reminders, goal setting, and gamification promises to increase the usage of these technologies by young people. Moreover, cultural differences significantly influence attitudes and behaviours towards digital technology content. However, a national study in the USA found no significant ethnic or racial disparities in the use of social media for health information (Chou et al., 2021). Cross-country comparative studies may provide more comprehensive insights into ethnic or racial differences. Only study 164 among those reviewed explored the interaction of young people with digital technologies and social media, but it overlooked how attitude and behaviour changes occur.

While digital technologies, including social media, can ignite positive attitude and behaviour changes such as increased physical activity, healthy lifestyle, or diet, they may also lead to negative changes. Most studies included in the review focused on positive changes, often ignoring potential negative changes. None of the studies simultaneously addressed both positive and negative changes attributed to these digital technologies. The studies reveal that while digital interventions show promise, some long-established daily habits are resistant to change through digital means alone. Echoing Triptow et al.'s (2024) seminal study, attitudes towards the use of these technologies can be categorized into connoisseurs, enthusiasts, loyalists, and virtual friends, but the degree of transitivity between these categories remains unclear. Expanding on this categorization can strengthen our understanding of young people's engagement with digital technologies, including social media, and how behavioural changes occur.

Social Comparison

A significant portion of the included studies highlighted that increased usage of digital technologies leads to heightened social comparison (Tiggemann & Slater, 2013). This comparison and pressure often arise from unrealistic standards of health, beauty, and idealized physical appearances portrayed on digital platforms, particularly social media. Results indicate that such comparisons frequently result in low self-esteem and body dissatisfaction among young people. Given that these platforms prioritize idealized, attractive, and popular content, competition and social comparison with peers become more harmful, especially for those with lower digital media literacy (Carah & Dobson, 2016; Widdows, 2024). A recent study found that Snapchat and Instagram have more negative effects on social comparison than Facebook (Vandenbosch et al., 2022). Conversely, some studies

suggest that body-positive content on social media can positively affect users under certain conditions, though it should be approached cautiously as body positivity is often a contentious topic (Cohen et al., 2019; Vandenbosch et al., 2022). Additionally, celebrities or influencers like Taylor Swift can help reduce body dissatisfaction and aid in overcoming eating disorders, thereby supporting recovery and the adoption of a healthy lifestyle (Pope & Rose, 2024). This dichotomy necessitates further investigation into the extent to which content creators on social media and digital platforms, especially influencers, are aware of their impact in this area. It remains insufficiently examined, suggesting that studies addressing the attitudes, behaviors, perceptions, and opinions of both content producers and their audiences could be beneficial.

Product Promotion

Sports, diet, or health professionals, celebrities, and social media influencers are frequently sponsored by brands to promote their health, diet, or sports products (Johnson et al., 2021). This trend is driven by changing media consumption behaviours and scepticism towards traditional advertising, fuelling the growth of influencer marketing (Karagür et al., 2022). However, this systematic review reveals that only a limited number of studies have investigated the impact of digital content involving product promotion on young people in the context of diet, health, and sports. The promotion of unhealthy products, fitness supplements, and diet products for weight loss is central to youth marketing in the digital age (Dunlop et al., 2016). For example, a study found that social media often positively influences the buying behaviour of nutritional supplements (Renga, 2017), indicating young people's tendency to trust such platforms easily. However, this attitude can lead to serious health risks. Echoing De Regt et al. (2020), trust is built by first providing verifiable facts and establishing relationships with experts and/or popular influencers. Consequently, risky and unreliable information, especially for commercial purposes, is easily presented to users, blending with accurate information. In other words, the main aim often revolves around selling products or promoting sponsors, rather than fostering a healthy lifestyle, encouraging physical activity, or supporting healthy dietary habits.

Conclusion

This systematic review compiled 29 studies spanning 20 years (Supplementary Document 3), examining how young people interact with digital health, diet, and sports interventions. The results highlight well-recognised benefits of digital technologies; however, there remains a lack of consensus and limited consideration of significant risks associated with promoting healthy lifestyles among youth. This implies that while digital technologies are valuable resources for health, diet, and sport-related information, they may also propagate misinformation. In particular, this study highlights that digital technologies enhance awareness, knowledge, and self-efficacy. Likewise, digital technologies, including social media, play a crucial role in shaping young people's attitudes and behaviours regarding health, diet, and physical activity choices. While these technologies offer both risks and benefits, existing findings provide limited insight into the mechanisms behind these behavioural changes, particularly over the long term, underscoring the need for further research. In contrast, the findings indicate that these technologies pose a significant risk of fostering social comparison and pressure among youth, which can result in dissatisfaction, and mental-health problems. More critically, such dissatisfaction and mental health challenges can amplify the likelihood of accepting misinformation about sport, diet, and health, without critical thinking, driven by the desire to quickly achieve socially imposed ideals, such as a fit body. Similarly, the findings highlight that the reliability, safety, and credibility of digital content related to diet, health, and sports present a potential risk and remain

insufficiently explored in research. Lastly, results show that only few studies have examined the impact of digital promotions of diet, health, and sports products on youth and comparisons with non-promotional content are lacking in the literature. In conclusion, future studies should further investigate both the positive and negative aspects of young people's digital engagement. Given rapid developments in AI technologies, particularly generative AI like ChatGPT-4, Gemini, or Lama, and their potential role in accessing information on diet, health, and sports (Saraç et al., 2025), future studies should also examine how young people engage with these technologies. Furthermore, as AI-generated content related to sports, health, and diet can be released on social media and other digital platforms, it may be necessary to consider various legal measures, as such information can easily cause serious health risks, injuries, or malnutrition.

Limitations

This systematic review has several limitations that must be acknowledged. Firstly, there is significant heterogeneity in the methodologies of the included studies, which limits the ability to make direct comparisons and draw definitive conclusions. This diversity includes variations in study design, participant demographics, types of interventions, and outcome measures, resulting in a wide range of findings that may not be consistently applicable. Secondly, publication bias is a potential concern. Despite comprehensive search strategies, relevant unpublished studies or studies published in non-indexed journals may have been missed, potentially leading to an overestimation of the effectiveness of mobile applications and social media interventions in promoting health, diet, and sports lifestyles among young people. Thirdly, the quality of the included studies varied considerably. While some studies were robust and well-conducted, others lacked rigorous methodological designs, such as randomized controlled trials, adequate sample sizes, and long-term follow-ups. These methodological shortcomings can affect the reliability and validity of the findings. Additionally, different studies focused on varying metrics for evaluating the effectiveness of interventions, making it complex to extract best practices or guidelines. Standardization in reporting would enhance the comparability and synthesis of findings in future research. Consequently, the studies included in this review may not fully capture the latest trends and innovations in these technologies, limiting the applicability of the findings to current practices.

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