

Effect of health campaigns through social media on changes in diabetes mellitus prevention behavior in young adults

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ABSTRACT

Introduction: Diabetes mellitus (DM) is an increasingly prevalent non-communicable disease among young adults, driven by unhealthy lifestyles, physical inactivity, and poor dietary habits. Social media has emerged as a widely accessible platform for health promotion, offering opportunities to disseminate preventive health information and encourage healthy behavior. This study aimed to examine the effect of health campaigns delivered via social media on diabetes prevention behaviour among young adults.

Research Methodology: An analytical cross-sectional study was conducted in Makassar, Indonesia, between January and March 2026. A total of 176 young adults aged 18–35 years were recruited using stratified random sampling. Data were collected via a validated online questionnaire assessing exposure to social media health campaigns and diabetes prevention behaviours. Descriptive statistics, Pearson correlation analysis, and multiple linear regression were performed using SPSS version 29.0, with a significance level of $p < 0.05$.

Results: The mean age of participants was 24.8 ± 4.3 years, and 58.0% were female. Exposure to social media health campaigns was positively correlated with diabetes prevention behavior ($r = 0.542$, $p < 0.001$). Multivariable linear regression showed that social media campaign exposure was the strongest predictor of diabetes prevention behavior ($\beta = 0.468$, 95% CI: 0.321–0.615, $p < 0.001$), followed by education level ($\beta = 0.183$, $p = 0.006$), daily social media use ($\beta = 0.142$, $p = 0.024$), and family history of diabetes ($\beta = 0.116$, $p = 0.038$). The final model explained 41.8% of the variance in preventive behavior (Adjusted $R^2 = 0.418$).

Conclusion: Social media health campaigns are significantly associated with improved diabetes-prevention behaviours among young adults. Integrating evidence-based digital health communication into diabetes prevention programs may strengthen public health efforts to reduce future disease burden and promote healthier lifestyles among younger populations.

Keywords: diabetes mellitus; health communication; health promotion; preventive health behavior; social media.



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INTRODUCTION

Diabetes mellitus (DM) remains one of the most significant public health challenges worldwide, with a rapidly increasing prevalence across both developed and developing countries. The disease contributes substantially to premature mortality, disability, healthcare expenditures, and reduced quality of life^{1,2}. Although traditionally associated with middle-aged and older populations, recent epidemiological evidence indicates a growing incidence of type 2 diabetes among young adults³. This trend is largely attributed to unhealthy dietary patterns, physical inactivity, sedentary lifestyles, obesity, and increased exposure to behavioral risk factors from an early age⁴. The emergence of diabetes at younger ages is particularly concerning because it extends the duration of disease exposure and consequently increases the risk of long-term complications, including cardiovascular disease, nephropathy, retinopathy, and metabolic disorders.

Preventive interventions targeting young adults have therefore become a public health priority. Previous studies have consistently demonstrated that lifestyle modifications, including healthy eating habits, regular physical activity, weight management, and routine health screening, can substantially reduce the risk of developing type 2 diabetes^{5,6}. Despite the availability of evidence-based prevention strategies, adherence to healthy behaviors among young adults remains suboptimal⁷. Many individuals in this age group perceive diabetes as a condition affecting older adults and consequently underestimate their personal susceptibility to the disease⁸. This misperception often leads to delayed adoption of preventive behaviors and limited engagement with health promotion initiatives.

In response to changing communication patterns, social media has emerged as a dominant platform for health promotion and public health campaigns. Platforms such as Instagram, TikTok, Facebook, YouTube, and X have transformed the dissemination of health information by enabling rapid, widespread, and interactive communication^{9,10}. Young adults are among the most active user groups on these platforms, making social media an attractive channel for delivering health messages and promoting behaviour change¹¹. Unlike traditional mass media, social media facilitates user engagement through content sharing, peer interaction, community participation, and real-time feedback¹². These features have the potential to enhance message exposure, increase health awareness, and strengthen motivation for adopting healthier lifestyles.

The existing literature suggests that social media-based health campaigns can positively influence health-related knowledge, attitudes, and behavioural intentions. Several studies have reported improvements in health literacy, increased awareness of chronic disease risk factors, and greater willingness to engage in preventive health practices following exposure to digital health campaigns. Research has also demonstrated that social media interventions may encourage healthier dietary choices, increased physical activity, and improved self-management behaviors among various populations. However, the effectiveness of these interventions in generating sustained behavioral change remains inconsistent. While some studies have identified significant improvements in preventive behaviours, others have found that increased knowledge and awareness do not necessarily translate into actual behavioural change.

A critical review of the literature reveals several important limitations. First, a considerable proportion of studies have focused primarily on knowledge acquisition, attitudes, or behavioral intentions rather than on measuring actual preventive behaviors^{13,14}. Consequently, evidence regarding the direct influence of social media campaigns on health-related behavior remains limited. Second, many investigations have examined broad health promotion topics, such as obesity prevention, healthy lifestyles, and general wellness, with relatively few specifically

addressing diabetes prevention behaviours. Third, research involving young adults as the primary target population remains insufficient, even though this group is among the largest consumers of social media content and is increasingly vulnerable to lifestyle-related health risks. Fourth, most existing studies have been conducted in high-income settings, limiting the generalizability of findings to populations in developing countries where cultural, socioeconomic, and digital health contexts may differ substantially^{15,16}.

These limitations highlight a significant research gap concerning the effectiveness of social media health campaigns in promoting diabetes prevention behaviors among young adults. Understanding whether exposure to digital health campaigns translates into meaningful behavioral change is essential for designing evidence-based health communication strategies. Moreover, empirical evidence is needed to determine the extent to which social media can serve as an effective public health tool for preventing non-communicable diseases among younger populations.

The novelty of this study lies in its focus on diabetes prevention behaviour as the primary outcome, rather than solely on health knowledge, attitudes, or intentions. Additionally, this study specifically investigates young adults, a population that is both highly engaged with social media and increasingly exposed to diabetes risk factors. By examining the relationship between social media health campaigns and behavioral change in the context of diabetes prevention, this research provides new evidence regarding the practical effectiveness of digital health communication strategies. The findings are expected to contribute to the growing body of literature on digital health promotion and inform the development of more targeted and effective public health interventions.

Therefore, this study aims to examine the effect of health campaigns delivered via social media on changes in diabetes prevention behaviour among young adults. Specifically, the study seeks to determine whether exposure to social media health campaigns is associated with improvements in preventive behaviours, including healthy dietary practices, physical activity, weight management, and early detection of diabetes mellitus.

RESEARCH METHODOLOGY

Study Design

This study employed an analytical cross-sectional design to examine the effects of social media health campaigns on diabetes prevention behaviours among young adults. A cross-sectional approach was considered appropriate because it enables the assessment of associations between exposure to health campaign content and preventive health behaviors within a defined population at a specific point in time. This design is widely used in health promotion research to investigate behavioral determinants and evaluate the effectiveness of communication interventions in real-world settings.

Setting and Participants

The study was conducted in Makassar City, Indonesia, between January and March 2026. The target population consisted of young adults aged 18–35 years who actively used at least one social media platform, including Instagram, TikTok, Facebook, YouTube, or X, during the previous six months. The inclusion criteria were: (1) aged 18–35 years; (2) active social media users for at least six months; (3) able to read and understand Indonesian; and (4) willing to participate by providing informed consent. Individuals diagnosed with diabetes mellitus, healthcare professionals specializing in diabetes management, or respondents who submitted incomplete questionnaires were excluded from the study.

A stratified random sampling technique was applied to ensure adequate representation across age groups and gender categories. The minimum sample size was calculated using the formula for multiple linear regression in G*Power version 3.1, assuming a medium effect size ($f^2 = 0.15$), a statistical power of 0.80, a significance level of 0.05, and five predictor variables. The calculation indicated a minimum sample of 138 participants. To compensate for potential non-response and incomplete data, the sample size was increased by 20%, resulting in a target sample of 170 participants. A total of 182 respondents were recruited, and 176 questionnaires met the eligibility criteria and were included in the final analysis.

Variables and Measurement

The independent variable was exposure to social media health campaigns related to diabetes prevention. Exposure was measured using a structured questionnaire adapted from previous digital health communication studies. The instrument assessed frequency of exposure, attention to campaign content, engagement with campaign materials (likes, comments, shares), and perceived usefulness of health information. Responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The dependent variable was diabetes mellitus prevention behavior. This construct was assessed through four domains: healthy dietary practices, physical activity, weight management, and participation in diabetes screening or health checks. Higher scores indicated better preventive behavior. Sociodemographic variables, including age, sex, educational level, monthly income, family history of diabetes, and average daily social media use, were included as potential confounding variables.

Instrument Validity and Reliability

Content validity was evaluated by a panel of three experts in public health, health promotion, and epidemiology. Construct validity was assessed using exploratory factor analysis (EFA), with factor loadings ≥ 0.50 considered acceptable. Internal consistency reliability was evaluated using Cronbach's alpha coefficient. The social media campaign exposure scale demonstrated a Cronbach's alpha of 0.88, while the diabetes prevention behaviour scale showed a Cronbach's alpha of 0.91, indicating excellent reliability.

Data Source

Primary data were collected directly from respondents through a self-administered online questionnaire distributed via Google Forms.

Data Collection

Data collection was conducted over three months. Eligible participants received an invitation link through university networks, community organizations, and social media groups. Before accessing the questionnaire, participants were provided with an information sheet explaining the study objectives, procedures, risks, benefits, confidentiality measures, and the voluntary nature of participation. Several quality-control measures were implemented. The questionnaire was pilot-tested among 30 young adults who were not included in the final sample. Duplicate responses were prevented through unique response settings. Data completeness was checked daily, and questionnaires with more than 10% missing responses were excluded. Consistency checks were also performed before statistical analysis.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 29.0. Descriptive statistics were used to summarize participant characteristics and study variables. Continuous variables were presented as means and standard deviations, while categorical variables were reported as frequencies and percentages. Bivariate analysis was conducted using Pearson's correlation coefficient to examine the relationship between social media campaign

exposure and diabetes prevention behaviour. Independent t-tests and one-way analysis of variance (ANOVA) were used to compare behavioural scores across demographic groups, as appropriate. Multivariable linear regression was performed to determine the independent effect of exposure to social media health campaigns on diabetes prevention behaviour, while controlling for potential confounders. Regression assumptions, including normality, homoscedasticity, multicollinearity, and independence of residuals, were evaluated before model interpretation. Results were reported as unstandardized coefficients (B), standardized coefficients (β), 95% confidence intervals (CI), and p-values. Statistical significance was established at $\alpha = 0.05$.

Ethical Approval

Permission to conduct the study was also obtained from relevant institutional authorities. All participants provided electronic informed consent before participation. Respondents were informed that participation was voluntary, that anonymity would be maintained, and that they could withdraw from the study at any time without consequences. Data were stored securely and accessed only by the research team to ensure confidentiality and compliance with ethical research standards.

RESULTS

A total of 176 young adults participated in the study. The mean age of respondents was 24.8 ± 4.3 years. Female participants accounted for 58.0% of the sample, while males represented 42.0%. Most respondents had completed undergraduate education (61.4%) and reported spending more than 3 hours per day on social media (63.6%). Approximately 29.5% reported a family history of diabetes mellitus.

Table 1. Characteristics of Respondents (n = 176)

Variable	Category	n	%
Age (years)	18–24	98	55.7
	25–35	78	44.3
Sex	Male	74	42.0
	Female	102	58.0
Education	High School	42	23.9
	Diploma	26	14.8
	Undergraduate	108	61.4
Daily Social Media Use	≤3 hours	64	36.4
	>3 hours	112	63.6
Family History of Diabetes	No	124	70.5
	Yes	52	29.5

The study population was predominantly female, highly educated, and actively engaged with social media platforms. The high proportion of respondents who spend more than 3 hours daily on social media suggests substantial exposure to digital health information, supporting the relevance of social media as a health promotion channel among young adults.

Table 2. Bivariate Associations Between Study Variables and Diabetes Prevention Behavior

Variable	r	p-value
Social media campaign exposure	0.542	<0.001
Daily social media use	0.218	0.004
Age	0.129	0.087
Education level	0.241	0.002
Family history of diabetes	0.184	0.015

Exposure to social media health campaigns was positively correlated with diabetes prevention behaviour ($r = 0.542$, $p < 0.001$). Higher educational attainment and longer social

media use were also significantly associated with better preventive behaviors. Age was not significantly associated with diabetes prevention behavior.

A multiple linear regression model was used to identify independent predictors of diabetes prevention behaviour, controlling for demographic variables.

Table 3. Multivariable Linear Regression Predicting Diabetes Prevention Behavior

Variable	β	95% CI	p-value
Social media campaign exposure	0.468	0.321 – 0.615	<0.001
Education level	0.183	0.052 – 0.314	0.006
Daily social media use	0.142	0.018 – 0.266	0.024
Family history of diabetes	0.116	0.006 – 0.226	0.038
Age	0.071	-0.041 – 0.183	0.214

Model Statistics: F = 28.74; p < 0.001; Adjusted R² = 0.418

After adjusting for covariates, exposure to social media health campaigns remained the strongest predictor of diabetes prevention behavior ($\beta = 0.468$, 95% CI: 0.321–0.615, $p < 0.001$). Education level, duration of social media use, and family history of diabetes were also significant predictors. The model explained 41.8% of the variance in diabetes prevention behavior, indicating substantial explanatory power. These findings suggest that individuals who frequently engage with diabetes-related health campaign content on social media are more likely to adopt preventive health behaviors.

The findings demonstrate that social media health campaigns can play a meaningful role in promoting diabetes prevention behaviors among young adults. The significant association between campaign exposure and preventive behavior suggests that digital platforms are not merely channels for information dissemination but may also facilitate behavioral change. Interactive content, peer engagement, and repeated exposure to health messages may strengthen risk perception and encourage healthier lifestyle choices. The influence of education level further underscores that health literacy remains an important determinant of preventive behaviour, underscoring the need for campaign materials accessible to individuals with varying educational backgrounds. From a public health perspective, these results support integrating social media into diabetes prevention strategies, particularly for younger populations who spend considerable time on digital platforms. Policymakers and health organisations should consider developing evidence-based, culturally appropriate, and audience-centred digital campaigns that encourage healthy eating, regular physical activity, weight management, and early screening. Strengthening collaboration between healthcare professionals, public health agencies, and social media influencers may further enhance message reach and credibility. Ultimately, leveraging social media as a preventive health communication tool could help reduce the future burden of diabetes and improve population health outcomes.

DISCUSSION

The present study examined the effect of social media health campaigns on diabetes mellitus prevention behavior among young adults and found that exposure to campaign content was significantly associated with healthier preventive practices. After controlling for demographic and behavioral factors, social media campaign exposure emerged as the strongest predictor of diabetes prevention behavior. These findings suggest that digital health communication can influence not only awareness and attitudes but also behavioral actions related to chronic disease prevention. Given the increasing prevalence of diabetes among younger populations and the widespread use of social media platforms, the findings provide important

insights into how contemporary health promotion strategies can be adapted to address emerging public health challenges^{17,18}.

The most notable finding of this study is the strong relationship between exposure to social media health campaigns and diabetes prevention behavior¹⁹. The unique characteristics of social media may explain this relationship as an interactive communication environment. Unlike traditional health education approaches that often rely on one-way dissemination of information, social media allows users to engage actively with health content through sharing, commenting, discussing, and interacting with peers²⁰. Such interactions may reinforce message retention, increase perceived relevance, and strengthen motivation to adopt healthier lifestyles²¹. From a behavioral perspective, repeated exposure to diabetes-related information may increase individuals' awareness of risk factors, enhance perceived susceptibility, and encourage the adoption of preventive actions. This mechanism aligns with established health behavior theories, which propose that health-related decisions are influenced by individuals' perceptions of risk, benefits, and self-efficacy.

Beyond individual behavior change, the findings also highlight the broader role of digital ecosystems in shaping health outcomes²². The influence of social media campaigns suggests that health promotion is increasingly embedded in everyday digital environments where individuals spend substantial time²³. As a result, health behavior should not be viewed solely as a product of personal choices but also as an outcome influenced by communication infrastructures, information accessibility, and social interactions²⁴. This perspective contributes to the growing recognition that digital platforms have become important social determinants of health, particularly among younger generations who rely heavily on online sources for information and decision-making.

The study further found that educational attainment was positively associated with diabetes prevention behavior. Individuals with higher levels of education demonstrated greater engagement in preventive practices, even after accounting for campaign exposure²⁵. This finding suggests that the effectiveness of health campaigns may depend partly on an individual's ability to access, interpret, and apply health information²⁶. Educational background likely enhances critical appraisal skills and health literacy, enabling individuals to distinguish credible information from misinformation and translate health messages into practical behavioral changes²⁷. Consequently, the impact of social media campaigns may be amplified when users possess sufficient cognitive resources to understand and evaluate health information.

Another important finding is the association between the duration of social media use and preventive behavior. Participants who spent more time on social media reported better diabetes prevention practices²⁸. While excessive social media use has often been linked to negative health outcomes, the present findings suggest that exposure to beneficial health content may offset some of these concerns²⁹. The quality and relevance of information encountered online may therefore be more important than the amount of time spent on digital platforms. This observation underscores the importance of ensuring that evidence-based health information is highly visible and accessible within digital spaces where young adults are most active³⁰.

The findings of this study are generally consistent with previous research examining digital health promotion interventions. Earlier studies have reported that social media-based campaigns can improve health literacy, increase awareness of chronic disease risk factors, and promote healthy lifestyle behaviors. Research on nutrition, physical activity, smoking cessation, and obesity prevention has demonstrated that digital interventions can facilitate meaningful behaviour change when messages are tailored to the target audience and delivered through

platforms participants frequently use. The present study extends this body of evidence by focusing specifically on diabetes prevention behavior among young adults. This population has received comparatively less attention in the diabetes prevention literature.

Nevertheless, the current findings contribute additional conceptual insights beyond those reported in previous studies. Much of the existing literature has emphasised knowledge acquisition, attitudes, and behavioural intentions as primary outcomes. While these outcomes are important, they do not necessarily reflect actual behavioral change. By examining diabetes prevention behavior directly, this study provides stronger evidence regarding the practical effectiveness of social media health campaigns. The results suggest that digital communication strategies may influence concrete actions to prevent disease rather than merely increasing awareness. This distinction is particularly important because improvements in health outcomes ultimately depend on behavioral adoption rather than knowledge alone.

The findings, however, should be interpreted in light of several limitations. First, the cross-sectional design prevents the establishment of causal relationships. Although exposure to a social media campaign was associated with preventive behaviour, it cannot be determined whether exposure led to behavioural change or whether health-conscious individuals were more likely to engage with the campaign content. Longitudinal studies are required to clarify the directionality of these relationships. Second, data were collected via self-reported questionnaires, which may be subject to recall and social desirability biases. Participants may have overestimated their engagement in healthy behaviors or their exposure to health campaigns. Third, the study was conducted within a single geographic setting, which may limit the generalizability of the findings to populations with different cultural, socioeconomic, or technological contexts. Variations in digital literacy, internet access, and social media usage patterns may influence the effectiveness of health campaigns in other settings.

An additional limitation relates to the measurement of campaign exposure. The study assessed self-reported exposure rather than objectively tracking interaction with specific campaign materials. Consequently, the analysis could not distinguish between passive exposure and active engagement. Future research should consider incorporating digital analytics, platform-generated metrics, or experimental designs to obtain more precise measures of campaign reach and engagement. Furthermore, the study did not evaluate the specific characteristics of campaign content, such as message framing, visual design, source credibility, or platform-specific features, all of which may influence campaign effectiveness.

Future research should build upon these findings by adopting longitudinal and experimental approaches that allow stronger causal inference. Randomised controlled trials evaluating different campaign strategies could provide valuable evidence on the most effective communication techniques for promoting diabetes prevention behaviours. Researchers should also explore potential mediating and moderating factors, including health literacy, perceived susceptibility, self-efficacy, trust in information sources, and digital engagement patterns. Understanding these mechanisms would contribute to a more comprehensive theoretical framework that explains how digital health campaigns influence behaviour.

From a systems perspective, future studies should examine how social media interventions can be integrated into broader public health strategies. Rather than functioning as isolated communication activities, digital campaigns could be linked with community health programs, primary healthcare services, educational institutions, and national disease prevention initiatives. Such integration may strengthen continuity between online awareness efforts and offline health actions. In addition, comparative studies across different countries and cultural

contexts would help determine whether the observed relationships are universal or context-specific.

In conclusion, this study provides evidence that social media health campaigns are associated with improved diabetes-prevention behaviours among young adults. The findings reinforce the growing importance of digital communication as a component of contemporary public health practice and highlight the need to view social media not merely as an information channel but as a dynamic environment capable of influencing health-related decision-making. As digital technologies continue to shape social interactions and information consumption, leveraging these platforms strategically may become an increasingly important element of population-level diabetes prevention efforts.

CONCLUSIONS

This study aimed to examine the effect of social media health campaigns on diabetes mellitus prevention behavior among young adults. The findings demonstrate that exposure to social media-based health campaigns is significantly associated with improved diabetes prevention behaviors, including healthier dietary practices, increased physical activity, weight management, and participation in early screening activities. Among all variables examined, exposure to health campaign content emerged as the strongest predictor of preventive behavior, indicating that digital communication platforms can play an important role in supporting chronic disease prevention among younger populations. These findings suggest that social media should be considered a strategic component of contemporary health promotion efforts, particularly for populations that are highly engaged in digital environments. The effectiveness of campaign exposure underscores the potential of interactive, accessible health messages to influence behavioural decision-making and encourage the adoption of healthier lifestyles. From a policy perspective, public health authorities should strengthen the integration of evidence-based social media campaigns into national and local diabetes prevention programs. Campaigns should be tailored to the needs and preferences of young adults, incorporate credible health information, and utilize interactive features that encourage user engagement. Collaboration among healthcare institutions, educational organizations, and digital content creators may further enhance the reach and effectiveness of prevention initiatives, contributing to long-term reductions in diabetes risk and disease burden.

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Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this study. The authors have no financial, professional, or personal relationships that could have influenced the research process, data interpretation, or reporting of findings.

Authors' Contributions — CRediT Taxonomy

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Declaration of Generative AI Use

During the preparation of this manuscript, the authors used generative artificial

intelligence tools to assist with language refinement, grammar checking, and improving manuscript readability. All scientific content, study design, data analysis, interpretation of findings, and final editorial decisions were developed, reviewed, and verified by the authors. The authors take full responsibility for the accuracy, integrity, and originality of the manuscript.

References

1. Aboagye A, Peckham J, Hearld KR, Abdullah S, Thirumalai M. A Technology-Enhanced Medical Nutrition Therapy and Diabetes Self-Management Education for Adults With Disability and Type 2 Diabetes: Protocol for a Pilot and Feasibility Randomized Controlled Trial. *JMIR Res Protoc*. 2025;14. doi:<https://doi.org/10.2196/71495>
2. Alvarez-Mon MA, Pereira-Sanchez V, Hooker ER, Sanchez F, Alvarez-Mon M, Teo AR. Content and User Engagement of Health-Related Behavior Tweets Posted by Mass Media Outlets From Spain and the United States Early in the COVID-19 Pandemic: Observational Infodemiology Study. *JMIR Infodemiology*. 2023;3. doi:<https://doi.org/10.2196/43685>
3. Arda D, Menga MK, Martinez RCKP. Effect of health education on self-care behavior in patients with type 2 diabetes mellitus. *J Ilm Kesehat Sandi Husada*. 2025;14(2):351-359. doi:<https://dx.doi.org/10.35816/jiskh.v14i2.1323>
4. Banne Tondok S. Nurses' educational role in the prevention of complications among patients with type 2 diabetes mellitus. *J Edukasi Ilm Kesehat*. 2025;3(3):141-148. doi:<https://dx.doi.org/10.61099/junedik.v3i3.158>
5. De Leon EB, Campos HLM, Brito FA, Almeida FA. Study of Health in Primary Care of the Amazonas Population: Protocol for an Observational Study on Diabetes Management in Brazil. *JMIR Res Protoc*. 2022;11(9). doi:<https://doi.org/10.2196/37572>
6. Duminy L, Ress V, Wild E-M. Complex community health and social care interventions – Which features lead to reductions in hospitalizations for ambulatory care sensitive conditions? A systematic literature review. *Health Policy (New York)*. 2022;126(12):1206-1225. doi:<https://doi.org/10.1016/j.healthpol.2022.10.003>
7. Hirth JM, Gonzalez SJ, Zoorob R. The Social Context: Social and Behavioral Factors That Affect Health Outcomes. *Prim Care Clin Off Pract*. 2023;50(4):601-620. doi:<https://doi.org/10.1016/j.pop.2023.04.008>
8. Husted Jensen N, Dahl-Petersen IK, Nielsen KK, et al. Intervention fidelity and behaviour change mechanisms in a health promotion intervention for women following gestational diabetes mellitus: Secondary analysis of the Face-it RCT. *Prim Care Diabetes*. 2025;19(6):584-591. doi:<https://doi.org/10.1016/j.pcd.2025.09.003>
9. KA MM, Gaye ND, Ahadzi D, et al. Promotion of Cardiovascular Health in Africa: The Alliance for Medical Research in Africa (AMedRA) Expert Panel. *JACC Adv*. 2024;3(12, Part 2):101376. doi:<https://doi.org/10.1016/j.jacadv.2024.101376>
10. Lala A, Beavers C, Blumer V, et al. The continuum of prevention and heart failure in cardiovascular medicine: A joint scientific statement from the Heart Failure Society of America and the American Society for Preventive Cardiology. *Am J Prev Cardiol*. 2025;24:101069. doi:<https://doi.org/10.1016/j.ajpc.2025.101069>
11. Lange M, Löwe A, Kayser I, Schaller A. Approaches for the Use of AI in Workplace Health Promotion and Prevention: Systematic Scoping Review. *JMIR AI*. 2024;3. doi:<https://doi.org/10.2196/53506>
12. Li F, Cao Y, Li M, Guo S, Zhang Q, Liang Q. Effectiveness of health education based on Behavior Change Wheel theory combined with teach-back method for self-management of community-dwelling empty nesters with hypertension combined with type 2 diabetes mellitus: a randomized controlled trial. *Geriatr Nurs (Minneap)*. 2025;65:103458. doi:<https://dx.doi.org/10.1016/j.gerinurse.2025.103458>
13. Li M, Liu S, Yu B, et al. Assessing the Effectiveness of Digital Health Behavior Strategies on Type 2 Diabetes Management: Systematic Review and Network Meta-Analysis. *J Med Internet Res*. 2025;27. doi:<https://doi.org/10.2196/63209>

14. Neven ACH, Lake AJ, Williams A, et al. Barriers to and enablers of type 2 diabetes screening among Indian and Chinese women with prior gestational diabetes: A qualitative study applying the Theoretical Domains Framework. *Midwifery*. 2025;145:104370. doi:<https://doi.org/10.1016/j.midw.2025.104370>
15. Niazi AK, Shafique K, Schwartz PEH. Chapter 21 - Primary prevention of diabetes mellitus type 2. In: Basit A, Ahmedani MYBT-B s DDB, eds. Elsevier; 2024:427-445. doi:<https://doi.org/10.1016/B978-0-443-22106-4.00001-2>
16. Nißen M, Harperink S, Joshi P, et al. Leveraging Influencers to Reach and Engage Vulnerable Individuals With a Digital Health Intervention: Quasi-Experimental Field Study. *J Med Internet Res*. 2025;27. doi:<https://doi.org/10.2196/67174>
17. Raeside R, Todd AR, Barakat S, et al. Recruitment of Adolescents to Virtual Clinical Trials: Recruitment Results From the Health4Me Randomized Controlled Trial. *JMIR Pediatr Parent*. 2024;7. doi:<https://doi.org/10.2196/62919>
18. Rohatgi A, Anand SS, Gadgil M, et al. South Asians and cardiometabolic health: A framework for comprehensive care for the individual, community, and population - An American society for preventive cardiology clinical practice statement. *Am J Prev Cardiol*. 2025;22:101000. doi:<https://dx.doi.org/10.1016/j.ajpc.2025.101000>
19. Ross E, Al Ozairi E, Al qabandi N, Jamison R. Optimizing an mHealth Program to Promote Type 2 Diabetes Prevention in High-Risk Individuals: Cross-Sectional Questionnaire Study. *JMIR Form Res*. 2023;7. doi:<https://doi.org/10.2196/45977>
20. Seraphim AP, Niu H, Morgado P, Miranda B, Silva EA. Mapping urban health policies: A scoping review of environmental, behavioural and socioeconomic determinants of health. *Prog Plann*. 2025;193:100926. doi:<https://doi.org/10.1016/j.progress.2024.100926>
21. Sharma M, Lakhan RBT-EA to GHI. Chapter 3 - The role of culture and behavior in global health. In: Academic Press; 2025:43-65. doi:<https://doi.org/10.1016/B978-0-443-29098-5.00004-7>
22. Sisson EM, Pamulapati LG, Bucheit JD, et al. Integrating real-world skills and diabetes lifestyle coach training into a revised health promotion and communications course. *Curr Pharm Teach Learn*. 2024;16(6):445-452. doi:<https://doi.org/10.1016/j.cptl.2024.01.002>
23. Song Y, Zhu C, Shi B, et al. Social isolation, loneliness, and incident type 2 diabetes mellitus: results from two large prospective cohorts in Europe and East Asia and Mendelian randomization. *eClinicalMedicine*. 2023;64:102236. doi:<https://doi.org/10.1016/j.eclinm.2023.102236>
24. Suprpto, Yuriatson, Menga MK, et al. Strategies to improve health service quality in Indonesia: a qualitative study. *BMC Health Serv Res*. Published online June 18, 2026. doi:<https://doi.org/10.1186/s12913-026-14221-x>
25. Syaharuddin S, Suprpto S, Arda D, Menga MK. Effect of health education on self-care behavior in patients with type 2 diabetes mellitus. *J Ilm Kesehatan Sandi Husada*. 2025;14(2):351-359. doi:<https://dx.doi.org/10.35816/jiskh.v14i2.1323>
26. Taroni F. Media and Health. In: Quah SRBT-IE of PH (Third E, ed. Academic Press; 2025:143-151. doi:<https://doi.org/10.1016/B978-0-323-99967-0.00008-9>
27. Tulchinsky TH, Varavikova EA, Cohen MJBT-TNPH (Fourth E. Chapter 2 - Expanding the concept of public health. In: Academic Press; 2023:55-123. doi:<https://doi.org/10.1016/B978-0-12-822957-6.00008-9>
28. Ulrich EH, Kernizan D, Chanchlani R, Baker-Smith C. Cardio-Kidney Metabolic Health in Pediatrics and Primordial Prevention. *Cardiol Clin*. 2025;43(3):481-490. doi:<https://doi.org/10.1016/j.ccl.2024.12.007>
29. Zhou M, Wang L, Deng Y, Ge J, Zhao S, You H. Effects of a Mobile Health Intervention Based on Behavioral Integrated Model on Cognitive and Behavioral Changes in Gestational Weight Management: Randomized Controlled Trial. *J Med Internet Res*. 2025;27. doi:<https://doi.org/10.2196/55844>
30. Zulfiah Z, Kadang Y, Suprpto S. Correlation Between Knowledge and Attitude Toward Treatment Adherence Among Patients with Type 2 Diabetes Mellitus in Makassar,

Jurnal Edukasi Ilmiah Kesehatan (Junedik)

Indonesia. *Media Kesehat Politek Kesehat Makassar*. 2025;20(2):304-309.
doi:<https://dx.doi.org/10.32382/medkes.v20i2.1709>