

MSc Public Health and Social Care in Practice

Population Health and Digital Health Promotion

LCHS7009

Component 2 Poster

Student Name: AMI PATEL

Student ID: 2508221

AI-Enabled Glucose Monitoring: A Digital Health Strategy for Promoting Type 2 Diabetes Management in the UK

Background

A significant health issue in the UK is Type 2 Diabetes, affecting over 4.6 million people and posing a burden on the healthcare system (Soares Andrade et al., 2023). This condition arises from insulin resistance or insufficient insulin production, leading to increased blood glucose levels and serious complications if not managed. Effective health promotion interventions are necessary for disease prevention and management. Traditional interventions include lifestyle education, dietary counselling, physical activity promotion, and community health campaigns. Additionally, digital interventions, such as mobile health apps, telehealth, and wearable technologies, are on the rise (Kumiawan et al., 2025). Continuous Glucose Monitoring (CGM) devices leveraging Artificial Intelligence (AI) show promise in real-time glucose monitoring and personalized insights, potentially enhancing lifestyle choices, treatment adherence, and early intervention for better health outcomes in individuals with Type 2 Diabetes in the UK (Ji et al., 2025).

Behavioural change theory

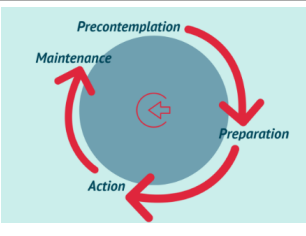
The Social Cognitive Theory (SCT) describes behaviour as an interaction of personal factors, behaviour and environment (reciprocal determinism). The main ones are self-efficacy, outcome expectations, observational learning, goal setting, and reinforcement (Almulla and Al-Rahmi, 2023). In reference to Continuous Glucose Monitoring (AI-CGM), real-time feedback and predictive warnings enhance self-efficacy, demonstrating how different behaviours (diet, exercise, and medication) have an impact on glucose levels (Ungersboeck et al., 2022). Goal setting and outcome expectations are supported by personal insights and trend charts, whereas observational learning relies on the use of clinician dashboards and peer groups. Continuous reinforcement prompts, summaries of progress and feedback by clinicians stimulate persistence. Comprehensively, the AI-CGM design based on SCT improves capability, opportunity and motivation towards change in behaviour that is long-term.

Conclusion

Continuous Glucose Monitoring (CGM) is an artificial intelligence tool that has policy, education, and research implications that are critical. The policymakers should come up with laws that protect privacy and equal access to digital health technologies for the underserved groups. Digital health literacy education is needed by the healthcare team and patients to help them use CGM data in managing diabetes. More longitudinal and real-world studies are also needed to assess the long-term effectiveness, cost-effectiveness, and behavioural effects of AI-driven glucose monitoring, which eventually can help in improving the function of the algorithms, reducing the disparities, and aid the evidence-based healthcare practices.

Health Promotion values and principles

The equity, empowerment, participation, intersectoral action, and evidence-based ethical practice, which are described in the Ottawa Charter and strengthened in digital health systems, are the foundations of health promotion (WHO, 2021). The AI-based continuous glucose monitoring (AI-CGM) helps in enhancing these values by offering customised feedback, aiding clinical judgement, and facilitating the prevention of the population level with aggregated information (Fraser et al., 2025). Co-designing, cultural adaptation, and training support of digital health interventions are the most effective (Stark, Geukes and Dockweiler, 2022). Nevertheless, disparities in access among disadvantaged and ethnic minority groups can expand the digital health disparities without fair approaches (Thomas, 2026).



Expected Outcome

Improvements in clinical and behavioural outcomes from using Social Cognitive Theory (SCT) for an AI-enabled continuous glucose monitoring (CGM) intervention are expected to be quantifiable, leading to reduced HbA1c and increased Time-In-Range (Kong and Cho, 2024). SCT mechanisms help users recognise that specific actions affect glucose levels (Zainuddin et al., 2023). Secondary outcomes should include fewer hypoglycemic events and better medication adherence, with real-world studies supporting these benefits (Kong and Cho, 2024). However, implementation factors such as engagement, clinician integration, and digital literacy will influence these outcomes, and without equity-related interventions, disparities in access may persist. Thus, the positive results depend on effective training, subsidisation, and thorough evaluation for lasting health benefits.

References

Almulla, M.A. and Al-Rahmi, W.M., 2023. Integrated social cognitive theory with learning input factors: The effects of problem-solving skills and critical thinking skills on learning performance sustainability. *Sustainability*, 15(5), p.3978. <https://www.mdpi.com/2071-1056/15/5/3978>

Prince, R.A., Walker, R.J., Campbell, J.A., Ekwoji, O., and Eggle, L.E., 2025. Integration of artificial intelligence and wearable technology in the management of diabetes and prediabetes. *npj Digital Medicine*, 8(1), p.687. <https://www.nature.com/articles/s41746-025-01313-6#ref-cite1>

Ji, C., Jiang, T., Liu, L., Zhang, J., and You, L., 2025. Continuous glucose monitoring combined with artificial intelligence: redefining the pathway for prediabetes management. *Frontiers in Endocrinology*, 16, p.1571362. <https://www.frontiersin.org/journal/endocrinology/articles/10.3389/fendo.2025.1571362/full>

Kong, S.Y. and Cho, M.K., 2024, February. Effects of continuous glucose monitoring on glycemic control in type 2 diabetes: a systematic review and meta-analysis. In *Healthcare* (Vol. 12, No. 5, p. 571). MDPI. <https://doi.org/10.3390/health12050571>

Kong, S.Y. and Cho, M.K., 2024, February. Effects of continuous glucose monitoring on glycemic control in type 2 diabetes: a systematic review and meta-analysis. In *Healthcare* (Vol. 12, No. 5, p. 571). MDPI. <https://doi.org/10.3390/health12050571>

Kumiawan, A.L., Theresia, T., Farid, A., Paramastri, R., Haryana, N.R., Ginting, R.M.S., Nurahma, B.A., Kinasih, L.S., Khan, A.F., Aji, A.S., and Unami, Z., 2025. Digital intervention targeting nutrition and physical activity behaviour among healthy individuals in low-and middle-income countries: a scoping review. *Journal of Health, Population and Nutrition*, 4(1), p.3-48. <https://doi.org/10.1186/s41043-025-00183-z>

Soares Andrade, C.A., Shahin, B., Dede, O., Akpeji, A.O., Ajayi, C.I., Abomo Israel, F.E., and Varga, O., 2023. The burden of type 2 diabetes mellitus in states of the European Union and United Kingdom at the national and subnational levels: A systematic review. *Obesity Reviews*, 24(9), p.e13593. <https://onlinelibrary.wiley.com/doi/10.1111/obr.13593>

Stark, A.L., Geukes, C., and Dockweiler, C., 2022. Digital health promotion and prevention in settings: scoping review. *Journal of Medical Internet Research*, 24(1), p.e21063. <https://www.jmir.org/2022/1/e21063/>

Thomas, T. (2026). *Ethnic minorities in England are less likely to have access to diabetes tech - study*. [online] the Guardian. Available at: <https://www.theguardian.com/uk/society/2026/jan/01/ethnic-minorities-in-england-less-likely-to-have-access-to-diabetes-tech-study>

Ungersboeck, M., Tang, X., Neeff, V., Steele, D., Grimm, P., and Fenech, M., 2022. Personalised nutritional recommendations based on individual post-prandial glycaemic responses improve glycaemic metrics and PROMs in patients with type 2 diabetes: a real-world assessment. *Nutrients*, 14(10), p.2123. <https://www.mdpi.com/2072-6648/14/10/2123>

WHO (2021). *Global strategy on digital health 2020-2025*. [online] Available at: <https://www.who.int/digitalhealth/global-strategy>

Zainuddin, Abdullah, A.Z., Jafar, N., Suriah, Nuzulim, Darmawansyah, Syahrd, S., Wahiduddin, Widiantoro, F.X., and Irfandi, R., 2023. The application of social cognitive theory (SCT) to the mHealth diabetes physical activity (PA) app to control blood sugar levels of type 2 diabetes mellitus (T2DM) patients in Takalar regency. *Journal of Public Health Research*, 12(2), p.22799036231172759. <https://www.e-scopus.com/doi/10.1111/1752-9756.14533>