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Component 1

Task 1- Blog

Task 2- Poster

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Task 1: Blog writing

Blog 1: The Impact of Mobile Health (mHealth) Apps in Digital Health Promotion

Non communicable disease includes obesity and cardiovascular diseases. This creates a significant global health challenge. It is approximately 74% of all death globally (Istepanian 2022). Non communicable disease are not spread among individual and population. However, they can be controlled by several lifestyle modifications and in severe cases medications are also required. The economic burden of non-communicable diseases is increased by rising healthcare costs and limited accessibility to preventive care. This requires innovative solution like mobile health application. These tools have revolutionised the promotion of health care by offering inconvenient and personalised approach which are cost effective for disease prevention and management (Filip et al. 2022). Mobile health application like my fitness pal and Fitbit helps users by facilitating self-monitoring of important health matrices. This includes physical activity along with nutrition intake and chronic disease indicators. Real time feedback along with goal setting and developed interventions promote behavioural change (Mahmood et al. 2019). This ultimately results in improved adherence to healthier lifestyle. Several research have highlighted that digital intervention can have a significant effect to improve physical health by activating metabolism. This helps in weight management outcome and chronic disease control. In spite of several health benefits the mobile health application have faced several challenges. The major challenge is privacy concern which remains a major barrier for users to share their sensitive health information freely due to the chance of misuse. The data collection process can have security measures as the data can be unethically used for study without the concern of the respective individual (Pires et al. 2020).

Moreover, there is a limited digital literacy which can disturb the widespread application of and adoption of the mobile health application especially among the older populations and among the lower socio-economic backgrounds. Furthermore, sustaining long-term engagement remains a challenge, as users often experience app fatigue or fail to maintain consistent usage (Melin et al. 2020). Addressing these issues through improved security measures, user-friendly designs, and behavior change strategies will be essential for maximizing the impact of mHealth solutions in combating NCDs.

References

- Filip, R., Gheorghita Puscaselu, R., Anchidin-Norocel, L., Dimian, M. and Savage, W.K., 2022. Global challenges to public health care systems during the COVID-19 pandemic: a review of pandemic measures and problems. *Journal of personalized medicine*, 12(8), p.1295.
- Istepanian, R.S., 2022. Mobile health (m-Health) in retrospect: the known unknowns. *International journal of environmental research and public health*, 19(7), p.3747.
- Mahmood, A., Kedia, S., Wyant, D.K., Ahn, S. and Bhuyan, S.S., 2019. Use of mobile health applications for health-promoting behavior among individuals with chronic medical conditions. *Digital health*, 5, p.2055207619882181.
- Melin, J., Bonn, S.E., Pendrill, L. and Lagerros, Y.T., 2020. A questionnaire for assessing user satisfaction with mobile health apps: development using Rasch measurement theory. *JMIR mHealth and uHealth*, 8(5), p.e15909.

Pires, I.M., Marques, G., Garcia, N.M., Flórez-Revuelta, F., Ponciano, V. and Oniani, S., 2020. A research on the classification and applicability of the mobile health applications. *Journal of personalized medicine*, 10(1), p.11.

Blog 2: A Personalized AI-Powered mHealth App for Digital Health Promotion

The mobile health Application have revolutionised self-monitoring approach which exists as a solution for individuals who require personalised care. A personalised mobile application can be helpful to sustain user engagement. For addressing these limitations, a healthcare application needs to be designed (Oyeniya 2024). It will have advanced artificial intelligence power mobile health application which would deliver customised health intervention based on the data of the users. The name of the application is Healthtrack AI. This application includes cutting edge wearable device tracking where artificial intelligence driven behavioural coaching and Telehealth connectivity will be incorporated. This would help to provide a comprehensive health management experience for the users (Methineni 2025). This application would drastically adopt user goal with the help of machine learning to ensure that recommendations are developed based on individual progress and changing health requirement. By using real time psychological and behavioural data the application provides personalised nutritional guidance (Azad_Khaneghah et al. 2021). It will also be helpful to plan the fitness goal and mental health support of the user by providing an effective evidence-based approach for health improvement. Several research indicates that artificial intelligence driven health coaching can enhance adherence to healthier lifestyle by providing you service with targeted intervention and timely feedback to improve user motivation (Mubeen et al. 2021).

Despite its numerous benefits, HealthTrack AI faces challenges that need to be addressed. AI bias is a potential concern, as algorithms trained on non-diverse datasets may produce recommendations that are less effective for underrepresented populations. Data privacy risks also pose a significant hurdle, requiring robust

encryption and transparent data policies to ensure user trust (Bradway et al. 2020). Additionally, digital exclusion remains a challenge, as individuals with limited access to technology or low digital literacy may struggle to benefit from AI-powered health solutions. Overcoming these obstacles through ethical AI development, enhanced security measures, and inclusive design will be key to maximizing HealthTrack AI's impact in combating NCDs.

References

- Azad-Khaneghah, P., Neubauer, N., Miguel Cruz, A. and Liu, L., 2021. Mobile health app usability and quality rating scales: a systematic review. *Disability and Rehabilitation: Assistive Technology*, 16(7), pp.712-721.
- Bradway, M., Gabarron, E., Johansen, M., Zanaboni, P., Jardim, P., Joakimsen, R., Pape-Haugaard, L. and Årsand, E., 2020. Methods and measures used to evaluate patient-operated mobile health interventions: scoping literature review. *JMIR mHealth and uHealth*, 8(4), p.e16814.
- Mubeen, M., Iqbal, M.W., Junaid, M., Sajjad, M.H., Naqvi, M.R., Khan, B.A., Saeed, M.M. and Tahir, M.U., 2021, March. Usability evaluation of pandemic health care mobile applications. In *IOP conference series: earth and environmental science* (Vol. 704, No. 1, p. 012041). IOP Publishing.
- Muthineni, S.R., 2025. *AI in Mobile Health Apps: Transforming Chronic Disease Management*.
- Oyeniya, J., 2024. The role of AI and mobile apps in patient-centric healthcare delivery. *World Journal of Advanced Research and Reviews*, 22(1), pp.1897-1907.

Task 2: Poster

HealthTrack AI: A Digital Health Solution for Sustainable Behavior Change

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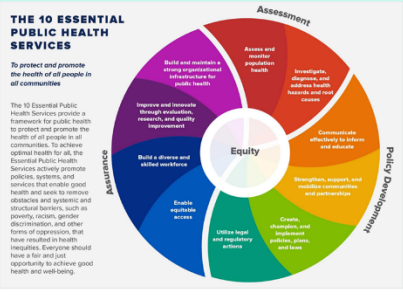
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Background

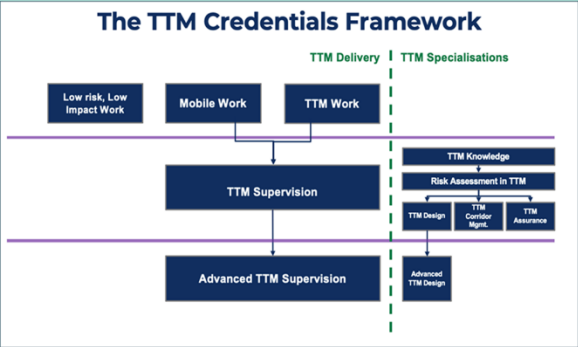
HealthTrack AI It is an innovative artificial intelligence powered healthcare application that is designed for integrating variable data along with behavioural coaching and Telehealth support. The aim of the application is to help sustainable healthcare change by providing real time and personalised recommendation that are developed for individual health needs of the user (Klossner, 2022). With the emerging of digital technology it is also observed in Healthcare for its use and effectiveness for providing patient care. As the digital health solution continues to develop its importance the application development align with contemporary trend in health promotion and preventive care (Azad-Khaneghah et al. 2021).



Behavioral Change Theory: The Transtheoretical Model (TTM)

The trans theoretical model that was developed by researchers Prochaska and DiClemente in the year 1983 helps to outline the stages present in behavioural change for improving health outcome of a patient (Fouad et al. 2020). These stages include pre contemplation followed by contemplation preparation action and maintenance (Bradway et al. 2020). This application applies the TTM framework by the following approach:

- Identifying user readiness:** Artificial intelligence algorithm will analyse the stage of change within the user and develop a personalised interventions as per the requirement (Mubeen et al. 2021).
- Providing personalized guidance:** The application would deliver state specific recommendation to the user for facilitating progress from one stage to the next and improve health outcome of the patient (Melin et al. 2020).
- Offering continuous support:** artificial intelligence driven information and reminder would help the user for maintaining their progress according to an interval and prevent relapse of any stage or indulge into unhealthy behaviour (Bhatt et al., 2022).



References

Alanzi, T., 2021. A review of mobile applications available in the app and google play stores used during the COVID-19 outbreak. *Journal of multidisciplinary healthcare*, pp.45-57.

Azad-Khaneghah, P., Neubauer, N., Miguel Cruz, A. and Liu, L., 2021. Mobile health app usability and quality rating scales: a systematic review. *Disability and Rehabilitation: Assistive Technology*, 16(7), pp.712-721.

Bradway, M., Gabarron, E., Johansen, M., Zanaboni, P., Jardim, P., Joakimsen, R., Pape-Haugaard, L. and Årsand, E., 2020. Methods and measures used to evaluate patient-operated mobile health interventions: scoping literature review. *JMIR mHealth and uHealth*, 8(4), p.e16814.

Filip, R., Gheorghita Puscaselu, R., Anichidin-Norocel, L., Dimian, M. and Savage, W.K., 2022. Global challenges to public health care systems during the COVID-19 pandemic: a review of pandemic measures and problems. *Journal of personalized medicine*, 12(8), p.1295.

Fouad, H., Hassanein, A.S., Soliman, A.M. and Al-Feel, H., 2020. Analyzing patient health information based on IoT sensor with AI for improving patient assistance in the future direction. *Measurement*, 159, p.107757.

Istepanian, R.S., 2022. Mobile health (m-Health) in retrospect: the known unknowns. *International journal of environmental research and public health*, 19(7), p.3747.

Mahmood, A., Kedia, S., Wyant, D.K., Ahn, S. and Bhuyan, S.S., 2019. Use of mobile health applications for health-promoting behavior among individuals with chronic medical conditions. *Digital health*, 5, p.205520761988218.

Lokhande, M., Kaipnadevi, D., Kate, V., Tripathi, A.K. and Bethapudi, P., 2023. Study of Computer Vision Applications in Healthcare Industry 4.0. In *Healthcare Industry 4.0* (pp. 151-166). CRC Press.

Melin, J., Bonn, S.E., Pendrill, L. and Lagerros, Y.T., 2020. A questionnaire for assessing user satisfaction with mobile health apps: development using Rasch measurement theory. *JMIR mHealth and uHealth*, 8(5), p.e15909.

Mubeen, M., Iqbal, M.W., Junaib, M., Sajjad, M.H., Naqvi, M.R., Khan, B.A., Saeed, M.M. and Tahir, M.U., 2021, March. Usability evaluation of pandemic health care mobile applications. In *IOP conference series: earth and environmental science* (Vol. 704, No. 1, p. 012041). IOP Publishing.

Nadal, C., Sas, C. and Doherty, G., 2020. Technology acceptance in mobile health: scoping review of definitions, models, and measurement. *Journal of Medical Internet Research*, 22(7), p.e17256.

Pires, I.M., Marques, G., Garcia, N.M., Flórez-Revuelta, F., Ponciano, V. and Oniani, S., 2020. A research on the classification and applicability of the mobile health applications. *Journal of personalized medicine*, 10(1), p.11.

Pradhan, B., Bhattacharyya, S. and Pal, K., 2021. IoT-based applications in healthcare devices. *Journal of healthcare engineering*, 2021(1), p.6632599.

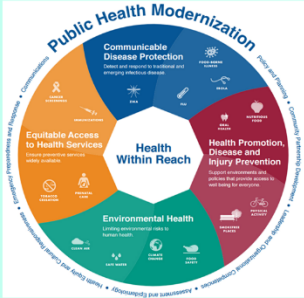
Sharma, S.K., Al-Wanani, M.I., Alowaidi, M. and Alsagheer, H., 2024. Mobile healthcare (m-Health) based on artificial intelligence in healthcare 4.0. *Expert Systems*, 41(6), p.e13025.

Taiwo, O. and Ezugwu, A.E., 2020. Smart healthcare support for remote patient monitoring during covid-19 quarantine. *Informatics in medicine unlocked*, 20, p.100428.

Health Promotion Values and Principles

Health promotion is based on principles that emphasise an effective approach of providing care by empowering and providing evidence based approach for Health and well being Pires et al. 2020). The Ottawa Carter for health promotion highlights the importance of helping individual to take control of their health (Taiwo and Ezugwu 2020). It also helps to address the broader determinant of Healthcare like effective care with evidence based support, Mental well being and physical requirement (Filip et al. 2022). The application would help to include several values to the user with the following factors associated with it:

- Empowering users:** with the help of real time health information gained from the user the person would be able to have a clear understanding about their health status and make necessary adjustments while taking active part in their wellness journey (Istepanian 2022).
- Promoting equity:** the adaptive and inclusive feature of the application with clear interface would ensure accessibility and easy use for diverse population (Alanzi 2021). They includes individual that have different levels of digital literacy and those who are from different socio economic background (Nadal et al. 2020).
- Encouraging participation:** with the help of ai driven goal setting and motivation technique the user would be able to be engaged and accountable for positive health outcome (Paul, 2021).



Expected Outcomes

By integrating AI and the principles of TTM, HealthTrackAI is expected to:

- Enhance long-term adherence to healthy behaviors:** Personalise feedback and adaptive goal setting for improving the likelihood of sustained habit formation (Sharma et al. 2024).
- Increase user engagement and motivation:** artificial intelligence driven gamification and Najs to encourage consistent participation of the user (Pradhan et al. 2021).
- Reduce risks associated with obesity and chronic diseases:** proactive health monitoring and early intervention which would help to mitigate lifestyle related health condition as per the requirement of the user (Mahmood et al. 2019).
- Improve digital inclusion:** by providing personalised content suitable for various literacy level of the user the platform helps to ensure accessibility of the application for a broader user base (Lokhande et al. 2023).

Conclusion

HealthTrack AI represents a significant advancement in digital health, effectively combining AI technology, behavioral science, and health promotion principles. Its implications extend across multiple domains:

- Policy:** The app supports national and global digital health strategies aimed at preventing non-communicable diseases (NCDs) through proactive health interventions.
- Education:** By enhancing digital literacy, HealthTrack AI empowers users to take control of their self-care and well-being.
- Research:** The app generates valuable health data, enabling researchers to evaluate the effectiveness of digital health interventions and contribute to the evolution of evidence-based health solutions.

As digital health continues to evolve, HealthTrack AI serves as a model for how technology can be leveraged to promote lasting health behavior change, ultimately improving public health outcomes on a larger scale.