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Table of Contents

TASK 1: Blogs.....	3
Blog 1:.....	3
Blog 2:.....	7
References	12
TASK 2: Poster	

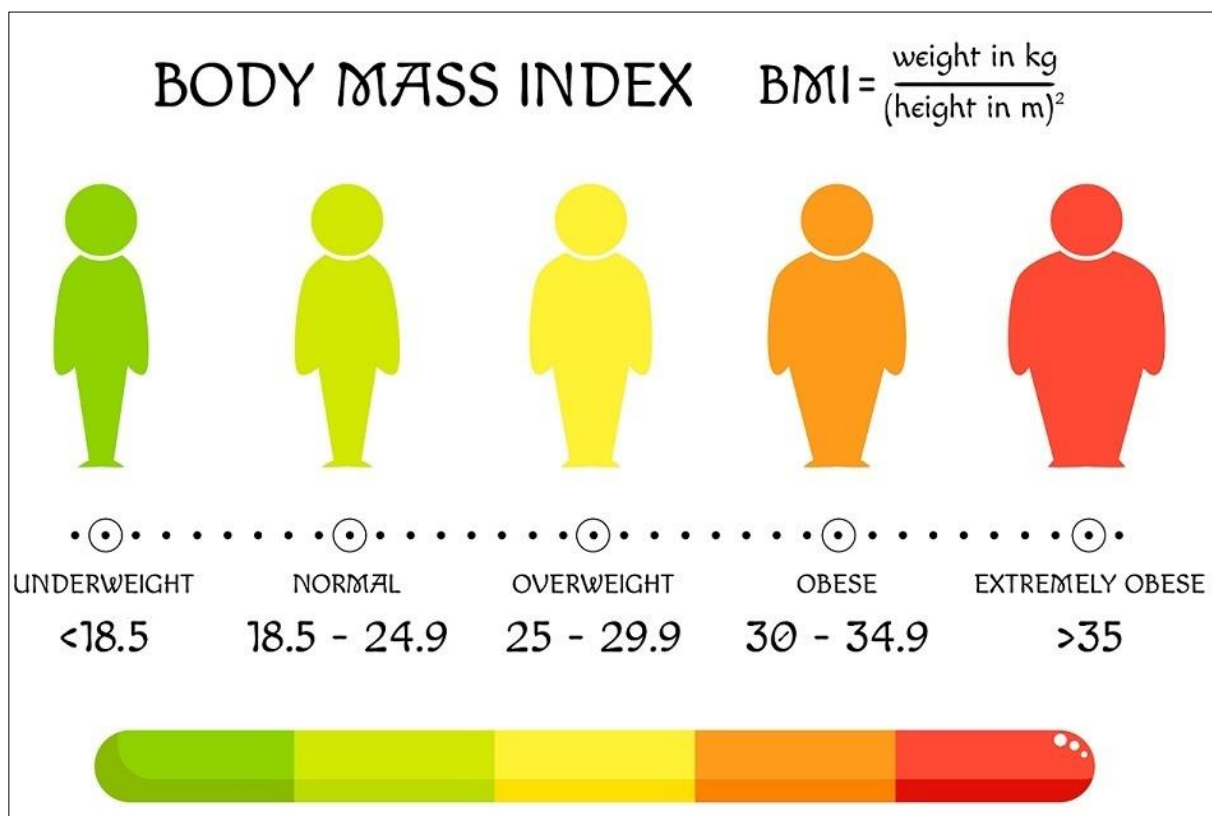
TASK 1: Blogs

Blog 1:

Digital Technology for Health Promotion: Obesity and their Mobile Apps

Public Health Concern: Obesity

Current data suggests that obesity is a major international health issue, from which non-communicable diseases including cardiovascular diseases, type 2 diabetes, and some types of cancer are strongly associated. The current data from the World Health Organisation mentioned that in 2023; 39% of the world's adults were considered overweight while 13% were regarded as obese. Thus, obesity prevalence in children and adolescents is on the increase: more than 340 million children and adolescents worldwide are affected by this condition and are aged 5-19 years (Muscogiuri *et al.* 2021). In the UK, for example, 25.9% of the adults were obese in 2022 costing the health sector dearly and adversely affecting the quality of life.



(The Irish Times, 30 May 2021)

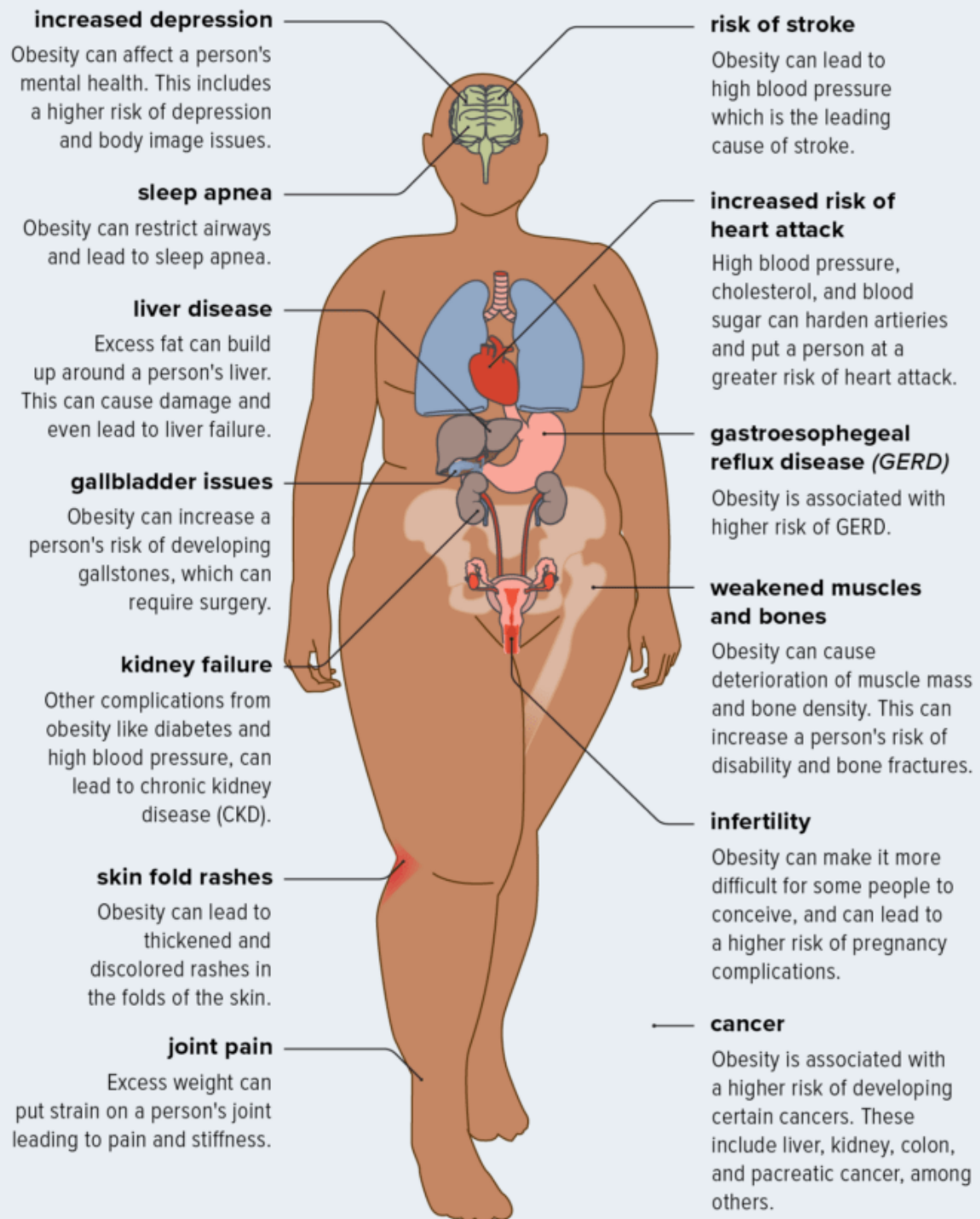
Digital Technology: Mobile Health Applications

In recent years, mHealth applications have been placed at the forefront of health promotion where health information is delivered through smartphones to fight obesity. Several decided to introduce their application such as the ***MyFitnessPal*** app, and ***Noom*** app, which offer dietary plans, recognition of caloric intake, evaluation of physical activity, and behavioral therapy (Markovic *et al.* 2022). These apps have the intention of helping people, raising awareness, and facilitating them to make better choices to live healthier.

Evidence of Effectiveness

A systematic review published in *Obesity Reviews* (2021) concluded that mobile apps significantly enhanced weight loss outcomes upon traditional interventions. Specific BCTs identified included: action planning, reviewing completed goals, and feedback (Oppert *et al.* 2021). Reporting on an RCT in the *Journal of Medical Internet Research*, 2022, it was shown that users of a mobile app lost 5.5% of their body weight during 12 months in comparison with non-users. Such conclusions are evidence of the capability of digital interventions in translating individual changes in terms of obesity management and prevention.

WHAT ARE THE EFFECTS OF OBESITY?



MEDICALNEWSToday

Critical Discussion: Advantages and Shortfalls

Advantages

- **Accessibility:** Mobile apps are easily accessible and affordable thus eliminating challenges when it comes to health resource access.
- **Personalization:** Customised suggestions further the active participation rates and compliance levels.
- **Scalability:** It can easily reach a lot of people and doesn't have the same challenges as programs that need to be conducted physically.

Shortfalls

- **Digital Divide:** It requires a Smartphone and internet connection that locks out the potential users from the lower side of society and senior citizens.
- **Data Privacy Concerns:** Apps obtain users' personal information, thus posing questions as to data protection and utilization (Morgan-Bathke *et al.* 2023).
- **Sustainability of Behaviour Change:** Diet electronic application recommendations indicate that it may stall or even rewind once the workouts are stopped.

Addressing Shortfalls

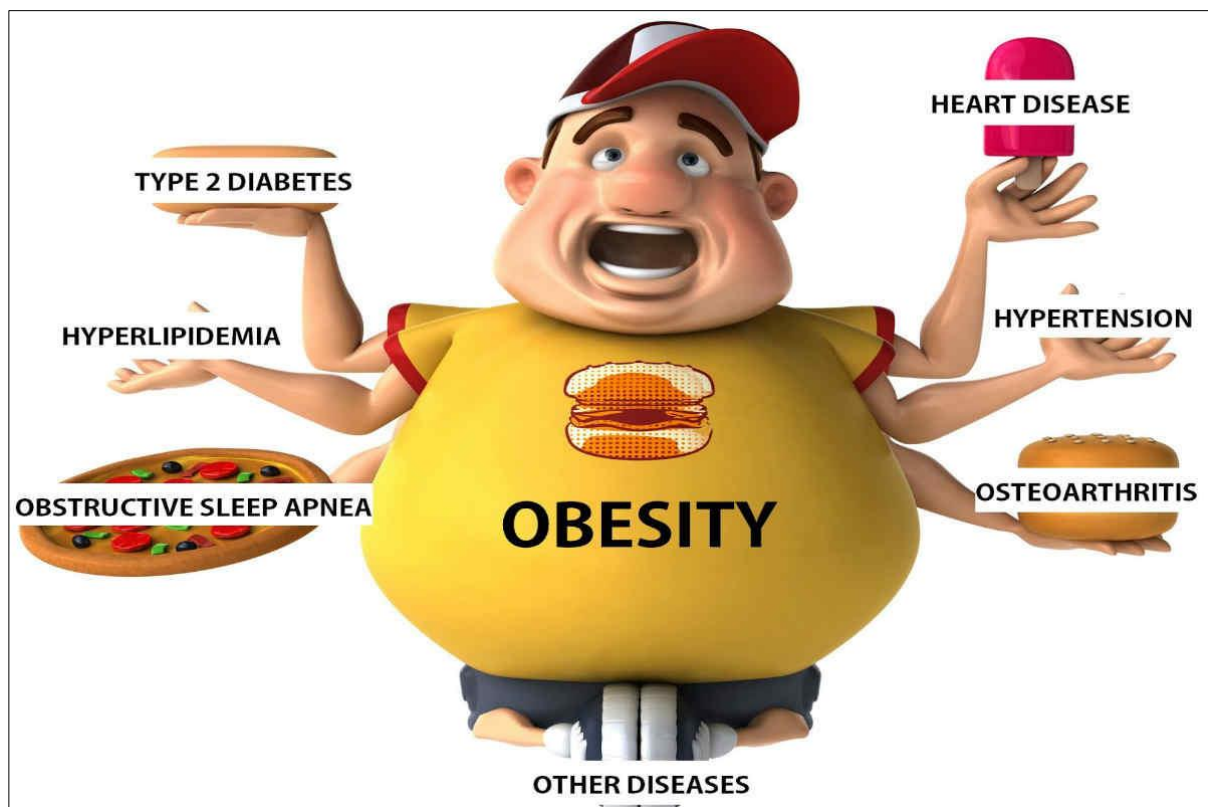
There are gaps in digital access, and hence public health programs have to subsidize the cost of the applications for those who cannot afford it and educate them on how to use the applications. Due to this, several legal requirements must be met when developing applications to ensure that user information protection is well-addressed. mHealth apps offer a potentially effective solution to obesity, but their shortcomings must be addressed if this approach is to make the biggest possible positive difference at the population level.

Blog 2:

Digital Health Technology Design: “WellTrack”: An Overarching Obesity Treatment Application

Public Health Problem: Obesity

Thus, obesity is one of the most important and widely spread public health problems in the world that has recently shown meanwhile a rapid rise in incidence rates. According to the WHO, 1.9 billion adults were overweight in 2023, and 13% of the global population represented obesity. In children and adolescents, obesity prevalence in many countries is over four times higher compared with previous decades (Busetto *et al.* 2024). This condition predisposes a person to develop chronic diseases like diabetes, hypertension, and specific forms of cancer, and the costs of related are very enormous. Obesity is defined as an individual state that needs a population-level global approach that should be effective, unique, and long-lasting.



(Source: Jebeile et al. 2021)

Proposed Technology: WellTrack

“WellTrack” is one of the mobile tools studied in this investigation that is intended to reduce obesity as a multifaceted app. Moreover, WellTrack provides options such as artificial intelligence analysis in real-time, and augmented reality services for meal planning and social support. The elements of the app incorporate actionable goals of behaviour change theories to transform users to embrace sustainable change.

Key Features:

- **Personalized AI Coach:** Flexible and optimized to give users what they seem to need based on past and current behaviour and performance.
- **AR Meal Planner:** Allows the users to take pictures of their current portions on their plate using the phone’s camera and then compare them with recommended portions which are more detailed compared to the first one (McMaster *et al.* 2023).
- **Community Challenges:** Promotes motivation through group NHM challenges, incentives, and goals that make the peer groups more accountable.
- **Integrated Health Metrics:** Matches with wearable devices on physical activity, sleep, and pulse, and develops an all-around health perspective.



Health Promotion Example

WellTrack addresses obesity risk factors by informing patients about where they can fail, promoting social norms, and developing self-competence to change unhealthy eating and increased inactivity.

Impact assessment: Advantages and disadvantages

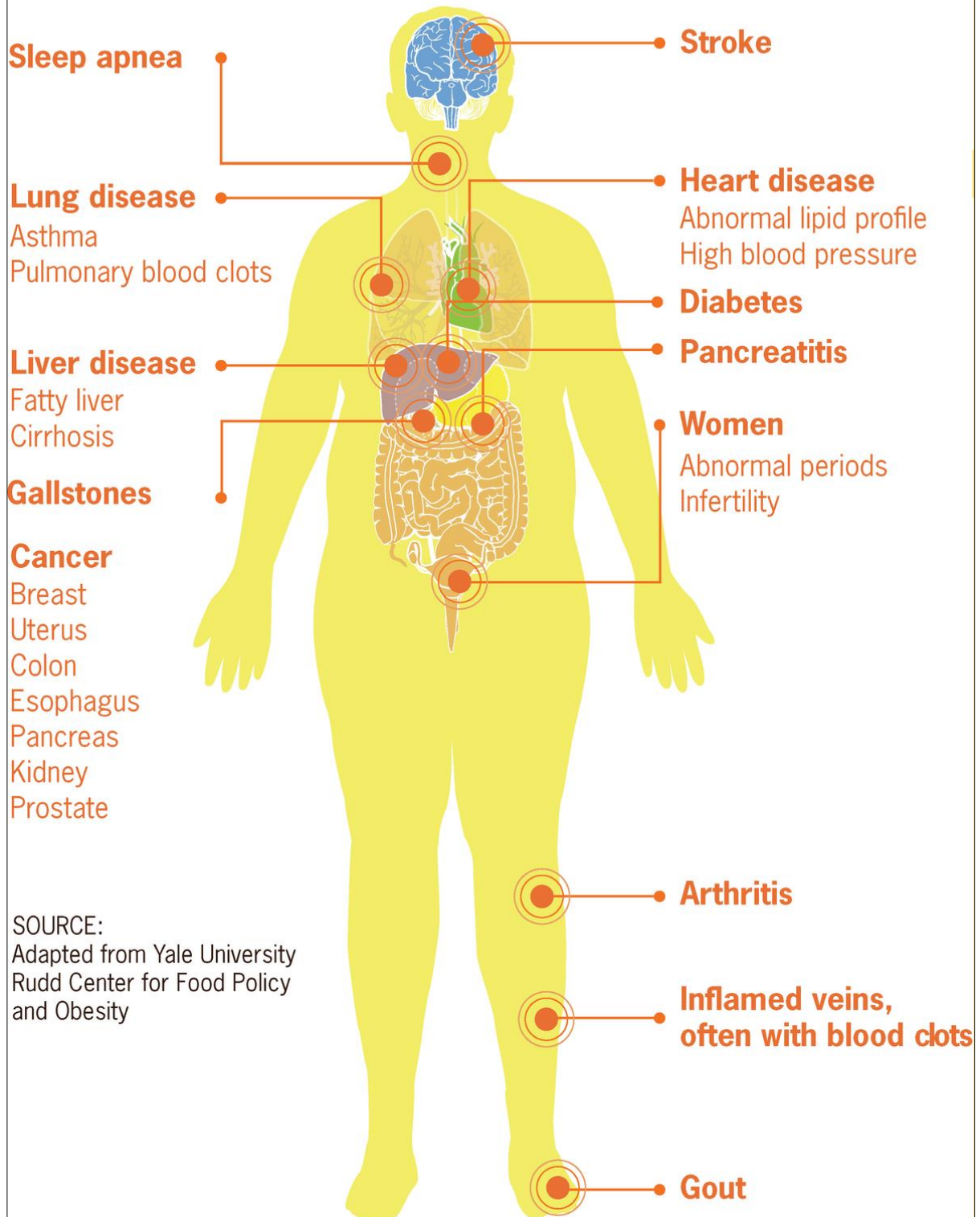
Advantages:

- **Personalization:** As compared with normal coaching, the AI coach adjusts its approach to boost involvement and efficacy.
- **Innovative Technology:** Using AR meal planning helps to fill gaps in knowledge concerning portions and nutritional values (Wadden, Tronieri and Butryn, 2020).
- **Holistic Approach:** Connectivity with wearables gives a broader picture of health-related behaviours.
- **Community Engagement:** Peer pressure increases health-related outreach, and conduct away from the feeling of loneliness during the weight loss process.

Disadvantages:

- **Digital Divide:** Smartphone- and wearables-only approach may bypass certain populations.
- **Behaviour Sustainability:** People can abandon the app without constant stimulation or an impression of the improvement.
- **Data Security:** Sophisticated statistics need strong security features to preserve customer information confidentiality.

Medical Complications of Obesity



Addressing Shortfalls

To tackle these issues, WellTrack can be provided to clients for some amount of money or given for free to the less fortunate. To maintain users, gamification and periodic content change are possible solutions while to guarantee their inclusion in routine practice, cooperation with healthcare providers may help (Wharton *et al.* 2020). Encryption of data and adherence to rules and regulations such as GDPR is likely to help build confidence and act as a wise measure will also help to develop confidence and security.

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Empowering Health with MyFitnessPal

Bridging Gaps in Obesity Management and Digital Equity



Health Promotion Values

- Health promotion is guided by values such as equity, empowerment, participation, and sustainability:
- Equity: Promoting equal health care to all citizens regardless of some factors like status, keenness on the necessities, and the general population care that Less privileged groups need in order to be healthy as they should be.
 - Empowerment: Empowering clients and communities to assume personal and communal production of health knowledge, skills, and resources (Cornier, 2022).
 - Participation: Engaging people and communities within the intervention process of health promotion.
 - Sustainability: Designing programs that have sustained positive effects for health enhancement (Dehestani, Stratford and le Roux, 2021).

Health Promotion Principles

- The principles include:
- Addressing social determinants of health: Addressing systemic determinants which include social determinants of health and health system access.
 - Holistic approach: Being aware that the customers have a physical need, a mental need, and a social need as well.
 - Intersectoral collaboration: Collaboration between organizations within fields such as education, health, and ICT for the realization of objectives (Ferdowsy et al. 2021).
 - Evidence-based interventions: A key application of research is in relation to solutions of strategies and policies.

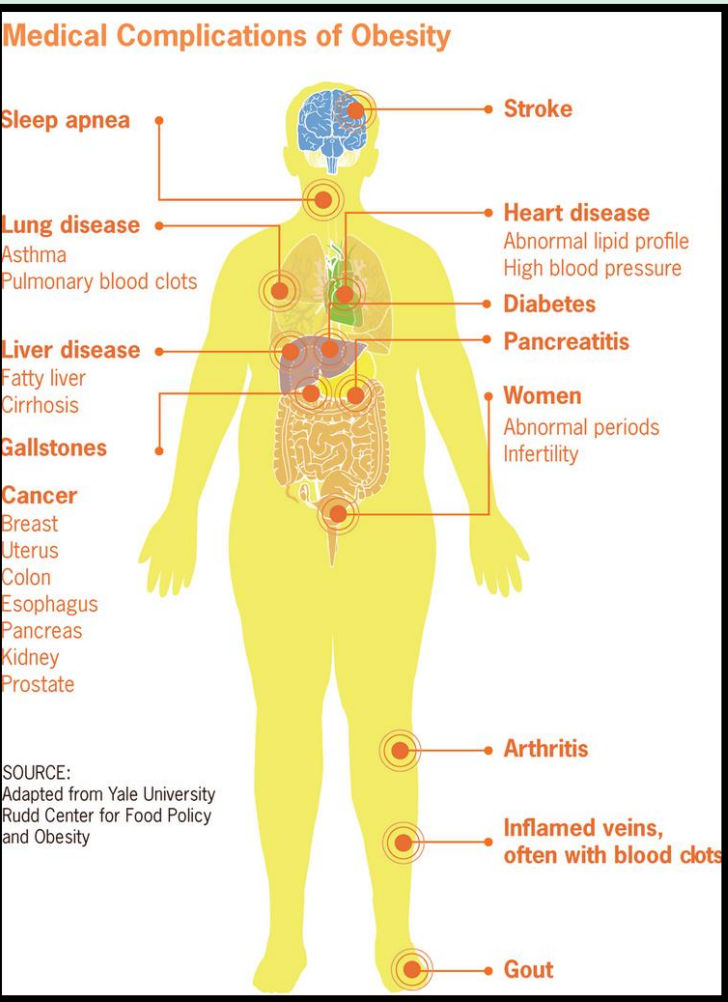
Expected outcome

Using HBM, MyFitnessPal is expected to increase positive health behaviours and health status, mainly in preventing obesity.

Expected Positive Outcomes

- Increased Awareness: The idea is that thanks to the feedback and the HRA health metrics users will be more inclined to cultivate a better perception of their key health risks such as obesity-associated diseases. This is consistent with the perceived seriousness and vulnerability factors of the HBM, and the need for change (Rakhra et al. 2020).
- Enhanced Engagement: Tools like Real Time Calorie Intake Count, Progress Charts, and Real Time Reminders are prompts to induce “activity.” Prior studies have shown that compliance with weight reduction programs is vital and should be sustained through more frequent contact.
- Improved Self-Efficacy: When applied in small pieces with rewards the goals are achievable and this builds confidence in the users. Self-efficacy is a key predictor of behavioural maintenance and actualization: users are more likely to practice a healthy diet and exercise in compliance with their goals if they feel that they can accomplish them.
- Behavioural Changes: Perceived benefits and reduced barriers include eating healthy meals to lose weight or build muscles; an easier method of logging meals than preparing tasty unhealthy meals (Tak and Lee, 2021). Research evidence indicates that interventions containing elements from behavioural theories result in weight loss as compared to interventions without those components.

- Health Equity (if barriers are addressed): That is why it is possible to speak about activities to close the digital divide: MyFitnessPal can offer a low-cost or even free registration for people with low income, to make health inequalities less severe among the targeted populations (Cardel et al. 2020).
- Potential Challenges
- As we know the HBM is a reliable theory, and we can still identify differences in outcomes due to the influence of exogenous variables. For example, continually faced with barriers (for example, economic difficulties, or low level of digital literacy) will not allow them to participate (Jastreboff and Kushner, 2023). In addition, self-monitoring is used in the app and, as has been already mentioned, self-motivation in people tends to fade with time.



(Source: Popkin *et al.* 2020)

Comparison of MyFitnessPal with Health Promotion Values and Principles

- Equity: MyFitnessPal access is free and this is possible due to funding from other sources, this in turn should be a plan for MyFitnessPal to identify governments or NGOs who can provide devices with training to the various underprivileged communities.
- Empowerment: The app also enhances self-sufficiency because user is empowered with basic resources of caloric counters, physical activity clicker, and individual goals (Storz, 2020). The use of BCTs such as goal setting and feedback means changes aim at developing confidence and perceived self-efficacy.
- Participation: The app stands for engaging and active participation in health management which is possible due to the enabling of the creation of individual health plans, as well as social interaction with the community of users (Zeng et al. 2021).
- Sustainability: Long-term adherence to MyFitnessPal encourages proper healthy behaviours enhanced through frequent updates and features supported by evidence.
- Social Determinants of Health: Though primarily personal, incorporating the use of MyFitnessPal into other PA health programs (e.g., government-subsidized health diets) will help eliminate pervasive injustices (Cooper et al. 2021). In conclusion, it is evident that MyFitnessPal is fully in line with health promotion values and principles of enabling participation, and partnership and helps staff action and mental models. Yet, improving both opportunities and outcomes in digital health is still the key challenge to enhance its potential.

The Health Belief Model (HBM)

The Health Belief Model (HBM) is a psychological model that explains behaviour in relation to certain diseases and predicts it depending on people's beliefs about such diseases.

Key Constructs of the HBM

- Perceived Susceptibility: Understanding of the risk for developing a health problem (for example, diseases associated with obesity).
- Perceived Severity: Consideration of the implications of the violation not only for development or lack of significant health issues (diabetes, heart disease). (Storz, 2020).
- Perceived Benefits: Perceived self-efficacy about performing behaviours to minimize the risk (for example, using an app to track calorie intake in order to facilitate weight loss) (Henning, 2021).
- Perceived Barriers: Pointing out the reasons that prevent a person from acting in a certain way (for instance, he/she might lack time or might be unaware of how to proceed).
- Cues to Action: The following are triggers of behaviour including app notifications or reminders (Jebeile et al. 2021).
- Self-Efficacy: Perceived control or self-efficacy, related to the ability to implement the necessitated behaviours such as following diets or exercising.

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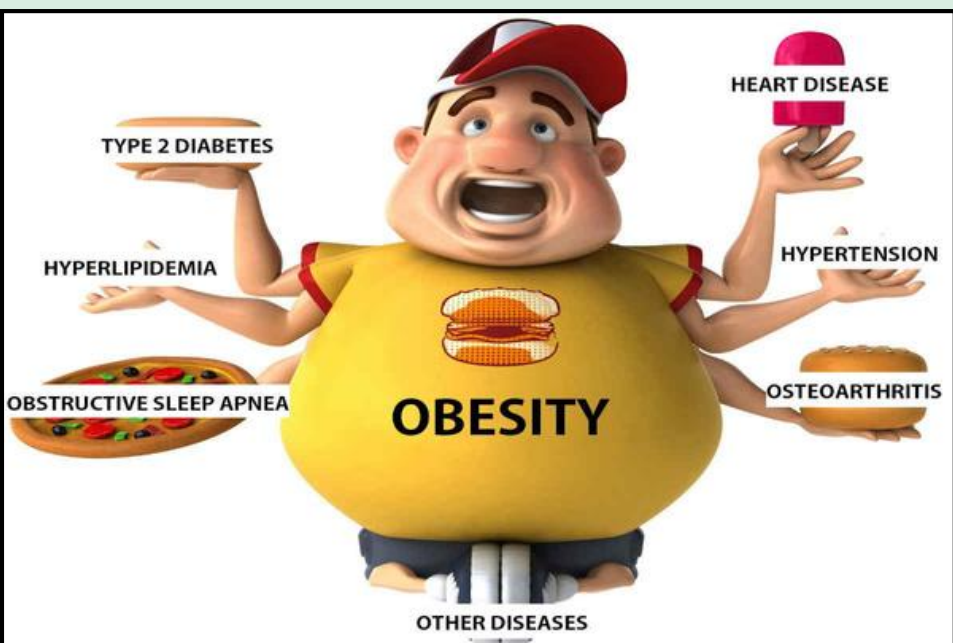
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The scale of the Public Health Issue

Currently, overweight is a severe problem all over the world: more than two billion adults are overweight, and 650 million of them are obese (World Health Organization, 2023). Current statistics indicate that 25.9 % of adults in the UK were obese in 2022 and the statistics are still rising. Obesity itself is recognized to be a major risk factor for chronic diseases such as type 2 diabetes, cardiovascular diseases, and some cancers. It also results in significant healthcare expenses and costs with figures in the billions figure (Sarma, Sockalingam and Dash, 2021). Several antecedents explain it, including behavioural, environmental as well as societal aspects, for instance, inadequate physical exercise, and unhealthful diets. As such, inviting and pervasive, there is a pressing need for effective interventions as it pertains to health and healthcare systems (Blüher et al. 2023).



(Source: Jebeile *et al.* 2021)

Sample Public Health Interventions

Other interventions include commercial self-help programs like weight consciousness groups, and information dissemination targeting healthful diets as well as physical workouts. In a way, non-electronic instruments such as pedometers have been used to encourage people to be active (Paul et al. 2020). Use of technologies for monitoring changes in lifestyle include wearable devices (Fitbit), and Smartphone applications.

Chosen Digital Health Intervention: MyFitnessPal

MyFitnessPal is a popular weight loss mobile application specially developed to measure calorie and nutrient consumption, physical activity, and biometrics. Behavioural change is achieved through the use of a large online food database and compatibility with wearable technology along with recommendation systems (Popkin et al. 2020). Alone has more than 200 million users in the world: it proves that large-scale technologies for the health management of the population can effectively prevent obesity.



(Source: Ferdowsy *et al.* 2021)

Application in MyFitnessPal

MyFitnessPal aligns well with the HBM by integrating features that address these constructs:

- Perceived Susceptibility and Severity: The number of cases is supported by the ability for users to input health data (e.g., BMI, weight trends) showing the risks associated with obesity to support the calls for change.
- Perceived Benefits: Some of the features offer evidence-based proof approaches such as portion sizing and exercise logging which give tangible indications of improved behaviours (Sullivan and Kincaid, 2020).
- Perceived Barriers: The tracking process is simplified, and the choice of recipes is convenient, minimizing the time and necessary amount of knowledge.
- Cues to Action: Signals for interaction include notifications for entering food intake and exercising.
- Self-Efficacy: Customization of feedbacks and individual progress report leads to increased users' self-confidence and interest (Hachula et al. 2023).

HBM as a Framework and its effects on Behaviour Change

The HBM encourages the maintenance of sustainable health behaviours by underlining perceived risks, rewards, and user control. It is due to this fact that MyFitnessPal operationalizes this theory in a user-friendly platform that tackles psychological and logistical challenges to a healthier lifestyle (Lingvay and Agarwal, 2023).

Conclusion

The implementation of digital health interventions such as MyFitnessPal is beneficial in various aspects including policies, research, and education development. All the identified policies must emphasize equitable access to digital literacy initiatives that need to be managed by data protection regulations. Digital tools are applicable in empowering individuals with self-management skills. These platforms are significant enough to generate valuable data to analyse behavioural trends and also improve interventions as well. In addressing all these barriers digital health technologies need to be complemented with traditional approaches. To drive innovations and also create scalable solutions to address public health challenges like obesity.