



University of Wales
Trinity Saint David
LONDON

Population Health and Digital Health Promotion

Module code: LCHS7007

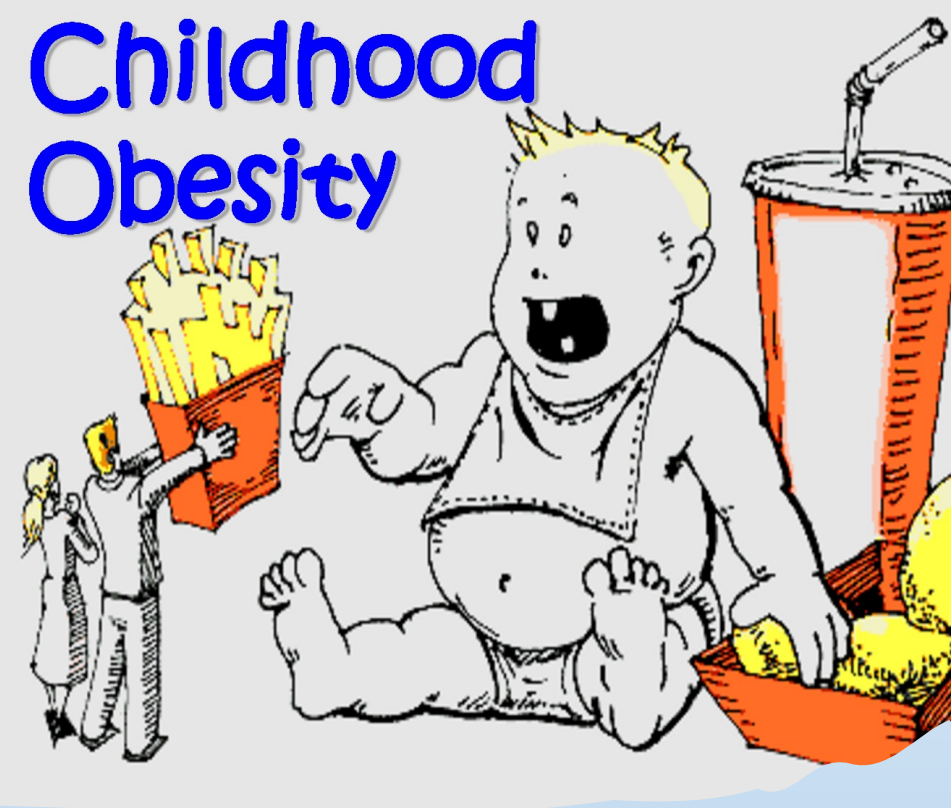
Submission date: 10 August 2023



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And
VR Technology

Activity and aim of the activity

- The Activity involves running and different body movements like aerobic movements such as: step up/down, v-step, lift steps, repeater lifts, turn steps, over/across the top, lunge steps, straddle and tap steps (AllActive, 2016).
- Aim: Promote physical activity and reduce obesity rates among children living in Barking and Dagenham (East London).



The health technology

- The chosen health technology to promote physical activity for children aged 5 to 18 years old, is a virtual reality game called *"FUNFITGAME"*.





Funfitgame
FIT IS FUN!





Carlene Campbell Task 1.

Justification

Who is a Child?

According to Gov.UK (2022) definition anyone who is younger than 18 years is considered a child. This is in accordance with civil law in England and Wales as well as the United Nations (UN) Convention on the Rights of the Child.



Source: NHLBI

National Guidelines



Health and care
Act 2022



Joint Strategic
Needs
Assessment
(JSNA 2022)
(BHR, 2022).



Draft National
Strategy for AI
Health and
Social Care
September
2021



Public Health
England (PHE)
and the UK
Food Standards
Agency (FSA)



NHS Digital:
Obesity, physical
activity and diet
analyses from The
Health Survey for
England (NDNS),
(HSE).



Public Health
England: Diet and
nutrition analyses
from the National
Diet and Nutrition
Survey (NDNS),
(PHE, 2020).

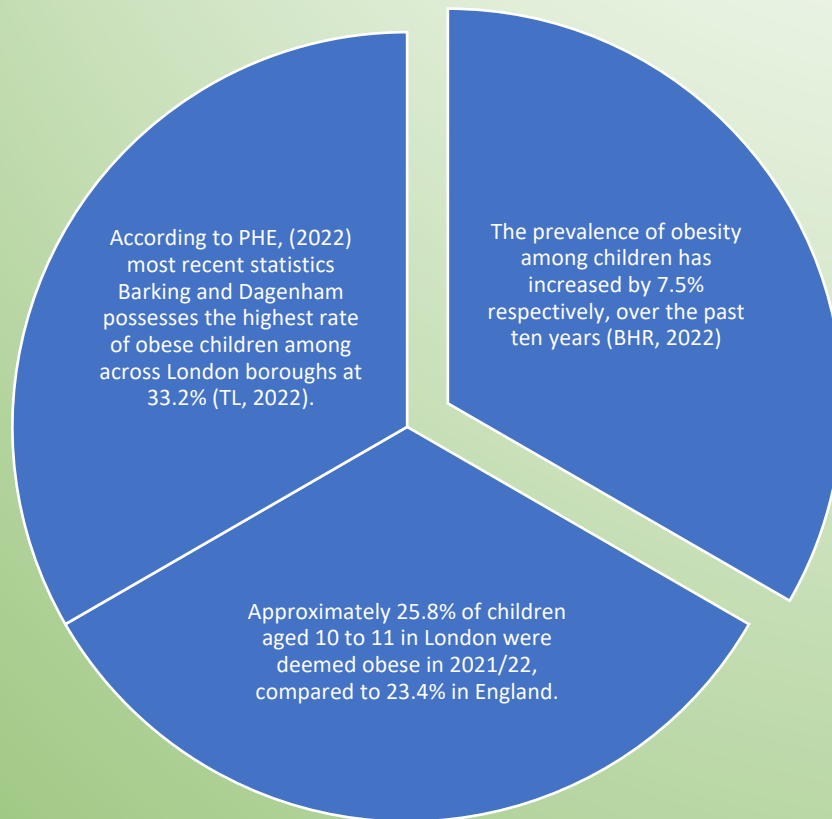
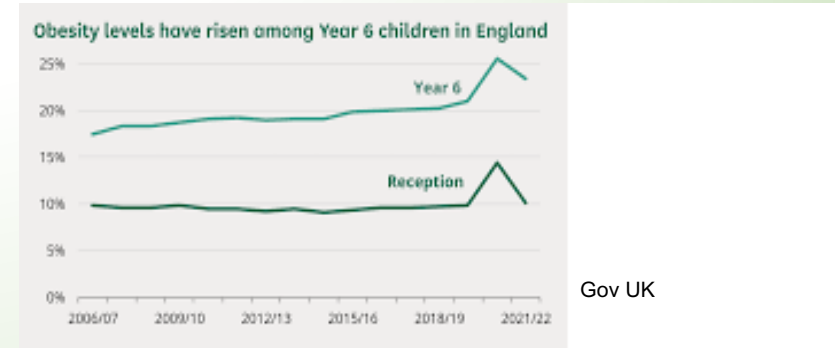


Childhood
Obesity: a
plan for action
(2016-2019)



Tackling Obesity: government
strategy (2020) (Dolly and
White, 2022)

Statistic



- The incidence of obesity in kindergarten grew from 9.7% to 9.9% in one year and in Year 6 from 20.2% to 21.0%.
- Boys are more likely than females to be obese. In reception, 10.1% of boys and 9.7% of girls were overweight. While 23.6% of boys and 18.4% of girls were obese in year 6 children (NHS75 Digital, 2020).
- Children who lived in the poorest regions were more likely to be obese 40.8% while in the least deprived areas were 17.9% (NHS75 Digital, 2020).

Consequences of Obesity



Source: [express.co.uk](https://www.express.co.uk)

According to NHS (2023) the following medical issues are more likely to develop in children who are obese.

High cholesterol

High blood pressure

Diabetes type 2.

Respiratory problems

Anxiety, and sadness (psychological issues).

Low levels of self-worth.

Bullying and stigma.

Physical activities

Adult obesity (NHS, 2023).

Digital Health Promotion Intervention

This digital health intervention is a virtual game name FunFitGame. It will be part of an awareness-raising campaign about combatting obesity and how to play the Funfitgame. Which should be accessible to obese children under NHS.

FunFitGame is a VR game design to use headset, fitness band, handset, and sensors. The game combine fun and fitness promoting a healthy gaming experience.

Step 1 : Carefully read the precautions and usage guidelines.

Step 2 : Install the game with digital screen or smart television.

Step 3 : Set up playing task on digital screen.

Step 4 : All gaming equipment should be worn when playing to achieve the full health benefits of the game.

Step 5 : Be ready, gear yourself up and take advantage of FunFitGame gaming experience.



The VR spec is equipped with sensors that track the movements of the player head and eyes.



A wearable device designed to monitor and track various aspects of physical activity and health.



VR specs, players can physically interact with virtual objects by using virtual tools and weapons

Rahul Arunbhai Patel Task 2.



Needs...

Game tools FUNFITGAME...

- **VR Specs:** creating immersive gaming experiences. primary interface between the player and the virtual world. providing a three-dimensional, interactive and immersive environment (Cao, Xie, and Chen, 2019).
- **Head tracking:** The VR spec is equipped with sensors hear its track the movements of the player's head and eyes (Kok , et al., 2014).
- **VR room size:** Advanced VR setups support room-scale experiences where players can move around a designated play area (Aurand, et al., 2017)
- **Fitness bend:** A fitness band, also known as an activity tracker or fitness tracker, is a wearable device designed to monitor and track various aspects of your physical activity and health (Haghi, et al., 2018)

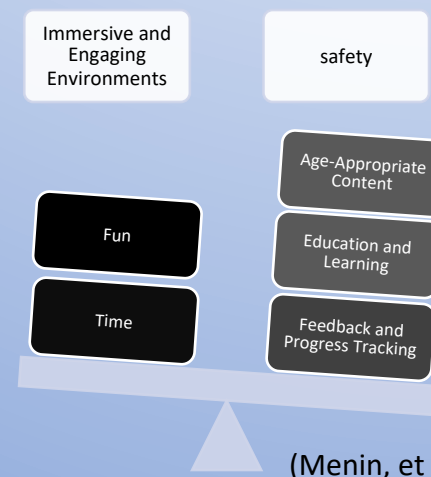


(headsets)



(Handsets and sensors)

Priorities...



(Menin, et al., 2019).



(Fitness band)

Aim

- To develop a game which can help to children's overall health and well-being by encouraging physical activity in a playful and engaging virtual environment, while also delivering a fun and memorable experience.
- improve physical fitness, and foster a positive attitude towards regular exercise in children

Objectives

- Active Participation
- Exercise Variety
- Rewards and Incentives

how to achieve aim ???



- I. Incorporate Playful Challenges.
- II. Progressive Difficulty Levels.
- III. Regular Updates and Content.

(Lara, et al., 2013)

Resources

1

- Educational Content and Research
- Physical Activity Guidelines and Expert Advice

2

- VR Development Tools and Platforms
- Game Development Team

3

- Sound and Visual Assets

Plan evaluation method...

game layout FUNFITGAME...

- **Step 1** : Perches the game and install it with digital screen or television on empty room.
- **Step 2** : Care full read the precautions and usage guidelines.
- **Step 3** : Set up playing task on digital screen.
- **Step 4** : Wear all the game tools or devises.
- **Step 5** : Enjoy the playing experience.

Description...

we will have two types of eating items healthy like fruits and vegetables which player must collect using Wright hand tool whereas unhealthy or junk food items like burgers and deep-fried food which player must smash using left hand tool (Lee, et al., 2002).

For collecting healthy they will get plus point and increased speed on the other hand for unhealthy they will get negative points.

There will be one battery life indicator which shows the stamina of player with particular time period engaging in playing it will go down in this case player will see two types of drinks healthy and unhealthy if they collect unhealthy instead of distorting it then player will lose the game or in opposite if they select healthy they have to remove the game tools and drink any healthy drink to boost there energy then they will continue the game and battery indicator will shown full charged (Lee, et al., 2002).

Action Plan

Game layout of FUNFITGAME...

➤ **Weekly game levels**

- **1st week** : Player will allow to play for 30 minutes only, to increase their stamina and set their mind with game environment.
- **2nd to 4th week** : Time will be respectively increased by 45minutes to 1.5 hours. With every new week the amount of speed, awkward running jump or dive steps will increase also mixture of healthy and unhealthy food items will rise to make it more physically active and intrusting.
- **Role of fitness band** : When player will commence to play game, this band will examine their body and fitness changes. So, after every week of play experience upcoming week play plan can be made to improve their health and fitness.
- **2nd month** : Through examine the whole month of playing skill and player involvement game software will generate BMI (body mass index) report using fitness band data to see the fitness improvement and future needs of improvement. The report will show in digital screen which will be used in game.

PROCESS OF UPCOMING WEEKS AND MONTHS WILL RESPECTIVELY GO SAME AS THIS FORMULA.

Implementation and publicity of FUNFITGAME...

Promotion...

In primary stage :

we will convince children movies and shows celebrity to promote FUNFITGAME on their social media accounts through making informative reels and videos.

Intermediate stage :

we will create advertisement and introduce new eye-catching offers on websites and retail sellers on FUNFITGAME parches.

Final stage :

we will use posters and banners on city centers and streets as well as on television and cell phone ads showcasing FUNFITGAME its fetchers benefits, and price offers on it.



Isaac Zzimbe
Task 3.1.

Key Stakeholders for Digital Health Promotion Intervention for Obese Children in the UK (United Kingdom)

Introduction

- The implementation and delivery of digital health promotion interventions for obese children in the UK require a collaborative approach involving multiple stakeholders.
- These stakeholders can influence, be affected by, or have a vested interest in the successful execution of these interventions.
- This article identifies and discusses the potential stakeholders that can facilitate the implementation and delivery of these interventions.





HM Government



Government Agencies

- Government agencies, such as the National Health Service (NHS) and the Department of Health and Social Care, are key stakeholders.
- They can provide funding, develop policies and guidelines, and support research and development efforts for these interventions (Brown et al., 2019).

Technology Companies

- Technology companies, including game developers and digital health platforms, are crucial stakeholders.
- They can develop, maintain, and update the gaming intervention platforms and ensure their accessibility, usability, and safety for children (Hollis et al., 2017).

Non-Profit Organizations

- Non-profit organizations focusing on children's health, such as the National Childhood Obesity Foundation, can raise awareness about these interventions, provide funding, and advocate for policies and programs that support their implementation and delivery (Brown et al., 2019).

Potential Barriers to the Successful Implementation and Delivery of Digital Health Promotion Interventions

Introduction

- With the advent of digital technology, health promotion interventions have taken a significant shift towards digital platforms.
- However, while digital health promotion interventions promise numerous benefits, they are beset with various barriers that hinder their successful implementation and delivery.
- This article identifies and discusses these barriers in the context of the UK's health system.

Digital Literacy

- Digital literacy is a vital factor in the successful implementation of digital health promotion interventions.
- With the intervention relying heavily on digital platforms, a lack of digital literacy among the target population can significantly impede its success.
- Individuals with poor digital skills may struggle to access and use digital health services effectively, leading to reduced participation and engagement (Norman and Skinner, 2006).

Data Privacy and Security Concerns

- Data privacy and security are major concerns when it comes to digital health interventions.
- With the increasing number of data breaches and cyber-attacks, patients may be hesitant to share their personal health information online (NHS Digital, 2020).
- These concerns can deter individuals from participating in digital health promotion interventions, thereby affecting their adoption and success.



Lack of Interoperability

- Interoperability is the ability of different information systems, devices, and applications to access, exchange, integrate, and cooperatively use data in a coordinated manner.
- Lack of interoperability in digital health platforms can cause significant barriers to the successful deployment of digital health promotion interventions.
- This could result in fragmented care, poor communication between healthcare providers, and missed opportunities for health promotion (Department of Health and Social Care, 2018).

Resistance to Change

- Resistance to change from healthcare professionals and patients can also pose a significant barrier to the implementation of digital health promotion interventions.
- With the shift from traditional to digital platforms, some individuals may be resistant to change due to unfamiliarity with technology or fear of losing personal interaction (Greenhalgh et al., 2017). This resistance can slow down the adoption and implementation of digital health interventions.

Inequality in Access to Digital Technology

- Inequalities in access to digital technology, often referred to as the 'digital divide', can also hinder the successful implementation of digital health promotion interventions.
- This divide is prominent amongst older adults, those with low income, and those living in rural areas, who may not have access to reliable internet or digital devices (NICE, 2018).



Ashima Sherin Chalil Task 3.2.

LEGAL AND ETHICAL ISSUES



When addressing ethical challenges in the realm of digital health, it is imperative to consider the various factors that play a role.

Prior to engaging with digital health tools, it is essential to have access to accurate and reliable information, feel empowered, and provide informed consent.

During the utilization of digital health, fairness in aspects such as data storage, access, sharing, and ownership is critical, along with the preservation of dignity and autonomy. Technical components, including safeguarding data through secure storage and firewalls, hold significant importance.

General governance aspects, such as accountability and transparency, should also be carefully considered (Brall, Schröder-Bäck and Maeckelberghe, 2019)



BEFORE UTILIZATION OF DIGITAL HEALTH

01

ACCESS

To successfully implement digital health projects, it's vital that everyone has equal access. Bias and discrimination have no place in this field..(Brall, Schröder-Bäck and Maeckelberghe, 2019)

02

TRUTHFUL INFORMATION, EMPOWERMENT AND INFORMED CONSENT

- It's important to know the good and bad things about digital health methods before deciding to use them.
- Health information might be collected.
- Voluntary decision making.
- Users should motivate and lift (both technically and informationally) to use digital health technology (Brall et al., 2019).

03

INFORMED CONSENT

Users should be fully informed of the risks, benefits, and alternatives. It's crucial they understand the potential consequences before deciding (Shah et al., 2020).

DURING UTILIZATION OF THE SERVICES



Fairness in storage

There should not be any unauthorised access by hacking or other fraud.



SHARING OF OWNERSHIP

Data ownership is crucial for fair data usage. Data custodians must safeguard data and ensure ethical use for everyone involved



Dignity and autonomy

Respect people's autonomy to control and share their personal information. It's necessary for freedom and equality.(Jain, 2023)



Data privacy

Richard Rognehaugh defines privacy as "the right of an individual to keep information about themselves from being disclosed to others; the claim of individuals to be left alone, free of surveillance or interference from other individuals, organizations, or the government.. (Naik et al., 2022)

- kinematic fingerprint (Spiegel, 2018).

GUIDELINES



- The European Commission's independent high-level expert committee produced ethics recommendations in April 2019.
- (i) human agency and supervision,
- (ii) technical robustness and safety,
- (iii) privacy and data governance,
- (iv) openness,
- (v) diversity, non-discrimination, and justice,
- (vi) social and environmental well-being, and
- (vii) accountability are all important considerations (European Commission, 2018)
- WHO -Digital Health Atlas. (WHO, n.d.)



➤ **Security policies**

- Security is the state of not being jeopardised by any type of risk, whether physical, psychological, financial, emotional (Weiss and Biermann, 2021).
- These are tools, rules, regulations, processes, concepts, and managerial strategies. Many security hazards may be mitigated by using encryption, error-checking procedures, preventative systems, and identifying instructional tools.(Mthunzi et al., 2020)

➤ **General governance**

- The OECD For example, the Organisation for Economic Cooperation and Development has issued a set of principles for health data governance(Vayena et al., n.d.).

ETHICAL

Regulation
Privacy
Mitigation of Bias
Transparency
Relevance



LEGAL

Governance
Confidentiality
Liability
Accuracy
Decision Making

(Naik et al., 2022)

Ana Maria Elena Stanciu Task 4.



FUNFITGAME benefits

In the absence of interventions, overweight children can become overweight adults rising the likelihood of developing long-term conditions (Alotaibi, et al., 2022).

The existing known traditional interventions are not always achievable because of high prices, commute disadvantages and shortage of establishments (Alotaibi, et al., 2022).

FUNFITGAME is developed to cater for many problems because it enables tracking and monitoring health.

FUNFITGAME benefits

- ☐ It will be wearable - children will wear VR headsets which are safe and secure according to Starlight Children's Foundation (2022).
- ☐ Easily accessible - the game can be purchased from any game store or directly from the website and installed on their PCs (Cairns, et al., 2019).
- ☐ Versatile to various environments - it will modify elements of the virtual setting in real-time to develop a personalised occasion measured to the particular user (Baker and Fairclough, 2022).
- ☐ Affordable - for the children's parents it is cheaper to buy a VR game than traditional interventions for obesity (Alotaibi, et al., 2022).
- ☐ Time-saving - saves parents from having to take their children to walk, run or do other necessary daily activities (Alotaibi, et al., 2022).

FUNFITGAME benefits



It could reduce obesity and inactive behaviour among children (Guixeres, et al., 2013).



FUNFITGAME is a virtual game that will be delivering a program based on physical activity that will increase exercise among children.



Possibility of monitoring and tracking children's health (Guixeres, et al., 2013).



Gathering data (Guixeres, et al., 2013).

FUNFITGAME impute for policy makers and research

- Policymakers might direct their focus from healthy foods and beverages in schools to promoting physical activity through virtual reality exercise gaming (Alsharairi, 2018).
- Ramirez, et al. (2023) suggest that children have a higher tenancy to engage in virtual physical activity than in traditional ways. Therefore, an analysis of how to implement virtual reality gaming on a larger scale is needed.





FUNFITGAME impute for education

- Funfitgame is not just fun to play, it also improves children's selective engagement which helps the child selectively follow specific motivations and not others in real-life physical activities (Amprasi, et al., 2022).
- It also facilitates active involvement; therefore, physical education instructors should utilize this game to motivate reticent, overweight children that avoid physical instruction (Amprasi, et al., 2022).

Conclusion

- The successful implementation and delivery of digital health promotion interventions for obese children necessitate the involvement of multiple stakeholders.
- Each stakeholder plays a unique role in facilitating these interventions and contributing to their success.
- Therefore, a collaborative and coordinated approach is needed to leverage the strengths and resources of these stakeholders.
- While digital health promotion interventions hold great promise in improving public health, it is crucial to address these barriers to ensure their successful implementation and delivery.
- By addressing issues related to digital literacy, data privacy, interoperability, resistance to change, and digital divide, we can pave the way for a more inclusive and effective digital health ecosystem.
- Funfitgame can be a successful intervention to tackle childhood obesity through promoting physical activity in a fun way which is more attractive to children than the traditional way.

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