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Trinity Saint David

**MODULE NAME: POPULATION HEALTH AND DIGITALHEALTH
PROMOTION (LCSH7007)**

LECTURER: DR. DIOLA BIJLHOUT

GROUP PRESENTATION

**ASSIGNMENT TITLE: DIGITAL TECHNOLOGY INTERVENTION
FOR OBESITY IN CHILDREN OF EAST LONDON**

GROUP MEMBER: 1 (JUSTIFICATION)

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OBESITY IN CHILDREN IN EAST LONDON (10 TO 16 YEARS OLD)

When a child has too much fat in his/her body, they are overweight or obese. By the time when children finish their primary school, 4 out of 10 kids are dealing with this issue. Health issues can arise from being overweight, especially later in life. It may also impact your child's emotional wellbeing and sense of self-worth.



There are some causes which are the main reason for obesity in children in East London.

- Sedentary lifestyle (WHO, 2021)
- Genetics (WHO, 2021)
- Junk-food (WHO, 2021)
- Environment(WHO, 2021)
- Medical condition(WHO, 2021)



We have chosen some activities on treadmill with Virtual Reality Spects.

This technology help child to do a physical activities as well as help to choose a right food intake.

VR spects is making it more interesting.

It is also help to prevent obesity as well as help to reduce overweight in children.

Virtual Reality Spects with Treadmill



- Virtual reality spect(s)(VR SPECTS) is used to manage or prevent the obesity in children.
- It is a technology which is easily used by children and attached with the bluetooth device and treadmill.
- VR SPECTS is work as real world scene because there are some programs inserted like beach view, river view, mountain climbing and many more activities.
- Treadmill is attached to this device and is working according to fixed program which would be chosen by child.

Address the obesity

Children living with obesity also faces some emotional and social issues such as:

- Worse body image and self-esteem,
- Being more susceptible to depression,
- Developing an eating disorder in older children,
- Being teased or bullied,
- Having behavioural issues (GOV.UK, 2023)
- Children who are overweight or severely overweight have a higher chance of developing a number of diseases both as children and as adults, including high blood pressure, high cholesterol, and type 2 diabetes (pre-diabetes) (GOV.UK, 2023)





Consequences

Children who are overweight or severely overweight have a higher chance of developing a number of diseases both as children and as adults, including high blood pressure, high cholesterol, and type 2 diabetes (pre-diabetes) (GOV.UK, 2023)

cardiovascular difficulties, bronchial asthma, obstructive sleep apnea (OSA), hepatic steatosis, gastroesophageal reflux disease (GERD), and psychological problems could be lead by childhood obesity (Balasundaram and Krishna, 2022).

Musculoskeletal disorders (especially osteoarthritis) (WHO, 2021).

Interventions of VR specs:

VR specs has been work as a food scanner also so that children would manage food intake.

It is helpful for physical activity as well as diet and nutrition.

To promote this technology we are using:

- Stakeholders
- Get engage with different kind of NGO related health and management
- Family involvement and school collaboration
- Take a support from obesity champaign organization

Main aim is to promote this technology regarding obesity prevention and reduce the rate in childhood obesity to prevent present and future health complications in child.

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A cartoon illustration of a male runner in a yellow tank top and shorts, wearing a yellow headband and white sneakers, running on a treadmill. The treadmill is grey with a digital display showing a bar chart and several buttons. The background is a stylized golf course with green hills, a yellow flag on a green, and a blue pond. The entire scene is set against a light purple background.

GROUP MEMBER : 2

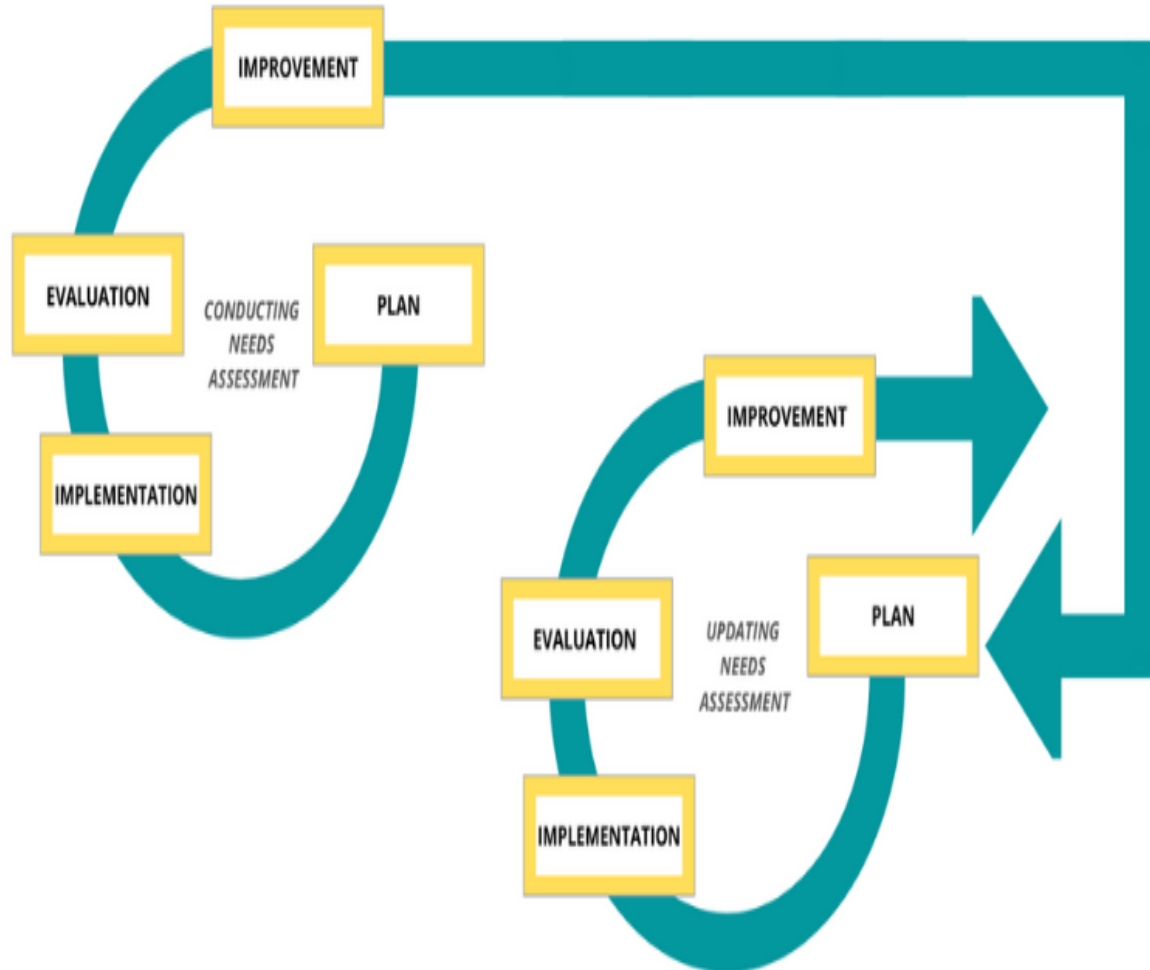
NENCY RAMESHBHAI ABHANGI

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APPLICATION OF THE MODEL AND IT'S INTERVENTION

APPLICATION OF VR SPACS AND UPGRADED TREADMILL TO REDUCE OBESITY

NEEDS ASSESSMENT IN IMPROVEMENT CYCLE



Ewles and simnett model (2019)

NEEDS ASSESSMENT

Addressing childhood obesity is not only in East London but also worldwide is critical to reducing health inequalities and improving wellbeing in the future. This pressing issue affects children's health, school performance and sets the stage for health problems in adulthood. Tackling this is in line with the goals of social justice, reducing health care costs, and promoting stronger communities. The London Borough of Barking and Dagenham Action Strategy emphasizes appropriate interventions to promote health equity and the general welfare of the community (Brown, S et al, 2017).

Promoting physical activity in East London is key to improving public health, wellbeing and social cohesion. It combats a sedentary lifestyle, reduces the risk of chronic diseases, and improves mental health. Increased activity fosters community engagement and strengthens the fabric of society. The London Borough of Newham physical activity strategy emphasizes the importance of the right initiatives to encourage active living and create vibrant and healthier communities

AIMS AND OBJECTIVES

Improve children's physical activity and weight reduction using treadmills and virtual reality spaces.

Specifically: By combining treadmill workouts with interactive VR experiences .(Ke-Chong, Q. et al, 2008)

Measurable: A 20% increase in average daily steps was achieved in participating children within 3 months.

Feasibility: Provide age-appropriate VR content tailored to children's interests and abilities. Set up scheduled sessions to ensure regular attendance (D. Calandra et al, 2019).

Relate to: This goal aligns with promoting physical activity in children and leveraging technology to make exercise more enjoyable.

Time limit: Within 3 months, measure and evaluate the success of the intervention.

METHOD

Interactive VR games:

Develop or host VR games that require physical movement, such as dancing, jumping, or obstacle course, to encourage children to be active while having fun (Bevilacqua, R. et al 2019).

Structured treadmill session:

Design age-appropriate treadmill routines that gradually increase intensity and duration. Combine games and challenges in sync with VR experiences.(Ke-Chong, Q. et al, 2008)

Rankings and Awards:

Set up a reward system, such as badges or virtual points, to motivate children to compete against their own previous records or with peers.

Scheduled sessions:

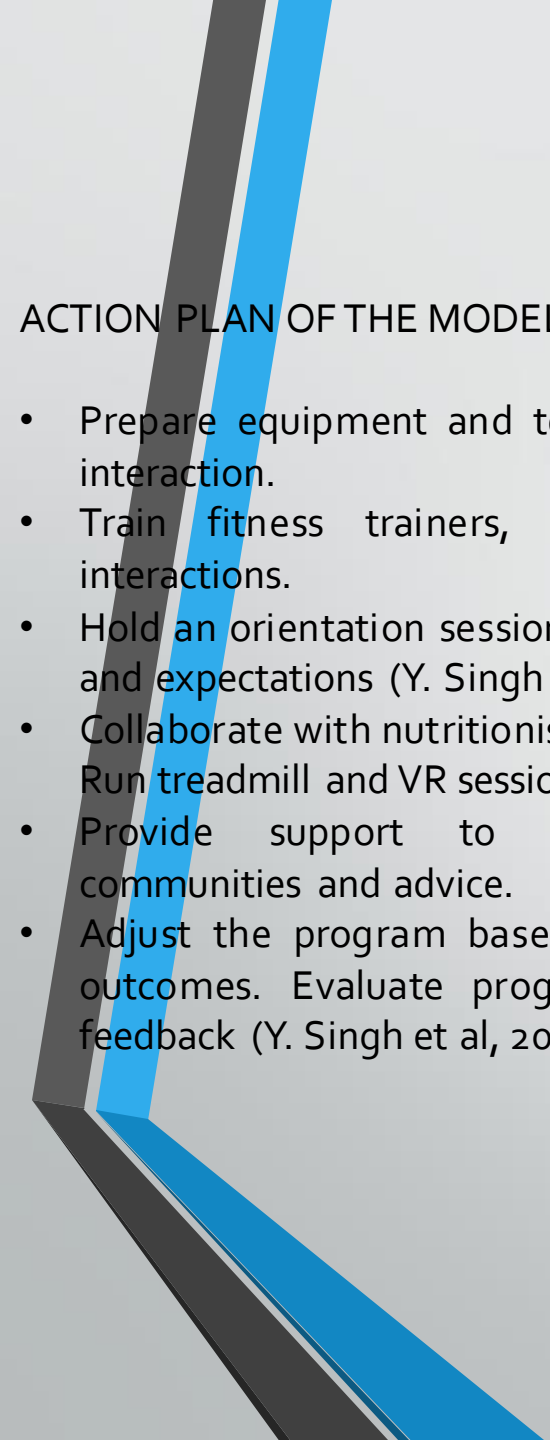
Set specific times for VR treadmill sessions, making the habit a much-anticipated part of your child's day.



RESOURCES

To identify resources for integrating VR spaces and children's treadmills, evaluate physical requirements such as treadmills and VR headsets, considering quality and safety. Source or develop age-appropriate, purpose-appropriate VR content. Allocate budgets for equipment, software, and possibly employees, ensuring a reliable internet connection. Collaborate with educators, healthcare professionals, and content developers. Obtain funding through grants or partnerships. Plan security measures, regulatory compliance, and marketing efforts. Strive for a balanced allocation of physical, technological, human and financial resources to achieve successful and rewarding VR treadmill activities. (Bevilacqua, R. et al 2019).

Assess the success of the VR treadmill program through a multifaceted assessment method. Use quantitative metrics like steps increased, cardiovascular endurance improvements, and engagement rates in VR scenarios. (Chen, K. et al, 2017). Qualitative methods such as participant feedback and observations can provide insight into the experience. Surveys are regularly used to gauge user satisfaction and identify areas for improvement. Compare the results obtained with the original goal to measure effectiveness. This comprehensive assessment strategy ensures a comprehensive understanding of the program's impact and guides future improvements.



ACTION PLAN OF THE MODEL

- Prepare equipment and technical setup for VR-treadmill interaction.
- Train fitness trainers, educate participants on VR interactions.
- Hold an orientation session to explain the program's goals and expectations (Y. Singh et al, 2020)
- Collaborate with nutritionists to provide dietary guidelines. Run treadmill and VR sessions on schedule.
- Provide support to participants through virtual communities and advice.
- Adjust the program based on participant feedback and outcomes. Evaluate program effectiveness and gather feedback (Y. Singh et al, 2020).

IMPLEMENTATION OF THE PLAN

SETTING UP A PLAN:

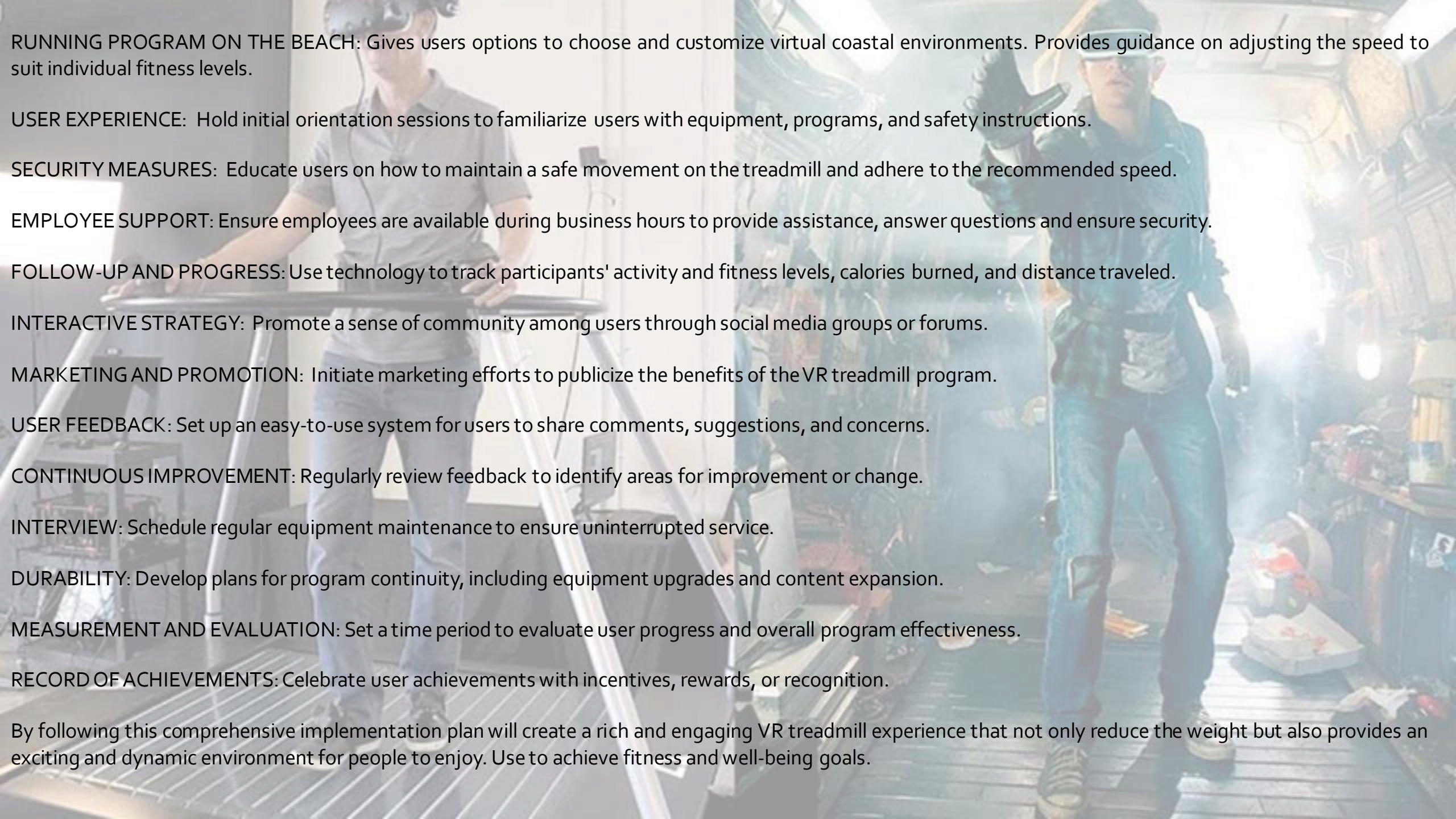
- Room setup: Designate a spacious, well-ventilated room to set up the VR treadmill.
- Device layout: Arrange treadmills and VR stations to maximize safety and comfort.
- Charging station: Make sure the VR headset and treadmill console are charged and ready to use.

TECHNOLOGY SETTINGS:

- Bluetooth Connection: Connect VR headsets, treadmill controls, and other tools via Bluetooth for seamless interaction.

TREADMILL PROGRAM:

- THE HILL TRACKING PROGRAM: The fitness trainer uses the slope tracking program effectively. Develop a user manual that explains how to adjust the tilt setting.
- SCHEDULE: Install and test VR games like "Subway Surfers" with built-in treadmills. Organize training sessions for users, teaching them how to control the game through movement.



RUNNING PROGRAM ON THE BEACH: Gives users options to choose and customize virtual coastal environments. Provides guidance on adjusting the speed to suit individual fitness levels.

USER EXPERIENCE: Hold initial orientation sessions to familiarize users with equipment, programs, and safety instructions.

SECURITY MEASURES: Educate users on how to maintain a safe movement on the treadmill and adhere to the recommended speed.

EMPLOYEE SUPPORT: Ensure employees are available during business hours to provide assistance, answer questions and ensure security.

FOLLOW-UP AND PROGRESS: Use technology to track participants' activity and fitness levels, calories burned, and distance traveled.

INTERACTIVE STRATEGY: Promote a sense of community among users through social media groups or forums.

MARKETING AND PROMOTION: Initiate marketing efforts to publicize the benefits of the VR treadmill program.

USER FEEDBACK: Set up an easy-to-use system for users to share comments, suggestions, and concerns.

CONTINUOUS IMPROVEMENT: Regularly review feedback to identify areas for improvement or change.

INTERVIEW: Schedule regular equipment maintenance to ensure uninterrupted service.

DURABILITY: Develop plans for program continuity, including equipment upgrades and content expansion.

MEASUREMENT AND EVALUATION: Set a time period to evaluate user progress and overall program effectiveness.

RECORD OF ACHIEVEMENTS: Celebrate user achievements with incentives, rewards, or recognition.

By following this comprehensive implementation plan will create a rich and engaging VR treadmill experience that not only reduce the weight but also provides an exciting and dynamic environment for people to enjoy. Use to achieve fitness and well-being goals.

THE DIGITAL HEALTH PROMOTION INTERVENTION

Integrating a VR headset with a treadmill can create a powerful platform for delivering digital health-enhancing interventions. Here's how it will work:

Custom workouts:

Users wear a VR headset while on the treadmill, immersing themselves in a virtual environment that aligns with their fitness goals.

Interactive challenge:

Users can be prompted to collect virtual rewards or complete fitness tasks during their treadmill sessions.

Personalization support:

Virtual trainers in VR headsets can provide real-time instruction, stay in the right form, and provide motivation, just like having a personal fitness trainer.

Gamification:

Users can hunt virtual items, compete against their own records, or participate in virtual races to stay motivated and entertained.

Community involvement:

Users can participate in virtual group workouts, fostering a sense of community and friendly competition, even when training alone.

Spiritual well-being:

Virtual reality can incorporate relaxation exercises, breathing techniques or mindfulness sessions, promoting holistic wellness.

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Topic: Children Obesity

Focus Group: 10 to 16 years

Location: East London Tower Hamlets Borough

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Introduction

1. Targeted interventions are necessary to tackle the developing public health concern of pediatric obesity and improve health outcomes (Cazaly, 2022).

2. Our focus here is on a health promotion campaign in Tower Hamlets aimed at children and adolescents aged 10 to 16 who are overweight or obese.

3. This presentation aims to promote and introduce a digital health intervention promotion to address children obesity using VR spectacles.



Digital health promotion intervention “VR SPECTS”

VR SPECTS Intervention Overview:

- ▶ The VR-based intervention complements the Ecological Systems Model.
- ▶ Childhood obesity has several root causes for example sleep routines, eating patterns and lack of physical activity.

Engaging with VR Technology:

- ▶ Children are enthralled by fully immersive experiences.
- ▶ The immersive nature of virtual reality makes it a useful tool for teaching self-control and healthy lifestyle.
- ▶ Taking part in virtual workouts is good for children health as it offers physical activities and exercise programs (Schroeder et al., 2023)



VR technology for Children :

1. Educative virtual reality (VR) courses are used to combat children's lack of knowledge and promotes a joyful healthy training models and simulations.
2. Resilience training through online role models: the positive effects of peer pressure.
3. The availability of nutritious products is restricted, but a digital shopping guide might help.
4. Sedentary way of life: Adventure missions to promote physical activity outside.

Digital Health Intervention Promotion Model

Health education for students aged 10 to 16 using VR technology. The advantages of a healthy diet and regular exercise are emphasized in immersive experiences.

Model: Ecological Systems Model	Designing the Intervention	Delivering the Intervention
❑ Considers social, political, economic, and personal factors. ❑ Examines the multifaceted issue of adolescent obesity while taking a holistic approach to it.	❑ Personalized instructional materials on nutrition and the risks of obesity. ❑ Interesting animations that illustrate the effects on health serve as interactive tools. ❑ Promotion of healthier school diets through collaboration with school authorities. ❑ Campaigns promoting active living in the community through public education (Cazaly, 2022)	❑ Including regular nutrition and fitness instruction in the curriculum. ❑ Workshops to engage parents in the design of healthier living environments. ❑ The creation of gamified apps: interactive tasks that promote physical activity. ❑ Ensure that all socioeconomic categories can utilize the application.

Challenges And Strategies

Challenge 1: Lack of Awareness and Education (Ages 10-12)	Challenge2: Peer Pressure and Social Norms (Ages 13-14)	Challenge 3: Limited Access to Healthy Foods and Sedentary Lifestyle (Ages 10-16)
Strategy 1. Health education for students aged 10 to 16 using VR technology. 2. The advantages of a healthy diet and regular exercise are emphasized in immersive experiences.	Strategy 1. Creating Virtual Reality (VR) modules demonstrating the risks of obesity. 2. Assistance to academic institutions in integrating VR technology into existing curriculum (Granada, 2019)	Strategy 1. Create in-app training session to encourage healthy behavior and diet habits. 2. The digital intervention encourages users to go outside and peruse more physically active lifestyle.

Stakeholders Facilitation

Parents

- ✓ Encourage and help spread wholesome habits in the home.
- ✓ Get kids moving, keep them learning, and involved in the community.

Community Health Centers:

- ✓ As part of the intervention, children will have access to professional medical counsel and services.
- ✓ Workshop leader, medical provider, and intervention implementation helper (shaikh, 2022)



Schools:

- ✓ This aims is to include health education units in the syllabus.
- ✓ developing a framework for education and integrating health activities into the curriculum are particularly noteworthy (COLLIS and THORLBY, 2022)

Technology Businesses:

- ✓ Responsibilities include providing technical assistance and creating new VR supported applications.
- ✓ Development of an accessible, user-friendly, and interesting application (Marshall et al., 2022)

Barriers for Success

Comprehensive Collaboration Plan:

1. comprised of guardians, schools, hospitals, and IT companies.
2. Promotes the pooling of individual efforts towards a common objective.

Barriers and Participation:

1. Tailor-made VR programs for various age brackets.
2. Parents attending lectures meant to encourage family participation (Shaikh, 2022).
3. Participation-inducing community events.

Importance of Technical Assistance:

1. Guarantees the VR app's usability and quality of life for its users.
2. Quickly resolves problems with shipment delivery and equipment availability (Schroeder, 2022)



Conclusion



1. In the last section of our presentation, we stress the need of a comprehensive strategy to reduce the rate of adolescent obesity in Tower Hamlets.
2. By coordinating with the chosen health promotion planning model, including relevant parties, and tackling problems head-on, our intervention provides a proactive solution.
3. Immersive experiences made possible by virtual reality (VR) technology provide a new perspective and encourage the development of positive routines.
4. This intervention has the potential to have a long-lasting impact on the problem of Childhood obesity in East London by promoting cooperation and adopting individualized tactics.

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TOPIC: CHILDREN OBESITY

FOCUS GROUP: 12 TO 16 YEARS

LOCATION: ISLINGTON

Potential stakeholders



- ▶ Parents: can help their children to develop healthy eating habits and help them to gain information regarding the use of VR technology to maintain a healthy body.
- ▶ Schools: they can include adequate and essential information regarding the technology which can help them to promote digital health intervention among obese children.
- ▶ Community Health Centres: with the help of this campaign, children can be able to gain access to professional counsel or medical services.

Potential Barriers

- ▶ Parents lack the necessary knowledge to help their children navigate through the required technology
- ▶ The use of these technologies are becoming more viable (Bravou *et al.* 2022).
- ▶ However, these technologies are very expensive thus making it a financial barrier for the parents to purchase for their children
- ▶ Another barrier includes the lack of parental control needed for using this particular technology



Potential Barriers

- ▶ There is a possibility that malware and other viruses could be installed within the AR device (Kaspersky, 2023).
- ▶ Therefore, the lack of applications of the necessary security in these technologies could be an issue for the parents and child
- ▶ Another barrier includes a sudden cutt-off from the information network where the technology needs to be connected to
- ▶ This would render the technology virtually useless
- ▶ Data privacy issues and breaches are the main barrier that is needed to be addressed by parents while dealing with this technology

Potential Barriers

- ▶ Cost and digital security can be some of the major barriers (Sarbadhikari and Sarbadhikari, 2020).
- ▶ Privacy concern- this has been considered one of the potential barriers to the successful digital health promotion intervention as the application to connect the VR spectacle may collect individual data that is required to be stored securely.
- ▶ Cost- it has become vital for children to use VR spectacles but often these tools are costly and need proper training for adequate operation.



Ethical issues

Other ethical issues that are associated with this technology includes the data privacy issue that is associated with the application of VR technology

The lack of consent that is required for the use of these technology and the information that could be accessed through the VR technology

Another ethical issue includes the kind of gore scenes that the children could be subjected to while using this particular technology

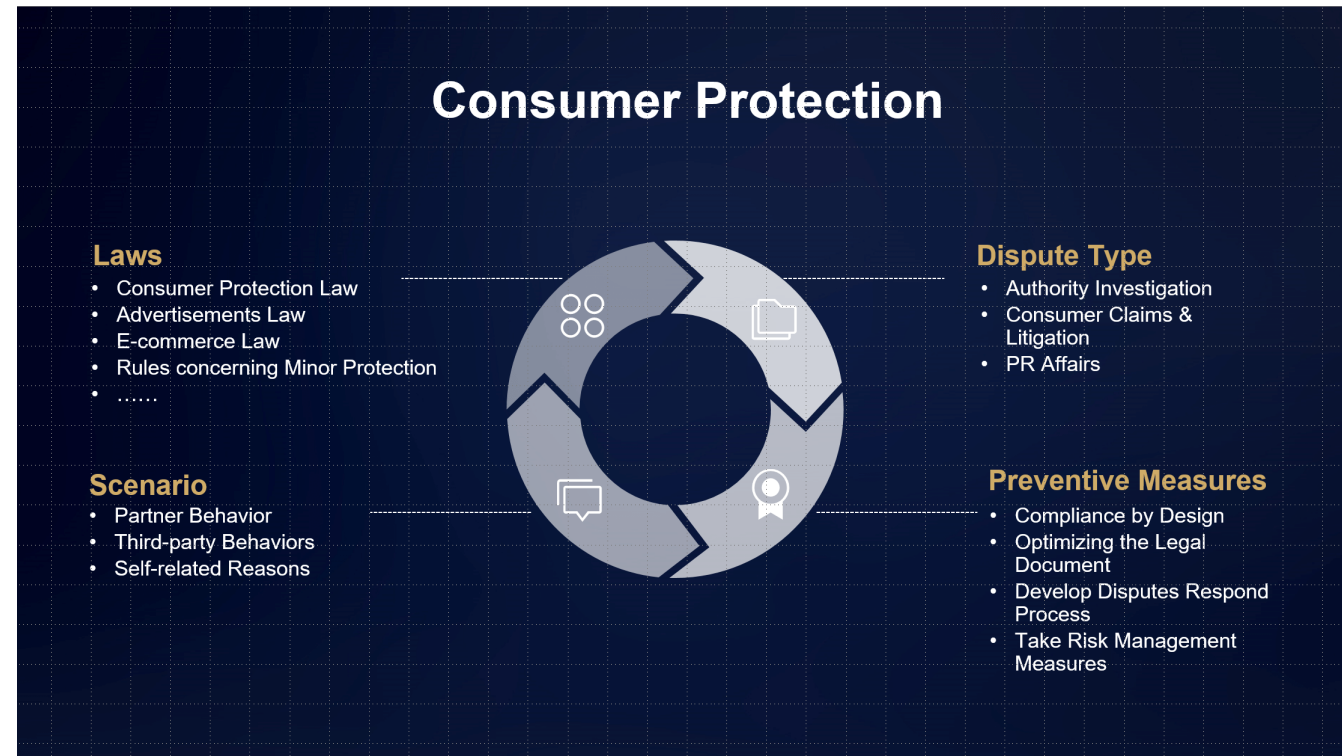
Ethical issues

- ▶ Habit-forming Content
- ▶ User Isolation and Social
- ▶ Pornography



Legal issues

- ▶ Compliance, in the context of digital intervention by handing the data of individuals with the need of the General Data Protection Regulation, as well as the UK Data Protection Act (2018).
- ▶ Compliance, in the delivery of the digital health service with the adequate UK healthcare regulation regime.



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Gargi d Gosai(2225809)

POTENTIAL BENEFITS

- An increase in cardiorespiratory fitness
- Enhanced energy level
- The improved immune system
- More significant muscle strength
- Bone strength
- Lessened anxiety and depression signs
- The risk of developing diseases like obesity, type 2 diabetes and cancer is decreased
- Improved psychological health.
- Managed weight
- Better blood flow throughout the body
- Lower blood cholesterol levels
- Prevention of bone deterioration
- Increased capacity for sound sleep and quicker sleep



WHY IS PHYSICAL ACTIVITY IMPORTANT FOR YOUNG CHILDREN?



Physical inactivity

Lungs



Produce less oxygen

Skin



Lack of nutrients leads to unhealthy skin and hair, exhaustion, headaches, low moods and difficulties in concentrating

Muscles and joints



When you do not use your muscles, you lose muscle mass. You gain weight easily and become weaker

Heart



Your heart muscles grow weak and it becomes a strain to do basic activities

Stomach and intestines



Can cause constipation

Bones



Can weaken bones and cause osteoporosis

Other organs



Your body becomes weak and more likely to become sick

IMPLICATION OF DIGITAL HEALTH PROMOTION INTERVENTION ON POLICIES

LAWS AND REGULATIONS FOR DATA SECURITY IN THE UK

- **Data Protection Act 2018 (DPA)**

Sensitive information is covered by enhanced legal protection, including viewpoints on politics, race, cultural heritage beliefs in religion genes associated with affiliation to a union. As an identification method, biometric orientation, welfare, and sexuality.

- **UK General Data Protection Regulation (UK-GDPR)**

The General Data Protection Regulation (GDPR) has been implemented in the UK by the Data Protection Act 2018.

- **Network and Information Systems (NIS) Regulations**

The laws seek to strengthen how the internet-based economy operates by addressing risks to networks as well as knowledge technologies.

LAWS AND REGULATION FOR DATA SECURITY IN UK

- **Telecommunications (Security) Act 2021**

The Act mandates that telecommunications companies put in place procedures to recognize and protect their servers from online attacks as well as to foresee potential dangers.

- **Privacy and Electronic Communications Regulations (PECR)**

When employing electronic communication, it addresses people's freedom of privacy. With the PECR, clients are safeguarded against potential cyberattacks and knowledge exploitation.

- **Computer Misuse Act 1990 (CMA)**

The primary intent behind the legislation was to make it illegal to obtain or alter data without the individual's permission.

CHILD PROTECTION LAW

These rules guarantee that young minds are heard, specify when young ones can engage in different activities, safeguard children's safety, and protect the privacy of young's sensitive data.(CHILD PROTECTION SYSTEM, 2022)

PARENTS CONSENT

To protect the children and young people in their care, it is the responsibility of every group or agency in the UK. Included in this is ensuring the safety of all kids who participate in events and activities. Get the parents' or guardians' permission before allowing their child to participate in any events or activities that your group or organization sponsors for kids and teenagers. In order to keep kids safe during the activity, it's also critical to collect relevant data.(NSPCC,2022)

CONCLUSION

The relationship between physical activity and mental health directly targets kids and teenagers. Numerous benefits of engaging in physical activity can help with mental health, and how active you need to be to feel better. (RCPSYCH, 2022)

Throughout and following physical activity, lymphocyte movement and cell acquisition both rise. The correct implementation of such practice must be taken into account to prevent harm because it has an impact on the decreased frequency, severity of indications, and morbidity of viral infections reported in those who practice vigorous physical activity on a regular basis. (NATIONAL LIBRARY OF MEDICINE,2021)

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upguard.com

ramsac.com

Laws and regulations against cybercrime in the UK include¹²

<https://learning.nspcc.org.uk/child-protection-system/children-the-law>

NSPCC JAN 2022

GOVT.UK

THANK YOU