Nourish VR Project: A Virtual Reality Solution for Binge Eating Disorder

Welcome to the Nourish VR Project, a virtual reality-based solution aimed at helping individuals struggling with binge eating disorder (BED). This project leverages VR technology to create immersive and interactive experiences that promote healthier eating habits and provide therapeutic exercises for managing binge eating.

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Project Overview

Nourish is designed to simulate real-life scenarios where overeating is often triggered, offering users a safe and controlled environment to confront and manage their condition. It incorporates elements like guided breathing exercises, self-reflection, and nutritional education to help users build healthier relationships with food.

Download and Install APK

To experience the Nourish VR Project, download and install the APK file on your headset.

Download APK

Project was design in Unity Version 2022.3.11f1 and tested on Meta Quest 2 and Meta Quest 3.

Features

- **Immersive Environment:** The VR experience simulates social eating dynamics, offering a realistic yet safe setting for users to explore food-related triggers and responses.

- **Guided Exercises:** Nourish includes guided breathing exercises and self-reflective prompts to help users manage stress and cravings.
- **Nutritional Education:** The project provides nutritional information and educates users on portion control and healthy eating habits.
- **Accessibility:** The VR experience can be accessed from the comfort of the user's home or therapist's office, providing flexibility in therapy.
- **Therapeutic Focus:** Nourish offers a compassionate and judgment-free environment, encouraging users to build self-compassion and mindfulness.

Interaction Techniques

- **Self-Reflective Messages:** Prompts that encourage users to think about their emotional state and food choices.
- **Pop-up Questionnaires:** Questions that assess users' responses to various food items.
- **Nutritional Information:** Display nutritional information on the health benefits or repercussions of various foods, allowing users to make more educated decisions.
- **Fullness Meter:** A tool to encourage portion control and combat overeating.
- **Breathing Exercises:** Guided breathing sessions to help manage stress and cravings.
- **Cutting Food:** An option for users to practice cutting food into smaller pieces for portion control.

Concept and Design

The Nourish VR experience takes place in a kitchen as a birthday party is being prepared. This environment is brimming with various food triggers, including tempting items such as cakes, donuts, sweets, and alcohol, in addition to healthier options such as fruits and vegetables. This scenario is intended to mimic a real-life situation in which overeating is frequently triggered. Users navigate through this environment, encountering pop-up messages that prompt self-reflection and guided breathing exercises. A fullness meter helps users understand portion control, and educational prompts offer nutritional information.

Nourish - Virtual Reality for
Binge Eating Management

GitHub: https://github.com/randomoi   October 2023 - March 2024

Target Users

Nourish is designed for teenagers and young adults (ages 16-21) suffering from binge eating disorder. This age group is more open to digital platforms, making the VR approach engaging and relatable. Additionally, Nourish aims to be a useful tool for mental health professionals and dietitians as part of a comprehensive treatment plan for BED.

Domain

- Health and Psychology
- Nutrition and Dietetics
- Behavioral Therapy and Rehabilitation
- Education and Awareness

Navigation and Simulator Sickness

To navigate the VR kitchen, users utilize controllers with thumbsticks for movement. Given the potential for simulator sickness, various techniques are employed to minimize discomfort, such as gradual acceleration/deceleration and fixed reference points.

Visual Style

Nourish features a safe and welcoming environment with soft color schemes and calming illumination. The kitchen and food items are semi-realistic 3D models, and the sound design includes soothing voices and relaxing nature sounds.

Project Team and Collaboration

Nourish aims to collaborate with medical professionals, including therapists and dietitians, to ensure the project meets the needs of those with BED. The goal is to demonstrate the potential of virtual reality in treating eating disorders and support a broader audience.

Assets

3D Models

- Kitchen: Simple House Kitchen
- Bar Stools: Bar Stool Avorio
- Birthday banner: Party Pack
- Flowers with vase: Free Flower Ceramic Vases
- White Vase with Lilies: Flower Vase
- Plant: Free Pothos Potted Plant
- Presents: Present
- Cutting Board: Cutting Board
- Knife: Basic Kitchen Knife
- Champagne Glasses: Bar Glasses
- Fries: French Fries
- Breathing Exercise Sparkles: DL Fantasy RPG Effects
- Window: Window Glass2
- Plate: Plates Bowls Mugs Pack
- Exotic Fruit: Cartoon Prickly Pear

- Champagne: [Bottle of Champagne](#)
- Fruits & Vegetables: [Lowpoly Fruits Vegetables](#)
- Burger: [Burger](#)
- Strawberry Cake: [Cake](#)
- Chocolate Cake: [Food Kit](#)
- Donut: [Donut](#)

Skyboxes

- Sky: [Starfield Skybox](#)
- Trees: [Forest Clearing 1 Ground Skybox](#)

Audio

- Button Clicks: [Free UI Click Sound Effects Pack](#)
- Voiceover: [Elevenlabs](#)
- Royalty Free Sound Track: [Nebular Focus by Dan Henig](#)
- Glass Sound: Sound Effect by [floraphonic](#) from [Pixabay](#)
- Bottle sound: Sound Effect from [Pixabay](#)
- Cutting Sound: Sound Effect from [Pixabay](#)
- Plate Sound: Sound Effect from [Pixabay](#)
- On Plate Sound: Sound Effect from [Pixabay](#)
- Splat Sound: Sound Effect from [Pixabay](#)
- Alert Sound: Sound Effect by [UNIVERSFIELD](#) from [Pixabay](#)
- Vase Put Down Sound: Sound Effect from [Pixabay](#)
- Box for Gifts: Sound Effect from [Pixabay](#)
- Cutting Board Sound: Sound Effect from [Pixabay](#)
- Chair Moving Sound: Sound Effect from [Pixabay](#)

Icons

- Add to Plate Icon: [Down Chevron](#)
- Look at Particles Icon: [Focus](#)
- Play Icon: [Play](#)
- Can't cut Icon: [No Knife](#)

Bibliography

For more information on the sources and references used in the Nourish project, please refer to the full bibliography included in the project documentation.

- [1]   Cleveland Clinic. Binge Eating Disorder: What It Is, Symptoms & Treatments. Retrieved December 6, 2023 from https://my.clevelandclinic.org/health/diseases/17652-binge-eating-disorder
- [2]   Cristiana Duarte and José Pinto-Gouveia. 2017. The impact of early shame memories in Binge Eating Disorder: The mediator effect of current body image shame and cognitive fusion. Psychiatry Res 258, (December 2017), 511–517. DOI:https://doi.org/10.1016/j.psychres.2017.08.086
- [3]   Leslie Citrome. 2017. Binge-Eating Disorder and Comorbid Conditions: Differential Diagnosis and Implications for Treatment. J Clin Psychiatry 78 Suppl 1, (2017), 9–13.

DOI:https://doi.org/10.4088/JCP.SH16003SU1C.02

- [4]   Binge Eating Disorder Facts, Statistics, Prevalence, Diagnosis and Treatment. Retrieved December 21, 2023 from https://www.therecoveryvillage.com/mental-health/binge-eating/binge-eating-statistics/

- [5]   Rodrigo Smiderle, Sandro José Rigo, Leonardo B. Marques, Jorge Arthur Peçanha de Miranda Coelho, and Patricia A. Jaques. 2020. The impact of gamification on students' learning, engagement and behavior based on their personality traits. Smart Learning Environments 7, 1 (December 2020), 1–11. DOI:https://doi.org/10.1186/S40561-019-0098-X/FIGURES/2

- [6]   7 Stress-Relief Breathing Exercises for Calming Your Mind. Retrieved December 21, 2023 from https://positivepsychology.com/breathing-exercises-for-stress-relief/

- [7]   Mindfulness exercises - Mayo Clinic. Retrieved December 21, 2023 from https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/mindfulness-exercises/art-20046356

- [8]   Binge Eating Disorder | ColumbiaDoctors - New York. Retrieved December 6, 2023 from https://www.columbiadoctors.org/treatments-conditions/binge-eating-disorder

- [9]   P. Nivière, D. Da Fonseca, C. Deruelle, and F. Bat-Pitault. 2021. Utilisation de la réalité virtuelle dans les troubles des conduites alimentaires. Encephale 47, 3 (June 2021), 263–269. DOI:https://doi.org/10.1016/J.ENCEP.2020.11.003

- [10]   Giuseppe Riva, Clelia Malighetti, and Silvia Serino. 2021. Virtual reality in the treatment of eating disorders. Clin Psychol Psychother 28, 3 (May 2021), 477. DOI:https://doi.org/10.1002/CPP.2622

- [11]   Gian Luca Cesa, Gian Mauro Manzoni, Monica Bacchetta, Gianluca Castelnuovo, Sara Conti, Andrea Gaggioli, Fabrizia Mantovani, Enrico Molinari, Georgina Cárdenas-López, and Giuseppe Riva. 2013. Virtual Reality for Enhancing the Cognitive Behavioral Treatment of Obesity With Binge Eating Disorder: Randomized Controlled Study With One-Year Follow-up. J Med Internet Res 15, 6 (2013). DOI:https://doi.org/10.2196/JMIR.2441

- [12]   D. Freeman, S. Reeve, A. Robinson, A. Ehlers, D. Clark, B. Spanlang, and M. Slater. 2017. Virtual reality in the assessment, understanding, and treatment of mental health disorders. Psychol Med 47, 14 (October 2017), 2393–2400. DOI:https://doi.org/10.1017/S003329171700040X

- [13]   Kerri N. Boutelle and Mark E. Bouton. 2015. Implications of learning theory for developing programs to decrease overeating. Appetite 93, (October 2015), 62. DOI:https://doi.org/10.1016/J.APPET.2015.05.013

- [14]   Nesse van der Meer, Vivian van der Werf, Willem Paul Brinkman, and Marcus Specht. 2023. Virtual reality and collaborative learning: a systematic literature review. Front Virtual Real 4, (May 2023), 1159905. DOI:https://doi.org/10.3389/FRVIR.2023.1159905/BIBTEX

- [15]   Wilma Elzeline Waterlander, Yannan Jiang, Ingrid Hendrika Margaretha Steenhuis, and Cliona Ni Mhurchu. 2015. Using a 3D virtual supermarket to measure food purchase behavior: a validation study. J Med Internet Res 17, 4 (April 2015), e107. DOI:https://doi.org/10.2196/JMIR.3774

- [16]   (PDF) Effect of a Mindfulness intervention with virtual reality in adolescents on Attention and working memory. Retrieved December 21, 2023 from https://www.researchgate.net/publication/359625559_Effect_of_a_Mindfulness_intervention_with_virtual_reality_in_adolescents_on_Attention_and_working_memory

- [17]   Virtual Reality Motion Sickness VR Simulator Illne... - Meta Community Forums - 30037. Retrieved December 7, 2023 from https://communityforums.atmeta.com/t5/Game-Design/Virtual-Reality-Motion-Sickness-VR-Simulator-Illness-Guide/td-p/30037

- [18]   Aniruddha Prithul, Isayas Berhe Adhanom, and Eelke Folmer. 2021. Teleportation in Virtual
  Reality; A Mini-Review. Front Virtual Real 2, (October 2021), 730792.
  DOI:https://doi.org/10.3389/FRVIR.2021.730792/BIBTEX

Author: https://github.com/randomoi/