Project Proposal: Adolescent Health Chatbot & Intervention Platform

Executive Summary

This proposal outlines the development of an AI-powered interactive chatbot module to be integrated into a digital health platform. The goal is to provide adolescents (ages 12-18) in managing obesity and developing healthy habits through a comprehensive digital health application that incorporates mental health, physical activity, nutrition, and coaching. All these elements are required to support real lifestyle changes. The system will feature a friendly AI persona (e.g., "Vita" or "Finn") as an empathetic “pal” (EMPAL) capable of introducing CBT-lite features, promoting lifestyle change, providing features supporting emotional regulation, answering questions about nutrition, sleep, stress, and activity using safe, vetted content. This effort is a novel digital health app targeting teens with comprehensive integrated health care to guide their healthy choices.

Key elements include a "Human-in-the-Loop" Admin Panel allowing researchers to monitor live chats and intervene, a mental health (CBT-lite) set of features, Food Analysis Engine that uses computer vision to identify food and map it to a "Red/Green/Yellow" health system.

Project funding to date: The CSO has funded the pilot ($100,000) which provides support for the pilot research study of 60 participants, principal investigator, staff support for initial mental health screening, and app development. Research Institute in-kind contribution includes biostatistical support, project supervision, app development supervision, regulatory support, evaluation and implementation science support, contractor supervision.

- Version 1 is very basic integrating knowledge content and basic chatbot features to support health lifestyle management.
- Version 2 (proposed) provides advanced interactive features to promote engagement. Version 2 also integrates GARMIN-CONNECT-which is a not-yet-released Garmin wearable feature that provides more physical activity features and feedback; Version 2 also supports opportunities for live content (group therapy) and more options for the family to also engage in the content on the digital health app along with their teen, supporting family empowerment and family engagement.

Our request: We are requesting funding ($100,000) to support Version 2 development, deployment, and clinical testing.

Version 1: The Pilot AI Agent

The AI agent is the core intelligence of the system. We will utilize a Retrieval-Augmented Generation (RAG) engine that grounds the AI's answers in the specific documents and URLs you provided, rather than general internet knowledge.

- **Knowledge Base Ingestion:** Indexing of provided sources, including *HealthyChildren.org*, CDC guidelines, and the "5-2-1-0" plan.
- **Food Recognition & Nutrition API:**
    - Integration with **Nutritionix API** to retrieve calorie and macronutrient data.
    - Image processing to analyze user-uploaded food photos and estimate ingredients.
    - Logic to categorize food into the **Traffic Light System** (Red/Yellow/Green) based on nutritional density.

- **Safety Guardrails:** Implementation of strict filters to detect self-harm or inappropriate queries, immediately flagging them to the admin panel and stopping the bot from responding.
- **Persona Design:** Configuring the AI to speak in a teen-friendly tone (e.g., "Vita" or "Finn") and handle "stupid questions" without judgment.

Version 2 AI Agent**:** *advanced features, "pushes" to participant's wearable; personalization of the AI agent (avatar, likes/dislikes); automated update of new information; seamless connectivity to physical activity options using video.*

Version 1: Mobile/Chat Interface

We will develop the chat interface to be embedded within the Centralive ecosystem.

- **Chat UI:** A familiar messaging interface where users can text or upload photos.
- **Multimedia Support:** The bot will be able to serve links to vetted videos (e.g., cooking videos, workout ideas) as requested.
- **User Journey:** Version 1-simple onboarding where the user is encouraged to ask a "test question" to get comfortable.

Version 2 Mobile Chat Interface: *Advanced features, e.g. Integrated live video formats for personalized "health" community for participants; challenges, seamless connectivity to meditation, health sleeping features, emotional regulation features.*

Version 1 Researcher Admin & Monitoring Panel (Web App)

We will develop a secure web dashboard for the research team to manage the pilot program.

- **Live Monitor:** View active conversations between teens and the bot in real-time.
- **Human Override/Intervention (for safety):** A feature allowing the admin to pause the bot and send a message manually if the AI is struggling or if the situation requires a human touch.
- **Content Management:** Ability to toggle specific "Guardrails" or update the "Red/Green/Yellow" logic.

Version 2 Researcher Admin and Monitoring Panel: In Version 2, *we will have the ability to support remote monitoring for any wearable. We will also have the ability to introduce live content such as group therapy and targeted groups addressing teen issues that impact healthy lifestyle management. For the pilot, group therapy to support project goals will be implemented via ZOOM. Version 2 will allow us to support this feature digitally and supplement mental health support with CBT-trained AI agents.*

Budget

Total Current Budget Allocated for Version 1: $100,000

Current Request for Version 2: $100,000

Component	Description	Estimated Hours	Cost Allocation
Version 2 Engineering	AI Agent coding advanced features, RAG pipeline, *Nutritionix* integration, Improve image recognition, API development. Extend Chat UI, add video to photo upload feature, expand research dashboard to include Garmin-Connect; expand features for live monitoring web-socket, test integration into RADY system, strengthen override function, testing, version 2 deployment .	700 Hours	$35,000
Clinical Testing	PI support, clinical test for version 2 (N=60); evaluation of implementation and outcomes for version 2, clinical testing		$65,000
TOTAL			$100,000

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