

# NutriGenius: AI Powered Wellness Hub

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## Abstract:

In the contemporary landscape of health and fitness, achieving an all-round fitness and wellness remains a massive challenge for individuals seeking a comprehensive approach to nutrition. Despite an abundance of available applications designed to aid in health management, a critical void persists in the realm of integrated functionalities. There is an absence of a platform that combines calorie tracking and macro nutritional breakdown with personalized AI-driven meal planning. The prevailing issue arises from the disjointed nature of existing solutions, which compel users to navigate through multiple disparate tools lacking in interoperability and synergy. Users face the daunting task of managing and analyzing data across various platforms, hindering their ability to maintain a consistent and holistic approach to fitness and wellness. Furthermore, the lack of user-friendly interface of the applications and nuanced, user-specific guidance within these fragmented systems exacerbates the challenge, hindering individuals from attaining optimal health goals and a seamless fitness journey.

**Keywords:** AI dietician, ChatGPT, calorie tracking, nutrition breakdown.

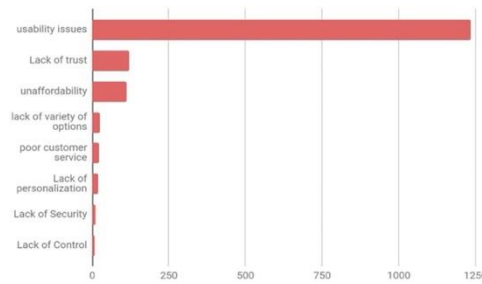
## 1. Introduction

This research paper endeavours to address the pervasive gap between health conscious users and existing applications by proposing a novel and comprehensive solution. This proposed platform aims to integrate functionalities that include nutritional breakdown, total calorie intake in a day (breakfast, lunch, dinner), leveraging AI to curate personalized meal plans that adapt dynamically to the user's pantry inventory and calorie targets. By amalgamating these fundamental features into a singular, user-friendly interface, the envisioned solution seeks to streamline the user experience, providing tailored guidance and support towards achieving individualized wellness goals. Through an interdisciplinary approach merging new-age technologies like MongoDB, ExpressJS, ReactJS, NodeJS (MERN), OpenAI with nutritional science and user-centric design, this research seeks to explore the development and implementation of an innovative health and wellness platform. This platform not only bridges the existing chasm in health technology but also aims to revolutionize the user experience by fostering a cohesive, user-friendly and intuitive ecosystem, empowering individuals to navigate their wellness journey seamlessly.

## 2. Related Study

### 2.1. Study about similar platforms

Study on multiple health oriented applications concluded that most of them had one or more shortcomings as shown in figure 1. NutriGenius aims to solve two out of the top three issues as discussed below:



**Figure 1 - Issues with current Healthcare and Nutrition platforms**

### 2.1.1 Usability

**Complexity and Fragmentation:** Many healthcare apps offer fragmented experiences, each addressing a specific aspect of health, like fitness tracking, meal planning, or symptom monitoring. This fragmentation leads to users juggling multiple apps, causing confusion and difficulty in managing their overall health goals.

**Poor User Interface (UI) and User Experience (UX):** Some apps suffer from cluttered interfaces, confusing navigation, or unintuitive designs. This results in a steep learning curve for users, making it challenging to access features or input data effectively. Cumbersome UI/UX contributes to low user engagement and eventual abandonment of the app.

### 2.1.2 Unaffordability

**Subscription Costs:** Many healthcare apps operate on a subscription-based model, requiring users to pay recurring fees for access to premium features or content. While some offer free versions, access to advanced functionalities often comes with a price tag, limiting access for individuals with limited financial resources.

**In-App Purchases:** Some apps offer essential functionalities for free but monetize through in-app purchases for additional features, content, or tools. These purchases can accumulate and become costly for users, especially if the app relies heavily on paid add-ons for a comprehensive experience.

**Limited Free Access:** While some apps provide basic functionalities for free, their effectiveness might be limited without access to premium features or content. This limited access to critical information due to financial constraints hampers equitable healthcare access.

### 2.1.3 Lack of variety of options

Many healthcare apps focus on specific health aspects, such as fitness tracking, calorie counting, or medication reminders. While these apps excel in their specialized functions, they often lack versatility in addressing a broad spectrum of health needs comprehensively.

Sex	Number		Aware of Health Apps		Uses Apps on Mobile			
			Yes	No	Yes	No		
Male	58	41.4%	Yes	51	87.9%	Yes	33	64.7%
			No	7	12.1%	No	18	35.3%
Female	82	58.6%	Yes	76	92.7%	Yes	42	55.3%
			No	6	7.3%	No	31	40.8%
			No Ans	3	3.9%	No Ans	3	3.9%
Total	140		Yes	127	90.7%	Yes	75	59.1%
			No	13	9.3%	No	49	38.5%
			No Ans	3	2.1%	No Ans	3	2.1%

**Figure 2 – Awareness and use of Health apps among students**

The findings underscore critical challenges faced by users in the realm of healthcare and nutrition applications. It is evident from the data that two of the top three concerns highlighted by users pertain to the unaffordability and usability issues prevalent in existing apps. The staggering percentage of respondents citing these factors as primary concerns reflects the significant barriers hindering widespread adoption and sustained usage of such applications. Simultaneously, the pervasive usability issues, encompassing complexities in navigation, unintuitive interfaces, and fragmented experiences, impede users from harnessing the full potential of these apps, resulting in suboptimal engagement and diminished health outcomes. Addressing these concerns becomes imperative in designing solutions that are not only accessible but also intuitive, user-friendly, and inclusive, ensuring broader accessibility and efficacy in promoting health and wellness among diverse user groups.

### 2.2 Popularity of fitness applications

Results of a recent survey on “Usage of Mobile Health Apps among Medical Undergraduates” [3], conducted on 140 students of Rajarajeshwari Medical College and Hospital showed that 127 (91%) were aware of existing health and nutrition apps. 75 (59%) of the students were already using health apps on their mobiles, of which majority were females (56%). 58.7% of the students were motivated to be fit.

### 3. Solution

According to a study [7] based on user experience of 106 mental health apps. Users placed more emphasis on the user interface and the user-friendliness of the app. Users also appreciated apps that present them with a variety of options, functionalities, and content that they can choose. It also showcased that affordability is a major factor for a user in deciding to use an app or not. These factors can be held relevant in similar domains like all-round physical health care and nutrition. Keeping the above factors in mind, the proposed application includes following features/functionality-

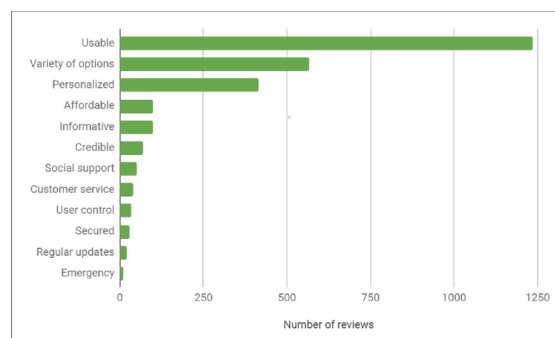


Figure 3 –Qualities that users liked

### 3.1 AI Integration

One of the key advantages of AI tools (like ChatGPT) is their ability to generate coherent and contextually appropriate responses to text inputs, even for open-ended prompts such as chatbot conversations. This is achieved by using the pre-trained model to generate a probability distribution over the next word in the sequence, and sampling from this distribution to generate the output. By repeatedly generating the next word based on the previous words, the model can produce fluent and coherent text [4].

According to its own description [1], ChatGPT is “a powerful machine learning software that uses the Generative Pre-trained Transformer (GPT) algorithm to generate human-like responses to text-based

inputs”. Transformative potential of AI could revolutionize education with ChatGPT and other solutions already available. Usually, ChatGPT is used for content creation, research assistance and language learning (including computer languages coding) [2].

The no-cost integration of AI technology within the application, offering personalized meal suggestions utilizing existing pantry items, stands as a resourceful and credible solution in addressing the concerning issue of unaffordability in health and nutrition apps. By leveraging this AI-driven functionality, users are empowered to optimize their meal planning and preparation without incurring additional costs. This feature not only minimizes the need for users to frequently shop for specific ingredients but also curtails wastage of excess food. Consequently, this streamlined approach ensures that individuals, irrespective of their financial constraints, can access tailored meal suggestions that align with their dietary preferences and health goals. AI integration thereby fosters a more inclusive and affordable approach to wellness for all users.

### **3.2 Nutrition breakdown**

According to its own study [5], a proper nutrition is one of the most effective and least costly ways to decrease the burden of many diseases including obesity. Nutrition is a fundamental ingredient in maintaining a good health and functionality. The role that food components, particularly novel ingredients, contribute to health maintenance and thus, the food we eat requires nutritional breakdown.

Through the comprehensive nutrition breakdown of meals offered within the application, it aims to tackle the prevalent issue of the lack of variety in health and nutrition options. By furnishing users with detailed insights into the nutritional composition of diverse meal choices, the application empowers individuals to make informed decisions about their dietary goals and food preferences. This feature serves as a catalyst for expanding options, enabling users to explore a wide array of meals while ensuring that each choice aligns with their nutritional requirements. This functionality mitigates the limitations of homogeneous suggestions and also fosters enhanced user engagement and encourages a more varied and balanced dietary intake. The application also provides a detailed breakdown of traditional Indian food and thereby showcasing its high nutritional value and fibre content.

### **3.3 Total Calorie Calculator**

The integration of a total calorie calculator within the application significantly contributes to addressing prevalent usability concerns encountered in health and nutrition apps. By offering users a consolidated tool to calculate the total caloric intake across breakfast, lunch, and dinner, the application streamlines the tedious process of manually tracking and calculating nutritional intake. This feature eliminates the need for users to navigate multiple interfaces or applications to compile their daily caloric consumption. Through a single, intuitive interface, users can easily input their meal details and instantly obtain a comprehensive overview of their total calorie intake. By simplifying and centralizing this critical aspect of nutritional tracking, the application significantly enhances usability, user experience.

## **4. Conclusion**

In conclusion, the contemporary health and fitness landscape confronts individuals with multifaceted challenges in achieving holistic wellness, compounded by the limitations present in existing healthcare and nutrition applications. Through an in-depth analysis of prevalent issues, it has become evident that the critical gaps in areas like usability, affordability, and variety significantly impede the widespread adoption and efficacy of these apps. However, amidst these challenges lies an opportunity for development and transformation. The proposed solution, exemplified by the comprehensive health and wellness application,

aims to bridge these gaps by amalgamating total calorie calculation, personalized AI-driven meal planning, nutrition breakdown and simplified user interfaces. By addressing usability concerns through features like the total calorie calculator and fostering affordability, the application strives to revolutionize the user experience, providing a seamless and personalized journey toward holistic wellness.

With a variety of options, the application aims to provide a better experience to the user. As we chart the path forward, it is imperative to prioritize user-centric design, inclusivity, and technological advancements to create solutions that cater to diverse needs and promote accessible, effective, and sustainable health and wellness management. The application aims to pave the way for a future where healthcare and nutrition applications become indispensable allies in empowering individuals to lead healthier and more fulfilling lives.

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