

# HEALTH BUDDY

## A PROJECT REPORT

*Submitted by,*

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*Under the guidance of,*

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*in partial fulfillment for the award of the degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING(CSE)**

**At**



**PRESIDENCY UNIVERSITY**

**BENGALURU**

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**PRESIDENCY UNIVERSITY**  
**SCHOOL OF COMPUTER SCIENCE ENGINEERING**  
**CERTIFICATE**

This is to certify that the Project report “**HEALTH BUDDY**” being submitted by “Siddhant Chavan, Poorvika P, Anisha Kumari, Tilakraj Ratnanj Revankar” bearing roll number(s) “20211CSE0532, 20211CSE0547, 20211CSE0537, 20211CSE0531” in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a bonafide work carried out under my supervision.

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**DECLARATION**

We hereby declare that the work, which is being presented in the project report entitled **HEALTH BUDDY** in partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Dr. Abdul Khadar A, Associate Professor, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru**. We have not submitted the matter presented in this report anywhere for the award of any other Degree.

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# **ABSTRACT**

## **PROBLEM STATEMENT:**

**Organization:** Cognizant

**Category (Hardware / Software / Both):** Software

## **Problem Description:**

Our app allows you to enter the food you ate and with the help of a trained model it'll be able to predict the different types of vitamins and proteins and also calculate the calories consumed. After analyzing the data entered by the user for a couple of days, the app will tell you what vitamin you might be deficient of and the possible diseases you might get if you don't include that in your diet. It also keeps a track of the number of glasses of water you've had while also reminding you to hydrate yourself regularly. It also keeps a track of your physical activities and calories burned.

**Difficulty Level:** Moderate.

## **EXPLANATION:**

In today's fast-paced world, maintaining a balanced diet and staying hydrated can often be overlooked, leading to potential health issues. Our application provides a comprehensive solution to this problem by tracking users' dietary habits, physical activities, and hydration levels. Using a trained machine learning model, the app allows users to log the food they consume, predicting the vitamins, proteins, and calories in their diet. Over time, the app analyzes the nutritional data to identify potential deficiencies in essential vitamins and nutrients, providing personalized suggestions to improve overall health and prevent possible diseases. Additionally, the app tracks physical activities and calories burned, while sending regular reminders to ensure users stay hydrated. By offering tailored insights and proactive health recommendations, this app empowers individuals to make informed lifestyle choices for a healthier, more balanced life.

## ACKNOWLEDGEMENT

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We express our sincere thanks to our respected dean **Dr. Md. Sameeruddin Khan**, Pro-VC, School of Engineering and Dean, School of Computer Science Engineering & Information Science, Presidency University for getting us permission to undergo the project.

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We would like to convey our gratitude and heartfelt thanks to the PIP2001 Capstone Project Coordinators **Dr. Sampath A K, Dr. Abdul Khadar A and Mr. Md Zia Ur Rahman**, department Project Coordinators “**Mr. Amarnath J.L**” and Git hub coordinator **Mr. Muthuraj**.

We thank our family and friends for the strong support and inspiration they have provided us in bringing out this project.

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# **CHAPTER-1**

## **INTRODUCTION**

### **1.1 Health and Lifestyle Verse the Labs Life - The Balance of Diet and Hydration**

Foods and water are easy to forget in the modern fast-tempo and stressful life. Nutrition and waters have little hope when priorities hit a hectic pace, usually upsetting nutrition, making it less than desirable in many ways. Oftentimes, disregard for personal health leads to other conditions that may very well lead to long-lasting diseases such as obesity, diabetes, and heart disease.

### **1.2 Being Unaware of Nutrient Deficiency**

Though most people are quite aware of their physical demands, they have hardly an idea about which vitamins and nutrients they are consuming or are deficient in their daily diet. Although micronutrient deficiencies, such as deficiency of vitamin D, calcium, iron, etc., usually go unnoticed until other more severe health issues arise, such is the case with bone density loss, extreme fatigue, etc. The absence of such tracking makes it rather challenging for that person to ensure a well-balanced diet feasible without guidance to meet nutritional needs.

### **1.3 Difficulty Knowing Dehydration and Physical Activity**

Various work pressures and lifestyles develop an environment in which monitoring hydration levels and physical activity maintenance becomes a major issue. Physical fitness can very rarely be discussed. The requisite exercise and drinking of sufficient water are important parts of one's health, but many times the person will forget this fact along with many other such things in their pulling schedules. Such laziness breeds further complications: easy behaviors bring on deficiencies, inactivity, and dehydration, which per se will facilitate healthy living.



## **CHAPTER-2**

### **LITERATURE SURVEY**

#### **1. Personalized Dietary Advisories**

Viewers have more personalized recommendations for diets with an application of machine learning in nutrition tracking and health. Programs described in this manner by Espinosa et al. (2016) support tracking dietary intake on a mobile health app while providing unsolicited feedback. In using food diaries to obtain data collection and the relative information from some food-disposal devices, these systems get the users feedback relating to their own nutritional habits and deficiencies. This study has elucidated the way ML models take vast datasets and detect patterns in user behavior and suggest proactive health recommendations.

#### **2. Dietary Support Systems on the Basis of Health Conditions**

Some chronic diseases like diabetes and cardiovascular ailments require unique or specific dietary plans. A good example in this direction is the "Diabetic Buddy" system as described by Borle et al. (2020); it is using a different personalized ML algorithm to monitor and control dietary intake within diabetic patients. The system uses real-time blood sugar figures incorporated with food consumption data, which are the basis for recommendations on glycemic control and nutrition adequacy. Systems based on ML like this can reduce the burden on the users by automating monitoring and making other suggestions based on the health profile.

#### **3. Nutrition Estimation from Images**

Estimating nutrition from food images constitutes a promising aspect of ML investigations. The method entails the training of deep learning models on the datasets containing food pictures to predict their nutritional composition. For instance, a research paper by Yanai et al. describes systems unfolding information from multiple food image datasets, estimating calories, macronutrients, and vitamins from photos. Such an application could make a substantive difference in dietary self-reporting by lessening the need for individuals to record everything manually about their intakes.

## CHAPTER-3

### RESEARCH GAPS OF EXISTING METHODS

#### 1. Lack of Deep Personalization

**Issue:** Most health applications provide general advice, tips, and health tracking. They do not take into account individual variations, such as medical history, lifestyle, genetic predispositions, or specific goals.

**Impact:** Users may not find the recommendations relevant to their specific conditions, hence they are less likely to engage with the application.

#### 2. Inconsistent Data Integration

**Issue:** Integration of data from sources such as wearables, e.g., Fitbit and Apple Watch, or EHRs and other health monitoring devices.

**Impact:** Users may need to input data manually or juggle several apps, which can be inconvenient and might result in incomplete or even wrong health tracking.

#### 3. Privacy and Security Issues

**Issue:** Health apps gather sensitive information regarding personal health, and inadequate security measures can endanger the data. Common problems include poor encryption, lack of user control over data, or confidentiality breaches.

**Impact:** Users may be reluctant to use the app or provide the accurate data due to concerns over privacy, and security problems could lead to legal and trust issues.

#### 4. User Engagement and Retention

**Issue:** Many health apps are unable to retain users over time. Users may find the application hard to use, not engaging, or not motivational enough to continue their health goals.

**Impact:** Poor user retention can cause a high churn rate and thus reduce the long-term impact of the app on health outcomes.

## **5. Overwhelming or Complex UI/UX**

**Issue:** UI and UX that are cumbersome or too complicated can result in health apps being burdensome to use.

**Impact:** Users may give up on a health app if it is too hard or too complicated to use, which defeats its purpose of helping them achieve desired health outcomes.

## **6. Lack of Interactivity with Healthcare Providers**

**Issue:** Some health applications are only about self-care and do not connect them to healthcare professionals.

**Impact:** Users may get misleading advice or miss significant health signs that need medical attention. They will not be able to fully benefit from the application without discussing their health condition with their healthcare providers.

## **7. Not Flexible Enough for Chronic or Specific Conditions**

**Issue:** Apps generally do not offer sufficient assistance to chronic patients or individuals with specific health issues like diabetes, hypertension, or mental disorders.

**Impact:** This constraint makes the utility of the app less attractive to those who need such specialized care and constant attention.

## **8. Lack of Behavioral Science Integration or Habit Formation**

**Issue:** Majority health applications do not utilize behavioral science techniques to facilitate users in developing habitual behavior patterns. They usually do not provide support with gradual changes in behavior and positive reinforcement or goal establishment.

**Impact:** Their users might not be motivated enough to continue their adherence to health-related goals or wellness activities.

## CHAPTER-4

### PROPOSED MOTHODOLOGY

#### 1. Advanced Personalization

**Methodology:** This will use AI and machine learning to personalize recommendations based on individual user data such as medical history, lifestyle, age, gender, genetic predispositions, and specific health goals.

**Features:**

- Customized health and fitness plans for individuals.
- Adapt-algorithms which, learning from user feedbacks and behaviors, finely tune recommendations.
- The possibility of setting personalized reminders for medications, exercises, or hydration, depending on user habits.

#### 2. Strong Privacy and Safety Measures

**Methodology:** State-of-the-art data encryption, anonymization, and compliance to regulations like HIPAA or GDPR for user information protection.

**Features:**

- MFA for login and data access.
- Transparency for the user to have control over data-sharing preferences and the ability to delete it once and for all.
- Regular audits of the application to ensure its proper security against new threats.

#### 3. Habit formation based on behavioral science

**Methodology:** Behavioral science principles are applied here to assist users in building sustainable health habits.

**Features:**

Gradual setting of goals and forming habits based on user's readiness and motivation.  
Positive reinforcement, with rewards implemented when users achieve small increments of progress toward larger health goals.

## **CHAPTER-5**

### **OBJECTIVES**

#### **1. Health Monitoring:**

Users are able to measure various health metrics, such as physical activity, heart rate, and other vital signs, to gain insight into their health status.

#### **2. Personalized Recommendations:**

These personalized recommendations on diet, exercise, and lifestyle changes depend upon the user's health data, preferences, and goals.

#### **3. Habit Tracking:**

It will track users and progress on their ways towards regular exercise, balanced eating habits or giving up smoking while sending them reminders.

#### **4. Goal Setting and Progress Tracking:**

The users set health goals and monitor their process through visual aids, like graphs or progress bars.

#### **5. Alerts and Reminders:**

Users will be notified about the tasks related to health such as intake of medications, or completion of goals for that day.

#### **6. Data Security and Privacy:**

User health data is stored confidentially and protected whilst giving users access to sharing options and privacy settings.

## **CHAPTER-6**

### **SYSTEM DESIGN & IMPLEMENTATION**

The system is developed using the Flutter Framework for cross-platform compatibility. Key features of the architecture include:

**1. Backend API Integration:**

- Utilizes APIs like together.xyz for chatbot responses.
- Stores and retrieves user preferences via SharedPreferences.

**2. Local Storage:**

- Manages food lists and chat messages locally using sqflite and SharedPreferences.

**3. User Interface:**

- Modern UI/UX with animations using Lottie and carousel sliders for smooth user interactions.
- Implements a chat interface for the diet assistant.

**4. Custom Features:**

- Allows users to create and manage custom food lists.
- Provides feedback on body temperature changes and adjusts food suggestions accordingly.

## Implementation Details

### 1. Frontend Implementation:

- Framework: Flutter SDK (Dart language).
- Dependencies: Includes get, shared preferences, sqflite, http, and carousel\_slider.
- UI/UX Design: Implements material design with animated\_bottom\_navigation\_bar and custom themes.

### 2. Backend and Data Management:

- Database: SQLite integration for storing user data (e.g., food lists).
- APIs:
  - Uses HTTP calls to external APIs for chatbot functionality.
  - Retrieves food data and nutritional information from predefined CSV files.

### 3. Core Functionalities:

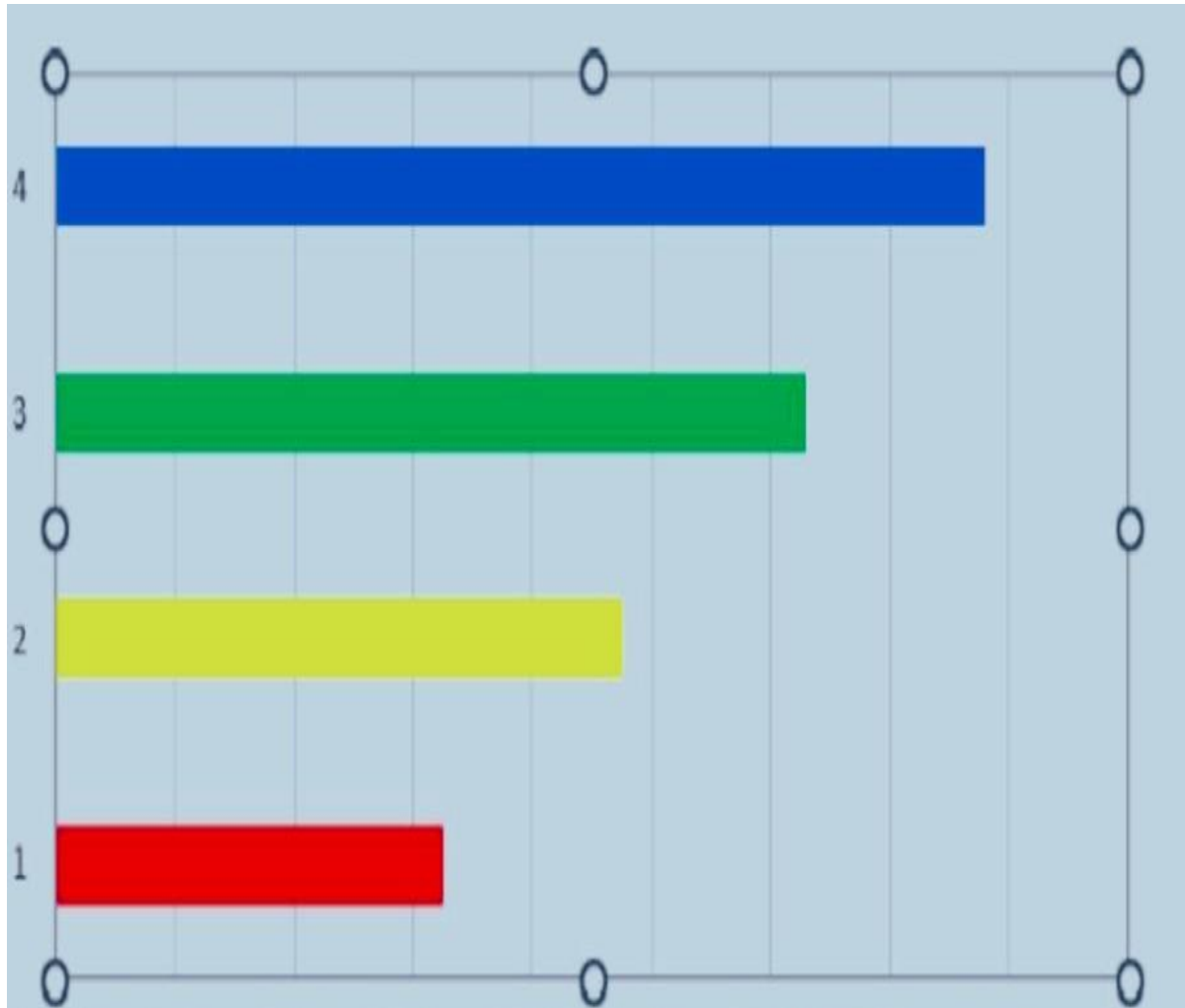
- Chatbot Implementation:
  - Interacts with users through a chatbot powered by the Together API.
  - Chat history is saved locally for continuity.
- Food List Management:
  - Dynamically updates food lists based on user input or health indicators like body temperature.
- Temperature Alerts:
  - Alerts users if their body temperature is high or low, recommending dietary adjustments accordingly.

### 4. Deployment and Configuration:

- Android/iOS Compatibility:
  - Configured with platform-specific Gradle files for Android.
- Version Control: Initial version 1.0.0 with customizable features for future updates.

## CHAPTER-7

### TIMELINE FOR EXECUTION OF PROJECT (GANTT CHART)





## **CHAPTER-8**

### **OUTCOMES**

#### **1. Nutrition Analysis:**

- Allows users to input the foods they consume and analyzes their nutritional content, including vitamins, proteins, and calorie intake.
- Detects potential vitamin deficiencies based on the user's dietary habits over a period and provides warnings about related diseases.

#### **2. Hydration Monitoring:**

- Tracks water intake and provides regular reminders to ensure users stay hydrated.

#### **3. Activity Monitoring:**

- Monitors physical activities and calculates calories burned during workouts.

#### **4. Personalized Recommendations:**

- Suggests foods based on body temperature and other health indicators, ensuring tailored dietary recommendations.

#### **5. Diet Assistant Chatbot:**

- Provides a chatbot feature for nutrition guidance, acting as a virtual gym mentor and nutritionist.

## CHAPTER-9

### RESULTS AND DISCUSSIONS

Track progress toward your nutrition, water, fitness, and weight loss goals with MyFitnessPal. This all-in-one food tracker and health app is like having a nutrition coach, meal planner, and food diary with you at all times.

#### SO MUCH MORE THAN A CALORIE TRACKER & FOOD JOURNAL

It's like having a dietitian, personal trainer, and nutrition coach at your fingertips.

**Log Food** – Easy-to-use tools make food tracking quick and simple

**Record Activity** – Add workouts and steps with the fitness tracker

**Customize Your Goals** – Weight loss, weight gain, weight maintenance, nutrition & fitness

**See Your Progress** – Track at a glance, or analyze nutrition & calories in detail

**Learn From a Registered Dietitian** – Meal Plans customized for your target calories, whether you want to lose or gain weight—with access to our Meal Planner tool

**Stay Inspired** – 500+ healthy goal-focused recipes and 50 workouts keep routines fresh and fun

#### GITHUB LINK:

[https://github.com/GroupCSE120/Healthbuddy\\_cse\\_120](https://github.com/GroupCSE120/Healthbuddy_cse_120)

## CHAPTER-10

### CONCLUSION

This study evaluated the quality and effectiveness of popular calorie-counting apps in weight management and behavior change. The top 20 apps from the Google Play Store were assessed using a 55-point scale based on standards, content accuracy, user interface, and database sources, with a mean quality score of  $36.95 \pm 5.65$ . Over 65% of the apps miscalculated calorie intake. To test effectiveness, 60 young volunteers were divided into an intervention group (n=30), using top apps for 8 weeks, and a control group (n=28). While no significant changes in anthropometry or diet were observed, the intervention group showed a 13.33% increase in physical activity.

**Table 1.** Assessment of quality of calorie counting apps using summarised scoring scale.

Sl. no	Category	Score awarded	No. of apps obtaining a score (n = 20)
<b>Scientific information</b>			
1	Does the app calculate BMI?	1	11
2	Does it interpret BMI or indicate healthy weight range?	1	9
3	Does it provide realistic weight loss goal (0.5–1 kg/week)	1	14
4	For energy requirement calculations, does it take into consideration		
	(a) Height	1	20
	(b) Weight	1	20
	(c) Gender	1	20
	(d) Age	1	20
	(e) Physical activity level	1	17
	(f) Weight loss/gain goal	1	17
5	Does the app track foods eaten?	1	20
6	Does the app contain FDB to count consumed calories?	1	20
7	Does it count other nutrients?		
	(a) Macro nutrients	1	17
	(b) Micro nutrients	1	14
8	Does the app provide information on serving size and portion control?	1	20
9	Does it encourage healthy eating?		
	(a) Recommends inclusion of fruits and vegetables.	1	7
	(b) Recommends inclusion of high fibre, low glycemic index foods	1	11
	(c) Recommends limitation of saturated fats, salt and sugar	1	9
10	Does the app keep a track of anthropometric changes?		
	(a) Weight	1	20
	(b) Waist circumference	1	5
	(c) Hip circumference	1	4
11	Does the app provide option of future menu planning?	1	11
12	Does the app provide different diet types or nutrition programmes?	1	5
13	Does the app provide healthy cooking ideas?	1	11
14	Does the app track water intake?	1	15
15	Does the app track physical activity?	1	19
16	Does the app encourage regular physical activity?	1	10
<b>Content accuracy</b>			
17	The difference in calories counted with the app's FDB with 'Count What You Eat'		
	≤ 10% difference	5	6
	11–20% difference	4	6
	21–30% difference	3	3
	31–40% difference	2	1
	41–50% difference	1	2
	> 50% difference	0	2
18	Difference in energy expenditure calculated with the app with MET values by Ainsworth		
	(a) Walking (3.5 mph/5.63 km/h level, brisk, firm surface, walking for exercise)		
	≤ 10% difference	2	5
	> 10% difference	0	15
	(b) Running (5 mph or 12 min/mile)		
	≤ 10% difference	2	8
	> 10% difference	0	12
	(c) Bicycling (12–13.9 mph or 19.31–22.36 km/h, leisure, moderate effort)		
	≤ 10% difference	2	10
	> 10% difference	0	10
<b>Cognitive Behavioural Therapy</b>			
19	Does the app include the following cognitive behavioural therapy for weight loss?		
	(a) Goal setting	1	19
	(b) Self-monitoring	1	20
	(c) Feedback and reinforcement	1	19
	(d) Boosting	1	16
	(e) Incentives	1	10
20	Does the app include advanced technological features?		
	(a) Diet calendar	1	20
	(b) Weight progress graph or chart.	1	18
	(c) Modifiable FDB	1	19
	(d) Inclusion of popular restaurant or supermarket foods in FDB	1	19
	(e) Barcode scanner	1	12
	(f) Reminders to log meal	1	15
	(g) Photo logging of meal	1	6
	(h) Communication with other users for social support	1	16
	(i) Report sharing (through mail, message or PDF)	1	9
	(j) Website link	1	20
	(k) In-app pedometer	1	5
21	Does the app mention sources of its content?	1	18

BMI: body mass index; FDB: food data base; MET: metabolic equivalent.

## REFERENCES

### Research Papers:

- <https://mhealth.jmir.org/2016/3/e85/>
- [https://www.researchgate.net/publication/364083577\\_Nutrition\\_information\\_estimation\\_from\\_food\\_photos\\_using\\_machine\\_learning\\_based\\_on\\_multiple\\_datasets](https://www.researchgate.net/publication/364083577_Nutrition_information_estimation_from_food_photos_using_machine_learning_based_on_multiple_datasets)
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5499922/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9776646/>
- <https://www.ijraset.com/research-paper/vitamin-deficiency-and-food-recommendationsystem-using-ml>
- [https://www.researchgate.net/publication/348403597\\_The\\_Diabetic\\_Buddy\\_A\\_Diet\\_Regulator\\_andTracking\\_System\\_for\\_Diabetics](https://www.researchgate.net/publication/348403597_The_Diabetic_Buddy_A_Diet_Regulator_andTracking_System_for_Diabetics)
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- [https://www.healthyfamiliesbc.ca/sites/hfbcprox-prod.health.gov.bc.ca/files/restaurant\\_info/guide-to-nutrient-analysis.pdf](https://www.healthyfamiliesbc.ca/sites/hfbcprox-prod.health.gov.bc.ca/files/restaurant_info/guide-to-nutrient-analysis.pdf)

### Dataset:

- <https://www.kaggle.com/datasets/utsavdey1410/food-nutrition-dataset>
- [https://www.researchgate.net/figure/Assessment-of-quality-of-calorie-countingapps-using-summarised-scoring-scale\\_tbl1\\_333777044](https://www.researchgate.net/figure/Assessment-of-quality-of-calorie-countingapps-using-summarised-scoring-scale_tbl1_333777044)

## APPENDIX-A

### PSUEDOCODE

#### **build.gradle :**

```
plugins {  
    id "com.android.application"    id "kotlin-android"  
    // The Flutter Gradle Plugin must be applied after the Android and Kotlin Gradle plugins.  
    id "dev.flutter.flutter-gradle-plugin" }  
  
android {  
    namespace = "com.example.health_buddy"    compileSdk = flutter.compileSdkVersion  
    ndkVersion = flutter.ndkVersion  
    compileOptions {  
        sourceCompatibility = JavaVersion.VERSION_1_8  
        targetCompatibility = JavaVersion.VERSION_1_8 }  
    kotlinOptions {  
        jvmTarget = JavaVersion.VERSION_1_8 }  
    defaultConfig {  
        // TODO: Specify your own unique Application ID  
(https://developer.android.com/studio/build/application-id.html).  
        applicationId = "com.example.health_buddy"  
        // You can update the following values to match your application needs.    // For  
more information, see: https://flutter.dev/to/review-gradle-config.  
        minSdk = flutter.minSdkVersion    targetSdk = flutter.targetSdkVersion  
        versionCode = flutter.versionCode  
        versionName = flutter.versionName  
    }  
    buildTypes {        release {  
        // TODO: Add your own signing config for the release build.  
        // Signing with the debug keys for now, so `flutter run --release` works.  
        signingConfig = signingConfigs.debug  
    } } }  
    flutter {    source = "../.." }
```

**main.dart:**

```
import 'package:flutter/material.dart'; import 'package:get/get.dart';
import 'package:health_buddy/Pages/splash_screen.dart';
void main() async {
  WidgetsFlutterBinding.ensureInitialized();
  runApp(const MyApp());
}
class MyApp extends StatelessWidget {
  const MyApp({super.key});
  @override
  Widget build(BuildContext context) { return GetMaterialApp(
debugShowCheckedModeBanner: false, title: 'Health Buddy', theme: ThemeData(
  colorScheme: ColorScheme.fromSeed(seedColor: Colors.deepPurple),
useMaterial3: true, ),
  home: const SplashScreen(), ); }
```

**foodList\_controller.dart:**

```
import 'dart:convert';
import 'package:flutter/material.dart'; import 'package:get/get.dart';
import 'package:health_buddy/Controllers/home_controller.dart'; import
'package:health_buddy/Modals/food_modal.dart';
import 'package:shared_preferences/shared_preferences.dart';
class FoodListController extends GetxController {
  List<List<FoodModal>> userFoodLists = [];
  List<String> listTitles = [];
  List<FoodModal> foodList = [];
  List<bool> selectedItems = [];

  HomeController homeController = Get.find<HomeController>();
  @override
  void onInit() {
    foodList = homeController.foodList;
    userFoodLists = homeController.userCustomFoodLists;
    listTitles = homeController.userCustomFoodListTitles;
```

```
selectedItems = List<bool>.filled(foodList.length, false);
super.onInit(); }

void getFoodItemList() async {  foodList = Get.find<HomeController>().foodList;
selectedItems = List<bool>.filled(foodList.length, false);
update(); }

void createFoodList(String title) {  List<FoodModal> selectedFoods = [];  for (int i = 0;
i < foodList.length; i++) {    if (selectedItems[i]) {
    selectedFoods.add(foodList[i]);
  } }
if (selectedFoods.isNotEmpty) {
  userFoodLists.add(selectedFoods);  listTitles.add(title);
  update(); }
saveData();
update(); }

void refineFoodListByTemperature(double temperature) {
  int tempRange;
  if (temperature < 36.5) {
    tempRange = 1;    Get.snackbar(
      "Temperature Alert",    "Your body temperature is Low.",    snackPosition:
      SnackPosition.TOP,    backgroundColor: Colors.grey.shade800,
      colorText: Colors.white,
      margin: const EdgeInsets.symmetric(horizontal: 15, vertical: 10),    borderRadius: 10,
      borderColor: Colors.cyan,    borderWidth: 2,
      icon: Icon(Icons.thermostat, color: Colors.cyan, size: 24),    padding: const
      EdgeInsets.all(16),
      animationDuration: const Duration(milliseconds: 300),    barBlur: 15,
      isDismissible: true,
      duration: const Duration(seconds: 5), );
  }
}
```

```

else if (tempreature > 37.5){    tempRange = 2;    Get.snackbar(
    "Temperature Alert",    "Your body temperature is High",    snackPosition:
SnackbarPosition.TOP,    backgroundColor: Colors.grey.shade900,
    colorText: Colors.white,
    margin: const EdgeInsets.symmetric(horizontal: 15, vertical: 10),    borderRadius:
10,    borderColor: Colors.cyan,    borderWidth: 2,
    icon: Icon(Icons.thermostat, color: Colors.cyan, size: 24),    padding: const
EdgeInsets.all(16),
    animationDuration: const Duration(milliseconds: 300),    barBlur: 15,
isDismissible: true,
    duration: const Duration(seconds: 5), );
}
else{    tempRange = 0;    Get.snackbar(
    "Temperature Alert",
    "Your body temperature is Normal.",    snackPosition: SnackbarPosition.TOP,
backgroundColor: Colors.grey.shade800,    colorText: Colors.white,
    margin: const EdgeInsets.symmetric(horizontal: 15, vertical: 10),    borderRadius:
10,    borderColor: Colors.cyan,    borderWidth: 2,
    icon: Icon(Icons.thermostat, color: Colors.cyan, size: 24),    padding: const
EdgeInsets.all(16),
    animationDuration: const Duration(milliseconds: 300),    barBlur: 15,
isDismissible: true,
    duration: const Duration(seconds: 5), );
}
List<FoodModal> refinedList = [];    if(tempRange == 1){
    refinedList = foodList.where((food) => food.tempRate == 1).toList();
}
else if( tempRange == 2){
    refinedList = foodList.where((food) => food.tempRate == 2).toList();
}
else{
    refinedList = foodList;
}
update();}

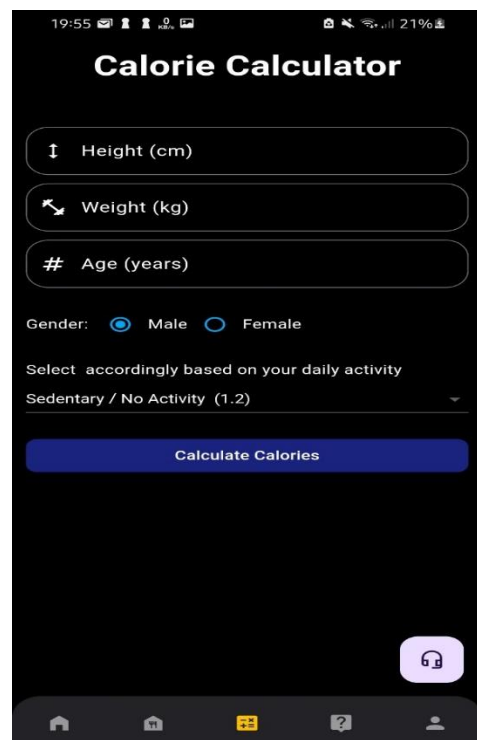
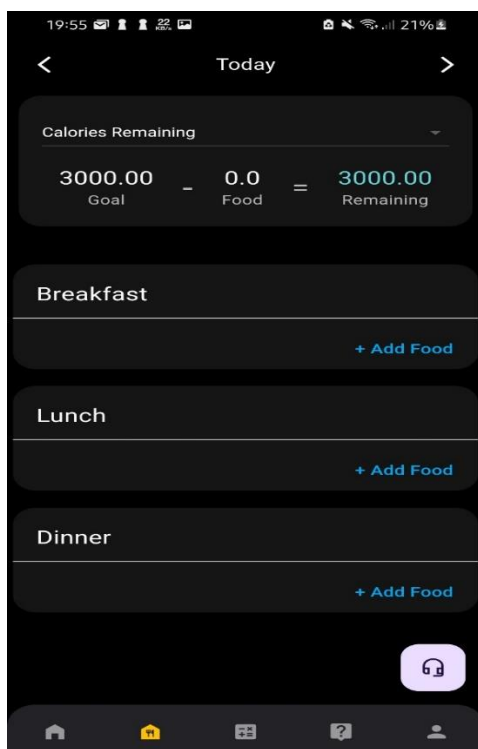
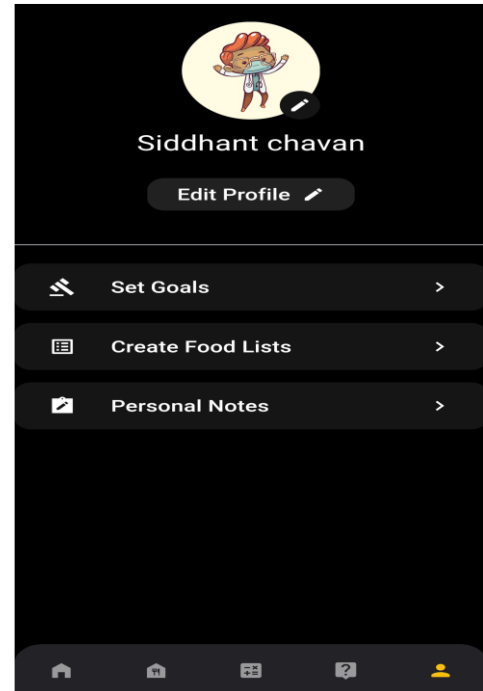
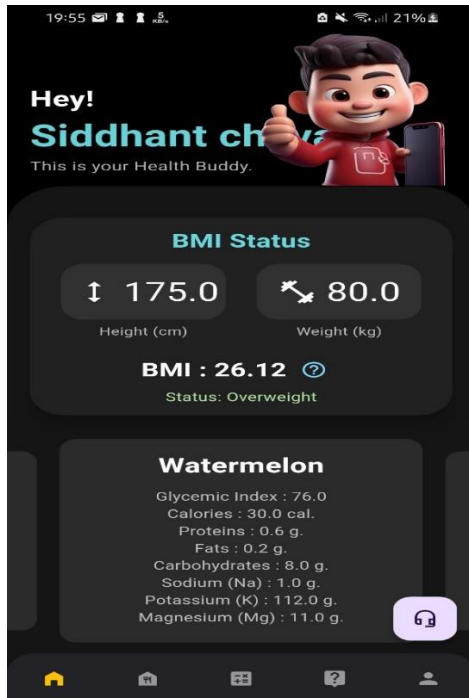
```



```
void saveData() async {  
    SharedPreferences sharedPreferences = await SharedPreferences.getInstance();  
    sharedPreferences.setStringList("userCustomFoodListTitles", listTitles);  
  
    List<String> userFoodListsJson = userFoodLists.map((list) {  
        return jsonEncode(list.map((food) => food.toJson()).toList());  
    }).toList();  
    await sharedPreferences.setStringList(  
        "userCustomFoodList", userFoodListsJson);  
    }  
    void updateFoodList(String listname) {}  
}
```

## APPENDIX-B

### SCREENSHOTS



19:55 22%

### Diet Planner

Age

Height (cm)

Weight (kg)


▼ Gender ▼


▼ Physical Activity ▼






▼ Goal ▼

▼ Diet Type ▼

Foods to Exclude

 Generate Diet Plan



19:55 22%

### Set your Goals accordingly...

Set Calories :


Enter Your Daily Calories Goals Cal.

Set Proteins :

Enter Your Daily Protein Goals g.

Set Fats :

Enter Your Daily Fats Goals g.



Diet Assistant

how to track calories


As your nutritionist, I'd be happy to guide you on how to track calories. Here's a step-by-step guide:






**\*\*Why Track Calories?\***

Before we dive into the how, let's quickly discuss why tracking calories is important. Tracking calories helps you:

1. **\*\*Achieve weight loss or gain\*\***: By monitoring your calorie intake, you can create a calorie deficit or surplus to reach your weight goals.
2. **\*\*Maintain a healthy weight\*\***: Tracking calories ensures you're consuming the right amount of energy to support your daily activities and overall health.
3. **\*\*Improve overall health\*\***: By monitoring your calorie intake, you can identify potential nutrient deficiencies and make informed choices to support your overall well-being.

**\*\*Tools to Track Calories:\*\***

Type your message... 


19:55 22%

← Create / Update Lists

Please enter your temperature:

Enter your current body temperature (°C)

No Lists Created Yet



## **APPENDIX-C**

### **ENCLOSURES**

- 1. Journal publication Paper.**
- 2. Include certificate(s) of any Achievement won in any project-related event.**
- 3. Similarity Index / Plagiarism Check report clearly showing the Percentage (%). No need for a page-wise explanation.**
- 4. Details of mapping the project with the Sustainable Development Goals (SDGs).**

# RESEARCH PAPER

**Abstract-** In a fast-paced modern world, maintaining optimal health through proper nutrition and hydration is often neglected. This paper introduces *Health Buddy*, a comprehensive application designed to address these challenges. The app employs a trained machine learning model to analyze users' dietary inputs, predict nutritional content (vitamins, proteins, and calories), and track physical activities and hydration. Over time, it identifies potential nutrient deficiencies and suggests ways to mitigate them, preventing health risks associated with imbalances. Health Buddy also integrates habit-forming techniques, reminders, and data visualization to encourage consistent health management. This study discusses the app's methodology, features, implementation, and the potential impact on personalized healthcare.

## **INTRODUCTION:**

### **1.1 Health and Lifestyle Verse the Labs Life - The Balance of Diet and Hydration**

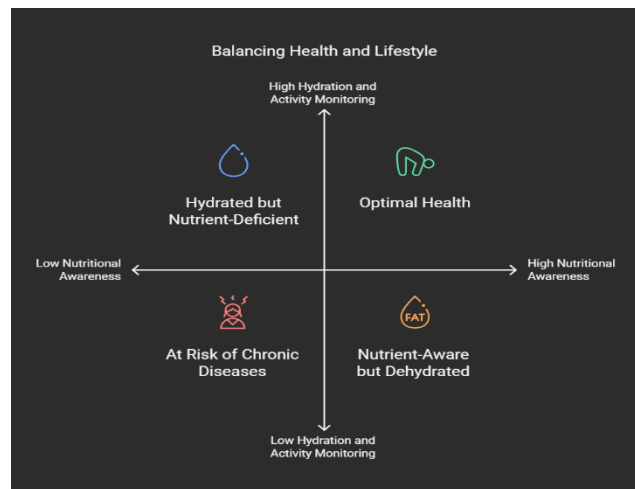
Foods and water are easy to forget in the modern fast-tempo and stressful life. Nutrition and waters have little hope when priorities hit a hectic pace, usually upsetting nutrition, making it less than desirable in many ways. Oftentimes, disregard for personal health leads to other conditions that may very well lead to long-lasting diseases such as obesity, diabetes, and heart disease.

### **1.2 Being Unaware of Nutrient Deficiency**

Though most people are quite aware of their physical demands, they have hardly an idea about which vitamins and nutrients they are consuming or are deficient in their daily diet. Although micronutrient deficiencies, such as deficiency of vitamin D, calcium, iron, etc., usually go unnoticed until other more severe health issues arise, such is the case with bone density loss, extreme fatigue, etc. The absence of such tracking makes it rather challenging for that person to ensure a well-balanced diet feasible without guidance to meet nutritional needs.

### 1.3 Difficulty Knowing Dehydration and Physical Activity

Various work pressures and lifestyles develop an environment in which monitoring hydration levels and physical activity maintenance becomes a major issue. Physical fitness can very rarely be discussed. The requisite exercise and drinking of sufficient water are important parts of one's health, but many times the person will forget this fact along with many other such things in their pulling schedules. Such laziness breeds further complications: easy behaviors bring on deficiencies, inactivity, and dehydration, which per se will facilitate healthy living.



## LITERATURE REVIEW:

### 1. Personalized Dietary Advisories

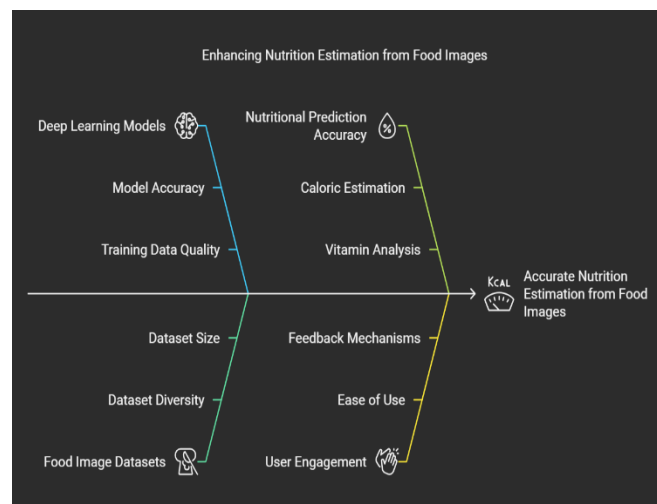
Viewers have more personalized recommendations for diets with an application of machine learning in nutrition tracking and health. Programs described in this manner by Espinosa et al. (2016) support tracking dietary intake on a mobile health app while providing unsolicited feedback. In using food diaries to obtain data collection and the relative information from some food-disposal devices, these systems get the users feedback relating to their own nutritional habits and deficiencies. This study has elucidated the way ML models take vast datasets and detect patterns in user behavior and suggest proactive health recommendations.

## 2. Dietary Support Systems on the Basis of Health Conditions

Some chronic diseases like diabetes and cardiovascular ailments require unique or specific dietary plans. A good example in this direction is the "Diabetic Buddy" system as described by Borle et al. (2020); it is using a different personalized ML algorithm to monitor and control dietary intake within diabetic patients. The system uses real-time blood sugar figures incorporated with food consumption data, which are the basis for recommendations on glycemic control and nutrition adequacy. Systems based on ML like this can reduce the burden on the users by automating monitoring and making other suggestions based on the health profile.

## 3. Nutrition Estimation from Images

Estimating nutrition from food images constitutes a promising aspect of ML investigations. The method entails the training of deep learning models on the datasets containing food pictures to predict their nutritional composition. For instance, a research paper by Yanai et al. describes systems unfolding information from multiple food image datasets, estimating calories, macronutrients, and vitamins from photos. Such an application could make a substantive difference in dietary self-reporting by lessening the need for individuals to record everything manually about their intakes.



## **RESEARCH GAP**

### **1. Lack of Deep Personalization**

**Issue:** Most health applications provide general advice, tips, and health tracking. They do not take into account individual variations, such as medical history, lifestyle, genetic predispositions, or specific goals.

**Impact:** Users may not find the recommendations relevant to their specific conditions, hence they are less likely to engage with the application.

### **2. Inconsistent Data Integration**

**Issue:** Integration of data from sources such as wearables, e.g., Fitbit and Apple Watch, or EHRs and other health monitoring devices.

**Impact:** Users may need to input data manually or juggle several apps, which can be inconvenient and might result in incomplete or even wrong health tracking.

### **3. Privacy and Security Issues**

**Issue:** Health apps gather sensitive information regarding personal health, and inadequate security measures can endanger the data. Common problems include poor encryption, lack of user control over data, or confidentiality breaches.

**Impact:** Users may be reluctant to use the app or provide the accurate data due to concerns over privacy, and security problems could lead to legal and trust issues.

### **4. User Engagement and Retention**

**Issue:** Many health apps are unable to retain users over time. Users may find the application hard to use, not engaging, or not motivational enough to continue their health goals.

**Impact:** Poor user retention can cause a high churn rate and thus reduce the long-term impact of the app on health outcomes.

### **5. Overwhelming or Complex UI/UX**

**Issue:** UI and UX that are cumbersome or too complicated can result in health apps being burdensome to use.

**Impact:** Users may give up on a health app if it is too hard or too complicated to use, which defeats its purpose of helping them achieve desired health outcomes.



## **6. Lack of Interactivity with Healthcare Providers**

**Issue:** Some health applications are only about self-care and do not connect them to healthcare professionals.

**Impact:** Users may get misleading advice or miss significant health signs that need medical attention. They will not be able to fully benefit from the application without discussing their health condition with their healthcare providers.

## **7. Not Flexible Enough for Chronic or Specific Conditions**

**Issue:** Apps generally do not offer sufficient assistance to chronic patients or individuals with specific health issues like diabetes, hypertension, or mental disorders.

**Impact:** This constraint makes the utility of the app less attractive to those who need such specialized care and constant attention.

## **8. Lack of Behavioral Science Integration or Habit Formation**

**Issue:** Majority health applications do not utilize behavioral science techniques to facilitate users in developing habitual behavior patterns. They usually do not provide support with gradual changes in behavior and positive reinforcement or goal establishment.

**Impact:** Their users might not be motivated enough to continue their adherence to health-related goals or wellness activities.

## **9. Connectivity and Accessibility Issues**

**Issue:** Health apps that need constant internet connectivity or consume a lot of data are problematic for users in low-connectivity areas or those with limited data plans.

**Impact:** The user will not be able to access the app when needed, which can reduce its effectiveness, especially in emergencies or rural areas.

## **10. Monetization and Accessibility**

**Issue:** Many applications use subscription-based models, advertisements, and in-app purchases, making it inaccessible for some people who cannot afford it.

**Impact:** Excludes particular groups of users because they do not have the financial capabilities to afford the application and it defeats the purpose of offering health support to everyone.

## **PROPOSED METHODOLOGY**

### **1. Advanced Personalization**

**Methodology:** This will use AI and machine learning to personalize recommendations based on individual user data such as medical history, lifestyle, age, gender, genetic predispositions, and specific health goals.

**Features:**

- Customized health and fitness plans for individuals.
- Adapt-algorithms which, learning from user feedbacks and behaviors, finely tune recommendations.
- The possibility of setting personalized reminders for medications, exercises, or hydration, depending on user habits.

### **2. Strong Privacy and Safety Measures**

**Methodology:** State-of-the-art data encryption, anonymization, and compliance to regulations like HIPAA or GDPR for user information protection.

**Features:**

- MFA for login and data access.
- Transparency for the user to have control over data-sharing preferences and the ability to delete it once and for all.
- Regular audits of the application to ensure its proper security against new threats.

### **4. Habit formation based on behavioral science**

**Methodology:** Behavioral science principles are applied here to assist users in building sustainable health habits.

**Features:**

Gradual setting of goals and forming habits based on user's readiness and motivation.

Positive reinforcement, with rewards implemented when users achieve small increments of progress toward larger health goals.

Customized habit-tracking tools that help monitor nutrition, exercise, sleep, or mindfulness on a day-to-day basis.

## **OBJECTIVES**

### **1. Health Monitoring:**

Users are able to measure various health metrics, such as physical activity, heart rate, and other vital signs, to gain insight into their health status.

### **2. Personalized Recommendations:**

These personalized recommendations on diet, exercise, and lifestyle changes depend upon the user's health data, preferences, and goals.

### **3. Habit Tracking:**

It will track users and progress on their ways towards regular exercise, balanced eating habits or giving up smoking while sending them reminders.

### **4. Goal Setting and Progress Tracking:**

The users set health goals and monitor their process through visual aids, like graphs or progress bars.

### **5. Alerts and Reminders:**

Users will be notified about the tasks related to health such as intake of medications, or completion of goals for that day.

### **6. Data Security and Privacy:**

User health data is stored confidentially and protected whilst giving users access to sharing options and privacy settings.

## **SYSTEM IMPLEMENTATION:**

### **1. System Architecture**

Health Buddy is designed with a modular architecture to ensure scalability, flexibility, and maintainability. The key components of the system include:

**User Interface (UI):** A user-friendly mobile application developed using Flutter and Dart, ensuring cross-platform compatibility (iOS and Android). The development is conducted in Android Studio.

**Backend Server:** A robust backend server developed responsible for handling data storage, processing requests, and interacting with the machine learning model.

### **2. Data Collection and Preprocessing**

**Dietary Input:** Users input their daily food intake through the mobile app. The input can be in the form of text, voice, or images. Natural Language Processing (NLP) techniques are used to parse text and voice inputs, while image recognition algorithms analyze food images.

**Activity and Hydration Logging:** Users manually log their physical activities and hydration levels. The app can also integrate with wearable devices and fitness trackers to automate data collection.

**Preprocessing:** The collected data is preprocessed to ensure consistency and accuracy. This includes data cleaning, normalization, and transformation.

### **3. Nutritional Analysis**

**Model Training:** The machine learning model is trained on a comprehensive dataset of food items and their nutritional content. The dataset includes information on vitamins, proteins, calories, and other essential nutrients.

**Prediction:** The trained model predicts the nutritional content of the user's dietary inputs. The predictions are stored in the database for further analysis.

### **4. Deficiency Identification and Recommendations**

**Nutrient Deficiency Analysis:** The app continuously monitors users' nutritional intake and compares it against recommended daily allowances. The machine learning model identifies potential nutrient deficiencies over time.

**Personalized Recommendations:** Based on the identified deficiencies, the app provides personalized recommendations to mitigate potential health risks. These recommendations application developed using Flutter and Dart, ensuring cross-platform compatibility (iOS and Android). The development is conducted in Android Studio.

**Backend Server:** A robust backend server developed responsible for handling data storage, processing requests, and interacting with the machine learning model.

## **5. Habit Formation and Reminders**

**Habit-Forming Techniques:** The app incorporates behavior change techniques, such as goal setting, progress tracking, and positive reinforcement, to encourage healthy habits.

**Reminders and Notifications:** Users receive timely reminders and notifications to log their dietary intake, physical activities, and hydration levels. The app uses push notifications and in-app alerts to ensure user engagement.

## **6. Data Visualization**

**Visual Dashboard:** Health Buddy features a visual dashboard that presents users with a comprehensive overview of their health data. The dashboard includes charts, graphs, and summary statistics to make data interpretation easy.

**Progress Tracking:** Users can track their progress over time, view trends, and set health goals. The visual representation of data helps users stay motivated and informed.

## **7. Integration of Chatbot**

**Chatbot Integration:** Health Buddy includes a chatbot feature to provide users with real-time assistance and support. The chatbot is powered by a machine learning model and integrated using an API key. It helps users with dietary suggestions, answers health-related queries, and provides motivational support.

**API Key Management:** The API key for the chatbot is securely stored and managed within the backend server. The chatbot communicates with the backend to fetch necessary information and provide responses to user queries.

**RESULT AND DISCUSSION:**

Track progress toward your nutrition, water, fitness, and weight loss goals with MyFitnessPal. This all-in-one food tracker and health app is like having a nutrition coach, meal planner, and food diary with you at all times.

**SO MUCH MORE THAN A CALORIE TRACKER & FOOD JOURNAL**

It's like having a dietitian, personal trainer, and nutrition coach at your fingertips.

**Log Food** – Easy-to-use tools make food tracking quick and simple

**Record Activity** – Add workouts and steps with the fitness tracker

**Customize Your Goals** – Weight loss, weight gain, weight maintenance, nutrition & fitness

**See Your Progress** – Track at a glance, or analyze nutrition & calories in detail

**Learn From a Registered Dietitian** – Meal Plans customized for your target calories, whether you want to lose or gain weight—with access to our Meal Planner tool.

**Stay Inspired** – 500+ healthy goal-focused recipes and 50 workouts keep routines fresh and fun.

**CONCLUSION:**

This study evaluated the quality and effectiveness of popular calorie-counting apps in weight management and behavior change. The top 20 apps from the Google Play Store were assessed using a 55-point scale based on standards, content accuracy, user interface, and database sources, with a mean quality score of  $36.95 \pm 5.65$ . Over 65% of the apps miscalculated calorie intake. To test effectiveness, 60 young volunteers were divided into an intervention group (n=30), using top apps for 8 weeks, and a control group (n=28). While no significant changes in anthropometry or diet were observed, the intervention group showed a 13.33% increase in physical activity.

**REFERENCE :****Research Papers:**

- <https://mhealth.jmir.org/2016/3/e85/>
- [https://www.researchgate.net/publication/364083577\\_Nutrition\\_information\\_estimation\\_from\\_food\\_photos\\_using\\_machine\\_learning\\_based\\_on\\_multiple\\_datasets](https://www.researchgate.net/publication/364083577_Nutrition_information_estimation_from_food_photos_using_machine_learning_based_on_multiple_datasets)
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5499922/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9776646/>
- <https://www.ijraset.com/research-paper/vitamin-deficiency-and-food-recommendationsystem-using-ml>
- [https://www.researchgate.net/publication/348403597\\_The\\_Diabetic\\_Buddy\\_A\\_Diet\\_Regulator\\_and\\_Tracking\\_System\\_for\\_Diabetics](https://www.researchgate.net/publication/348403597_The_Diabetic_Buddy_A_Diet_Regulator_and_Tracking_System_for_Diabetics)
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7551874/>
- <https://www.sciencedirect.com/science/article/pii/B9780124095472143124>
- <https://www.sciencedirect.com/science/article/pii/B9780124095472143148>
- <https://www.sciencedirect.com/science/article/pii/B9780123848628000091>
- [https://www.healthyfamiliesbc.ca/sites/hfbcprox-prod.health.gov.bc.ca/files/restaurant\\_info/guide-to-nutrient-analysis.pdf](https://www.healthyfamiliesbc.ca/sites/hfbcprox-prod.health.gov.bc.ca/files/restaurant_info/guide-to-nutrient-analysis.pdf)

**Dataset:**

- <https://www.kaggle.com/datasets/utsavdey1410/food-nutrition-dataset>
- [https://www.researchgate.net/figure/Assessment-of-quality-of-calorie-countingapps-using-summarised-scoring-scale\\_tbl1\\_333777044](https://www.researchgate.net/figure/Assessment-of-quality-of-calorie-countingapps-using-summarised-scoring-scale_tbl1_333777044)

## CERTIFICATES







## **Sustainable Development Goals (SDGs)**

**Our project is based on Good Health and Well-being (SDG 3)**

**Under SDG 3 we follow these points:**

- 1.How it is improving health outcomes.**
- 2.How it reduces the risk of chronic diseases.**
- 3.How it will increase physical activity.**

### **Health Buddy Improves Health Outcomes in the following ways:**

- Maintain a balanced diet: Ensuring adequate intake of essential vitamins and minerals.
- Reduce the risk of chronic diseases: Such as heart disease, diabetes, and obesity, which are often linked to poor nutrition.
- Improve overall health and well-being: By providing the body with the necessary nutrients for optimal functioning.
- Increased Physical Activity: By encouraging and tracking physical activity, Health Buddy can help users:
- Improve cardiovascular health: Reducing the risk of heart disease and stroke.
- Maintain a healthy weight: Promoting weight management and reducing the risk of obesity.
- Boost mood and mental well-being: Regular physical activity has been shown to improve mental health and reduce symptoms of anxiety and depression.
- Improved Hydration: By reminding users to drink water and tracking their hydration levels, Health Buddy can help them:
- Maintain proper bodily functions: Adequate hydration is essential for various bodily functions, including digestion, circulation, and temperature regulation.
- Prevent dehydration: Which can lead to fatigue, headaches, and other health problems.
- Improve cognitive function: Staying hydrated can enhance cognitive function, including memory and concentration.
- Early Detection of Health Issues: By continuously monitoring user data and identifying potential nutrient deficiencies or other health concerns, Health Buddy can help users:
- Address health issues early: Allowing for timely interventions and potentially preventing more serious health problems.

- **Make informed decisions about their health:** Empowering users to take control of their health and make informed choices about their lifestyle and healthcare.
- **Increased Motivation and Engagement:** By providing personalized feedback, progress tracking, and reminders, Health Buddy can help users:
- **Stay motivated and engaged in their health goals:** Making it more likely that they will stick to healthy habits and achieve their desired health outcomes.
- **Develop healthy habits:** Promoting long-term behavior change and a healthier lifestyle.

**Health Buddy Reduces the risk of chronic diseases in following ways:**

1. **Heart Disease:**

**Preventing:** By ensuring adequate intake of nutrients like potassium, magnesium, and fiber, which help regulate blood pressure and cholesterol levels.

- **Managing:** By identifying and addressing potential nutrient deficiencies that can contribute to heart disease risk factors, such as high blood pressure and high cholesterol.

2. **Type 2 Diabetes:**

- **Preventing:** By promoting a balanced diet with appropriate carbohydrate intake and encouraging regular physical activity, both of which are crucial for preventing type 2 diabetes.
- **Managing:** By helping users maintain a healthy weight and blood sugar levels through personalized dietary recommendations.

3. **Obesity:**

- **Preventing:** By providing personalized calorie and macronutrient targets, and by encouraging healthy eating habits and regular physical activity.
- **Managing:** By helping users track their food intake and identify areas for improvement in their diet and lifestyle.

4. **Promoting Healthy Lifestyles:**

- **Encouraging Regular Physical Activity:** Regular physical activity is crucial for preventing and managing chronic diseases. By tracking physical activity and providing reminders and encouragement, Health Buddy can help users increase their physical activity levels.

- **Promoting Healthy Eating Habits:** By providing personalized dietary recommendations and helping users track their food intake, Health Buddy can help them develop and maintain healthy eating habits.

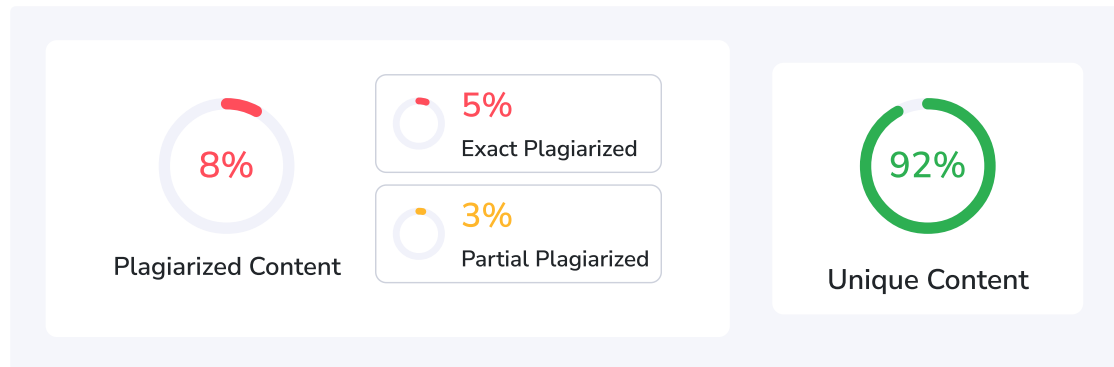
**Health Buddy increase physical activity in the following ways:**

- **Motivational Tool:** By tracking physical activity, the app provides users with a clear record of their progress. This can be highly motivating, as users can visually see their accomplishments and strive to improve.
- **Goal Setting:** The app can help users set realistic and achievable fitness goals, such as walking a certain number of steps per day or exercising for a specific duration. Tracking progress towards these goals provides a sense of accomplishment and encourages continued effort.
- **Reminders and Notifications:**
  1. **Staying on Track:** The app can send reminders to users to engage in physical activity, such as scheduling workout sessions or taking breaks from sedentary activities.
  2. **Breaking Inertia:** These reminders can help break sedentary patterns and encourage users to incorporate more physical activity into their daily routines.
- **Personalized Recommendations:**
  1. **Tailored Advice:** Based on user data and preferences, the app can provide personalized recommendations for physical activity, such as suggesting specific exercises, finding local fitness classes, or exploring new activities.
  2. **Variety and Engagement:** Personalized recommendations can help users find activities they enjoy, making it more likely that they will stick to a regular exercise routine.
- **Social Support (Potential):**

**Community Features:** If the app includes social features, such as connecting with friends or joining online communities, it can provide social support and encouragement for physical activity.

# Plagiarism Scan Report By SmallSEOTools

Report Generated on: Dec 22,2024



Total Words: 708

Total Characters: 6494

Plagiarized Sentences: 3.04

Unique Sentences: 34.96 (92%)

## Content Checked for Plagiarism

```
build.gradle
plugins{
id" com.android.application" id" kotlin- android"
/ The Flutter Gradle Plugin must be applied after the Android and Kotlin Gradle plugins.
id" dev.flutter.flutter- gradle- plugin"}
android{
namespace = " com.example.health_buddy" compileSdk = flutter.compileSdkVersion
ndkVersion = flutter.ndkVersion
compileOptions{
sourceCompatibility = JavaVersion.VERSION_1_8
targetCompatibility = JavaVersion.VERSION_1_8}
kotlinOptions{
jvmTarget = JavaVersion.VERSION_1_8}
defaultConfig{
/ TODO Specify your own unique operation ID
https//developer.android.com/studio/build/application-id.html).
applicationId = " com.example.health_buddy"
/ You can modernize the following values to match your operation needs. further information, see
https// flutter.dev/ to/ review- gradle- config.
minSdk = flutter.minSdkVersion targetSdk = flutter.targetSdkVersion
versionCode = flutter.versionCode
/ For
versionName = flutter.versionName

buildTypes{ release{
/ TODO Add your own signing config for the release figure.
/ Signing with the debug keys for now, so flutter run-- release workshop.
signingConfig = signingConfigs.debug
}}
flutter{ source = "./*"}
academy of Computer Science Engineering & Information Science, Presidency University.
14
Health Buddy

import' packageflutter/ material.dart'; import' packageget/ get.dart';
import' packagehealth_buddy runners/ splash_screen. outrage';
```

```

void main() async{
();
runApp( const MyApp());

class MyApp extends StatelessWidget{
const MyApp({ super.key});

contrivance figure( BuildContext environment){ return GetMaterialApp(
debugShowCheckedModeBanner false, title' Health Buddy', theme ThemeData(
colorScheme ColorScheme.fromSeed( seedColor Colors.deepPurple),
useMaterial3 true,),
home const SplashScreen(),.));}
foodList_controller. outrage
import' dartconvert';
import' packageflutter/ material.dart'; import' packageget/ get.dart';
import' packagehealth_buddy/ regulators/ home_controller. outrage'; import
packagehealth_buddy/ Modals/ food_modal. outrage';
import' packageshared_preferences shared_preferences. outrage';
class FoodListController extends GetxController{
List< userFoodLists = ();
List listTitles = ();
List foodList = ();
List selectedItems = ();
HomeController homeController = Get.find();

void onInit(){
foodList = homeController.foodList;
userFoodLists = homeController.userCustomFoodLists;
listTitles = homeController.userCustomFoodListTitles;
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Health Buddy
selectedItems = List.filled( foodList.length, false);
super.onInit();}
void getFoodItemList() async{ foodList = Get.find(). foodList;
selectedItems = List.filled( foodList.length, false);
update();}
void createFoodList( String title){ List selectedFoods = (); i< foodList.length; i){ if( selectedItems( i)){
( foodList( i));
}
if( selectedFoods.isNotEmpty){
( selectedFoods); listTitles.add( title);
update();}
saveData();
update();}
for( int i = 0;
void refineFoodListByTempreature( double tempreature){
int tempRange;
if( tempreature< 36.5){
tempRange = 1; Get.snackbar(
" Temperature Alert"," Your body temperature is Low.", snackPosition
SnackPosition.TOP, backgroundColor Colors.grey.shade800,
colorText Colors.white,
periphery const EdgelInsets.symmetric( vertical 15, perpendicular 10), borderColor Colors.cyan,
borderWidth 2,
icon Icon( Icons.thermostat, color Colors.cyan, size 24), EdgelInsets.all( 16),
animationDuration const Duration( milliseconds 300), isDismissible true,
borderRadius 10,
padding const

```

```

barBlur 15,
duration const Duration( seconds 5,);
}
academy of Computer Science Engineering & Information Science, Presidency University.

```

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Health Buddy

```

differently if( temprature> 37.5){ tempRange = 2; Get.snackbar(
" Temperature Alert"," Your body temperature is High", snackPosition
SnackPosition.TOP, backgroundColor Colors.grey.shade900,
colorText Colors.white,
periphery const Edgelnsets.symmetric( vertical 15, perpendicular 10), 10, borderColor Colors.cyan,
borderWidth 2,
icon Icon( Icons.thermostat, color Colors.cyan, size 24), Edgelnsets.all( 16),
animationDuration const Duration( milliseconds 300), isDismissible true,
borderRadius
padding const
barBlur 15,
duration const Duration( seconds 5,);
}
differently{ tempRange = 0; Get.snackbar(
" Temperature Alert",
" Your body temperature is Normal.", snackPosition SnackPosition.TOP,
backgroundColor Colors.grey.shade800, colorText Colors.white,
periphery const Edgelnsets.symmetric( vertical 15, perpendicular 10), borderRadius
, borderColor Colors.cyan, borderWidth 2,
icon Icon( Icons.thermostat, color Colors.cyan, size 24), padding const
Edgelnsets.all( 16),
animationDuration const Duration( milliseconds 300), barBlur 15,
isDismissible true,
duration const Duration( seconds 5,);
}
List refinedList = (); if( tempRange == 1){
refinedList = foodList.where(( food) = > food.tempRate == 1). toList();

```

```

differently if( tempRange == 2){
refinedList = foodList.where(( food) = > food.tempRate == 2). toList();
differently{
refinedList = foodList;

```

```

update();}
academy of Computer Science Engineering & Information Science, Presidency University.

```

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```

void saveData() async{
SharedPreferences sharedPreferences = await SharedPreferences.getInstance();
(" userCustomFoodListTitles", listTitles);
List userFoodListsJson = userFoodLists.map(( list){
return jsonEncode( list.map(( food) = > food.toJson()). toList());
}). toList();
await sharedPreferences.setStringList(
" userCustomFoodList", userFoodListsJson);
}

```

```

void updateFoodList( String listnam

```

This study estimated the quality and effectiveness of popular calorie- counting apps in weight operation and geste

change. The top 20 apps from the Google Play Store were


assessed using a 55- point scale grounded on norms, content delicacy, stoner interface, and database sources, with a mean quality score of  $36.95 \pm 5.65$ . Over 65 of the apps

misestimated calorie input. To test effectiveness, 60 youthful levies were divided into an intervention group( n = 30), using top apps for 8 weeks, and a control group( n = 28). While no significant changes in anthropometry or diet were observed, the intervention group showed a increase in physical exertion.


**/ The Flutter Gradle Plugin must be applied after the Android and Kotlin Gradle plugins.**



<https://github.com/flutter/flutter/issues/153668>

**/ TODO Add your own signing config for the release figure. **

<https://docs.flutter.dev/deployment/android>

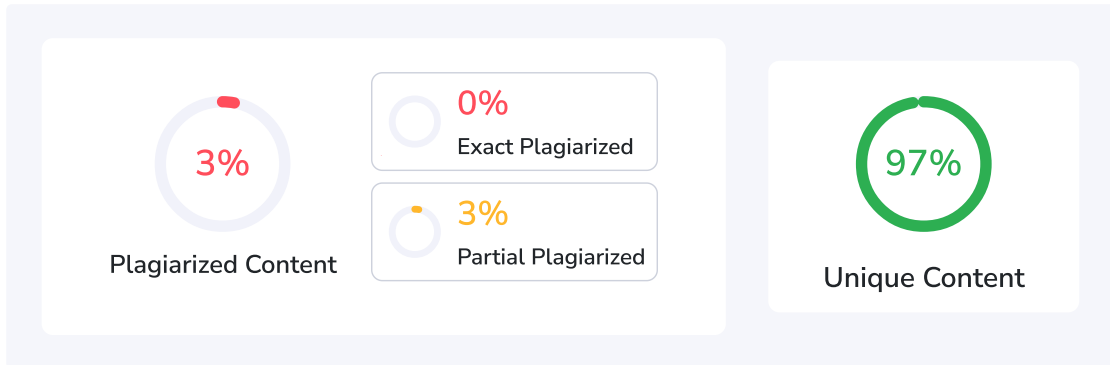
**significant changes in anthropometry or diet were observed, the intervention group showed a **

<https://jamanetwork.com/journals/jamapediatrics/fullarticle/1387377>



# Plagiarism Scan Report By SmallSEOTools

Report Generated on: Dec 22,2024



Total Words: 1000

Total Characters: 7301

Plagiarized Sentences: 1.08

Unique Sentences: 34.92 (97%)

## Content Checked for Plagiarism

Abstract- In a fast-paced modern world, maintaining optimal health through proper nutrition and hydration is often neglected. This paper introduces Health Buddy, a comprehensive application designed to address these challenges. The app employs a trained machine learning model to analyze users' dietary inputs, predict nutritional content (vitamins, proteins, and calories), and track physical activities and hydration. Over time, it identifies potential nutrient deficiencies and suggests ways to mitigate them, preventing health risks associated with imbalances. Health Buddy also integrates habit-forming techniques, reminders, and data visualization to encourage consistent health management. This study discusses the app's methodology, features, implementation, and the potential impact on personalized healthcare.

### INTRODUCTION:

#### 1.1 Health and Lifestyle Verse the Labs Life - The Balance of Diet and Hydration

Foods and water are easy to forget in the modern fast-tempo and stressful life. Nutrition and waters have little hope when priorities hit a hectic pace, usually upsetting nutrition, making it less than desirable in many ways. Oftentimes, disregard for personal health leads to other conditions that may very well lead to long-lasting diseases such as obesity, diabetes, and heart disease.

#### 1.2 Being Unaware of Nutrient Deficiency

Though most people are quite aware of their physical demands, they have hardly an idea about which vitamins and nutrients they are

consuming or are deficient in their daily diet. Although micronutrient deficiencies, such as deficiency of vitamin D, calcium, iron, etc., usually go unnoticed until other more severe health issues arise, such is the case with bone density loss, extreme fatigue, etc. The absence of such tracking makes it rather challenging for that person to ensure a well-balanced diet feasible without guidance to meet nutritional needs.

### 1.3 Difficulty Knowing Dehydration and Physical Activity

Various work pressures and lifestyles develop an environment in which monitoring hydration levels and physical activity maintenance becomes a major issue. Physical fitness can very rarely be discussed. The requisite exercise and drinking of sufficient water are important parts of one's health, but many times the person will forget this fact along with many other such things in their pulling schedules. Such laziness breeds further complications: easy behaviors bring on deficiencies, inactivity, and dehydration, which per se will facilitate healthy living.

## LITERATURE REVIEW:

### 1. Personalized Dietary Advisories

Viewers have more personalized recommendations for diets with an application of machine learning in nutrition tracking and health. Programs described in this manner by Espinosa et al. (2016) support tracking dietary intake on a mobile health app while providing unsolicited feedback. In using food diaries to obtain data collection and the relative information from some food-disposal devices, these systems get the users feedback relating to their own nutritional habits and deficiencies. This study has elucidated the way ML models take vast datasets and detect patterns in user behavior and suggest proactive health recommendations.

### 2. Dietary Support Systems on the Basis of Health Conditions

Some chronic diseases like diabetes and cardiovascular ailments require unique or specific dietary plans. A good example in this direction is the "Diabetic Buddy" system as described by Borle et al. (2020); it is using a different personalized ML algorithm to monitor and control dietary intake within diabetic patients. The system uses real-time blood sugar figures incorporated with food consumption data, which are the basis for recommendations on glycemic control and nutrition adequacy. Systems based on ML like this can reduce the burden on the users by automating monitoring

and making other suggestions based on the health profile.

### 3. Nutrition Estimation from Images

Estimating nutrition from food images constitutes a promising aspect of ML investigations. The method entails the training of deep learning models on the datasets containing food pictures to predict their nutritional composition. For instance, a research paper by Yanai et al. describes systems unfolding information from multiple food image datasets, estimating calories, macronutrients, and vitamins from photos. Such an application could make a substantive difference in dietary self-reporting by lessening the need for individuals to record everything manually about their intakes.

## RESEARCH GAP

### 1. Lack of Deep Personalization

Issue: Most health applications provide general advice, tips, and health tracking. They do not take into account individual variations, such as medical history, lifestyle, genetic predispositions, or specific goals.

Impact: Users may not find the recommendations relevant to their specific conditions, hence they are less likely to engage with the application.

### 2. Inconsistent Data Integration

Issue: Integration of data from sources such as wearables, e.g., Fitbit and Apple Watch, or EHRs and other health monitoring devices.

Impact: Users may need to input data manually or juggle several apps, which can be inconvenient and might result in incomplete or even wrong health tracking.

### 3. Privacy and Security Issues

Issue: Health apps gather sensitive information regarding personal health, and inadequate security measures can endanger the data.

Common problems include poor encryption, lack of user control over data, or confidentiality breaches.

Impact: Users may be reluctant to use the app or provide the accurate data due to concerns over privacy, and security problems could lead to legal and trust issues.

### 4. User Engagement and Retention

Issue: Many health apps are unable to retain users over time. Users may find the application hard to use, not engaging, or not motivational enough to continue their health goals.

Impact: Poor user retention can cause a high churn rate and thus reduce the long-term impact of the app on health outcomes.

#### 5. Overwhelming or Complex UI/UX

Issue: UI and UX that are cumbersome or too complicated can result in health apps being burdensome to use.

Impact: Users may give up on a health app if it is too hard or too complicated to use, which defeats its purpose of helping them achieve desired health outcomes.

#### Lack of Interactivity with Healthcare

##### Providers

Issue: Some health applications are only about self-care and do not connect them to healthcare professionals.

Impact: Users may get misleading advice or miss significant health signs that need medical attention. They will not be able to fully benefit from the application without discussing their health condition with their healthcare providers.

**provide the accurate data due to concerns over** 

<https://quizlet.com/430123123/hhmi-the-biology-of-skin-color-video-flash-cards>