

# Development of a Mobile Application for Predicting Risks and Monitoring of Hypertension

*Camille Marie P. Justimbaste & April Shelou G. Lequin*

## **Brief Summary of the Research Study**

This study focuses on the **development of a culturally adaptive mobile application that predicts the risks of hypertension and assists in its monitoring and management among Filipino adults**. It responds to the high prevalence of hypertension in the Philippines and the challenges of early detection, treatment adherence, and self-management. By integrating prediction models with real-time monitoring tools, the application aims to provide accessible risk assessment, promote independent health tracking, and encourage lifestyle modifications to prevent complications. The purpose of the study is to bridge the existing gaps in hypertension care through an innovative, user-centered digital health solution that aligns with both national and global health goals, including the Sustainable Development Goals (SDGs), the National Unified Health Research Agenda (NUHRA), the National Higher Education Research Agenda (NHERA), and the Department of Health's Eight-Point Action Agenda on non-communicable disease prevention.

## **Theoretical Framework of the Study**

The research is guided by the **Design Thinking Model**, a human-centered, iterative approach that places end-users at the core of the solution. The study follows five interconnected phases: **(1) Empathize and Define**, where lifestyle behaviors, risk factors, and user needs are identified through interviews and literature review; **(2) Ideate**, where potential solutions and features are brainstormed and refined; **(3) Prototype**, where a scaled-down version of the app is developed using the identified risk factors and monitoring needs; **(4) Co-Creation**, where the prototype is tested by target users and feedback is gathered to adjust or enhance features; and **(5) Test**, where the final version is evaluated using the Mobile Application Rating Scale (MARS) for engagement, functionality, aesthetics, information quality, and subjective app quality. This structured, iterative process ensures that the final application is both practical and culturally relevant, maximizing its potential impact on hypertension prevention and management among Filipinos.

## **Predictive Model Framework for Hypertension Risk**

*Based on Reviewed Literature*

### **RISK FACTORS BY CATEGORY**

#### **Category 1: Biological and Genetic Factors**

*Non-modifiable but high-weight predictors; ideal for baseline profiling.*

<b><i>Factor</i></b>	<b><i>Evidence Source(s)</i></b>
Increasing age (e.g., ≥50 years)	Patalen et al., 2021; Wong et al., 2025; Abalos et al., 2023
Male sex	Patalen et al., 2021; Florentino et al., 2023; Abalos et al., 2023
Family history of hypertension or diabetes	Li et al., 2021; Meher et al., 2023
Genetic predisposition / Presence of hypertension-linked variants	Zumaraga et al., 2022
Comorbid conditions: diabetes, dyslipidemia, elevated blood sugar, high cholesterol	Wong et al., 2025; Zumaraga et al., 2022

#### **Category 2: Socioeconomic and Demographic Factors**

*Contextual background for stratifying risk and targeting interventions.*

<b><i>Factor</i></b>	<b><i>Evidence Source(s)</i></b>
Low educational attainment	Patalen et al., 2021; Abalos et al., 2023
Socioeconomic status (both low and high)	Mohammed Nawi et al., 2021
Urban residence	Patalen et al., 2021; Wong et al., 2025; Florentino et al., 2023
Large household size or living alone	Patalen et al., 2021; Abalos et al., 2023
Widowhood/divorced marital status	Patalen et al., 2021
Certain ethnicities (if available in user base)	Mohammed Nawi et al., 2021

### Category 3: Lifestyle and Behavioral Factors

*Modifiable and dynamic; key drivers of risk and focus for intervention.*

Factor	Evidence Source(s)
Current or past smoking	Li et al., 2021; Meher et al., 2023
Frequent alcohol consumption / binge drinking	Florentino et al., 2023; Patalen et al., 2021
Physical inactivity / sedentary lifestyle	Meher et al., 2023; Florentino et al., 2023
Irregular sleep patterns	Florentino et al., 2023
Poor stress management	Florentino et al., 2023
Poor nutritional planning / unhealthy eating habits	Florentino et al., 2023

### Category 4: Dietary and Nutritional Indicators

*Modifiable and strongly correlated with metabolic and cardiovascular risk.*

Factor	Evidence Source(s)
High intake of sodium, saturated fat, and sugar	Zhao et al., 2011; Angeles-Agdeppa et al., 2020
Low intake of fruits, vegetables, seafood, low-fat dairy	Zhao et al., 2011; Angeles-Agdeppa et al., 2020
High body mass index (BMI $\geq 25$ )	Patalen et al., 2021; Meher et al., 2023
Large waist circumference / waist-to-hip ratio	Patalen et al., 2021
High protein and fat intake (Filipino-specific diet pattern)	Zumaraga et al., 2022
Low potassium, calcium, and fiber intake	Zhao et al., 2011

### Category 5: Medication and Healthcare Access Behaviors

*Helpful in identifying uncontrolled hypertension risk and gaps in care.*

Factor	Evidence Source(s)
Poor medication adherence	Sison et al., 2023; Abalos et al., 2023
No access to antihypertensive medication	Nguyen et al., 2025
Rarely or never uses home BP monitor	Sison et al., 2023
Reliance on traditional/non-evidence-based remedies	Sison et al., 2023
Lack of tailored or ongoing medical interventions	Nguyen et al., 2025
Low awareness of hypertension status	Abalos et al., 2023

**SCORE WEIGHTS**

The score weights in the hypertension risk model are assigned based on the strength and consistency of evidence drawn from the comprehensive literature review. Factors that have been repeatedly and strongly linked to hypertension across multiple studies are considered strongly associated and given a score of +3, reflecting their significant influence on risk. Those with moderate or limited evidence are assigned weights of +2 or +1, respectively. A score of 0 is used for factors with no clear association, ensuring that only relevant contributors affect the total risk score. Additionally, protective factors—such as healthy dietary habits or regular physical activity—can be scored negatively (e.g., –1 or –2) if integrated into the model. This evidence-based weighting system ensures that the risk scoring remains scientifically grounded and clinically relevant.

<i><b>Evidence Strength</b></i>	<i><b>Definition</b></i>	<i><b>Assigned Score</b></i>
Strongly Associated	Frequently reported across multiple studies; consistent, high-impact factor	+3
Moderately Associated	Reported in several studies; moderately correlated with hypertension	+2
Mildly Associated	Mentioned in limited studies; secondary/indirect influence	+1
No Clear Association	Lacking evidence or not supported in the literature	0
Protective (Optional)	Shown to reduce risk; scored negatively if included	-1 or -2

## **HYPERTENSION RISK SCORING MATRIX**

The Hypertension Risk Scoring Matrix is a structured tool that organizes all identified risk factors into five categories: biological and genetic, socioeconomic and demographic, lifestyle and behavioral, dietary and nutritional, and healthcare access and management. Each risk factor within the matrix is assigned a score based on its relative contribution to hypertension risk, guided by literature-based evidence. By summing the individual scores, the matrix generates an overall risk score that classifies users as low, moderate, or high risk. In addition to determining overall risk, the matrix also allows for analysis by category, enabling personalized health guidance and targeted intervention strategies within the application.

<b>Category</b>	<b>Risk Factor</b>	<b>Score</b>
Biological & Genetic	Age ≥ 50	+3
	Male sex	+2
	Family history of hypertension or diabetes	+2
	Genetic predisposition (if data available)	+3
	Comorbidities (e.g., diabetes, dyslipidemia, etc.)	+3
Socioeconomic & Demographic	Low educational attainment	+2
	Low or high socioeconomic status	+2
	Urban residence	+1
	Living alone or large household size	+1
	Widowed or divorced	+1
	High-risk ethnicity (if known)	+1
Lifestyle and Behavior	Current or past smoking	+2
	Frequent alcohol consumption	+2
	Physical inactivity / sedentary lifestyle	+2
	Irregular sleep patterns	+1
	Poor stress management	+1
	Poor nutritional planning or unhealthy routines	+1
Dietary & Nutritional	High intake of salt, sugar, and saturated fat	+3

	Low intake of fruits, vegetables, or low-fat dairy	+2
	BMI $\geq$ 25 (Overweight or Obese)	+2
	Large waist circumference or high waist-to-hip ratio	+2
	High protein and fat intake (Filipino diet pattern)	+2
	Low intake of potassium, calcium, and fiber	+2
Healthcare Access & Management	Poor medication adherence	+3
	No access to antihypertensive medication	+2
	Rare or no use of home BP monitor	+2
	Use of traditional or non-evidence-based remedies	+1
	Lack of tailored medical interventions	+2
	Low awareness of hypertension status	+2

**HYPERTENSION RISK SCORING MODEL**

In implementing the hypertension risk scoring model, both the total score and category-specific scores will be utilized strategically. The total score serves as the basis for overall risk classification (i.e. categorizing users into low, moderate, or high-risk levels). This provides a clear, evidence-based assessment of a user's general risk status. Meanwhile, the individual category scores (i.e., biological and genetic, socioeconomic and demographic, lifestyle and behavior, dietary and nutritional, and healthcare access and management) can be used to generate personalized feedback, guide targeted recommendations, and support goal-setting features within the mobile application. This dual approach enhances clinical relevance and also empowers users to better understand and manage the specific areas contributing to their hypertension risk.

**Hypertension Risk Score Interpretation**

<i>Total Score</i>	<i>Risk Category</i>
0–6	Low Risk
7–12	Moderate Risk
13+	High Risk

A low-risk classification (total score between 0–6) suggests that the user currently has minimal exposure to the known risk factors for hypertension. While this is a favorable result, the app may still encourage the user to maintain healthy habits and monitor changes over time. A moderate-risk classification (score between 7–12) indicates the presence of several contributing risk factors that may not yet result in high blood pressure but could increase the likelihood over time. For these users, the app can recommend preventive strategies, such as dietary adjustments, regular exercise, and stress reduction. A high-risk classification (score of 13 or more) reflects a significant accumulation of risk factors and may warrant medical consultation. Users in this category can be guided to seek professional evaluation and adopt more intensive lifestyle modifications or monitoring practices.

## **Hypertension Risk Questionnaire (Draft)**

### **Biological and Genetic Factors**

**How old are you?**

- Under 40 → 0
- 40–49 → +1
- 50 and above → +3

**What is your sex assigned at birth?**

- Male → +2
- Female → 0

**Do you have a family history of hypertension or diabetes (parents or siblings)?**

- Yes → +2
- No / Not sure → 0

**Have you been diagnosed with any of the following conditions?**

*(Check all that apply)*

- Diabetes → +2
- High cholesterol or triglycerides → +1
- None of the above → 0

*(Optional if available)* **Have you been tested for any genetic predisposition to hypertension?**

- Yes, and results show increased risk → +3
- Yes, no risk found → 0
- No / Not tested → 0

---

### **Socioeconomic & Demographic Factors**

**What is your highest level of education completed?**

- Elementary or below → +2
- High school → +1
- College or higher → 0

**How would you describe your current financial situation?**

- Struggling or low-income → +2
- Comfortable / middle-income → +1
- Well-off / high-income → +2



**Where do you currently live?**

- Urban area → +1
- Rural or provincial area → 0

**What is your current living arrangement?**

- I live alone → +1
- I live with a large household (5 or more) → +1
- I live with 1–4 people → 0

**What is your marital status?**

- Widowed or Divorced → +1
  - Single or Married → 0
- 

**Lifestyle and Behavioral Factors**

**Do you currently smoke or have you smoked in the past year?**

- Yes → +2
- No → 0

**How often do you consume alcoholic drinks?**

- 3 or more times per week → +2
- 1–2 times per week → +1
- Rarely or never → 0

**How often do you engage in physical activity (e.g., walking, exercise)?**

- Rarely / Not at all → +2
- 1–2 times per week → +1
- 3 or more times per week → 0

**How would you describe your sleep pattern?**

- Irregular or insufficient (<6 hrs/night) → +1
- Mostly regular (6–8 hrs/night) → 0

**How often do you feel overwhelmed or stressed?**

- Often or daily → +1
- Sometimes → +0.5
- Rarely → 0

**How would you describe your meal planning habits?**

- I frequently eat out / don't plan meals → +1
  - I try to eat balanced meals → 0
- 

### **Dietary and Nutritional Factors**

**How often do you eat salty, fatty, or sugary foods (e.g., fast food, processed snacks)?**

- Almost daily → +3
- 2–3 times a week → +2
- Rarely → +1
- Never → 0

**How often do you consume fruits and vegetables?**

- Rarely → +2
- 2–3 times per week → +1
- Daily → 0

**What is your Body Mass Index (BMI)?** *(optional: auto-calculate based on height/weight input)*

- 25–29.9 (Overweight) → +2
- 30+ (Obese) → +3
- 18.5–24.9 (Normal) → 0

**Do you know your waist circumference or waist-to-hip ratio?**

- Yes, and it's high (male  $\geq 90$ cm, female  $\geq 80$ cm) → +2
- No or within normal range → 0

**How often do you eat high-protein/high-fat meals (e.g., meat-heavy, fried foods)?**

- Daily or often → +2
- Occasionally → +1
- Rarely → 0

**Do you include potassium, calcium, or fiber-rich foods in your diet?**

- Rarely → +2
  - Occasionally → +1
  - Daily → 0
- 

### **Healthcare Access and Management Behaviors**

**Do you take medication for hypertension?**

- Yes, but not regularly → +3
- Yes, regularly → 0
- No (not needed or not diagnosed) → 0

**Do you have access to antihypertensive medications if needed?**

- No or uncertain → +2
- Yes → 0

**Do you check your blood pressure at home using a BP monitor?**

- Rarely or never → +2
- Occasionally → +1
- Regularly → 0

**Do you use traditional remedies for managing blood pressure?**

- Yes → +1
- No → 0

**Have you been advised by a healthcare provider on how to manage your blood pressure?**

- No or not sure → +2
- Yes → 0

**Are you aware of your current blood pressure levels?**

- No → +2
- Yes → 0

**HEALTH TEACHING INFORMATION PER CATEGORY**

*(in progress; to be updated by the researchers)*

## HEALTH TEACHING INFORMATION PER CATEGORY

(input all, and per category, but only selected ang e show since individualized ang HT)

If with hypertension

Age	Diet	Exercise <i>Exercise Reminder: "Consult your doctor before starting new exercises to ensure they're safe and appropriate. Avoid overexertion and listen to your body."</i>	Lifestyle Changes	Medication Adherence
20 - 29	<ul style="list-style-type: none"> <li>• Eat more vegetables such as kangkong, malunggay, ampalaya and fruits such as banana, papaya, oranges, and mangga.</li> <li>• These food list helps lower BP and LDL "bad cholesterol": <ul style="list-style-type: none"> <li>◦ Fish</li> <li>◦ Chicken</li> <li>◦ Lean meat (meat with no fat)</li> <li>◦ Beans (Baguio beans, monggo, peas)</li> <li>◦ Nuts &amp; Seeds</li> </ul> </li> <li>• Limit sodium intake to 1,300 mg (¼ tablespoon) per day.</li> <li>• Limit saturated and trans fat such as fatty meats, full-fat dairy (e.g. whole milk, butter, full-fat cheese) and processed</li> </ul>	<ul style="list-style-type: none"> <li>• Do brisk walking or jogging at least 30 minutes, 5 days/week.</li> <li>• Do moderate-intensity sports like badminton, tennis, or basketball for at least 30 minutes, 3–5 days/week</li> <li>• Always include a 5-10 minute warm-up before exercise and a cool-down afterwards.</li> <li>• Stretch daily for flexibility.</li> <li>• Monitor your blood pressure before and after exercise</li> </ul>	<ul style="list-style-type: none"> <li>• Sleep 7–9 hours nightly with a regular schedule.</li> <li>• Practice stress relief like deep breathing or listening to music.</li> <li>• Maintain healthy weight (BMI &lt;25).</li> <li>• Avoid smoking and minimize alcohol intake.</li> </ul>	<ul style="list-style-type: none"> <li>• Take medicines at the same time daily as prescribed by your physician.</li> <li>• Use a pillbox or phone reminders such as alarms to help you in taking your medicine at the right time.</li> <li>• Never stop or skip medicines without doctor's advice.</li> </ul>

	foods. <ul style="list-style-type: none"> <li>• Reduce intake of sugary drinks, sweets, and desserts. Drink at least 6-8 glasses of water per day.</li> </ul>			
<b>30 - 39</b>	<ul style="list-style-type: none"> <li>• Eat more vegetables such as kangkong, malunggay, ampalaya and fruits such as banana, papaya, oranges, and mangga.</li> <li>• These food list helps lower BP and LDL “bad cholesterol”:             <ul style="list-style-type: none"> <li>◦ Fish</li> <li>◦ Chicken</li> <li>◦ Lean meat (meat with no fat)</li> <li>◦ Beans (Baguio beans, monggo, peas)</li> <li>◦ Nuts &amp; Seeds</li> </ul> </li> <li>• Limit sodium intake to 1,300 mg (¼ tablespoon) per day.</li> <li>• Limit saturated and trans fat such as fatty meats, full-fat dairy (e.g. whole milk, butter, full-fat cheese) and processed foods.</li> <li>• Reduce intake of sugary drinks, sweets, and desserts. Drink at least 6-8 glasses of water per day.</li> </ul>	<ul style="list-style-type: none"> <li>• Brisk walking or biking 30 minutes/day, 5 days/week.</li> <li>• Do home workouts like planking or resistance bands 2 days/week.</li> <li>• Always include a 5-10 minute warm-up before exercise and a cool-down afterwards.</li> <li>• Engage in active play with kids/family.</li> <li>• Monitor your blood pressure before and after exercise</li> </ul>	<ul style="list-style-type: none"> <li>• Manage work stress through short breaks and meditation.</li> <li>• Sleep 7–9 hours nightly with a regular schedule.</li> <li>• Maintain healthy weight (BMI &lt;25).</li> <li>• Avoid smoking and minimize alcohol intake.</li> </ul>	<ul style="list-style-type: none"> <li>• Take medicines at the same time daily as prescribed by your physician.</li> <li>• Use a pillbox or phone reminders such as alarms to help you in taking your medicine at the right time.</li> <li>• Never stop or skip medicines without doctor’s advice.</li> <li>• Track BP at home 2–3 times per week.</li> </ul>

40 - 49	<ul style="list-style-type: none"> <li>Follow DASH with Filipino meals: sinigang with lots of gulay, grilled tilapia, brown rice if affordable.</li> <li>Eat at least 1 serving of fruits (banana, papaya, mango) per day.</li> <li>Limit intake of processed foods (canned goods, instant noodles, chips) to prevent excess sodium intake.</li> <li>Reduce use of patis, bagoong, and toyo as they contain high amounts of sodium.</li> <li>Drink at least 6–8 glasses of water daily unless restricted by your doctor.</li> </ul>	<ul style="list-style-type: none"> <li>Do walking or cycling for at least 150 minutes per week (e.g., 30 minutes a day, 5 days a week).</li> <li>Choose active options like climbing stairs instead of elevators.</li> <li>Do strength training 2 days per week, with 1–3 sets of 10–15 reps for major muscle groups (e.g., squats, push-ups, resistance band exercises).</li> <li>Always include a 5–10 minute warm-up and cool-down during exercise sessions.</li> </ul>	<ul style="list-style-type: none"> <li>Schedule annual check-up for cholesterol and blood sugar.</li> <li>Practice relaxation exercises like yoga or stretching.</li> <li>Maintain a regular sleeping pattern and have at least 7-9 hrs of sleep daily.</li> <li>Avoid smoking and minimize alcohol intake.</li> </ul>	<ul style="list-style-type: none"> <li>Take prescribed medicines consistently at the same time each day, even if blood pressure feels normal.</li> <li>Never stop or adjust medication without doctor's advice.</li> <li>Use a pillbox or phone reminders to avoid missed doses.</li> <li>Consult your doctor before trying herbal remedies or supplements.</li> <li>Attend follow-up visits every 3–6 months for monitoring and adjustment of medications.</li> </ul>
50 - 59	<ul style="list-style-type: none"> <li>Choose boiled or grilled fish/chicken instead of fried.</li> <li>Increase vegetable servings (upo, sitaw, pechay).</li> <li>Drink at least 6–8 glasses of water daily unless restricted by your doctor.</li> </ul>	<ul style="list-style-type: none"> <li>Walk at a moderate pace for 30 minutes daily, at least 5 days a week.</li> <li>Join community Zumba or dance classes for motivation and fun.</li> <li>Do light strength training (using water bottles or resistance bands) at least 2 times per week.</li> <li>Practice daily stretching exercises to improve flexibility. (5-10 mins/day)</li> </ul>	<ul style="list-style-type: none"> <li>Avoid smoking and alcohol consumption as these worsen blood pressure.</li> <li>Manage stress through gardening, prayer, or enjoyable hobbies.</li> <li>Maintain a healthy weight and monitor BMI.</li> <li>Check weight monthly and monitor waistline regularly.</li> </ul>	<ul style="list-style-type: none"> <li>Take medicines consistently even if blood pressure is controlled.</li> <li>Use phone reminders, alarms, or pillboxes to avoid forgetting doses.</li> <li>Always consult a doctor before using herbal products or supplements.</li> <li>Attend follow-up visits every 3–6 months to adjust treatment if needed.</li> </ul>
60 - 69	<ul style="list-style-type: none"> <li>Eat soft but nutritious foods such as boiled</li> </ul>	<ul style="list-style-type: none"> <li>Do brisk walking or slow jogging for 30 minutes, 5</li> </ul>	<ul style="list-style-type: none"> <li>Ensure a safe home environment to prevent</li> </ul>	<ul style="list-style-type: none"> <li>Take prescribed medicines at the same</li> </ul>

	<p>saba, lugaw with malunggay, and fish tinola.</p> <ul style="list-style-type: none"> <li>• Maintain a low-salt diet by avoiding bagoong, instant soups, and processed canned goods.</li> <li>• Ensure daily protein intake (fish, eggs, tofu, or monggo) to prevent muscle loss.</li> <li>• Include fruits such as papaya and melon for daily vitamins and minerals.</li> <li>• Drink adequate fluids, unless restricted due to kidney or heart issues.</li> </ul>	<p>days a week.</p> <ul style="list-style-type: none"> <li>• Add balance exercises such as heel-to-toe walking or standing on one foot daily (5-10 mins/day).</li> <li>• Include stretching to improve flexibility and reduce muscle stiffness. (5-10 mins/day)</li> <li>• Avoid sitting for long periods; stand up and move every hour.</li> </ul>	<p>falls (remove clutter, install handrails if needed).</p> <ul style="list-style-type: none"> <li>• Maintain a regular sleeping pattern of 7–9 hours per night.</li> <li>• Avoid smoking and minimize alcohol intake.</li> <li>• Join community or church activities to prevent isolation and improve emotional well-being.</li> </ul>	<p>time daily, even if blood pressure is normal.</p> <ul style="list-style-type: none"> <li>• Have family members or caregivers assist with reminders if forgetful.</li> <li>• Check blood pressure at home twice a week for monitoring.</li> <li>• Attend follow-up visits every 3–6 months or as advised by the doctor.</li> </ul>
70 - 79	<ul style="list-style-type: none"> <li>• Eat easy-to-chew vegetables such as malunggay soup or mashed kalabasa.</li> <li>• Include soft fruits like banana, melon, or papaya daily.</li> <li>• Drink enough water throughout the day unless restricted by a doctor.</li> <li>• Prepare low-salt meals, avoiding canned foods and dried fish.</li> <li>• Encourage small but frequent meals to maintain energy.</li> </ul>	<ul style="list-style-type: none"> <li>• Do light walking at a comfortable pace for 20–30 minutes daily.</li> <li>• Add seated or chair exercises 2–3 times per week to maintain mobility and prevent stiffness.</li> <li>• Practice balance training (heel-to-toe walking, standing on one leg with support) 3 times per week.</li> <li>• Incorporate stretching (5-10 mins) after light activity at least 2 times per week.</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize sleep and daily routine to keep the body well-regulated.</li> <li>• Completely avoid smoking and limit alcohol.</li> <li>• Join light group activities (community exercises, church groups, family gatherings) to enhance mental wellness.</li> <li>• Keep home safe and accessible (non-slippery floors, proper lighting, clutter-free).</li> </ul>	<ul style="list-style-type: none"> <li>• Follow medication schedule and appropriate amount of dose.</li> <li>• Ask caregiver or family to help prepare and remind about medicines.</li> <li>• Check blood pressure at home twice a week for monitoring.</li> <li>• Always consult a doctor before stopping or changing doses.</li> </ul>

*If not diagnosed with hypertension*

Age	Diet	Exercise	Lifestyle Changes
<b>20 - 29</b>	<ul style="list-style-type: none"> <li>• Eat more gulay (kangkong, talbos ng kamote, malunggay, ampalaya) in every meal.</li> <li>• Choose fruits as snacks such as banana, papaya, or guava instead of chips or processed junk food.</li> <li>• Avoid energy drinks, soft drinks, and fast food which can raise blood pressure over time.</li> <li>• Prefer home-cooked meals with less oil and salt, such as boiled fish, pinakbet, or ginisang gulay.</li> <li>• Drink at least 6–8 glasses of water daily</li> </ul>	<ul style="list-style-type: none"> <li>• Engage in aerobic activities such as jogging, brisk walking, or cycling for 30 minutes at least 5 days per week.</li> <li>• Add strengthening exercises (push-ups, squats, planking, or resistance bands) at least 2 times per week.</li> <li>• Play sports such as basketball, badminton, or volleyball for fun and physical activity.</li> <li>• Include stretching or flexibility exercises daily. (5-10 mins/day)</li> </ul>	<ul style="list-style-type: none"> <li>• Sleep 7–9 hours daily and maintain a consistent schedule.</li> <li>• Avoid smoking and limit alcohol consumption to occasional, minimal intake.</li> <li>• Manage stress from school or work through breaks, hobbies, or relaxation activities.</li> <li>• Monitor your blood pressure at least once a year, especially if with family history of hypertension.</li> </ul>
<b>30 - 39</b>	<ul style="list-style-type: none"> <li>• Cook food with less oil and salt (examples: grilled fish, pinakbet, boiled chicken).</li> <li>• Reduce fast food meals to once a week or less.</li> <li>• Eat at least one serving of fruits daily such as banana, guava, mango, or papaya.</li> <li>• Limit salty condiments like patis, toyo, and bagoong.</li> <li>• Drink 6–8 glasses of water daily unless restricted.</li> </ul>	<ul style="list-style-type: none"> <li>• Walk or bike to work if possible to increase daily activity.</li> <li>• Exercise at least 150 minutes per week (e.g., brisk walking or cycling 30 minutes, 5 days a week).</li> <li>• Add resistance training 2 times per week (bodyweight exercises, dumbbells, or water bottles).</li> <li>• Do stretching or yoga for flexibility and stress relief. (5-10 mins/day)</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor your blood pressure at least once a month if at risk (family history, overweight, stressful job).</li> <li>• Avoid smoking and limit alcohol intake.</li> <li>• Manage stress through meditation, hobbies, or regular relaxation techniques.</li> <li>• Sleep at least 7–8 hours per night with consistent bedtime.</li> <li>• Maintain a healthy weight (BMI &lt;25) and active lifestyle.</li> </ul>



40 - 49	<ul style="list-style-type: none"> <li>• Eat high-fiber meals such as brown rice, mongo, and vegetables.</li> <li>• Limit fatty meats like lechon kawali or crispy pata.</li> <li>• Include potassium-rich fruits daily such as saba, melon, or papaya.</li> <li>• Drink 6–8 glasses of water daily unless otherwise restricted.</li> <li>• Choose home-cooked meals instead of frequent fast food.</li> </ul>	<ul style="list-style-type: none"> <li>• Do brisk walking or jogging 30 minutes daily.</li> <li>• Join community exercise programs like Zumba or aerobics.</li> <li>• Include strength exercises like lunges, planks, or resistance bands 2–3 times per week.</li> <li>• Stretch daily for flexibility (5-10 mins/day)</li> <li>• Use stairs instead of elevators when possible.</li> </ul>	<ul style="list-style-type: none"> <li>• Get annual BP check-ups.</li> <li>• Maintain healthy weight.</li> <li>• Manage stress through hobbies, prayer, or relaxation exercises.</li> <li>• Avoid smoking and limit alcohol intake.</li> </ul>
50 - 59	<ul style="list-style-type: none"> <li>• Eat high-fiber meals such as brown rice, mongo, and vegetables.</li> <li>• Limit fatty meats like lechon kawali or crispy pata.</li> <li>• Include potassium-rich fruits daily such as saba, melon, or papaya.</li> <li>• Drink 6–8 glasses of water daily unless otherwise restricted.</li> <li>• Choose home-cooked meals instead of frequent fast food.</li> </ul>	<ul style="list-style-type: none"> <li>• Engage in brisk walking, swimming, biking, dancing (Zumba) for 150 minutes per week.</li> <li>• Add light weightlifting or resistance band exercises 2 times per week.</li> <li>• Stretch daily to improve flexibility (5-10 mins/day)</li> <li>• Do active household chores for additional movement.</li> </ul>	<ul style="list-style-type: none"> <li>• Get annual medical check-ups to monitor blood pressure and cholesterol.</li> <li>• Monitor weight and waistline monthly.</li> <li>• Reduce alcohol and completely avoid smoking.</li> <li>• Engage in hobbies or relaxation activities to lower stress.</li> </ul>
60 - 69	<ul style="list-style-type: none"> <li>• Eat soft, low-salt meals such as lugaw with vegetables and tinola.</li> <li>• Consume daily servings of fruits (banana, papaya).</li> <li>• Ensure protein intake with fish, eggs, or tofu.</li> <li>• Drink adequate fluids, unless restricted.</li> <li>• Limit salty condiments (patis, bagoong, toyo).</li> </ul>	<ul style="list-style-type: none"> <li>• Do brisk walking or light jogging for 30 minutes daily.</li> <li>• Add balance training (heel-to-toe walking, standing on one foot with support, side leg raises) for 10-15 mins/session, 3 times per week.</li> <li>• Try stretching or yoga for flexibility. (5-10 mins/day)</li> <li>• Avoid long periods of sitting. Stand and move often.</li> </ul>	<ul style="list-style-type: none"> <li>• Get blood pressure checked at least once a month.</li> <li>• Maintain an active lifestyle with social activities.</li> <li>• Ensure a safe home environment to prevent falls.</li> <li>• Avoid smoking and limit alcohol intake.</li> </ul>
70 - 79	<ul style="list-style-type: none"> <li>• Prepare easy-to-chew, low-salt meals like malunggay soup or mashed kalabasa.</li> <li>• Ensure daily hydration unless restricted by a doctor.</li> </ul>	<ul style="list-style-type: none"> <li>• Do light walking 20–30 minutes daily at a comfortable pace.</li> <li>• Practice chair or seated exercises for mobility 5-10 mins, 3 times per week..</li> <li>• Include balance training for 5-10 mins</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain a consistent sleep routine (7–9 hours daily).</li> <li>• Keep the home safe to avoid falls (good lighting, clutter-free).</li> <li>• Stay socially connected with family,</li> </ul>

	<ul style="list-style-type: none"> <li>• Consume fruits daily such as banana, melon, or papaya.</li> <li>• Avoid instant soups, dried fish, and canned foods.</li> <li>• Serve small, frequent meals for better digestion..</li> </ul>	<p>at least 3 times per week.</p> <ul style="list-style-type: none"> <li>• Perform gentle stretching for 5-10 mins daily .</li> <li>• Move regularly to avoid stiffness and improve mobility.</li> </ul>	<p>friends, or community.</p> <ul style="list-style-type: none"> <li>• Avoid smoking and minimize alcohol intake.</li> </ul>
--	--	--	--

#### App Features as Suggested by Users (Interview Results)

- Alert notifications or reminders to take BP and medication
  - User-friendly interface that is simple and easy to navigate.
  - Stable performance (app should not crash easily).
  - Large and readable font size to accommodate users with visual difficulties.
  - Exercise recommendations with clear instructions and images (content for the Exercise section in Management will be revised by Shelou)
- Update (08/28/2025): **Revised** (will provide gdrive link for photos per category – within this week)

