

Article

Development and Validation of MyHTCare: An mHealth Application for Remote Monitoring and Self-Management of Hypertension

Prajwal Lemuel Salins ¹, Poornima P. Kundapur ^{2,*}, Sabu Karakka Mandapam ^{1,*} , Reshmi Bhageerathy ^{1,*} , Suma Nair ³ , Kirthinatha Ballala ⁴ , Roshan David Jathanna ² and Raksha Kamath ¹

¹ Department of Health Information Management, Manipal College of Health Professions, Manipal Academy of Higher Education, Manipal, India; prajwal.salins@manipal.edu (P.L.S.); raksha2.mchpmp12023@learner.manipal.edu (R.K.)

² Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal, India; roshan.jathanna@manipal.edu

³ School of Public Health, DY Patil Deemed to Be University, Nerul, Navi Mumbai 400706, Maharashtra, India; suma.nair@dypatil.edu

⁴ Department of Community Medicine, Kasturba Medical College, Manipal Academy of Higher Education, Manipal, India; kirthinath.ballala@manipal.edu

* Correspondence: poornima.girish@manipal.edu (P.P.K.); sabu.km@manipal.edu (S.K.M.); reshmi.b@manipal.edu (R.B.); Tel.: +91-99808-53396 (P.P.K.)

Abstract

(1) Background: Hypertension is a prevalent chronic condition requiring sustained self-management to prevent complications; however, long-term adherence to monitoring, medication, and lifestyle modification remains suboptimal. Mobile health (mHealth) technologies, supported by cloud-based connectivity, offer scalable platforms for structured remote monitoring and patient engagement. This study aimed to design, develop, and validate MyHTCare, a user-centered mHealth application for comprehensive hypertension self-management and connected remote monitoring. (2) Methods: An Agile-based, three-iterative development framework was adopted, incorporating clinical recommendations and inputs from patients, caregivers, and physicians. The application was developed using Flutter and integrated with Cloud Fire store to enable secure cloud-based data storage and real-time synchronization. Core modules included blood pressure tracking, medication reminders, infographic-based lifestyle education, and automated clinical alerts. Content validation involved 10 experts (clinicians and IT professionals) and 30 end users (adults with hypertension or caregivers). Usability was assessed using a pre-tested structured questionnaire, and educational materials were evaluated using the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-A/V). (3) Results: End-user validation demonstrated high usability, with mean scores ranging from 4.4 to 5.0 on a 5-point scale. Educational materials achieved 100% actionability and 92–100% understandability. Expert evaluation showed high ratings across usability domains, with acceptability scores exceeding 70%. (4) Conclusions: MyHTCare demonstrated strong content validity and usability, supporting further clinical evaluation to determine its effectiveness in improving blood pressure control and self-management.

Keywords: hypertension; mHealth application; cloud-based monitoring self-management; usability



Academic Editor: Mariusz Duplaga

Received: 17 April 2026

Revised: 2 June 2026

Accepted: 1 July 2026

Published: 28 July 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article

distributed under the terms and

conditions of the [Creative Commons](https://creativecommons.org/licenses/by/4.0/)

[Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

1. Introduction

Hypertension is a major global public health problem affecting nearly 1.28 billion adults and is a primary modifiable risk factor for chronic kidney disease, cardiovascular disease, stroke, and premature death [1–3]. Its prevalence continues to rise due to population aging and increasing risk factors such as obesity, physical inactivity, and unhealthy dietary practices, contributing substantially to the global healthcare burden [4,5]. Despite the effectiveness of medications, control of blood pressure remains poor due to therapeutic passiveness, non-adherence, and limited patient engagement in lifestyle modifications and monitoring [6,7].

Self-management plays a critical role in hypertension control through lifestyle modification, medication adherence, self-monitoring, and patient education [8]. Recent studies demonstrate that mHealth applications can support hypertension self-management by providing tailored education, self-monitoring tools, reminders, social support features and remote connectivity through widely accessible smartphone technologies [9–11]. Such interventions may improve blood pressure control, adherence, health outcomes, and continuity of care [12–14]. Cloud-based mHealth platforms enable real-time data storage, synchronization, and remote accessibility, thereby enhancing continuity of care and scalability within resource-constrained settings. However, many existing applications lack contextual adaptation, structured validation, cultural relevance, and integration of user-centered design principles [13–15].

Systematic reviews and randomized trials have shown that mHealth interventions can improve blood pressure control, medication adherence, self-management behaviors, and health knowledge among individuals with chronic diseases [14,16]. mHealth technologies are particularly valuable in low- and middle-income countries (LMICs) and geographically underserved areas, where they can support cost-effective remote monitoring, education, adherence, and continuity of care despite limited healthcare access [17].

However, developing mHealth applications for hypertension management requires systematic validation to ensure that the content is accurate, evidence-based, contextually relevant, and user-centered. Expert validation is essential for establishing scientific credibility, ensuring usability, and improving applicability within the intended healthcare setting [14,18]. Despite the growing availability of hypertension mHealth applications, many existing platforms remain commercially oriented, inadequately validated, and developed without sufficient clinical or end-user involvement. Several applications also lack cultural adaptation, age-friendly usability features, and contextual relevance for LMIC healthcare settings [11,16]. This gap is particularly pronounced in LMICs, which bear a significant portion of the global hypertension burden yet are often underserved by digital health solutions primarily designed in high-income contexts [19]. In response to these limitations, MyHTCare was developed as a culturally adapted, user-centered, and expert-informed mHealth application for hypertension self-management in LMIC community settings.

Therefore, this study aimed to design, develop, and systematically validate the MyHTCare mHealth application for hypertension self-management. The study specifically evaluated the application's informational content, contextual relevance, usability, understandability, applicability, and overall validity for hypertension care and follow-up management among the target population.

The application was designed to support comprehensive hypertension management through medication adherence, lifestyle modification, dietary management, exercise, stress management, and self-monitoring strategies, as evidence suggests that lifestyle interventions significantly contribute to blood pressure reduction [20].

2. Materials and Methods

Study Design and Ethical Considerations:

This usability validation study was conducted as part of a larger randomized controlled trial aimed at developing and evaluating the “MyHTCare” mHealth application for comprehensive hypertension self-management and remote monitoring among community-dwelling adults. The study was approved by the Kasturba Hospital & Kasturba Medical College institutional ethics committee (IEC No: 587-2021), and the study was registered prospectively under the Clinical Trial Registry of India (CTRI/2022/03/041544).

Written informed consent was obtained from all participants prior to participation in the study. Data confidentiality was maintained throughout the study and participants were informed that their health-related information would be collected and stored only for study purposes. Furthermore, the collected information was not shared with any organizations or commercial entities. All protected health information was stored on password-protected and encrypted servers accessible only to the research team.

Framework Development:

The development process followed an Agile-based system development life cycle (SDLC) and user-centered development approach, consisting of three iterative phases: (1) Requirements Analysis, (2) Design and Development, (3) Quality Assurance Testing and Deployment.

1. Requirements Analysis

The initial phase of MyHTCare development focused on defining core content and functions through a comprehensive review of hypertension management guidelines (e.g., WHO, American Health Association) [21,22]. An in-depth review of existing mHealth solutions and user input guided the design. Focus group discussions with 34 participants (27 patients and 7 caregivers) explored user preferences, while interviews with nine physicians (5 general practitioners and 4 cardiologists) captured clinical perspectives and requirements.

The app framework’s key domains are: medication adherence via reminders; lifestyle resources with customized instruction on diet and exercise; and blood pressure monitoring with graphical trends of blood pressure, pulse, and BMI. For continued care, the app includes physician consultations. Modules on warning signs were given priority due to the high risk of stroke and comorbidities [23]. The content was further customized for LMIC settings by including feasible lifestyle changes and affordable dietary techniques according to end-user requirements. Feedback obtained from patients, caregivers, and physicians was iteratively incorporated into the application design to improve navigation, educational content presentation, language simplicity, reminder functionality, and overall usability prior to final validation.

2. Design and Development

A multifaceted team of software engineers, cardiologists, general practitioners, and a health information management professional collaborated to convert the requirements into both high- and low-level designs. Based on standard hypertension management guidelines, the User Interface (UI) and User Experience (UX) were created using big fonts, bold color schemes, clear graphics, and easy navigation [24,25].

A Minimum Viable Product (MVP) was created utilizing React JS version 18.3.1 and the Agile methodology in order to minimize risk, manage expenses, and get early user input. MyHTCare version 1.3 was developed for the Android platform using Flutter version 3.24 and Dart version 3.5. Cloud Firestore handled data storage, authentication, and synchronization between the patient application and the provider’s portal.

The application included two interconnected modules:

- A secured web-based admin portal that allowed healthcare providers to monitor patient progress and modify treatment plans.
- An Android app for remote monitoring and self-management that connects with patients.

The key features included:

- (a) Blood pressure monitoring (manual entry);
- (b) Weight, height, and BMI tracking;
- (c) Medication reminders;
- (d) Physical activity (step count);
- (e) Weekly and monthly graphical reports of blood pressure and weight that can be shared in PDF format;
- (f) Abnormal warning alerts;
- (g) DASH diet plan;
- (h) Health Education Materials.

Participants were informed about standardized blood pressure measurement procedures during application orientation. General instructions regarding adequate rest, seated positioning, arm placement at heart level, and avoidance of conversation during measurement were displayed each time the application was opened to promote accurate self-monitoring and recording.

Both Kannada and English were supported by the app's design in order to improve regional accessibility. To ensure data security, all protected health information (PHI) was maintained on password-protected encrypted servers in compliance with applicable data protection regulations.

3. Quality Assurance (QA) Testing and Deployment

To identify and address bugs, usability problems, and performance gaps, diversified testing was conducted. Data safety, seamless synchronization, and reliable performance across various Android versions were ensured through security, integration, and unit testing. Following quality control, the application was made available for testing. Formal technical verification and functional testing were conducted during application development to ensure application stability, security, and performance, whereas the present study primarily focused on content validation, usability, understandability, actionability, and end-user acceptance evaluation.

Usability and Content Validation

The PEMAT–A/V (Patient Education Materials Assessment Tool—Audio/Visual) and a structured pre-tested questionnaire were used to evaluate the application's usability, quality, understandability, and actionability.

- Usability Evaluation

A structured questionnaire consisting of 11 items for experts and 14 items for end users was developed specifically for this study to assess the usability and overall quality of the application. The questionnaire items were developed based on the study objectives, usability domains identified from existing literature, and expert recommendations. Prior to implementation, the questionnaire underwent content review by 10 professionals to assess the clarity, relevance, and adequacy of the items. Pilot testing was conducted among a small group of participants to identify ambiguities and improve comprehensibility before final administration. Internal consistency reliability was assessed using Cronbach's alpha, which demonstrated acceptable reliability ($\alpha = 0.78$).

Purposive sampling was used to recruit 10 experts (physicians, cardiologists, software developers, and health information specialists) with more than five years of professional experience, and 30 hypertensive end users from RMCW (Adults aged 18–60 years diagnosed

with hypertension, having Android smartphones with internet access, and willing to participate in the usability evaluation). Individuals with cognitive or visual impairments were excluded.

Experts were approached individually and, upon consent, provided written informed consent. After evaluating the application, they were requested to fill out the usability questionnaire. Following a brief overview of the main functions of the application, end users were given one month to use the application before completing the questionnaire.

- Validation of Educational Material

The PEMAT-A/V, a standardized instrument designed to evaluate the readability and actionability of patient education materials delivered in audio-visual formats, was used to validate the application's instructional module. Expert consensus and field testing support the validity of the PEMAT-A/V, which showed high internal consistency (Cronbach's $\alpha = 0.87$ for understandability and 0.78 for actionability) and moderate to excellent interrater reliability (Kappa = 0.57).

Both laypersons and healthcare professionals can utilize the tool without any prior formal training. Therefore, no systematic training was offered in this trial. Validators were given a user guide explaining the scoring process and an overview of how to use the MyHTCare app and complete the PEMAT-A/V assessment.

In addition to the PEMAT-A/V assessment, expert review, bilingual content design, and usability evaluation among end users were incorporated during the development and validation process to improve contextual relevance and overall usability of the application.

The two domains of the PEMAT-A/V are actionability (four items) and understandability (13 items). Every item has a rating of either Disagree/Not applicable (0 points) or Agree (1 point) [26]. The domain-specific percentage score is calculated as:

$$\text{Percentage score} = \frac{\text{Total Score} \times 100}{\text{Maximum Possible Score}} \quad (1)$$

Sample Size Considerations

A formal sample size calculation was not performed because this was an exploratory preliminary usability validation study aimed at obtaining preliminary feedback regarding the application's usability, understandability, and feasibility. Previous research suggests that 3–5 specialists are sufficient for usability validation [27] and pilot usability testing with 15–20 participants can consistently identify most usability issues in digital health applications [28]. Therefore, a sample of 30 hypertensive end users and 10 experts was considered adequate for preliminary usability validation based on previous recommendations for pilot usability studies and expert-based validation approaches. Overall, this study used a simple and feasible approach to obtain practical feedback for improving the MyHTCare application.

Statistical Analysis:

Data were analyzed using IBM SPSS Statistics version 24.0. Demographic characteristics and usability-related variables were summarized using descriptive statistics. The Shapiro–Wilk test was used to assess the normality of PEMAT-A/V score distribution, which demonstrated significant deviation from normality. Therefore, actionability and understandability scores are presented as medians with ranges. Cronbach's alpha was used to assess the internal consistency reliability of the usability questionnaire. As the study primarily involved descriptive usability validation with a limited expert sample, no inferential statistical analysis was performed.

3. Results

3.1. Designing and Developing the Application

For qualitative input, the MVP for this app was developed and evaluated with two domain experts and patients with hypertension. Users reported problems with navigation and unclear instructional materials, which resulted in improvements in graphical reports, easier navigation, and customizable reminders.

Testing identified minor technical issues and limited feature engagement, indicating that system stability and user interaction were improved after iterative refinement. The finished software enables patients to effectively manage their blood pressure, medications, and lifestyle modifications due to its simple and intuitive interface. The five primary components of the final application are Provider Integration, Lifestyle/Education, Reminders, Monitoring, and Profile/Login credentials.

- Under the Profile/Login credentials and other modules section, users can access and modify personal information (name, age, height, weight, and medical history) and track health goals (a and b).
- In the Monitoring section, users can record blood pressure, pulse, and BMI, and view graphical trends over time (c and d).
- The Reminders feature provides customizable alerts for medication adherence (e).
- The Lifestyle and Education module provides curated instructional materials and reliable, evidence-based information on physical activity, stroke prevention, diet, and warning signs that is tailored for LMIC and coastal areas, such as the DASH diet plan (f).
- The Provider Integration module enables secure sharing of reports with doctors and supports remote consultation via the backend system.

Together, these components form a comprehensive, patient-centered digital tool designed to improve hypertension management and support self-care (Figure 1).

3.2. Evaluating the Application

3.2.1. End-User Usability and Acceptability Evaluation

After using MyHTCare for one month, thirty hypertension patients evaluated the application. The average age was 47.07 ± 9.12 years, with 19 males (63.3%) and 11 females (36.7%). The duration of hypertension was 9.03 ± 5.08 years on average (Table 1).

Table 1. Demographics of the end users ($n = 30$).

	Mean $\pm$ SD
Age	47.07 $\pm$ 9.12
Gender	
Male	19 (63.3%)
Female	11 (36.7%)
Duration of Hypertension (Years)	9.03 $\pm$ 5.08

A 14-item pre-validated questionnaire (Cronbach's $\alpha = 0.78$) was used to evaluate the application's quality and usability. A 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree" was used to score responses. The internal consistency of the end-user scale was acceptable for an exploratory usability assessment.

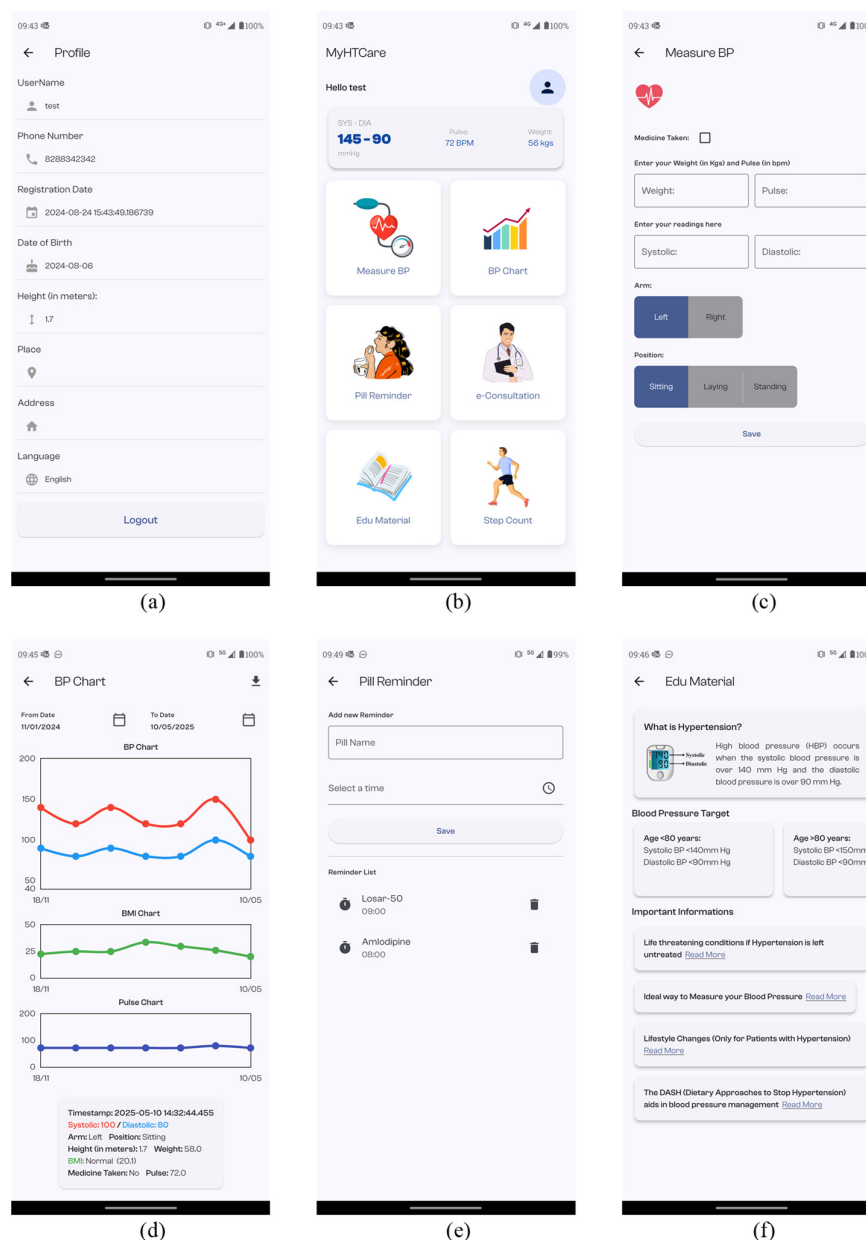


Figure 1. Screenshots of the MyHTCare application. (a) Profile/Login Page, (b) Track health goals—Dashboard, (c) Remote monitoring features, (d) Graphical representation, (e) Medication reminder, (f) Educational materials.

With mean values ranging from 4.4 to 5.0, participants reported high satisfaction with MyHTCare (Table 2). Top-rated features included educational clarity (5.0 ± 0.2), reminder usefulness (5.0 ± 0.2), navigation (4.9 ± 0.3), BP and BMI graphical representation (4.9 ± 0.3), and bilingual support in English and Kannada (4.8 ± 0.4).

Participants reported high usability and acceptability scores across all evaluated domains. These findings indicate that the MyHTCare application was perceived as easy to use, accessible, and useful for supporting hypertension self-management. Consistently high scores across domains indicate strong patient acceptability.

Table 2. This is a table. End-user evaluation of the MyHTCare app: usability, feature performance, and overall satisfaction ($n = 30$).

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean $\pm$ SD
The mHealth app is easy to use.	-	-	-	8 (26.7%)	22 (73.3%)	4.7 $\pm$ 0.5
The app interface is user-friendly	-	-	-	12 (40.0%)	18 (60.0%)	4.6 $\pm$ 0.5
The contents are easy to understand in both English and the local language	-	-	-	3 (10.0%)	27 (90.0%)	4.9 $\pm$ 0.3
The app's various features are well incorporated and can be used effortlessly	-	-	-	5 (16.7%)	25 (83.3%)	4.8 $\pm$ 0.4
The app is customized to the requirements of hypertension management in terms of remote monitoring and self-management	-	-	-	17 (56.7%)	13 (43.3%)	4.4 $\pm$ 0.5
BP measurement values can be entered easily	-	-	-	2 (6.7%)	28 (93.3%)	4.9 $\pm$ 0.3
The graphical chart helps to monitor/control my BP on a regular basis	-	-	-	6 (20.0%)	24 (80.0%)	4.8 $\pm$ 0.4
The BP chart can be easily shared with my doctor/	-	-	-	1 (3.3%)	29 (96.7%)	5.0 $\pm$ 0.2
Step count helps me monitor my physical activity on a regular basis	-	-	-	9 (30.0%)	21 (70.0%)	4.7 $\pm$ 0.5
It is easy to add medicine details to the app	-	-	-	1 (3.3%)	29 (96.7%)	5.0 $\pm$ 0.2
The pill reminder reminds me to take the medicine on time.	-	-	-	12 (40.0%)	18 (60.0%)	4.6 $\pm$ 0.5
E-consultation feature helps me connect with the healthcare provider seamlessly	-	-	-	3 (10.0%)	27 (90.0%)	4.9 $\pm$ 0.3
I will use the mHealth app for hypertension management	-	-	-	7 (23.3%)	23 (76.7%)	4.8 $\pm$ 0.4
I will recommend others to use the mHealth app	-	-	-	8 (26.7%)	22 (73.3%)	4.7 $\pm$ 0.5

3.2.2. Inter-Item Correlation (End-Users)

The 14-item user acceptance scale inter-item correlation analysis demonstrated the coefficients ranging from -0.52 to 0.80 , which indicates variable levels of association between items (Table S1). Moderate-to-strong positive correlations were shown by a number of items, indicating significant connections between particular app characteristics. For instance, there was the largest positive association ($r = 0.80$) between the e-consultation feature (Item L) and the convenience of entering BP values (Item F). Similarly, the intention to use the app (M) was substantially connected with the e-consultation function (L) ($r = 0.60$), and the sharing of BP charts (H) was correlated with the content's ease of understanding (C) ($r = 0.56$). Additionally, the pill reminder (K) demonstrated a weak link with the simplicity of entering medication details (J) ($r = 0.23$) and the user-friendly interface (B) ($r = 0.31$).

On the contrary side, several weak or negative associations were found, indicating that the entire scale was not very homogeneous. Step count monitoring (I) and ease of use (A) ($r = -0.23$), features included (D) and content that was easy to comprehend (C) ($r = -0.15$), and customization of the app for managing hypertension (E) and the pill reminder function (K) ($r = -0.52$) were among the notable negative associations. Additionally, there was a weak negative association ($r = -0.08$) between feature inclusion (D) and BP chart sharing (H).

Overall, while the scale displayed variability in item associations, clusters of moderate-to-strong positive correlations point to potential subdomains within the construct of user acceptance, particularly related to e-consultation, medication management, and graphical monitoring features. Therefore, inter-item correlation analysis showed heterogeneous relationships among items, with both positive and negative associations observed across the scale.

3.2.3. PEMAT A/V (End-Users)

Thirty end users (mean age 47.07 ± 9.12 years; 40% female, 60% male) assessed educational content using PEMAT-A/V.

All six sub-modules received high PEMAT-A/V scores for both understandability and actionability. Five sub-modules achieved a median understandability score of 100%. Sub-modules 4 and 5 ranged from 92% to 100%, indicating minor variability. Actionability scores were consistently high, with a median of 100% across all sub-modules. All scores were above the predefined threshold of 70% (Table S2).

PEMAT-A/V results indicated high understandability and actionability across all educational sub-modules.

3.2.4. Expert Usability Evaluation

Ten experts evaluated the application. The mean age was 45.50 ± 5.5 years, with equal gender distribution. The panel included cardiologists (30%), community medicine experts (40%), and health information management specialists (30%). Mean professional experience was 19.20 ± 8.8 years (Table 3).

Table 3. Demographics of experts ($n = 10$).

	Mean $\pm$ SD
Age	45.50 ± 5.5
Gender	
Male	5 (50.0%)
Female	5 (50.0%)
Profession	
Cardiologist	3 (30.0%)

An 11-item usability questionnaire assessed usability and functionality. Mean scores ranged from 4.4 to 5.0 (Table 4). Highest ratings were for educational content and clinical usefulness (5.0), followed by e-consultation (4.9 ± 0.3), clarity of content (4.8 ± 0.4), and ease of BP entry (4.8 ± 0.4). Interface design (4.4 ± 0.5) and feature integration (4.6 ± 0.5) received comparatively lower scores.

Experts considered high usability and acceptability scores across evaluated domains (well-designed, user-friendly, and clinically relevant tool for remote hypertension monitoring and self-management).

Table 4. Expert evaluation of the MyHTCare app: usability, feature performance, and overall satisfaction ($n = 10$).

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean $\pm$ SD
The mHealth app is easy to use.	-	-	-	3 (30.0%)	7 (70.0%)	4.7 ± 0.5
The app interface is user-friendly	-	-	-	6 (60.0%)	4 (40.0%)	4.4 ± 0.5

Table 4. *Cont.*

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean $\pm$ SD
The app's various features are well incorporated and can be used effortlessly	-	-	-	2 (20.0%)	8 (80.0%)	4.8 $\pm$ 0.4
The app is customized to the requirements of hypertension management in terms of remote monitoring and self-management	-	-	-	4 (40.0%)	6 (60.0%)	4.6 $\pm$ 0.5
BP measurement values can be entered easily	-	-	-		5 (100%)	5.5
The graphical chart helps to monitor/control my BP on a regular basis	-	-	-	2 (20.0%)	8 (80.0%)	4.8 $\pm$ 0.4
The BP chart can be easily shared with my doctor/	-	-	-		5 (100%)	5.0
Step count helps me monitor my physical activity on a regular basis	-	-	-	2 (20.0%)	8 (80.0%)	4.8 $\pm$ 0.4
It is easy to add medicine details to the app	-	-	-	1 (10.0%)	9 (90.0%)	4.9 $\pm$ 0.3
The pill reminder reminds me to take the medicine on time.	-	-	-	4 (40.0%)	6 (60.0%)	4.6 $\pm$ 0.5
E-consultation feature helps me connect with the healthcare provider seamlessly	-	-	-	1 (10.0%)	9 (90.0%)	4.9 $\pm$ 0.3

3.2.5. Internal Consistency and Inter-Item Correlation Results

The 11-item expert usability scale showed low internal consistency (Cronbach's $\alpha = 0.44$), indicating limited reliability of the exploratory expert instrument.

To further assess scale properties, inter-item correlation analysis of the 9-item version was performed (Table S3), with coefficients ranging from -0.67 to 0.67 .

Moderate-to-strong positive correlations were observed between selected items. Pill reminder (Item H) correlated with user-friendly design (Item B) ($r = 0.67$). Graphical BP chart (Item E) and step count monitoring (Item F) showed a correlation ($r = 0.38$). Interface usability (Item B) and feature integration (Item C) showed correlation ($r = 0.41$).

Negative correlations were observed between several items, including feature integration (C) and ease of use (A) ($r = -0.33$), customization (D) and pill reminder (H) ($r = -0.67$), and customization (D) and e-consultation (I) ($r = -0.27$). Overall, despite the presence of meaningful clusters, the low Cronbach's α and inconsistent inter-item correlations indicate the need for refinement of the user acceptance scale to improve reliability.

Inter-item correlation analysis indicated heterogeneous item relationships, and the expert scale demonstrated low internal consistency in this exploratory assessment.

3.2.6. PEMAT A.V (Expert Evaluation)

All six sub-modules received high PEMAT-A/V scores. The first three sub-modules achieved median understandability scores of 100%, while Sub-modules 4, 5, and 6 showed median scores of 96%, 92%, and 92%, respectively.

Actionability scores remained consistently high, with a median of 100% across all sub-modules. Some variability was observed, with minimum scores of 75% in select sub-modules (Table S4).

Overall, Experts stated the educational material was very easy to comprehend and beneficial. The higher the PEMAT-A/V scores, the better the understandability and actionability.

PEMAT-A/V results indicated high understandability and actionability across expert evaluations. Experts rated the educational material as clear and actionable across all sub-modules. All scores were above the 70% threshold, indicating no major revisions were required, with only minor qualitative refinements suggested.

4. Discussion

Hypertension is a significant public health issue, especially in LMICs, where fragmented healthcare systems, poor continuity of care, and inadequate chronic disease management substantially contribute to poor blood pressure control. MyHTCare was developed to improve hypertension self-management via culturally adapted mHealth platforms offering educational resources, medication reminders, blood pressure tracking, and physician connectivity in accordance with Indian EHR standards, to ensure data privacy, confidentiality, and secure handling of patient information. It highlights the need for expert-driven content and user-centered design in digital health interventions. The platform emphasizes actionable educational content, enhancing patient empowerment and treatment adherence [29,30]. Positive user feedback on clarity and design suggests it may support long-term engagement in managing blood pressure effectively [31,32].

Remote monitoring features of MyHTCare were well-received, especially for blood pressure tracking and report sharing, demonstrating the effectiveness of digital monitoring in enhancing care continuity [33,34]. However, this platform relies on manual self-entry for blood pressure data rather than automated synchronization, which may lead to inaccuracies and inconsistent monitoring but can accurately be described as a self-report-supported remote monitoring system rather than a fully automated physiological monitoring. Future integration with Bluetooth devices could enhance data reliability. The e-consultation feature enabled real-time communication between patients and providers, supporting care continuity, though the absence of peer-support mechanisms is physician connectedness provided comparable supportive functionality observed in previous digital hypertension interventions [35]. Implementing such digital health interventions in LMICs faces various structural and socioeconomic challenges affecting scalability and effectiveness.

One major issue is digital literacy among older adults with hypertension, who may struggle with smartphone monitoring systems. Despite MyHTCare's user-friendly features like simplified navigation and bilingual accessibility, large fonts, guided training, and varying technological confidence can hinder engagement. Previous studies on mHealth reveal that older age and low digital literacy impede use unless supplemented by support [36]. Preliminary assessment of digital readiness—covering smartphone literacy, alert interpretation, self-monitoring, caregiver support, and cognitive or visual limitations—may be crucial before implementing the application in various community settings. Moreover, challenges such as unstable internet, high mobile data costs, and limited device availability in resource-constrained settings may affect sustained use of app-based systems. Although MyHTCare enabled cloud synchronization and remote report sharing, long-term engagement may still depend on affordability, internet reliability, and device accessibility, consistent with findings from other LMIC digital health studies [37]. While initial usability scores for MyHTCare are positive, long-term engagement often declines due to factors like behavioral fatigue and notification desensitization. Thus, further longitudinal research is needed to assess ongoing engagement in chronic disease management.

The study highlights the strengths of a user-centered design approach in developing the MyHTCare application, refined through qualitative feedback from patients and physicians via interviews and focus groups. This alignment with participatory design methodologies likely enhanced usability and contextual relevance, echoing findings from similar mHealth studies [13,37,38].

To ensure methodological rigor, MyHTCare was assessed using PEMAT-A/V for understandability and actionability, alongside a custom usability and acceptance questionnaire. Previous studies show that multimedia education and tailored usability approaches improve home-based hypertension management, especially among older and low-literacy populations [39,40]. However, while these tools are effective for educating low-literacy populations, the study acknowledges limitations in evaluating all aspects of mobile application usability, scientific accuracy, and technical functionality. Thus, it emphasizes the need for comprehensive assessments in real-world settings.

Data governance and ethical management of patient-generated health information are important aspects in digital health implementation [41]. While MyHTCare employs secure storage measures, issues like regulatory compliance, interoperability, and consent management are increasingly important. Privacy concerns may affect user trust in digital health systems. Furthermore, integration with electronic medical records is essential for continuity of care. Scalability poses challenges for public healthcare systems. Although physician connectivity and e-consultation were well received, large-scale implementation may increase provider workload for monitoring patient data, alerts, and remote follow-up. Resource-constrained health systems may therefore face challenges related to workforce capacity, workflow integration, and digital infrastructure. Successful implementation depends on adequate staffing, institutional support, and interoperable systems.

Compared with commercially available or minimally customized “no-code” platforms, MyHTCare emphasized clinical relevance, contextual adaptation, and integrated self-management support for LMIC settings [42]. Customized mHealth applications can enhance hypertension self-management via education, medication support, and improved patient-provider communication. However, challenges such as digital literacy, infrastructure, sustained engagement, interoperability, and system integration must be addressed for successful long-term implementation. Future studies should focus on adherence, effectiveness, scalability, and sustainability in different LMIC healthcare contexts.

Strengths and Limitations

Strengths:

(1) Development of the application informed by a qualitative needs assessment involving physicians and end users; (2) integration of multiple functional domains, including clinical consultation support, remote monitoring, and self-management; (3) validation using structured assessment tools and the PEMAT-A/V; and (4) contextual adaptation to LMIC healthcare settings.

Limitations:

The relatively small sample size may limit the generalizability of the findings across diverse populations and healthcare settings, particularly in LMIC contexts with varying levels of health literacy, digital literacy, and accessibility. The present study was not designed to evaluate clinical effectiveness or long-term hypertension outcomes. These aspects will be evaluated in the subsequent phase of the study through a larger randomized controlled trial. Potential regional bias may also affect broader applicability. Formal construct validation and factor analysis of the usability questionnaire were not performed, as the instrument was developed primarily for exploratory usability assessment in the present study.

5. Conclusions

This study describes the development and validation of MyHTCare, a user-centered mHealth application designed to support hypertension self-management. The application demonstrated high usability, understandability, and acceptability among both pa-

tients and experts, indicating its feasibility for real-world use. Guided by inputs from patients and physicians, the application incorporated user-friendly design, infographic-based educational content, medication reminders, lifestyle support modules, and remote monitoring features.

Validation using pre-tested instruments and the PEMAT-A/V confirmed its understandability, actionability, and overall acceptability. The findings highlight the potential of structured, user-informed mHealth tools to support hypertension self-management and continuity of care in resource-limited settings.

Participants are currently being followed in a cluster-randomized trial to evaluate long-term clinical effectiveness. These preliminary findings provide a foundation for scalable and contextually adaptable mHealth interventions for hypertension management in LMICs. Additionally, future iterations of MyHTCare may incorporate IoT-enabled blood pressure monitoring devices to facilitate automated data capture and enhance real-time clinical monitoring.

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/digital6030062/s1>, Table S1: Interim correlation matrix showing relationships between variables A–N in the MyHTCare usability and feature evaluation study. Values represent Pearson correlation coefficients; Table S2: Scores of PEMAT—AV for educational material: End users ($n = 30$); Table S3: Interim correlation and internal consistency matrix showing relationships between variables A–I in the MyHTCare usability and feature evaluation study. Values represent Pearson correlation coefficients; Table S4: Scores of PEMAT—AV for educational material: Experts ($n = 10$).

Author Contributions: Conceptualization: P.L.S. and P.P.K.; Methodology: P.L.S., P.P.K., S.K.M., S.N., K.B., R.K. and R.D.J.; Software: P.L.S. and R.D.J.; Validation: P.L.S., P.P.K., S.K.M., S.N., R.B., K.B. and R.D.J.; Formal analysis: P.L.S. and R.K.; Investigation: P.L.S., P.P.K., S.K.M., S.N., K.B. and R.D.J.; Resources: P.L.S., R.B., K.B. and R.D.J.; Data curation: P.L.S., P.P.K., S.K.M., R.B., K.B. and R.D.J.; Writing—original draft: P.L.S. and R.K.; Writing—review and editing: P.L.S., P.P.K., S.K.M., R.B., K.B., R.D.J. and R.K.; Visualization: P.L.S., K.B. and R.D.J.; Supervision: P.P.K., S.K.M., S.N., R.B., K.B. and R.D.J.; Project administration: P.L.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Ethics Committee of Kasturba Medical College and Kasturba Hospital (IEC 587/2021, approved on 8 January 2022).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets generated or analyzed during the current study are available from the corresponding authors upon reasonable request.

Acknowledgments: The Department of Health Information Management, Manipal College of Health Professions, MAHE, Manipal, and the Department of Medicine, Kasturba Medical College, MAHE, Manipal are acknowledged by the authors for their support and guidance throughout the data collection process. The authors would like to thank Ashwath K. Naik for his support in conducting the statistical analyses for this study.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

mHealth	Mobile Health
PEMAT-A/V	Patient Education Materials Assessment Tool for Audiovisual Materials
LMICs	Low- and middle-income countries
MVP	Minimum Viable Product
UI	User Interface
UX	User Experience
PHI	Protected Health Information
DASH	Dietary Approaches to Stop Hypertension

References

1. WHO. Global report. In *Global Report on Hypertension: The Race Against a Silent Killer*; WHO: Geneva, Switzerland, 2023.
2. Global Burden of Cardiovascular Diseases and Risks 2023 Collaborators. Global, regional, and national burden of cardiovascular diseases and risk factors in 204 countries and territories, 1990–2023. *J. Am. Coll. Cardiol.* **2025**, *86*, 2167–2243. [\[CrossRef\]](#) [\[PubMed\]](#)
3. Beaney, T.; Wang, W.; Schlaich, M.P.; Schutte, A.E.; Stergiou, G.S.; Alcocer, L.; Alsaid, J.; Diaz, A.B.; Hernandez-Hernandez, R.; Ishaq, M.; et al. Global blood pressure screening during the COVID-19 pandemic: Results from the May Measurement Month 2021 campaign. *J. Hypertens.* **2023**, *41*, 1446–1455. [\[CrossRef\]](#) [\[PubMed\]](#)
4. Poulter, N.R.; Borghi, C.; Castillo, R.R.; Charchar, F.J.; Ramirez, A.J.; Schlaich, M.P.; Schutte, A.E.; Stergiou, G.; Unger, T.; Wainford, R.D.; et al. May Measurement Month 2017: Results of 39 national blood pressure screening programmes. *Eur. Heart J. Suppl.* **2019**, *21*, D1–D4. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Carnagarin, R.; Nolde, J.M.; Yang, J.; Marques, F.Z.; Picone, D.S.; Lambert, G.W.; Beaney, T.; Poulter, N.R.; Schutte, A.E.; Reid, C.M.; et al. Stagnating rates of blood pressure control in Australia: Insights from opportunistic screening of 10 046 participants of the May Measurement Month campaigns. *J. Hypertens.* **2023**, *41*, 632–637. [\[CrossRef\]](#) [\[PubMed\]](#)
6. Bourque, G.; Ilin, J.V.; Ruzicka, M.; Hundemer, G.L.; Shorr, R.; Hiremath, S. Nonadherence is common in patients with apparent resistant hypertension: A systematic review and meta-analysis. *Am. J. Hypertens.* **2023**, *36*, 394–403. [\[CrossRef\]](#) [\[PubMed\]](#)
7. Moran, A.E.; Gupta, R. Global Hearts initiative collaborators. Implementation of global hearts hypertension control programs in 32 low-and middle-income countries: JACC international. *J. Am. Coll. Cardiol.* **2023**, *82*, 1868–1884. [\[CrossRef\]](#) [\[PubMed\]](#)
8. Zhou, Y.; Li, S.J.; Huang, R.Q.; Ma, H.M.; Wang, A.Q.; Tang, X.Y.; Pei, R.Y.; Piao, M.H. Behavior change techniques used in self-management interventions based on mHealth apps for adults with hypertension: Systematic review and meta-analysis of randomized controlled trials. *J. Med. Internet Res.* **2024**, *26*, e54978. [\[CrossRef\]](#) [\[PubMed\]](#)
9. Bandeira, A.C.; Gama de Melo, P.U.; Johann, E.B.; Ritti-Dias, R.M.; Rech, C.R.; Gerage, A.M. Effect of m-Health-based interventions on blood pressure: An updated systematic review with meta-analysis. *Telemed. e-Health* **2024**, *30*, 2402–2418. [\[CrossRef\]](#)
10. Zhang, M. Older people's attitudes towards emerging technologies: A systematic literature review. *Public Underst. Sci.* **2023**, *32*, 948–968. [\[CrossRef\]](#) [\[PubMed\]](#)
11. Aovare, P.; Abdulai, K.; Laar, A.; van der Linden, E.L.; Moens, N.; Richard, E.; Moll van Charante, E.P.; Agyemang, C. Assessing the effectiveness of mHealth interventions for diabetes and hypertension management in Africa: Systematic review and meta-analysis. *JMIR mHealth uHealth* **2023**, *11*, e43742. [\[CrossRef\]](#) [\[PubMed\]](#)
12. de Souza Ferreira, E.; de Aguiar Franco, F.; dos Santos Lara, M.M.; Levcovitz, A.A.; Dias, M.A.; Moreira, T.R.; de Oliveira, A.H.; Cotta, R.M. The effectiveness of mobile application for monitoring diabetes mellitus and hypertension in the adult and elderly population: Systematic review and meta-analysis. *BMC Health Serv. Res.* **2023**, *23*, 855. [\[CrossRef\]](#) [\[PubMed\]](#)
13. Lobo, E.H.; Karmakar, C.; Abdelrazek, M.; Abawajy, J.; Chow, C.K.; Zhang, Y.; Kabir, M.A.; Daryabeygi, R.; Maddison, R.; Islam, S.M. Design and development of a smartphone app for hypertension management: An intervention mapping approach. *Front. Public Health* **2023**, *11*, 1092755. [\[CrossRef\]](#)
14. Babatunde, A.O.; Ogundijo, D.A.; Afolayan, A.G.; Awosiku, O.V.; Aderohunmu, Z.O.; Oguntade, M.S.; Alao, U.H.; Oseni, A.O.; Akintola, A.A.; Amusat, O.A. Mobile health technologies in the prevention and management of hypertension: A scoping review. *Digit. Health* **2024**, *10*, 20552076241277172. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Fotteler, M.L.; Kocar, T.D.; Dallmeier, D.; Kohn, B.; Mayer, S.; Waibel, A.K.; Swoboda, W.; Denking, M. Use and benefit of information, communication, and assistive technology among community-dwelling older adults—A cross-sectional study. *BMC Public Health* **2023**, *23*, 2004. [\[CrossRef\]](#) [\[PubMed\]](#)
16. Xu, H.; Long, H. The effect of smartphone app-based interventions for patients with hypertension: Systematic review and meta-analysis. *JMIR mHealth uHealth* **2020**, *8*, e21759. [\[CrossRef\]](#) [\[PubMed\]](#)

17. Abe, M.; Hirata, T.; Morito, N.; Kawashima, M.; Yoshida, S.; Takami, Y.; Fujimoto, T.; Kawasoe, S.; Shibukawa, T.; Segawa, H.; et al. Smartphone application-based intervention to lower blood pressure: A systematic review and meta-analysis. *Hypertens. Res.* **2025**, *48*, 492–505. [\[CrossRef\]](#) [\[PubMed\]](#)
18. Yap, H.J.; Lim, J.J.; Tan, S.Y.; Ang, C.S. Effectiveness of digital health interventions on adherence and control of hypertension: A systematic review and meta-analysis. *J. Hypertens.* **2024**, *42*, 1490–1504. [\[CrossRef\]](#) [\[PubMed\]](#)
19. Bhandari, B.; Neupane, D.; Thapa, P.; Pradhan, P.M.S. Use of mHealth for management of hypertension in low and middle-income countries: Opportunities and challenges. *Connect. Health* **2023**, *2*, 1–8. [\[CrossRef\]](#)
20. Charchar, F.J.; Prestes, P.R.; Mills, C.; Ching, S.M.; Neupane, D.; Marques, F.Z.; Sharman, J.E.; Vogt, L.; Burrell, L.M.; Korostovtseva, L.; et al. Lifestyle management of hypertension: International Society of Hypertension position paper endorsed by the World Hypertension League and European Society of Hypertension. *J. Hypertens.* **2023**, *42*, 23. [\[CrossRef\]](#) [\[PubMed\]](#)
21. Writing Committee Members; Jones, D.W.; Ferdinand, K.C.; Taler, S.J.; Johnson, H.M.; Shimbo, D.; Abdalla, M.; Altieri, M.M.; Bansal, N.; Bello, N.A.; et al. 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM guideline for the prevention, detection, evaluation and management of high blood pressure in adults: A report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation* **2025**, *152*, e114–e218. [\[CrossRef\]](#) [\[PubMed\]](#)
22. Unger, T.; Borghi, C.; Charchar, F.; Khan, N.A.; Poulter, N.R.; Prabhakaran, D.; Ramirez, A.; Schlaich, M.; Stergiou, G.S.; Tomaszewski, M.; et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. *Hypertension* **2020**, *75*, 1334–1357. [\[CrossRef\]](#) [\[PubMed\]](#)
23. McEvoy, J.W.; McCarthy, C.P.; Bruno, R.M.; Brouwers, S.; Canavan, M.D.; Ceconi, C.; Christodorescu, R.M.; Daskalopoulou, S.S.; Ferro, C.J.; Gerds, E.; et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension: Developed by the task force on the management of elevated blood pressure and hypertension of the European Society of Cardiology (ESC) and endorsed by the European Society of Endocrinology (ESE) and the European Stroke Organisation (ESO). *Eur. Heart J.* **2024**, *45*, 3912–4018. [\[CrossRef\]](#) [\[PubMed\]](#)
24. Bertolazzi, A.; Quaglia, V.; Bongelli, R. Barriers and facilitators to health technology adoption by older adults with chronic diseases: An integrative systematic review. *BMC Public Health* **2024**, *24*, 506. [\[CrossRef\]](#) [\[PubMed\]](#)
25. Jutai, J.W.; Hatoum, F.; Bhardwaj, D.; Hosseini, M. Implementation of digital health technologies for older adults: A scoping review. *Front. Aging* **2024**, *5*, 1349520. [\[CrossRef\]](#) [\[PubMed\]](#)
26. Shoemaker, S.J.; Wolf, M.S.; Brach, C. Development of the Patient Education Materials Assessment Tool (PEMAT): A new measure of understandability and actionability for print and audiovisual patient information. *Patient Educ. Couns.* **2014**, *96*, 395–403. [\[CrossRef\]](#) [\[PubMed\]](#)
27. Cazañas, A.; de San Miguel, A.; Parra, E. Estimating sample size for usability testing. *Enfoque UTE* **2017**, *8*, 172–185.
28. Six, J.M.; Macefield, R. *How to Determine the Right Number of Participants for Usability Studies*; UXmatters: San Francisco, CA, USA, 2016.
29. Muehlensiepen, F.; Bruch, D.; Seifert, F.; Wengemuth, E.; Heinze, M.; Spethmann, S.; May, S. mHealth Apps for Hypertension Self-Management: Interview Study Among Patient-Users. *JMIR Form. Res.* **2024**, *8*, e56162. [\[CrossRef\]](#) [\[PubMed\]](#)
30. Liu, F.; Song, T.; Yu, P.; Deng, N.; Guan, Y.; Yang, Y.; Ma, Y. Efficacy of an mHealth App to Support Patients' Self-Management of Hypertension: Randomized Controlled Trial. *J. Med. Internet Res.* **2023**, *25*, e43809. [\[CrossRef\]](#) [\[PubMed\]](#)
31. Cao, W.; Milks, M.W.; Liu, X.; Gregory, M.E.; Addison, D.; Zhang, P.; Li, L. mHealth Interventions for Self-management of Hypertension: Framework and Systematic Review on Engagement, Interactivity, and Tailoring. *JMIR mHealth uHealth* **2022**, *10*, e29415. [\[CrossRef\]](#) [\[PubMed\]](#)
32. Alzahrani, S.A.; Bin Muammar, M.F.; Bin Muammar, A.F.; Alolah, A.; Almutawa, M. The Adoption and Acceptance of mHealth Interventions for Self-Management of Hypertension Among Adult Patients: A Systematic Review. *Cureus* **2022**, *14*, e31584. [\[PubMed\]](#)
33. Teng, T.Q.; Sun, G.X.; Yu, Z.Y.; Liu, Z.S.; Wang, T.; Wu, Q.; Qin, R.; Wang, M.; Chen, R.; Xu, J.; et al. Efficiency of remote monitoring and guidance in blood pressure management: A randomized controlled trial: The role of remote monitoring in improving hypertension management. *BMC Med.* **2025**, *23*, 459. [\[CrossRef\]](#) [\[PubMed\]](#)
34. Lanssens, D.; Vandenberk, T.; Smeets, C.J.P.; De Cannière, H.; Molenberghs, G.; Van Moerbeke, A.; Hoogen, A.v.D.; Robijns, T.; Vonck, S.; Staelens, A.; et al. Remote monitoring of hypertension diseases in pregnancy: A pilot study. *JMIR mHealth uHealth* **2017**, *5*, e25. [\[CrossRef\]](#) [\[PubMed\]](#)
35. Mehta, S.J.; Volpp, K.G.; Troxel, A.B.; Teel, J.; Reitz, C.R.; Purcell, A.; Shen, H.; McNelis, K.; Snider, C.K.; Asch, D.A. Remote Blood Pressure Monitoring with Social Support for Patients with Hypertension: A Randomized Clinical Trial. *JAMA Netw. Open* **2024**, *7*, e2413515. [\[CrossRef\]](#) [\[PubMed\]](#)
36. Jena, B.; Paltasingh, T. Digital literacy among older adults: A systematic review in Indian context. *Educ. Gerontol.* **2025**, *51*, 371–386.

37. Reimer, L.M.; Nissen, L.; von Scheidt, M.; Perl, B.; Wiehler, J.; Al Najem, S.; Limbourg, F.P.; Tacke, T.; Müller, A.; Jonas, S.; et al. User-centered development of an mHealth app for cardiovascular prevention. *Digit. Health* **2024**, *10*, 20552076241249269. [[CrossRef](#)] [[PubMed](#)]
38. Agnes, T.; Maiya, G.A.; Kulakarni, M.M.; Hegde, S.R.; Ballal, K.; Balachandra, M. Smartphone Application-Based Rehabilitation Program for Older Adults with Type 2 Diabetes Mellitus: Insights from the Design, Development, and Validation. *J. Diabetes Sci. Technol.* **2025**, *Online ahead of print*. [[CrossRef](#)] [[PubMed](#)]
39. Litvin, C.B.; Ornstein, S.M. Development and Initial Use of an Evidence-Based Home Blood Pressure Monitoring mHealth Platform. *J. Med. Syst.* **2023**, *47*, 53. [[CrossRef](#)] [[PubMed](#)]
40. Kang, H.; Park, H.A. A mobile app for hypertension management based on clinical practice guidelines: Development and deployment. *JMIR mHealth uHealth* **2016**, *4*, e12. [[CrossRef](#)] [[PubMed](#)]
41. Deniz-Garcia, A.; Fabelo, H.; Rodriguez-Almeida, A.J.; Zamora-Zamorano, G.; Castro-Fernandez, M.; Alberiche Ruano, M.D.; Solvoll, T.; Granja, C.; Schopf, T.R.; Callico, G.M.; et al. Quality, usability, and effectiveness of mHealth apps and the role of artificial intelligence: Current scenario and challenges. *J. Med. Internet Res.* **2023**, *25*, e44030. [[CrossRef](#)] [[PubMed](#)]
42. Willms, A.; Rhodes, R.E.; Liu, S. The Development of a Hypertension Prevention and Financial-Incentive mHealth Program Using a “No-Code” Mobile App Builder: Development and Usability Study. *JMIR Form. Res.* **2023**, *7*, e43823. [[CrossRef](#)] [[PubMed](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.