

Evaluating the Acceptance of Digital Health Tools for Blood Pressure Monitoring in Jamaican Hypertension Patients with Family and Healthcare Support.

Group: MP O5

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CHAPTER ONE: Introduction

- **Background**
- **Problem Statement**
- **Purpose**
- **Research Question**
- **Significance**



Background

- Globally, about 40% of adults aged 25 and over had elevated blood pressure in 2008 (Xia et al., 2022).
- Only 34.8% of Jamaican hypertensive patients have their condition under control despite medication subsidies. (Willis et al., 2022)
- Patients value the consistent reminders and feedback provided by Digital HEalth Interventions (DHIs), which support lifestyle adjustments and medication adherence, further reinforcing their effectiveness (Morton, 2019).

Background cont'd

- Family Involvement in digital health interventions for high blood pressure has shown promise to improve medication adherence, self-monitoring, and lifestyle changes, which are vital for effective blood pressure control (Kario et al., 2022; Sun et al., 2023).
- Professional guidance is essential for Digital Health Interventions (DHIs), enabling individualized care and timely adjustments (Willis et al., 2022)



Problem Statement

- Jamaica has a high mobile penetration rate and hypertension is prevalent on the island. Approximately one in three Jamaicans aged 15 and older are hypertensive (Jamaica Health and Lifestyle Survey, 2016-2017).
- Digital Health Intervention (DHI) have shown promise in improving hypertension management (Kario et al., 2022), with enhanced potential when incorporating support from family members (Kario et al., 2022) and engagement from healthcare professionals (Hwang & Chang, 2023).



Purpose

Acceptability Evaluation

Evaluate the acceptability of DHI among Jamaican hypertensive patients, their healthcare providers, and family members who offer support.

Prototype Evaluation

Evaluate the acceptability of a prototype that manages hypertensive patients.

Research Question

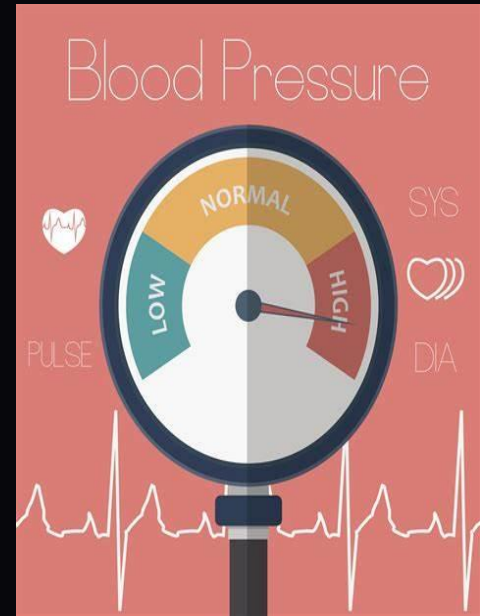
- How acceptable is the digital health intervention (DHI) for managing hypertension among Jamaican patients, as well as among their family members providing support and the healthcare professionals involved in their care?
- What are the barriers and facilitating conditions of a DHI for managing hypertension among Jamaican patients, as well as among their family members providing support and the healthcare professionals involved in their care?



Significance

This study may provide valuable insights into the acceptability of digital health interventions for managing hypertension among patients, their family members who provide support, and healthcare professionals.

These insights could potentially contribute to reducing the risk of uncontrolled blood pressure, cardiovascular complications, and associated healthcare costs by fostering a more collaborative and supported approach to hypertension management.



CHAPTER TWO:

Literature Review

- Overview
- Acceptability of Digital Health Interventions (DHIs) by Stakeholders
- Barriers and Limitations of DHI Adoption
- Theoretical Framework: UTAUT 2
- Research Gaps



Overview

- Digital Health Interventions (DHIs) are technology-based tools, such as mobile apps, telehealth platforms, or wearables, used to collect, share, and utilize health information to support clinical care and self-management (Flessa & Huebner, 2021).
- Digital Health Interventions (DHIs) are promising but require collaboration from healthcare providers and family support for effectiveness.

Acceptability of DHIs by Patients

Digital Health Interventions (DHIs) empower patients with self-monitoring tools, fostering autonomy and better blood pressure control (Wechkunanukul et al., 2020).

Digital Health Interventions (DHIs) provide timely prompts and health tracking to enhance adherence to treatment plans (Morton, 2019).

Digital Health Interventions (DHIs) address barriers in resource-limited settings by providing scalable and user-friendly solutions that expand healthcare access (Flessa & Huebner, 2021).

Acceptability of DHIs by Family Members

- **Active involvement of family members in understanding patient values and decisions boosts the acceptability of digital health interventions (Shin et al., 2023).**
- **Older adults are more willing to use DHIs when backed by their family network, highlighting family support as a key facilitator (Hamilton et al., 2024).**
- **Strong family support correlates with better hypertension self-management and blood pressure control, suggesting family-focused DHIs can enhance health outcomes (Chacko & Jeemon, 2020).**

Acceptability of DHIs by Healthcare Professionals

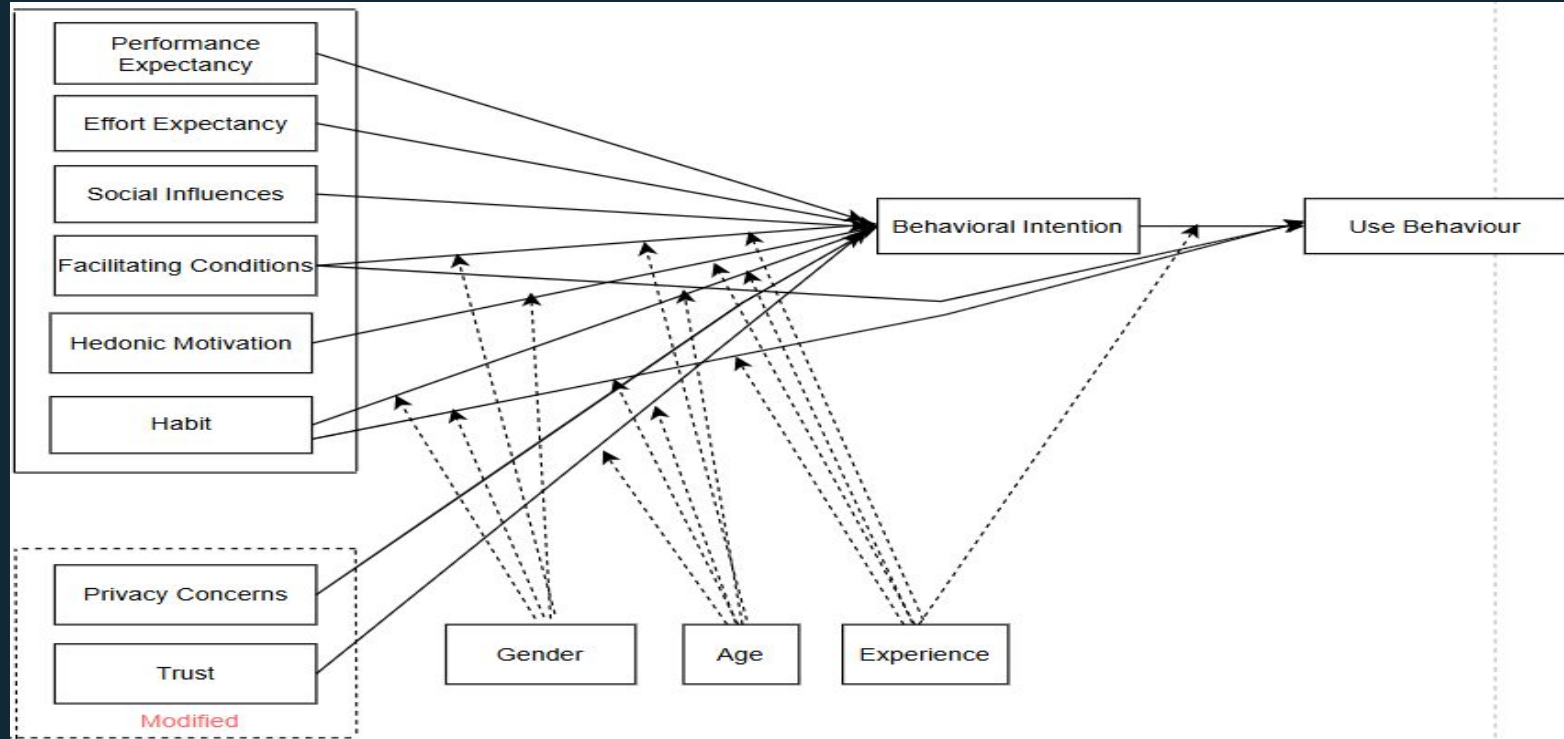
- Nurse-led DHIs have been successfully integrated into practice, with professionals acknowledging their value in improving patient outcomes and streamlining care delivery (Hwang & Chang, 2023).
- Involvement of healthcare professionals in DHI design processes fosters enthusiasm and willingness to adopt these tools in clinical settings (Grynne et al., 2021).
- Positive reception of apps like Noom demonstrates HCPs' readiness to adopt interactive DHI features that enhance patient communication and collaboration in hypertension management (Alnooh et al., 2024).

Barriers, Challenges, and Limitations of DHI Adoption

Digital health barriers are obstacles that limit the successful implementation and adoption of digital tools (Palacholla et al., 2019).

- **Patients report usability issues, insufficient support, and strained communication with providers (Khoong et al., 2021).**
- **Vulnerable groups, older adults, those with low education, experience digital health disparities (Khoong et al., 2021).**
- **Providers face difficulty integrating DHIs into clinical workflows and often lack technical training (Palacholla et al., 2019).**

Theoretical Framework: UTAUT 2



UTAUT 2 (Venkatesh et al., 2012), (Schomakers et al., 2021)

Theoretical Framework: UTAUT 2

UTAUT 2

The study uses a modified UTAUT2 framework augmented with trust and privacy to examine what drives users' intentions to adopt digital blood pressure monitoring tools.

Predictive Power

UTAUT1 surpasses earlier models like TRA, TAM, and TPB by explaining up to 70% of the variance in behavioral intention and 50% in technology use (Akinnuwesi et al., 2022), while UTAUT2 enhances this further by adding hedonic motivation, price value, and habit, raising its predictive power to 74% for intention and 52% for usage (Innovation Acceptance Lab, 2023). In this study, we adapt UTAUT2 by incorporating trust and privacy concerns to better reflect user priorities in sensitive domains like healthcare, aiming to offer a more robust and context-relevant model for analyzing digital health adoption.

Research Gaps

- Limited Focus on Family Members' Acceptance of DHIs: Few studies specifically explore how digital tools are perceived or adopted by family caregivers of hypertensive patients (Chacko & Jeemon, 2020).
- Short-Term Evaluation of DHI Outcomes: Most research focuses on short-term impact (≤ 12 months); long-term adherence, behavioral change, and DHI effectiveness remain largely unexamined (Sakima et al., 2024).
- Trust and Data Privacy Not Fully Addressed: Privacy concerns are frequently cited, but few studies offer actionable strategies for improving user trust in low-trust or digitally inexperienced environments (Pigera et al., 2025).
- Limited Information in Jamaica: In a developing country like Jamaica, there is a high prevalence of hypertension and widespread mobile penetration. However, limited research exists on the acceptability of digital health interventions (DHIs) within the Jamaican context.

CHAPTER THREE: METHODOLOGY

- Research Design
- Population and Sample
- Instruments
- Data Analysis
- Ethical Considerations
- Methodological Limitation
- Prototype Design
- Live Demo



Research Design

Cross-Sectional Study

The research design is a cross-sectional study, examining data at a single point in time.

Mixed Methods Approach

This study will employ a mixed-methods approach, combining both qualitative and quantitative data collection techniques to evaluate the acceptability of the digital health intervention (DHI).

Population and Sample

Target Population

The target population includes:

- Students or staff who have hypertension
- Hypertensive family member of student and staff
- Students and staff with a hypertensive family member
- Healthcare professionals supporting hypertension care

Sampling Method

Convenience snowball sampling will be used, selecting students and staff conveniently, who will then be asked to identify family members with hypertension to expand the sample.

Instruments

Online Surveys

Family Members and Hypertensive Patients are administered survey via Microsoft Forms with Likert scale questions to assess acceptability.

Semi-structured Interviews

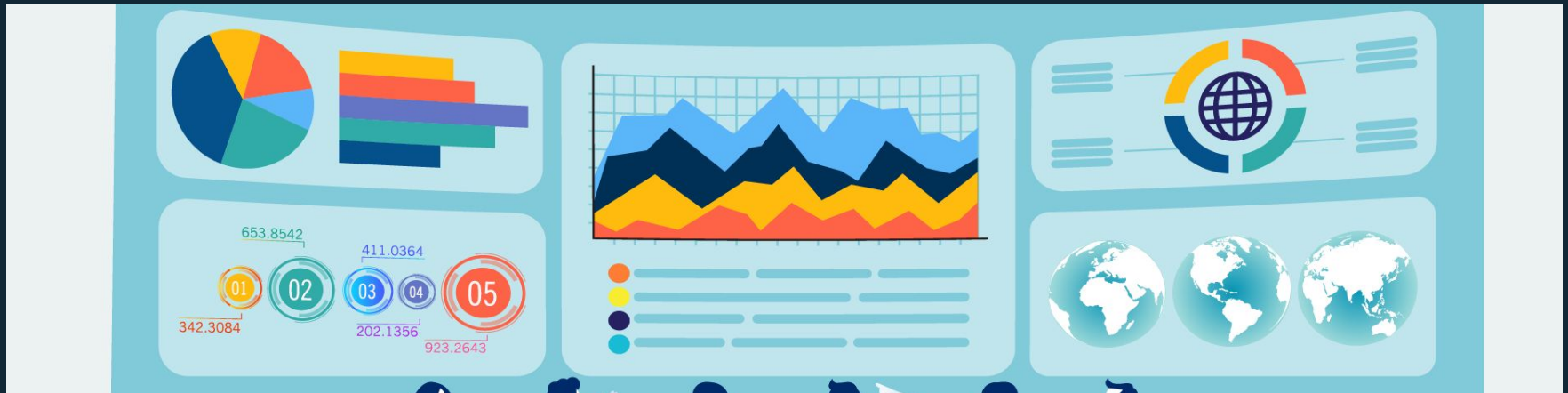
Healthcare professionals will be interviewed online or face-face, depending on their availability, to explore their perceptions of DHI tools and the prototype.



Data Analysis

Qualitative Analysis

Interview responses from Health Care Professional are organized in Microsoft Word for thematic analysis and cross-referencing of participant responses.



Data Analysis

Quantitative Analysis of Questionnaire responses

- Data visualisation was done using Excel (Bar graph and Pie chart)
- Descriptive statistic analysis done using SPSS (Pearson's Correlation, Cronbach's Alpha reliability and standard deviation).

Qualitative Analysis of Interview responses

- Thematic analysis was done on interviews to identify factors relating to the acceptability of DHI for hypertension management

Ethical Considerations

Anonymity

Participants' privacy is protected through anonymity; no personal identifiers are collected.

Informed Consent Form

Participants agreed to the conditions of the consent form, which outlined the study's objectives and the intended use of their data.

Data Protection

Similarly, all information gathered through questionnaires will be securely stored on an encrypted Microsoft Onedrive, with access restricted to the researchers and the supervisor.

Methodological Limitations

Convenience Sampling Method

The reliance on convenience snowball sampling within a predominantly STEM population may introduce selection bias, limiting the generalizability of the findings beyond sampled population

Low Response Rate

Out of the 100 targeted hypertensive patients and family members, only 52 and 61 completed the questionnaires, respectively. Only 3 out of the intended 5 interviews were done with healthcare professionals.

Variation in procedure

Some participants completed the questionnaire before viewing the prototype while others did the reverse may introduce inconsistency in the responses.

CHAPTER FOUR:

Result and Findings

- Data Collection
- Demographic
- Behavioural Intention
- Data Reliability
- Descriptive Statistics
- Pairwise Correlation
- Thematic analysis of Health Care Professional Interview



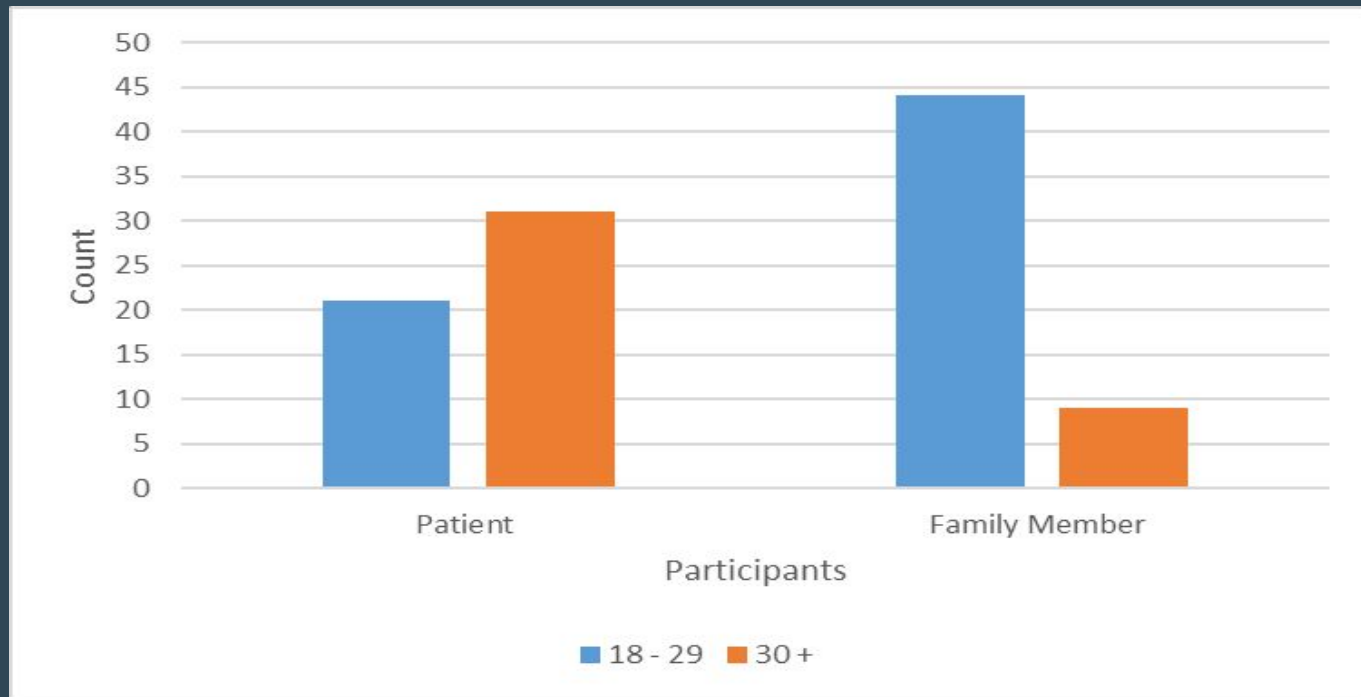
Data Collection

Ethics approval received in mid-March. Results of 3 weeks of data collection:

- **All participants were required to view a prototype demonstration before completing their surveys.**
- **Number of Participants:**
 - **52 Patients out of the targeted 100**
 - **61 Family Member out of the targeted 100**
- **3 planned interviews with healthcare professionals out of the targeted 5.**

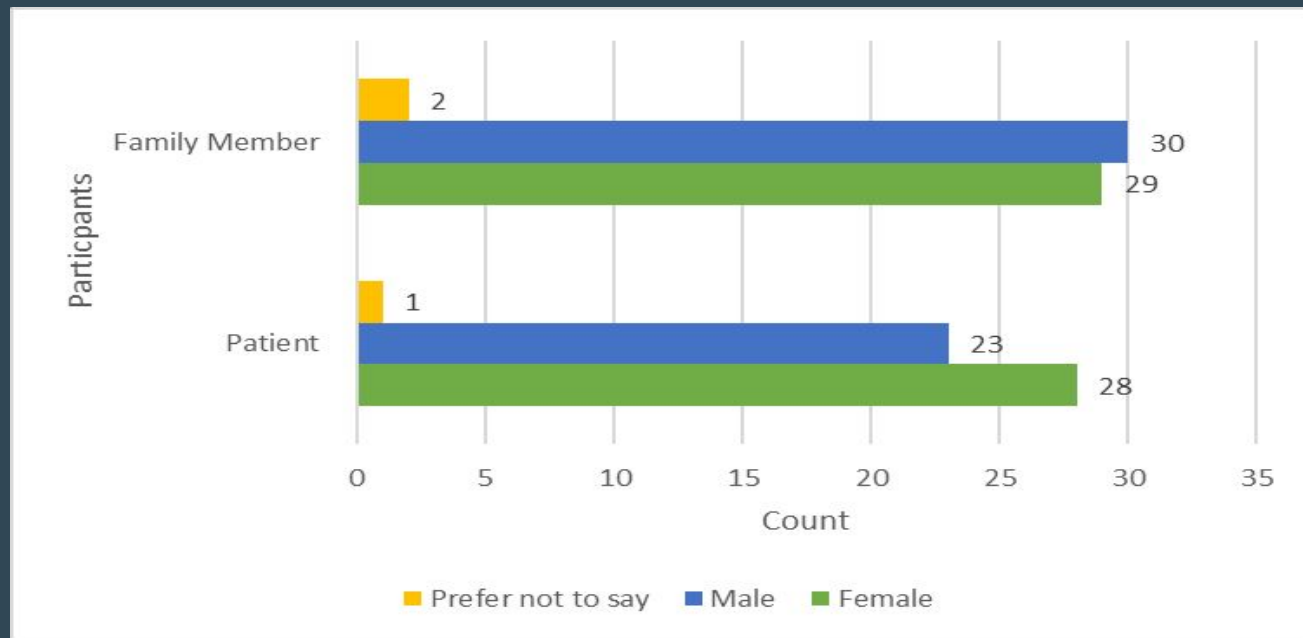
Demographic Information

- The Age Distribution of the Patient and Family Member Participants*



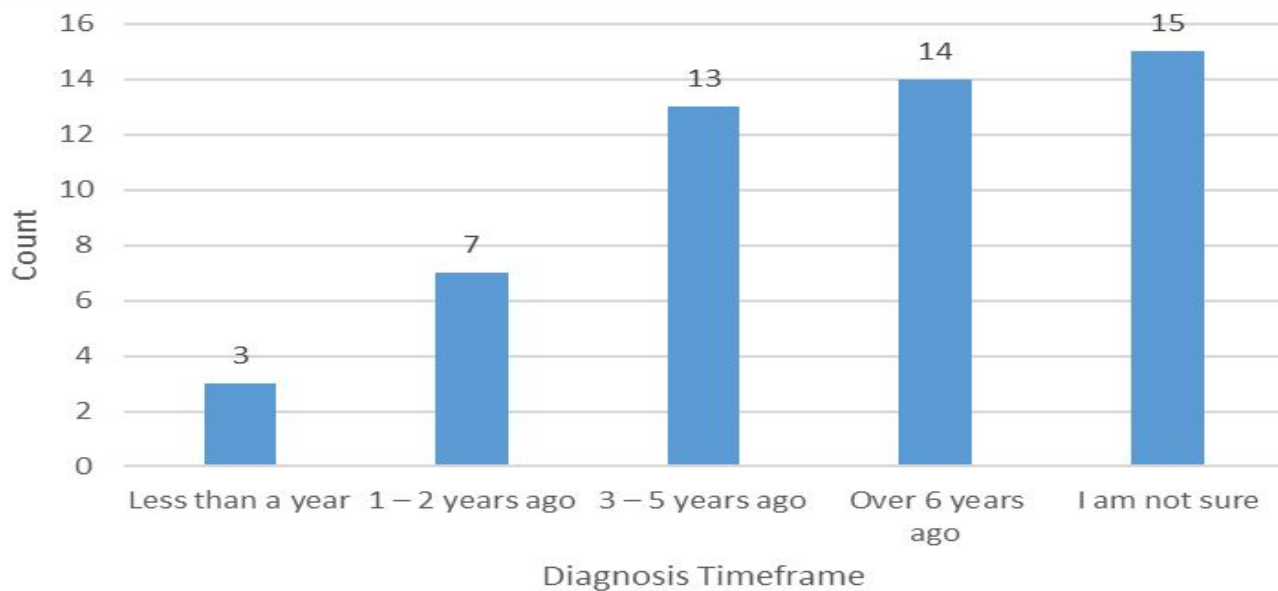
Demographic Information

- The Gender Distribution of the Patient and Family Member Participants*



Demographic Information

- The Diagnosis Timeframe Distribution of the Patient Participants*



Demographic Information

- *The academic backgrounds of patients and their family members*

	<i>STEM</i>	<i>Non-STEM</i>	<i>Did not say</i>	<i>Total</i>
<i>Patient</i>	19	19	14	52
<i>Family Member</i>	47	14	0	61

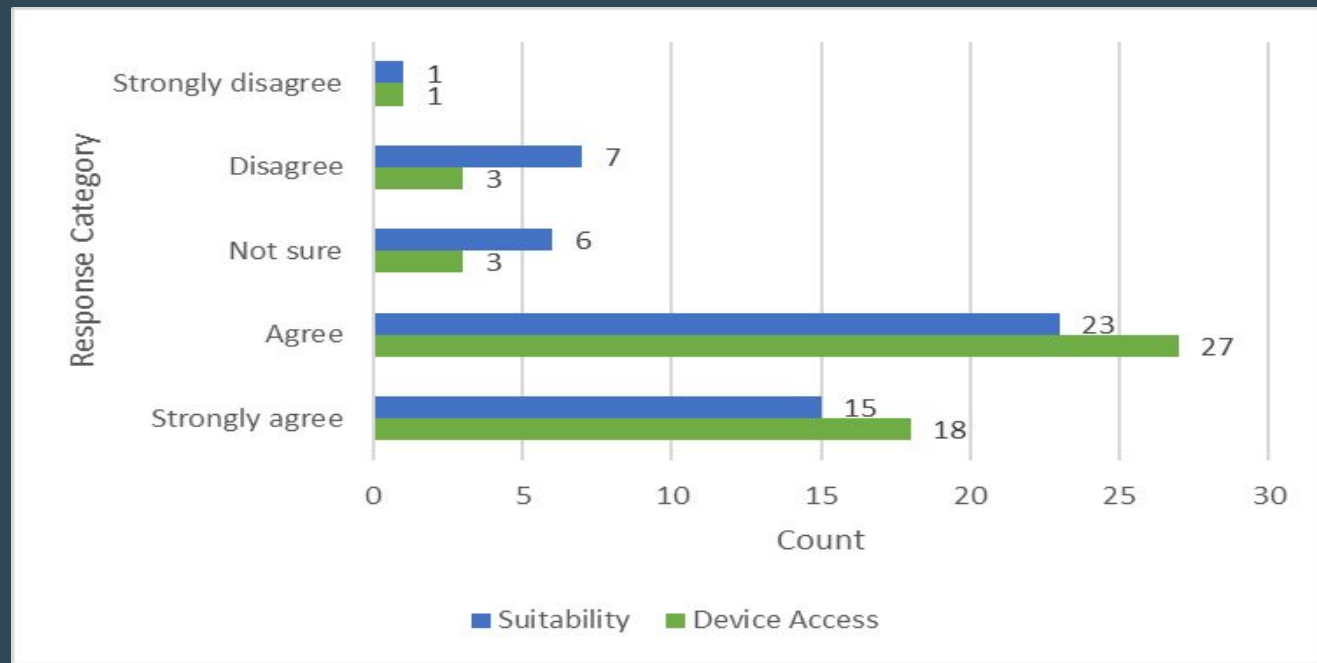
Behavioral Intention

- Patient and Family Member Intention to Use Digital Tools for Hypertension Management*

Behavioral Intention Category	Patients (n = 52)	Family Members (n = 61)
Initial Intent to Use (Intend to use/continue using)	39 Agree/Strongly Agree (75%) 11 Not Sure (21%) 2 Disagree (4%)	52 Agree/Strongly Agree (85%) 7 Not Sure (11%) 2 Disagree (3%)
Consistent Daily Use (Will always try to use)	32 Agree/Strongly Agree (61.5%) 17 Not Sure (33%) 3 Disagree (5.5%)	48 Agree/Strongly Agree (79%) 11 Not Sure (18%) 2 Disagree (3%)
Planned Regular Use (Plan to continue regular use)	37 Agree/Strongly Agree (71%) 13 Not Sure (25%) 2 Disagree (4%)	41 Agree/Strongly Agree (67%) 19 Not Sure (31%) 1 Disagree (2%)

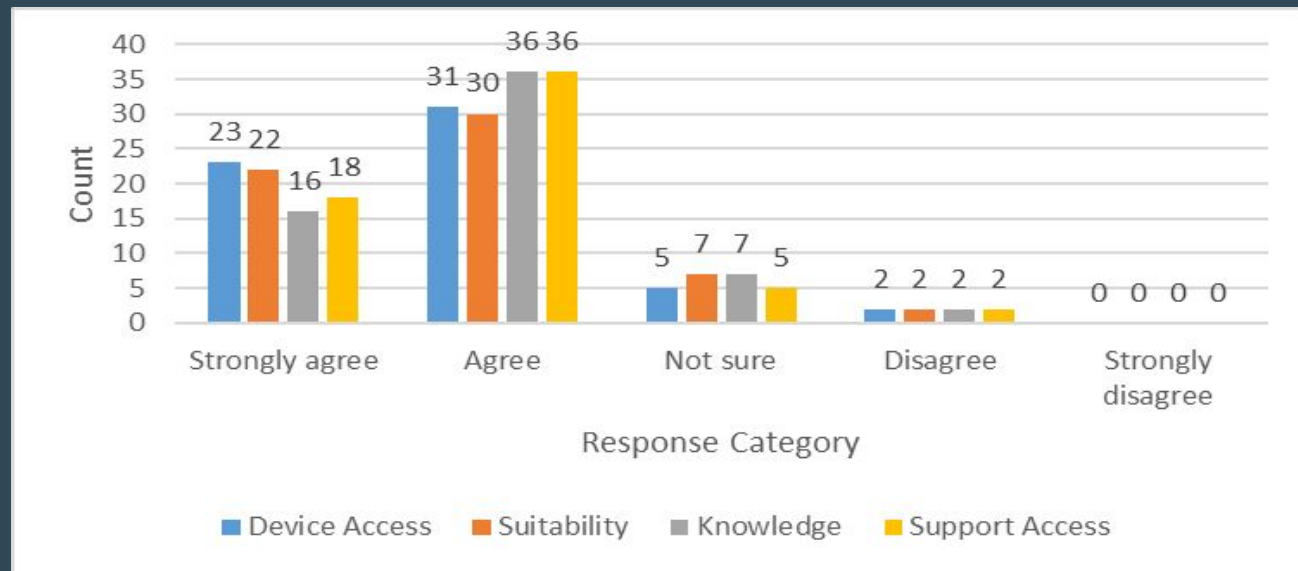
Facilitating Conditions

- Facilitating Conditions Response Summary Among Patients.



Facilitating Conditions

- Facilitating Conditions Response Summary Among Family Members.



Thematic analysis of Health Care Professional Interview

Theme 1 : Positive Perceptions of Digital Health Tool Acceptance

- Health Care Professionals (HCPs) express enthusiasm for digital tools' ability to enable timely intervention, a significant advantage over current paper-based methods that require patients to manually record readings and bring them to appointments for analysis.
- They also appreciate that digital tools facilitate more direct and immediate contact with patients, enabling quicker responses when blood pressure issues arise.

Thematic analysis of Health Care Professional Interview

Theme 2 : Experience and Usage of Digital Tools

Limited Direct Experience: HCPs generally reported limited direct experience using digital tools specifically for managing hypertension, indicating it's a relatively new area in their practice.

Thematic analysis of Health Care Professional Interview

Theme 3 : Barriers to Patient Adoption

- **Age-Related Challenges:** HCPs expressed concerns about potential difficulties older patients may face in learning to use digital tools.
- **Cost as a Barrier:** HCPs highlighted that cost and affordability are significant factors that can impede patient adoption of digital tools.
- **Trust and Privacy:** Some HCPs noted that certain patients are hesitant about their information going outside the medical center and prefer paper-based records, while others suggested that patients might be willing to share data if they perceive a benefit.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

- Conclusion
- Recommendation



Conclusion

- There is a positive acceptance of a DHI for blood pressure monitoring for hypertensive patients, family members and health care professionals.
- The factors that predict Behavioural Intention for the family members are : Behavior Expectancy, Use Behaviour, Performance Expectancy, Effort Expectancy and Social Influence.
- The factors that predict Use Behaviour for the family members are : Performance Expectancy and Facilitating conditions.

Conclusion

- The factors that predict Behavioural Intention for the hypertensive patients are : Behavioural Expectation, Performance Expectancy and Effort Expectancy.
- The factors that predict Use Behaviour for hypertensive patients are : Effort Expectancy, Hedonic motivation and Habit
- Family members largely report having access to suitable devices (89% agreeing/strongly agreeing) and feel confident in their ability to assist with digital tools (85% agreeing/strongly agreeing).
- Similarly, most patients indicate they possess a suitable device (86.5% agreeing/strongly agreeing), suggesting a solid base for digital engagement.

Conclusion

- DHIs are more likely to be accepted if they integrate easily into the HCP's existing workflow and align with their professional responsibilities.

Recommendations

- Involve patients, family and Health Care Professional in DHI design and testing.
- Conduct future research that evaluates the effectiveness of the DHI for managing hypertension in the Jamaican context

Live Demo

HypMonitor 

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[Record BP](#)

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**Empowering
Patients, Families,
and Healthcare
Providers to Manage
Hypertension
Together**

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 Dia_Pot15 

Track your blood pressure

Please enter today's readings

Systolic (mmHg)

Diastolic (mmHg)

Pulse / Heart Rate (BPM)

Date



Time



Confirm Reading

Cancel

Live Demo

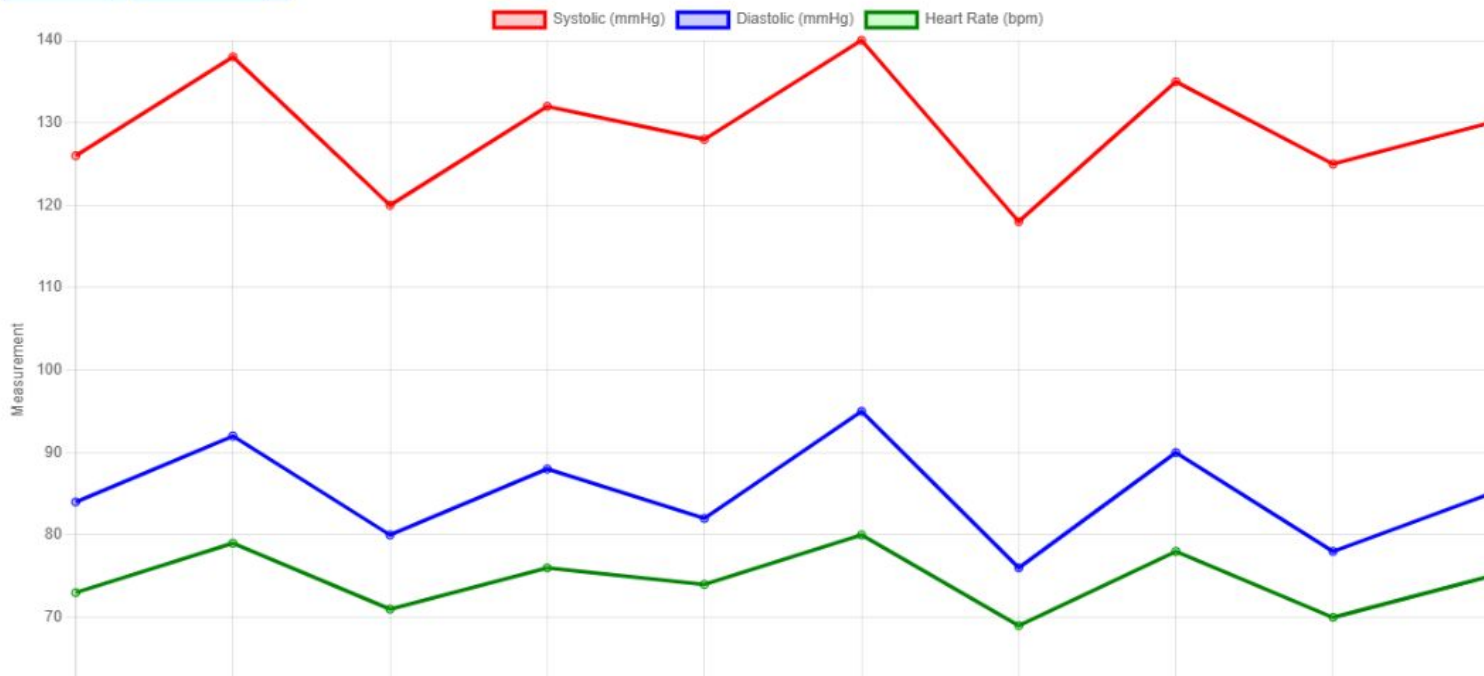
Blood Pressure Info

Number of Records to Display

Go

Next Readings

Previous Readings



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Thank You For Listening!

Any Questions?



Extras

Why we didn't use the Price as a factor in UTAUT 2

- UTAUT2 includes price value as a seventh predictor of use intention. However, we chose not to include it in our model, as most widely used mHealth apps are offered free of charge, making cost a less relevant factor in this context (Schomakers et al., 2021b).

Demographic Information

- *Background Information on Interviewed Health Care Professionals*

<i>HCP</i>	<i>Gender</i>	<i>Years of Experience</i>	<i>Specialty</i>
#1	Male	38	General Practice
#2	Female	30+	General Medicine
#3	Male	15	Primary Care

Data Reliability Patient

Variables	Number of Items	Alpha
E	1	---
BI	3	.815
UB	2	.848
BE	3	.772
PC	9	.865
PE	3	.753
EE	4	.906
SI	3	.863
FC	2	.803
HM	3	.795
Ha	3	.549
PT	5	.850

Note: E1 = Experience, Behavioral Intention = BI, Behavioural Expectations = BE, Use Behavioural = UB, Privacy Concerns = PC, Perceived Surveillance = PS, Perceived Intrusion = PI, Secondary Use of Personal Information = SUPI, Performance Expectancy = PE, Effort Expectancy = EE, Social Influence = SI, Facilitating Conditions = FC, Hedonic Motivation = HM, Habit = Ha, and Perceived Trust = PT.

Descriptive Statistics Patient

Variables	Number of Items	min	max	mean	Std. deviation
E	1	1	5	3.73	1.031
BI	3	1	5	3.8269	.68118
UB	2	1	5	3.2019	1.09929
BE	3	1	5	3.9231	.58529
PC	9	1	5	3.5342	.66994
PE	3	1	5	3.9103	.74715
EE	4	1	5	3.7596	.88279
SI	3	1	5	3.6026	.85568
FC	2	1	5	3.9808	.89641
HM	3	1	5	3.4264	.76402
Ha	3	1	5	3.2597	.72948
PT	5	1	5	3.6651	.68134

Note: E1 = Experience, Behavioral Intention = BI, Behavioural Expectations = BE, Use Behavioural = UB, Privacy Concerns = PC, Perceived Surveillance = PS, Perceived Intrusion = PI, Secondary Use of Personal Information = SUPI, Performance Expectancy = PE, Effort Expectancy = EE, Social Influence = SI, Facilitating Conditions = FC, Hedonic Motivation = HM, Habit = Ha, and Perceived Trust = PT.

Note. 1 = Strongly disagree, 2 = Disagree, 3 = Not sure, 4 = Agree, 5 = Strongly agree.

Pairwise correlation - Patients

	BI	UB	BE	PC	PE	EE	SI	FC	HM	Ha	PT	E1
BI	1											
UB	0.244	1										
BE	.551**	0.248	1									
PC	-0.015	0.120	0.194	1								
PE	.427**	0.102	.373**	0.167	1							
EE	.394**	.377**	0.166	0.265	.586**	1						
SI	0.160	.285*	0.168	0.148	.369**	.369**	1					
FC	.353*	0.173	.327*	0.139	.612**	.601**	.433**	1				
HM	-0.035	.501**	0.014	-0.052	0.138	0.294	0.106	0.063	1			
Ha	0.245	.514**	0.005	-0.221	0.025	.448**	0.225	0.144	.487**	1		
PT	.346*	0.285	0.301	-0.284	0.101	0.225	0.206	0.293	0.162	.385*	1	
E1	0.249	0.006	0.214	0.007	.273*	.304*	-0.094	0.185	-0.008	0.169	0.086	1
**. Correlation is significant at the 0.01 level (2-tailed).												
*. Correlation is significant at the 0.05 level (2-tailed).												

Note: E1 = Experience, Behavioral Intention = BI, Behavioural Expectations = BE, Use Behavioural = UB, Privacy Concerns = PC, Perceived Surveillance = PS, Perceived Intrusion = PI, Secondary Use of Personal Information = SUPI, Performance Expectancy = PE, Effort Expectancy = EE, Social Influence = SI, Facilitating Conditions = FC, Hedonic Motivation = HM, Habit = Ha, and Perceived Trust = PT.

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed)

Data Reliability Family Members

Variables	Number of Items	Alpha
BI	3	.733
BE	3	.781
PC	9	.833
PE	3	.785
EE	4	.849
SI	3	.861
FC	4	.816
HM	3	.87
Ha	3	.776
PT	5	.774

Note:, Behavioral Intention = FBI,
Behavioural Expectations = FBE, Use
Behavioural = FUB, Privacy Concerns =
PC_All, Performance Expectancy = PE,
Effort Expectancy = EE, Social Influence
= SI, Facilitating Conditions = FC,
Hedonic Motivation = HM, Habit = Ha,
and Perceived Trust = PT.

Descriptive Statistics - Family

Variables	Number of Items	Min	Max	Mean	Std. Deviation
BI	3	1	5	3.9454	0.63005
BE	3	1	5	3.9180	0.69829
PC	9	1	5	3.4408	0.78389
PE	3	1	5	4.0929	0.5097
EE	4	1	5	4.1270	0.61850
SI	3	1	5	3.6011	0.69341
FC	4	1	5	4.1598	0.58636
HM	3	1	5	3.3399	0.79019
Ha	3	1	5	3.2876	0.82763
PT	5	1	5	3.8657	0.57797
UB	1	1	5	3.8361	0.91616

Note. 1 = Strongly disagree, 2 = Disagree, 3 = Not sure, 4 = Agree, 5 = Strongly agree.

Note., Behavioral Intention = FBI,
Behavioural Expectations = FBE, Use
Behavioural = FUB, Privacy Concerns =
PC_All, Performance Expectancy = PE,
Effort Expectancy = EE, Social Influence
= SI, Facilitating Conditions = FC,
Hedonic Motivation = HM, Habit = Ha,
and Perceived Trust = PT.

Pairwise correlation - Family

	FBI	FBE	FUB	PC_All	PE	EE	SI	FC	HM	Habit	PT
FBI	1										
FBE	.709**	1									
FUB	.331**	.439**	1								
PC_All	-0.066	-0.083	0.020	1							
PE	.480**	.590**	.447**	-0.041	1						
EE	.446**	.542**	.309*	-0.121	.577**	1					
SI	.399**	.555**	.298*	-0.035	.333**	.311*	1				
FC	0.171	.392**	.344**	0.016	.343**	.592**	0.231	1			
HM	0.120	0.198	0.047	-0.063	0.236	.318*	.472**	0.057	1		
Habit	.339*	.400**	0.217	-0.179	0.192	0.178	.528**	0.080	.589**	1	
PT	.350*	.490**	0.117	-.390**	.536**	.483**	.453**	0.206	.444**	.362**	1

Note:, Behavioral Intention = FBI,
 Behavioural Expectations = FBE, Use
 Behavioural = FUB, Privacy Concerns =
 PC_All, Performance Expectancy = PE,
 Effort Expectancy = EE, Social Influence
 = SI, Facilitating Conditions = FC,
 Hedonic Motivation = HM, Habit = Ha,
 and Perceived Trust = PT.

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed)