

Health Storylines Mobile Application and Self-management among Chronically Ill Patients: A Quasi-experimental Research Design

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ABSTRACT

Background. Self-management is crucial for individuals with chronic illnesses. While mobile applications (mAPPs) have emerged to support diverse health needs, evidence regarding their efficacy for self-management among chronically ill Filipino patients is inconsistent and limited, particularly in provincial settings.

Objective. To investigate the effectiveness of the Health Storylines mAPP compared to a traditional pamphlet for enhancing self-management among individuals with chronic illnesses in Baguio City, Philippines.

Methods. We conducted a two-arm quasi-experimental study with 33 participants diagnosed with cancer, type 2 diabetes, or heart disease/hypertension. Participants were recruited via convenience sampling and allocated to an intervention group (n=17), which used the Health Storylines mAPP for four weeks, or a comparison group (n=16), which received a traditional pamphlet. Self-management was assessed pre- and post-intervention using the Self-Management Assessment Scale (SMASc).

Results. Participants demonstrated a high level of self-management at baseline ($\mu=5.20$, $SD=0.70$). After four weeks, the intervention group showed a non-significant decrease in self-management scores (from $\mu=5.25$ to 5.00, $p=0.27$), while the comparison group exhibited a non-significant increase (from $\mu=5.19$ to 5.37, $p=0.61$). There was no statistically significant difference in post-test self-management scores between the two groups ($U=83.50$, $p=0.23$).

Conclusion. In a population of chronically ill patients already proficient in managing their condition, the Health Storylines mAPP had a marginal impact on self-management, while the use of a traditional pamphlet showed a slight positive effect. The findings suggest that for this population, familiar, low-barrier resources remain valuable, and mHealth interventions must account for baseline self-management capabilities and digital literacy. Chronic Illness; Health Storylines mAPP; Self-management; mHealth; Philippines.

Keywords: chronic illness, Health Storylines mAPP, mHealth, self-management, telemedicine



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INTRODUCTION

Chronic illnesses, such as hypertension, heart disease, diabetes, and cancer, represent a significant and growing public health challenge, now standing as leading causes of mortality worldwide.¹ In the Philippines, this global trend is mirrored, with non-communicable diseases (NCDs) accounting for a substantial burden of disease.^{2,3} While these illnesses differ in their clinical management—ranging from chemotherapy for cancer to daily injections for diabetes or lifestyle adjustments for hypertension—they are unified by their chronic nature, demanding continuous monitoring and patient engagement for effective control.⁴ This variance in complexity underscores the need for individualized approaches to foster patient self-management.

In response, mobile health (mHealth) has emerged as a promising strategy. Globally, mobile applications (mAPPs) are increasingly used to help patients manage their conditions by tracking symptoms, providing medication reminders, and offering educational resources.⁵ These digital tools can powerfully complement traditional support systems, particularly the family-centric care model prevalent in the Philippines.² When family members are digitally literate and actively participate in care, an mAPP can serve as a crucial organizational tool, reinforcing self-management tasks for both the patient and their caregivers.

However, the evidence for the efficacy of mAPPs is not universally consistent, and adoption varies significantly, particularly in the local context. In the Philippines, while eHealth initiatives are developing, they face challenges such as a lack of coordinated strategies, variable digital literacy, and patient preferences for traditional care methods.⁶⁻⁸ Previous local studies have explored the potential of digital tools, for instance, showing that a custom app could improve self-care for diabetic patients in an urban setting.⁹ To better understand the potential mechanisms of such interventions, our study is framed by the Health Belief Model (HBM). The HBM posits that an individual's engagement in health-promoting behavior is influenced by their perceptions of the illness, the benefits of taking action, and the barriers to that action.¹⁰ An mAPP like Health Storylines is designed to target these constructs; for example, its features can act as cues to action and enhance self-efficacy. Yet, there remains a critical research gap concerning the real-world impact of such mAPPs within provincial communities. Our study aims to fill this gap by investigating the effectiveness of a general self-management mAPP in a provincial Philippine setting, providing a stronger context for its potential role in local healthcare.

Objectives

This research study aimed to determine the level of self-management of chronically ill patients before and after four weeks of utilizing the Health Storylines mAPP. Additionally, the study aimed to compare the levels of self-management between the usage of the mAPP and traditional pamphlet.

Health Storylines App Introduction

Health Storylines is a free mobile self-care software that makes it easy for users and caregivers to understand, keep track of, and manage their medical conditions. The mAPP was developed by Self Care Catalysts Inc. and released in 2017, now acquired by Alira Health. It has over 60 configurable tools such as a medication reminder, symptom tracker, daily mood tracker, personal journal, and daily vitals tracker. These features also help generate more accurate information that they can share with their healthcare providers, relatives, and researchers through the mAPP's 'Circle' feature. Health Storylines utilizes Self Care Catalysts cloud storage to keep or collect the User-Provided Information and Automatically Collected Data. All information will be processed and stored under the Philippines' Data Privacy standards.

Technological competency as caring in nursing (TCCN), authored by the eminent nurse scientist Rozanno Locsin, is the most appropriate theory to be used in the study.¹¹ The reasons are: (1) TCCN explains that knowledge and skills in the use of technology facilitate health attainment; (2) TCCN explains that integrating technology in health is an integral part of human lives in the 21st century; (3) TCCN emphasizes the relevance of providing whole person-centered care; and (4) TCCN acknowledges the availability of sophisticated technology such as smartphones wherein participants can record, manage, and update information utilizing the Health Storylines mAPP.

METHODS

Research Design

We used a two-arm quasi-experimental research design. This design has two groups: the intervention group, who used the Health Storylines mAPP, and the comparison group, who received a pamphlet that served as a placebo. The study received ethical approval from the Saint Louis University Research Ethics Committee (SLU-REC UG-2023-047). A deviation report was sent to the REC on March 16, 2023, to document revisions to the initial study design, specifically concerning the sample size, age inclusion criteria, and sampling technique.

Locale and Population

The study involved 33 individuals aged 18 and above with chronic illnesses in three barangays of Baguio City, Philippines. Recruitment occurred between February 13 and February 24, 2023, with the four-week follow-up period concluding by March 24, 2023. The sample size was determined based on the feasibility and exploratory nature of this quasi-experimental pilot study. While a formal *a priori* power analysis would necessitate a larger sample to detect a small to medium effect size, our sample sizes (n=17 for the intervention group; n=16 for the comparison group) are consistent with recommendations for pilot studies, which suggest a minimum of 12 participants per group to reliably

estimate key parameters for a future, larger trial.¹² Participants were recruited using convenience non-random sampling. Eligibility was extended to individuals diagnosed with hypertension, type 2 diabetes, or heart disease within the past 6 months. These conditions were selected as they represent some of the most prevalent non-communicable diseases in the Philippines, thus ensuring the relevance of our findings to the local public health context.^{2,3} Further inclusion criteria required participants to own a smartphone with internet access and be literate in English.

Intervention and Data Gathering Procedure

We obtained approval from the SLU Research Ethics Committee and requested permission from the City Health Officer to conduct the study in the three randomly selected health centers of Baguio City. After obtaining approval, a letter of request was sent to physicians in each health center through the assigned public health nurse. In two barangays, house-to-house visits were conducted to recruit participants from a list of chronically ill patients provided by the barangay health centers. In one barangay, researchers participated in monthly club health meetings to identify potential participants. Verbal consent was obtained from individuals, and any concerns or questions were addressed before written consent was obtained prior to participation.

Once consent was secured, pre-test questionnaires were administered to determine the initial level of self-management in both the intervention and comparison groups. For the intervention group, researchers assisted in installing the Health Storylines mAPP on participants' smartphones and created user accounts. Participants were instructed on using the mAPP's features for medication tracking, mood monitoring, vital sign recording, and journaling. Consent was obtained to add the researchers as a circle of support in the participants' accounts, allowing the researchers to monitor the patient remotely. For the comparison group, pamphlets were given and explained after their consent was obtained and pre-test questionnaires were administered. Assistance or concerns asked by the participants were entertained and thoroughly addressed by the researchers.

We then sent a general reminder through the mAPP's chat feature every Tuesday at 8 AM to inform the intervention group that an mAPP had been downloaded to their smartphones and to highlight its health-monitoring features. After the 4-week intervention, the researchers contacted participants from both groups to set a schedule for the administration of the post-test questionnaires at each participant's preferred meeting area. We then administered the post-test questionnaires, which were collected and interpreted from both groups.

The flow of participants through the study is detailed in Figure 1, following the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) guidelines.¹³ We initially assessed 45 individuals for eligibility. Of these, 12 were excluded (8 did not meet inclusion criteria, 4 declined

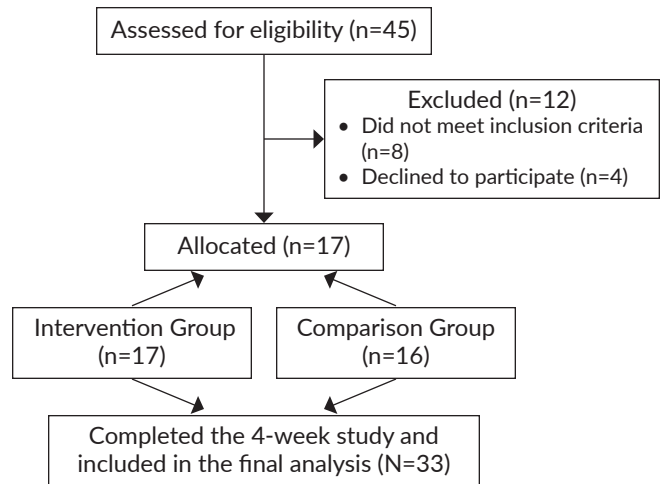


Figure 1. TREND flow diagram of participant progression.

to participate). The remaining 33 participants were allocated to either the intervention group (n=17) or the comparison group (n=16). All 33 participants completed the 4-week study and were included in the final analysis.

The researchers initially planned to use a randomized sampling technique for participant selection. However, significant practical challenges encountered during the recruitment phase necessitated a shift in methodology, a change that was formally documented in a deviation report submitted to the Research Ethics Committee.

Due to logistical constraints and to maximize ecological validity, a convenience sampling approach was adopted. The "Limitations" section of the study further details these recruitment barriers, which included potential participants having busy schedules, lacking smartphones, or expressing reluctance to install a new application. These factors made adhering to a strict random sampling protocol, which would require tracking down and securing the participation of specific individuals, highly impractical.

As a more pragmatic alternative, the researchers adopted a convenience non-random sampling technique. This method allowed the research team to recruit individuals who were readily accessible and met the inclusion criteria. The recruitment process involved two main strategies: Approaching patients directly at the barangay health centers while they were present for consultations or their monthly club meetings. Conducting house-to-house visits to find other eligible residents who were available and willing to participate in the study. By using convenience sampling, the researchers could more efficiently build their sample size despite the recruitment challenges, selecting participants based on their availability and willingness to join the study at the time of contact.

Data Gathering Tools

We used the Self-Management Assessment Scale (SMASc) to analyze how well the mAPP software works

for people with chronic conditions. SMASc is a ten-item screening tool that identifies potential barriers and strengthening factors that support self-management. It was validated through development and psychometric testing, which showed the scale had a high reliability with a Cronbach's alpha of 0.925, an adequate Content Validity Index (CVI) of 0.89, and an acceptable goodness-of-fit with a Chi-square of 1.84.¹⁴ For the current study, the instrument's reliability was confirmed with a Cronbach's α of 0.830.

Data Management and Analysis

We analyzed the collected data using Jamovi 2.3.18 software.¹⁵ We used descriptive statistics (mean, standard deviation) to summarize baseline demographic and clinical characteristics. To evaluate changes within each group from pre-test to post-test, we performed paired t-tests. The primary analysis to compare post-intervention self-management scores between the intervention and comparison groups was conducted using the Mann-Whitney U-test, which is appropriate for non-normally distributed data or small sample sizes. Fisher's exact test was used for analyzing categorical baseline variables to confirm group comparability.

Ethical Considerations

We followed the ethical guidelines set by the Philippine Health Research Ethics Board.¹⁶ The study received ethical approval from the Saint Louis University Research Ethics Committee (SLU-REC UG-2023-047). Permission to utilize the Health Storylines application for this research was granted by its developers, Alira Health, prior to conducting the study. No conflicts of interest were identified. Personal data collected adhered to the Data Privacy Act of 2012, with security measures in place.

RESULTS

User Statistics

The baseline demographic and clinical characteristics of the participants are presented in Table 1. The mean age of participants was approximately 58 years, and the majority in both groups were female (76.5% in the intervention group and 68.8% in the comparison group). Hypertension/Heart Disease was the most prevalent chronic illness reported. The two groups were broadly similar across these characteristics, and no statistically significant differences were found at baseline.

Evaluation Outcomes

Table 2 details the initial level of self-management across all participants. The results indicate a strong baseline competency, with a total mean score of 5.20 (SD=0.70), interpreted as "Always manages own condition." Participants reported the highest levels of capability in knowing how to handle their illness daily ($\mu=5.48$, SD=1.03) and in finding good daily routines despite their condition ($\mu=5.39$, SD=0.86).

Table 1. Demographics of the Participants

Variable	Label	Total
Age (years)	18-29	1
	30-39	1
	40-49	7
	50-59	8
	60 and above	16
Type of chronic illness	Hypertension/Heart Disease	23
	Cancer	1
	Diabetes	8
	Stroke	1
Follow up visits	Yes	23
	No	10
Support System	Yes	29
	No	3

While most aspects of self-management were rated highly, participants felt least satisfied with their overall situation ($\mu=4.67$, SD=1.34), which was the only domain to fall into the "Frequently manages own condition" category.

Table 3 presents the changes in self-management scores for the intervention group before and after the four-week period of using the mAPP. Overall, there was a slight, non-statistically significant decrease in the total self-management score from a mean of 5.25 to 5.00 ($p=0.27$). While most individual items showed a minor decrease, two aspects related to support—"Have support to make self-management work" and "Good social support"—exhibited a slight increase. Notably, the largest decrease was observed in the participants' satisfaction with their situation, which dropped from a mean of 4.75 to 3.94. The observed decline in satisfaction within the mAPP group suggests that the burden of monitoring may outweigh the perceived benefits for some patients, leading to technostress rather than empowerment. While the statistical significance is marginal ($p=0.09$), this 0.8-point drop is clinically relevant. However, none of the observed changes within the intervention group were statistically significant.

The comparison group, which received a pamphlet, showed a non-significant increase in overall self-management, with the mean score rising from 5.19 to 5.37 ($p=0.61$), as detailed in Table 4. Five of the ten self-management aspects showed improvement, with the most notable increase observed in "Good social support," which rose from a mean of 5.00 to 5.86. Other areas of improvement included having support, receiving sufficient information, and feeling satisfied with their situation. However, these positive changes were not statistically significant. When comparing the two groups post-intervention, there was no statistically significant difference in the overall self-management scores between the mAPP group ($\mu=5.00$) and the pamphlet group ($\mu=5.37$), as indicated by a Mann-Whitney U-test ($p=0.23$).

Table 5 shows the final comparison of post-test self-management scores between the two groups. The results indicate no significant difference in the level of self-management

Table 2. Baseline Level of Self-management among Chronically Ill Patients

Self-management	Never	Rarely	Occasionally	Sometimes	Frequently	Always	μ	SD	Interpretation	
1. Know how to handle the illness in daily life	1 (3.0%)	0	0	3 (9.1%)	6 (18.2%)	23 (69.7%)	5.48	1.03	Always manages own condition	
2. Find joy in daily life despite illness	0	0	2 (6.1%)	3 (9.1%)	8 (24.2%)	20 (60.6%)	5.39	0.90	Always manages own condition	
3. Found good daily routines	1 (3.0%)	0	0	5 (15.2%)	7 (21.2%)	20 (60.6%)	5.39	0.86	Always manages own condition	
4. Have support to make self-management work	1 (3.0%)	0	1 (3.0%)	4 (12.1%)	8 (24.2%)	19 (57.6%)	5.27	1.13	Always manages own condition	
5. Have concrete plans for future self-management	0	0	0	8 (24.2%)	8 (24.2%)	17 (51.5%)	5.27	0.84	Always manages own condition	
6. Received sufficient amount of information	0	1 (3.0%)	4 (12.1%)	2 (6.1%)	7 (21.2%)	0	5.18	1.18	Always manages own condition	
7. Good social support	1 (3.0%)	1 (3.0%)	4 (12.1%)	1 (3.0%)	5 (15.2%)	21 (63.6%)	5.15	1.39	Frequently manages own condition	
8. Have a plan for how to deal with illness	1 (3.0%)	0	0	7 (21.2%)	10 (30.3%)	15 (45.5%)	5.12	1.08	Frequently manages own condition	
9. Enough knowledge about my condition	0	1 (3.0%)	6 (18.2%)	2 (6.1%)	5 (15.2%)	19 (57.6%)	5.06	1.30	Frequently manages own condition	
10. Feel satisfied with situation	1 (3.0%)	1 (3.0%)	5 (15.2%)	5 (15.2%)	10 (30.3%)	11 (33.3%)	4.67	1.34	Frequently manages own condition	
							Total	5.20	0.70	Always manages own condition

5.17 – 6.00 = Always manages own condition; 4.33 – 5.16 = Frequently manages own condition; 3.50 – 4.32 = Sometimes manages own condition; 2.67 – 3.49 = Occasionally manages own condition; 1.84 – 2.66 = Rarely manages own condition; 1.00 – 1.83 = Never manages own condition

Table 3. Significant Difference in Self-management before and after the Use of the mAPP

Self-management	Pre-test μ	Post- test μ	Direction	Paired t-test	p-value	Interpretation
1. Know how to handle the illness in daily life	5.69	5.25	↓	1.81	0.08	Decrease in mean value. Not statistically significant.
2. Find joy in daily life despite illness	5.25	5.06	↓	1.00	0.33	Decrease in mean value. Not statistically significant.
3. Found good daily routines	5.38	4.94	↓	1.38	0.18	Decrease in mean value. Not statistically significant.
4. Have support to make self-management work	5.25	5.50	↑	-0.80	0.43	Increase in mean value. Not statistically significant.
5. Have concrete plans for future self-management	5.06	4.88	↓	0.89	0.38	Decrease in mean value. Not statistically significant.
6. Received sufficient amount of information	5.38	4.94	↓	1.33	0.20	Decrease in mean value. Not statistically significant.
7. Good social support	5.25	5.38	↑	-0.38	0.70	Increase in mean value. Not statistically significant.
8. Have a plan for how to deal with illness	5.19	4.81	↓	1.10	0.28	Decrease in mean value. Not statistically significant.
9. Enough knowledge about my condition	5.31	5.31	=	0.00	1.00	Equal in mean value. Not statistically significant.
10. Feel satisfied with situation	4.75	3.94	↓	1.77	0.09	Decrease in mean value. Not statistically significant.
Total	5.25	5.00	↓	1.14	0.27	Decrease in mean value. Not statistically significant.

<0.05 = Statistically Significant; >0.05 = Not statistically Significant; ↓ is decrease in mean value; ↑ is increase in mean value; = is equal in mean value; 5.17 – 6.00 = Always manages own condition; 4.33 – 5.16 = Frequently manages own condition; 3.50 – 4.32 = Sometimes manages own condition; 2.67 – 3.49 = Occasionally manages own condition; 1.84 – 2.66 = Rarely manages own condition; 1.00 – 1.83 = Never manages own condition

Table 4. Significant Differences in Self-management before and after the Use of Pamphlet

Self-Management	Pre-test mean	Post-test mean	Direction	Paired t-test	p-value	Interpretation
1. Know how to handle the illness in daily life	5.29	5.30	↑	-0.23	0.89	Increase in mean value. Not statistically Significant.
2. Find joy in daily life despite illness	5.50	5.43	↓	0.15	0.87	Decrease in mean value. Not statistically Significant.
3. Found good daily routines	5.50	5.29	↓	0.50	0.62	Decrease in mean value. Not statistically Significant.
4. Have support to make self-management work	5.21	5.57	↑	-0.64	0.52	Increase in mean value. Not statistically Significant.
5. Have concrete plans for future self-management	5.64	5.43	↓	0.64	0.53	Decrease in mean value. Not statistically Significant.
6. Received sufficient amount of information	5.14	5.50	↑	-1.09	0.29	Increase in mean value. Not statistically Significant.
7. Good social support	5.00	5.86	↑	-1.88	0.08	Increase in mean value. Not statistically Significant.
8. Have a plan for how to deal with illness	5.00	5.00	=	0.01	1.00	Equal in mean value. Not statistically Significant.
9. Enough knowledge about my condition	5.07	5.00	↓	0.14	0.89	Decrease in mean value. Not statistically Significant.
10. Feel satisfied with situation	4.57	5.29	↑	-1.07	0.30	Increase in mean value. Not statistically Significant.
Total	5.19	5.37	↑	-0.52	0.61	Increase in mean value. Not statistically Significant.

<0.05 = Statistically Significant; >0.05 = Not statistically Significant; ↓ is decrease in mean value; ↑ is increase in mean value; = is equal in mean value; 5.17 - 6.00 = Always manages own condition; 4.33 - 5.16 = Frequently manages own condition; 3.50 - 4.32 = Sometimes manages own condition; 2.67 - 3.49 = Occasionally manages own condition; 1.84 - 2.66 = Rarely manages own condition; 1.00 - 1.83 = Never manages own condition

Table 5. Level of Discharge Outcomes between the Intervention Group and Comparison Group during the Posttest

Discharge outcomes	Mean	SD	U	df	sig. (2-tailed)	Interpretation
Self-management (post-test)	Intervention group	5.00	0.80	83.50	28.0	0.23
	Comparison group	5.37	0.92			

<0.05 = Statistically Significant; >0.05 = Not statistically Significant

between the intervention group ($\mu=5.00$, $SD=0.80$) and the comparison group ($\mu=5.37$, $SD=0.92$). A Mann-Whitney U-test confirmed that this difference was not statistically significant ($U=83.50$, $p=0.23$).

An analysis of the changes within each group from pre-test to post-test revealed divergent, though not statistically significant, trends. The intervention group, which utilized the Health Storylines mAPP, demonstrated a slight overall decrease in self-management scores from a mean of 5.25 to 5.00 ($p=0.27$). This included a notable drop in participants' satisfaction with their situation. In contrast, the comparison group, which received an educational pamphlet, showed a slight overall improvement in self-management, with the mean score increasing from 5.19 to 5.37 ($p=0.61$). The most pronounced improvement in this group was seen in the domain of social support.

The primary analysis comparing the two groups' post-intervention scores found no statistically significant difference in the overall level of self-management. The mean post-test score for the mAPP group was 5.00 ($SD=0.80$), while the

pamphlet group had a mean score of 5.37 ($SD=0.92$). A Mann-Whitney U-test confirmed that this difference was not statistically significant ($U=83.50$, $p=0.23$). In summary, while the participants began the study with high self-management capabilities, neither intervention produced a significant change, with the final outcomes between the two groups being statistically comparable.

DISCUSSION

Living with a chronic illness requires a dynamic process of self-management—the activities undertaken to maintain one's life, health, and well-being.^{17,18} Our study's principal finding is that the Health Storylines mAPP had a limited impact on this process, while traditional pamphlets showed a slight positive effect. Interpreted through the Health Belief Model (HBM), these results suggest that for our participants, the perceived barriers to using the mAPP outweighed the perceived benefits.⁹ The most telling result from the mAPP group was the sharp drop in "satisfaction with situation." This

finding suggests a potential psychological burden associated with the intervention. For a population that already felt competent in their self-management, the act of constant digital monitoring may have increased health-related anxiety or made them more critically aware of their condition's burdens, thereby lowering their satisfaction.

Furthermore, the required data entry could have been perceived as a chore that disrupted established, effective routines rather than enhancing them. This friction represents a significant "perceived barrier" within the HBM framework. The technological demands, coupled with a learning curve for a predominantly older population, may have transformed self-management from an integrated part of their lives into a frustrating, daily task.^{19,20} This could explain why an intervention designed to support them paradoxically led to a decrease in their overall satisfaction. In contrast, the pamphlet group showed a notable, though not statistically significant, increase in the domain of "good social support." This aligns strongly with the Filipino cultural context, where older adults often rely on the support of family and friends to cope with illness.²¹ A physical pamphlet is an easily shareable object that can facilitate conversations with caregivers. From an HBM perspective, the pamphlet represents an intervention with very low perceived barriers and serves as a simple, tangible cue to action, reinforcing existing behaviors without requiring new skills.²²

Through these findings, we seek to refine the application of nursing theories such as Technological Competency as Caring in Nursing (TCCN)¹¹ within the digital health landscape. While TCCN posits that technology can facilitate health attainment, our results suggest an important prerequisite: for technology to be a successful medium of care, the patient must possess a baseline level of digital literacy and perceive the tool as more beneficial than their existing methods. Within Locsin's framework, we interpret the observed decrease in satisfaction as an indication that the digital interface may have failed to function as an authentic medium for caring. Specifically, we argue that the app lacked the essential human-to-human connection required to know the patient as a "whole person," which is a cornerstone of the TCCN theory.

Consequently, our study suggests that while technology can support self-management, it remains secondary to the relational aspect of nursing; in this instance, the absence of interpersonal dialogue through the app may have led to a perceived deficit in care. By highlighting the principle of whole person-centered care, we propose that true patient-centeredness involves acknowledging that a high-tech tool is not always the most caring option. We conclude that in our specific context, providing a simple, low-tech pamphlet may have constituted a more genuinely caring act than imposing a frustrating digital tool, as the former better suited our participants' existing skills, environmental context, and personal preferences.

It is crucial to contextualize these findings within our participants' high baseline self-management scores. For these individuals, integrating a new mAPP may have been perceived as an unnecessary disruption. This highlights a key consideration for mHealth implementation: the intervention must provide a clear and tangible benefit over a user's existing methods. While our results did not show a significant advantage for the mAPP, this does not negate its potential effectiveness in other contexts. For instance, a newly diagnosed patient might find the app's reminders and tracking features invaluable. Indeed, other research shows that combining educational pamphlets with mAPP reminders can enhance medication adherence.^{23,24} Ultimately, our findings suggest that for an mAPP to be effective, it must successfully shift the balance of HBM constructs—increasing perceived benefits and self-efficacy while lowering perceived barriers. Persistent guidance and personalized training are necessary prerequisites for this shift.

Limitations of the Study

A key limitation of our study is the aggregation of various chronic conditions. We acknowledge that each illness presents unique self-management challenges, and this heterogeneity may obscure the true effectiveness of the interventions on any specific condition. We chose this approach as a practical necessity, as stratifying the analysis by each illness would have yielded sample sizes too small for statistically valid conclusions. Further limitations include our use of a convenience non-random sampling method, which restricts generalizability, and a quasi-experimental design that cannot definitively establish causality.

CONCLUSION

In our study of chronically ill patients who were already proficient in self-management, the Health Storylines mAPP did not provide a significant benefit. A traditional pamphlet, however, was associated with a slight positive trend. This suggests that for this population, familiar, low-barrier resources remain valuable and that mHealth implementation must account for high baseline competency and potential technological barriers.

Recommendations

Based on these findings, we propose the following key recommendations:

1. Before implementing mHealth solutions, healthcare providers should assess a patient's existing self-management skills and digital literacy. For patients already managing their condition effectively, a complex digital tool may not be beneficial.
2. To improve adoption, particularly among older adults, mAPP developers must prioritize simple, intuitive interfaces. Features like adjustable font sizes and offline functionality are essential to lower perceived barriers.

3. Future interventions could explore a hybrid model that integrates simple, traditional tools (like pamphlets) with digital support, such as QR codes linking to supplemental online resources.
4. To better establish efficacy, future research should employ randomized controlled trials with longer follow-up periods. Studies should also focus on populations that might benefit most, such as newly diagnosed patients, and include a specific analysis of usability and barriers to adoption.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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