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A Teaching Kitchen Medical Groups Visit with an eHealth Platform for Hypertension and Cardiac Risk Factors: A Qualitative Feasibility Study

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Abstract

Introduction: Our Whole Lives-Hypertension (OWL-H) is an eHealth toolkit for hypertension and cardiac risks factors. It is a hybrid online self-management platform that teaches blood pressure (BP) self-monitoring and evidence-based lifestyle modifications combined with in-person teaching kitchen medical group visit. Qualitative feedback from participants regarding the facilitators and barriers of using OWL-H has been discussed in this article.

Methods: The OWL-H platform was pilot tested in a pre–post trial with two cohorts of participants with hypertension ($N=24$). The online intervention utilized OWL-H for teaching mindfulness meditation, the Dietary Approaches to Stop Hypertension nutrition plan, and evidence-based strategies for lifestyle modifications. Three in-person teaching kitchen medical group visits were held to demonstrate cooking skills to reinforce the online platform. Semi-structured focus group discussions (FGDs) were held after the intervention.

Results: Fourteen of the 24 participants in the trial participated in the FGDs, and 1 participant provided feedback in a solo interview. Major themes that emerged included: (1) participants' request to tailor OWL-H's recipes and meal planning to suit their own dietary needs or preferences, to personalize the Home Practices (e.g., meditation) according to individual preferences (e.g., addition of nature sounds or guided visual imagery); (2) the strengths and weaknesses of OWL-H as a BP self-monitoring tool; (3) the need for community support in managing BP; and (4) participants noted lack of time, work and commute, Internet connectivity, stress, and sickness as obstacles in using OWL-H. Participants described feeling outpaced by the growth of technology and raised concerns of poor Internet connectivity hampering their use of OWL-H.

Conclusion: OWL-H and the accompanying teaching kitchen medical group visit are potential tools to help reduce hypertension and cardiac risk factors. The intervention was found to have acceptability among people with lower income.

Clinical Trials Registration#: NCT03974334.

Keywords: hypertension, low socioeconomic status, technology, teaching kitchen, medical group visit, mindfulness

Introduction

FORTY-FIVE PERCENT of all people in the United States have high Blood Pressure (BP), with three out of our hypertensive adults having poor control.[1] The current main-stay of hypertension treatment includes lifestyle modifications, followed by initiating anti-hypertensive medications.[2] Increasingly, clinical guidelines are also recommending self-management strategies, including Home Blood Pressure Monitoring (HBPM).[3]

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People who have high BP and low socioeconomic status (SES) face greater challenges in controlling their hypertension.[4,5] The SES was found to be a strong determinant of poor hypertension control when compared with counterparts in other socioeconomic strata, even when receiving the same anti-hypertensive medications.[6] Adopting and maintaining lifestyle changes to improve hypertension self-management are more challenging for people from low SES groups due to factors such as food insecurity[7]; high salt diet and lower levels of physical activity[8,9]; chronic psychosocial stress[10–12]; and poor sleep quality.[13–15] Further, a few Electronic Health (eHealth) interventions, which are increasingly being studied for improving hypertension care, are developed with input from low SES patients and thus do not adequately address the barriers they face in hypertension control.[16–18] Thus, there is a clear need for an eHealth intervention that improves self-management of hypertension in low SES patients by teaching practical skills for modifying lifestyle.[19]

This article reports the qualitative findings from the 8-week feasibility pilot of the Teaching Kitchen Medical Group Visit (TKMGV) combined with Our Whole Lives (OWL) eHealth toolkit for Hypertension and cardiac risks factors, a self-management platform that encourages HBPM and teaches skill building on how to use mindfulness meditation,[20–22] dietary sodium reduction, and the Mediterranean and Dietary Approaches to Stop Hypertension (DASH) eating plans.[23,24] The DASH diet emphasizes vegetables, fruits, and low-fat dairy foods—and moderate amounts of whole grains, fish, poultry, and nuts.[23,24]

Our Whole Lives-Hypertension (OWL-H) platform was adapted from OWL eHealth toolkit for chronic pain, which was developed with input from a racially and ethnically diverse group of low-income patients with chronic pain.[25,26] Its curriculum was developed with a biopsychosocial framework for chronic disease and health disparities viewed through Engel's biopsychosocial model.[27]

Methods

Approval for conducting the study and collecting data was obtained from the University of Massachusetts Medical School Institutional Review Board.

Setting

The feasibility trial was conducted at the University of Massachusetts Memorial Health Care (UMMHC), Worcester, MA. Worcester has 20% of its population living below the poverty line.[28]

Study design

The intervention was a pre–post feasibility study that combines: (1) OWL-H (8 weeks); (2) daily HBPM; and (3) three in-person TKMGVs. We conducted focus groups (FGs) after the final TKMGV in each cohort. Results of the qualitative analysis of the data from the FGs are the central focus of this article.

Recruitment and enrollment

Inclusion criteria. Participants' eligibility criteria included: a current diagnosis of hypertension; age 18 and older; daily access to a device with an Internet connection (e.g., smartphone, desktop, laptop); ability to speak, read, and understand English; and capacity to provide informed consent.

Exclusion criteria. Participants' exclusion criteria included: physical comorbidities; cognitive impairments or active psychiatric conditions, including symptoms of psychosis or mania, that would prevent them from participating in the intervention; active substance abuse; current or planned pregnancy; and beginning new hypertension treatments within 2 weeks or planning a major medical procedure within 4 months.

Recruitment and enrollment. Recruitment methods included flyers or referral from health care providers. Potential participants were screened for eligibility by confirming diagnosis of hypertension in Electronic Medical Record (EMR). A current diagnosis of hypertension was confirmed in the patient's EMR. If eligibility was confirmed, the participants consented and were enrolled.

Intervention

OWL-H is hosted on a Health Insurance Portability and Accountability Act compliant server. It is compatible with varied platforms such as iPhone Operating System (iOS) and Android, and it can be navigated on smartphones, tablet devices, laptops, and desktop computers. OWL-H's weekly modules contain information about hypertension and HBPM, the DASH Diet, and low-cost DASH Diet-adherent recipes, stress, sleep, and exercise. Audios and videos for experiential learning of Mindfulness-Based Stress Reduction guided mind–body practices, such as body scans, meditation, and mindful movement, are also included. Detailed description of the content of OWL-H's weekly modules is available in Table 1.

All participants were given Omron-7 Upper Arm Blood Pressure monitors for HBPM. On logging in, OWL-H directs participants to a BP measurement record, where participants enter their BP and pulse readings obtained from home BP monitors once daily (refer to Fig. 1). It also serves as a medication adherence record for any prescribed BP medications. Participants move through the curriculum by: (1) watching the weekly topic video(s) and (2) completing a daily mindfulness practice. Finally, they comment publicly on the Community Board or reflect privately in their Journal.

In-person TKMGVs were held in the UMMHC Center for Applied Nutrition Teaching Kitchen (Fig. 2). A brief description of the TKMGVs is provided here.

At the beginning of every TKMGV, each participant completed an individual medical Check-In-Form and had a one-on-one medical visit with P.G. Then, they returned to the group setting where they were seated in a circle at a round table in a multimedia room adjacent to the teaching kitchen. Each TKMGV was divided into three parts:

1. Didactic and Socratic learning about selected topics.
2. Cooking class; and
3. Continued learning and discussions while enjoying the dinner cooked in the cooking class.

TABLE 1. SUMMARY OF THE OUR WHOLE LIVES AND THE IN-PERSON
TEACHING KITCHEN MEDICAL GROUP VISIT CONTENT

Title of class/session theme or activity

Week 1
  TKMGV 1/micronutrients = building blocks
  Sodium, potassium, and calcium+changing tastes; introduction to fiber; eating more fruits, veggies, herbs, and spices;
    water; knife skills and safety; basic cooking skills
  OWL orientation to our group
  Awareness of breath meditation, ground rules, introduction to mindfulness
  OWL what is hypertension?
  Summary of hypertension, how HTN is measured and treated, and introduction to HTN management lifestyle habits;
    body scan 6 out of 7 days
Week 2
  OWL eat for your health
  Introduction to DASH and Mediterranean eating plans and the healthy plate method
  Eat one meal mindfully, body scan 6 out of 7 days, meditation 6 out of 7 days
Week 3
  Stay active
  Setting SMART movement goals, exercise education, and guidance
  Alternate body scan/mindful movement 6 out of 7 days
Week 4
  TKMGV 2/what do we have with our veggies tonight?
  Fats—saturated, omega 3s; protein (plant based); Traffic light foods, glycemic index, portion control; alcohol and other
    enjoyments; Veggie entrees; What is "mise en place"?
  OWL foods to reduce inflammation and spotlight on healthy fats
  Nonpharmacological approaches to treating inflammation, tips to reduce salt intake and increase healthy fat consumption.
    Alternate body scan or meditation 6 out of 7 days
Week 5
  OWL stress less, live more
  Nonpharmacological approaches to reducing stress
  Alternate body scan, mindful movement, or meditation 6 out of 7 days
Week 6
  OWL sleep, sleep, it is good for your heart
  Nonpharmacological approaches to sleep
  Alternate body scan, mindful movement, loving kindness meditation 6 out of 7 days
Week 7
  Hypertension medications and supplements
  Discussion of HTN medications and side effects, research-supported supplements for HTN
  Alternate body scan, mindful movement, or meditation 6 out of 7 days
Week 8
  Practical ways to eat healthy
  A review of important food groups for HTN patients, tips for grocery shopping and eating out at restaurants, alternate
    body scan, mindful movement, or meditation 6 out of 7 days
  TKMGV 3/cooking "competition"
  Putting it all together; eating out—how to order; meal planning; planning ahead—batch cooking, freezing; shopping
    list—staples for your pantry; budget cooking and shopping; reading nutrition labels

  DASH, dietary approaches to stop hypertension; HTN, hypertension; OWL, Our Whole Lives; SMART goals, Specific, Measurable,
Achievable, Relevant and Time-based; TKMGV, Teaching Kitchen Medical Group Visit.

In each TKMGV, participants self-measured their BP by using the Omron-7 Upper Arm Blood Pressure monitors given to them, providing an avenue for refining technique and troubleshooting in person.

Before each TKMGV, three team stations were set up within the teaching kitchen, placing the relevant recipe printouts, ingredients, and cooking equipment at each station. During the cooking class, participants were divided into three teams and cooked together by following the recipe sheet placed at their respective team stations. L.J.M., a physician with culinary training, facilitated the cooking classes. Table 1 outlines the recipes and the specific topics taught during the TKMGVs. Focus group discussions (FGDs) were held after the last TKMGV. Additional details about the TKMGVs are available in our quantitative paper.

Data collection

Basic demographic information collected included the following: age, sex, race, ethnicity, financial security, food security, and questions on comfort and usage of technology (Table 2).
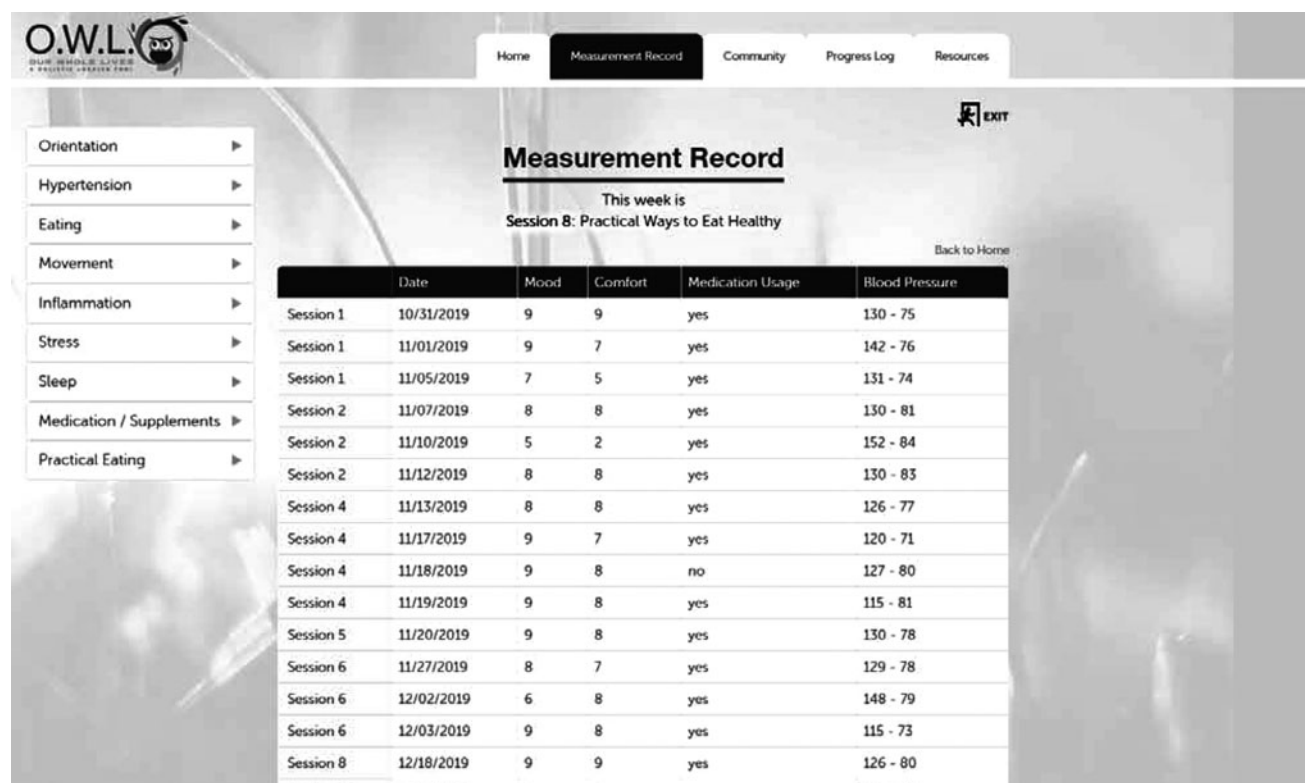
FIG. 1. Image of the OWL platform participant's Measurement record.

Data analysis

P.R. and A.V. independently coded all transcripts, generated new codes by using the modified grounded theory, and reconciled the codes with P.G. Differences were resolved by consensus and transcript review. The FGDs were audio recorded and transcribed by using professional software (NVIVO transcription).

Results

The FG data were obtained from 14 of the 24 participants in the study: 12 participated in the in-person FGs (7 in FG1 and 5 in FG2); 12 did not attend due to inclement weather or illness; and following attempts to reschedule those 12 participants, 2 participants were interviewed individually.

FIG. 2. Teaching kitchen used in the study.

TABLE 2. DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Variables	Baseline (N = 24)
Age (years), mean (SD)	57 (12.1)
Sex, n (%)	
Female	21 (88)
Male	3 (12)
Race, n (%)	
Caucasian/White	16 (67)
Black/African American	3 (13)
Other	2 (8)
Asian/Pacific Islander	1 (4)
More than one race	1 (4)
Prefer not to answer	1 (4)
Hispanic/Latino, n (%)	
No	20 (83)
Yes	4 (17)
Education level, n (%)	
Up to high school diploma/general education development	3 (13)
Some college, no degree	12 (50)
Bachelor's degree or higher	9 (38)
Employment status, n (%)	
Working outside of the home	12 (50)
Unemployed, retired	10 (42)
Student, home maker	2 (8)
Yearly household income, n (%)	
$0–29,999	11 (46)
$30,000 or more	11 (46)
Prefer not to answer	2 (8)

In the past 12 months…	Often true OR sometimes true	Never true
…the food that I bought just didn't last, and I didn't have the money to get more.	7 (29)	17 (71)
… I couldn't afford to eat balanced meals.	8 (33)	16 (67)
… I couldn't afford to buy fresh fruit and vegetables.	9 (38)	15 (63)

Technology use, n (%)	1 Not at all confident	2	3 Somewhat confident	4	5 Extremely confident
I feel confident learning how to use new computer programs.	1 (4.2)	2 (8.3)	5 (20.8)	7 (29.2)	9 (37.5)
I feel confident and relaxed while using a computer.	2 (8.3)	1 (4.2)	3 (12.5)	12 (50)	6 (25)
About how often do you use a computer?	Never	Rarely	Sometimes	Often	Always
	2 (8.3)	2 (8.3)	1 (4.2)	3 (12.5)	16 (66.7)

The average age was 57 years. The majority of participants were female, and 46% had annual household incomes of less than $30,000 US (Table 2).

Findings and themes are elucidated next:

Theme 1: Participants' opinions on OWL-H's customizability and flexibility

Regarding OWL-H's customizability and flexibility (89 comments), three sub-themes emerged: (1) participants' request to tailor OWL-H's recipes and meal planning to suit their own dietary needs or preferences; (2) the request to personalize the mindfulness Home Practices (e.g., meditation) according to individual preferences such as addition of

nature sounds or guided visual imagery; and (3) appreciation for the flexibility to use the online platform seamlessly across different devices.

The majority of participants appreciated the new cooking skills and techniques. Demonstrated recipes were liked by most participants. "I was very satisfied," said one participant, referring to the salads. Participants expressed a willingness to have online cooking classes to follow along at home. They also requested that OWL-H have the ability to track their food intake, an option not available now. They envisioned the visual tracker as a tool that would inform them of the nutrient composition and caloric content of their food. Participants desired OWL-H functions to build a healthy grocery list and support decision making

when dining out, for example, lists of local vegetarian restaurants and low-sodium menu options.

Eight of 14 participants established preferences for mindfulness home practices. They suggested including sounds of rain and ocean waves as background music during the meditations. Participants reported the convenience of using OWL-H in multiple settings such as while attending to household chores, at work, at bedtime, and the beach. There were 17 comments from seven unique participants recommending the development of educational resources to reduce stress-induced eating. There were also participants who reported difficulty in meditating.

The ability to use OWL-H over the iOS and Android platforms, and on smartphones, tablets, and desktop/laptop computers was highlighted as important by the participants. Smartphones emerged as the most commonly used device for logging into OWL-H. One participant noted, "I used my phone. Which I was surprised. I didn't think I would be using it on the phone. But it was always with me." Another participant shared similar thoughts about using OWL-H on the smartphone: "…it was very convenient when I would be on the go, and I needed to log in like [sic] what my blood pressure was. I always have my phone right there." Three participants reported using the desktop or laptop computers.

One participant spoke about needing to use the laptop sometimes because of difficulty reading the font on the smartphone screen.

Refer to Table 3 for all comments.

Theme 2: Participants using OWL-H for self-monitoring and self-reflection

The second major theme that emerged from FGs was that participants were relying on OWL-H for self-monitoring and self-reflection (50 comments). Six of the 14 focus study participants discussed their BP recordings and fluctuations. Participants suggested adding an additional space to the OWL-H BP tracker to record what they did before taking BP. For example, they noted a connection between their physical state, sensations, and emotions and their BP readings (Table 3). Another participant reflected on how the BP logging feature served as a self-accountability measure, saying, "I thought I did a good job of checking my blood pressure, but I found out during the study I don't do as good as I thought I did."

Participants wanted to use OWL-H as a self-monitoring tool for overall health management. One suggested having a second space for free texting about other symptoms they can

TABLE 3. PARTICIPANTS' COMMENTS FROM FOCUS GROUPS

Suggested OWL-H additions	*Exemplar comment*
1. Dietary suggestions	
Food substitutions	"Actually, with baking there is a lot of things you can do. I used flaxseed and almond meal. Oh, man, those cookies were the best." Participant 10
Food tracker tool	"I think that would be cool if there were like a checklist that would go green if you got it. But it would be yellow if you were a little above or a little below if it wasn't right on. And then red if it was vacant or way off.…it would motivate me to go green." Participant 4
Grocery shopping video	"And eat before you go. And only shop on the outside."… Participant 11
2. Mind–body suggestions	
Guided meditation and nature elements	"When I was learning how to do meditation, what I found most helpful was a guided meditation…. because they're like, 'Be in your favorite place'." Participant 10
3. Blood pressure tracking suggestion	
Text box to reflect on BP value	"And then you put in the blood pressure. At that point, I wish I had a dialog box…because sometimes I was wondering, 'Gee, is it high because I just came from swim class? Or is it low because I just came from swim class?' I was trying to relate why my blood…pressure went up and down." Participant 3
Desire to build robust community	"I think it would be better. Or meet twice a month instead of once a month." Participant 8
Barriers to the use of OWL-H	
Feeling outpaced by technology	"… I'm looking at all of us, and we're pretty much long graduated from school by the time technology came out. So, it's not how we're geared to, right? …I'm like pen, paper, in person." Participant 10
Limited Internet connectivity	"I was only able to do a lot of the movement and meditations at work. And I have spotty internet service at home, so I really couldn't do any of the body scans at home." Participant 2

BP, blood pressure; OWL-H, Our Whole Lives-Hypertension.

write in. There was ambivalence about the utility of the medication adherence tracker feature of OWL-H. A suggestion was to include columns to enter the names of morning and evening BP medications and time of measuring BP, hoping to correlate their BP readings to medication type and timing.

Theme 3: Participants using OWL-H to gain a community and peer group

Another major theme was the importance of community and peer support in BP management (48 comments). Participants stated that the TKMGV that accompanied OWL-H made them feel like they belonged to a community, and the majority of the participants wanted an increase in their frequency. Six participants, in 10 comments, said that they would like the TKMGV to be delivered online. In terms of the engagement with the online community, participants had mixed opinions. Seven participants stated that they thought that a robust online community would lead to greater engagement with the OWL-H platform. Participants also stated that they wanted to seek mentorship from each other.

Theme 4: Participants discussed barriers to use for OWL-H

The last major theme was the barriers that participants faced in using OWL-H (19 comments). Participants noted lack of time, work and commute, Internet connectivity, stress, and sickness as obstacles in using OWL-H. Participants described feeling outpaced by the growth of technology and raised concerns of poor Internet connectivity hampering their use of OWL-H (refer to Table 3). Participants also made suggestions for improving user experience with OWL-H. For example, one participant suggested including a spell-check feature on the Community Board. Another participant requested the addition of more educational videos.

Discussion

The OWL-H is an e-Health intervention that combines a TKMGV with practical skill building that is designed for low SES groups. Major themes that emerged from the FGs were: (1) need for customizability and flexibility of the OWL-H platform in managing high BP; (2) benefits of OWL-H as a self-monitoring tool; (3) role of community support in self-management; and (4) the lack of time, work and commute, Internet connectivity, stress, and sickness as obstacles in using OWL-H.

Participants' request for customizability and tailoring is aligned with findings from other studies.[29–31] For example, Maciejewski et al.'s randomized trial used patient-specific tailored algorithms for topics such as low salt intake, weight, and stress reduction and found improved BP at 18 months' follow-up.[30] The Milani et al. study, which used a smartphone, home BP monitor, and website, provided customized education on low-sodium foods during shopping and cooking, to those who screened positive for high salt intake. In their study, nearly 57% participants controlled their BP.[31] However, other customizable features requested by participants, such as a food tracker in terms of caloric and nutri-

tional value, are present in many apps in the marketplace, with little evidence of those features reliably and consistently helping to lower BP.[32]

Our participants also reported wanting flexibility in the order and type of mindfulness practices, and stated preferences for guided imagery meditation and inclusion of nature sounds, such as sounds of rain and the ocean. Indeed, previous studies show that individuals can have preferences for certain styles of meditation.[33] Studies evaluating mind–body interventions and meditation delivered through mHealth have found that personalized app interfaces and more customizable features can increase adherence to practice.[34,35] Kitson et al. found in their scoping review that inclusion of some aspects of nature was a major feature in the design of immersive interactive technologies.[36] However, systematic reviews of apps in the marketplace that offer many choices in mind–body practices have demonstrated that they have doubtful efficacy.[37,38]

One major theme that emerged was participants' experience of bodily sensations and emotions, and their desire to link it to their real-time BP readings, therefore using OWL-H as a self-monitoring and self-reflection tool. This has been demonstrated as useful to patients in other studies.[39,40] For example, Hallberg et al. found that the insight gained from a mobile phone-based system helped participants in self-managing their hypertension.[41] It is possible that self-reflection and insight play a key role in the mechanism by which self-monitoring or HBPM improves hypertension control.[42]

The connection between peer support and self-management is being actively studied. In Whittle et al.'s clinical trial that compared in-person, peer-led sessions with in-person, professionally led sessions for delivering hypertension self-management education, similar reductions in BP were found.[43] In a qualitative study, women veterans reported considering peer support as a credible intervention to support heart healthy behaviors.[44]

Further, user ability to interact with other users at the same time is a major design theme present in immersive integrative technological interventions.[36]

Barriers to the daily use of OWL-H were found to be lack of time, conflict with work and commute, Internet connectivity, and stress and sickness. Limitations of time and resources were noted as barriers by participants in another study that assessed the feasibility of mobile phone-based text message reminders to improve hypertension self-management.[45] Literature about barriers to the use of different kinds of telehealth interventions discusses difficulty with using technology such as mobile phones.[46] None of those concerns were mentioned by participants in the OWL-H study, probably because of high levels of baseline comfort with technology use (Table 1). Participants appreciated how OWL-H could be used across multiple devices such as smartphones, laptops and tablets, and it was compatible with both Android and iOS.

User-centered design that accounts for psychosocial context of users may increase eHealth interventions' potential to improve access to care and transform self-management.[46–50] In view of this, participant feedback is being thoroughly incorporated into the ongoing development of the upgraded version of OWL-H. Design modifications are being made to assist in overcoming barriers to

OWL-H use. The widely appreciated feature of asynchronous use is being retained. More gamification principles are being employed in the design, as they have been proved to improve user engagement.[51]

Limitations

There are several limitations to this study: (1) The sample size was small, limiting generalizability. (2) Thirty-three percent of participants were people of color. Though the racial composition of the study participants was representative of the demography of the city of Worcester, more research is needed on the cross-cultural acceptability of the OWL-H curriculum.[52,53] (3) Heterogeneity of device use, such as phones, laptops, and desktop computers, although reflective of real life, does not convey objectively which device is best for achieving optimal results with OWL-H. (4) The study design did not permit a comparative assessment of OWL-H combined with TKMGV with TKMGV and OWL-H individually in terms of feasibility and acceptability. There are also limitations about the scalability of the intervention due to the accessibility of teaching kitchens in hospital settings. Therefore, the study investigators' next step will include a randomized controlled trial to examine whether video delivery of the TKMGV is as acceptable as in-person delivery. The COVID pandemic has increased access to telemedicine, which would allow interventions such as OWL-H to be delivered as a part of medical group visits in clinical care.

Conclusions

In conclusion, the importance of HBPM and eHealth interventions in improving self-management of hypertension is growing.[54] It was found during FGs that participants wanted the content of OWL-H to be customizable and flexible to meet their needs for BP management. Participants highlighted community for peer support for better self-management of hypertension. The OWL-H is a unique eHealth intervention that combines online education for practical skill building and lifestyle modification with HBPM, with a special focus on people from lower SES groups.

Author Disclosure Statement

The authors report no known conflicts of interest with this study.

Funding Information

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