

Model e-Health Community for Aging Executive Summary

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The Front Porch Center for Innovation and Wellbeing (FPCIW) established the Model eHealth Community for Aging (MeHCA) to introduce and implement technology tools and enhance health education and telehealth services for vulnerable seniors in Los Angeles. Funded by the UC Davis and the California Telehealth Network's Model eHealth Community grant program, MeHCA set out to 1) use broadband-enabled technologies to proactively support the health and wellness needs and improve access to care for underserved populations of seniors in the greater Los Angeles area, and 2) leverage this technology to empower a community of providers to extend existing business models and services to create a coordinated and comprehensive ecosystem of health and wellness resources.

MeHCA was a two-year, multi-intervention, multi-site project that addressed senior health and wellness needs through several activity areas from August 2011 to July 2013. These areas included:

“Self-Health Knowledge” sought to improve digital/computer health literacy and cognitive fitness. The project trained participants on navigating the Internet to locate and identify in-language, online health resources and information. It also deployed cognitive/memory fitness units to promote brain health. These 1-day and 6-week computer workshops provided excellent information about the acceptability of the technology, high levels of satisfaction, and on the types of workshop issues that were of the most interest to participants. Additionally, participants reported significant improvements in the skills necessary to use computers and the internet to learn more about their health.

“Big Screen Health” included videoconference workshops to promote health and wellness education. These workshops were broadcast to participating partner locations from community health providers and experts, and covered a wide range of health and safety topics for senior audiences. The videoconference workshops were highly attended and most participants reported that the workshops were informative and useful. Participants also provided helpful feedback on topics of interest for future videoconference workshops. The videoconference workshops reached diverse populations, were offered in several different languages, covered numerous topics, and evidenced the extensive commitment and qualifications of project partners.

“Know Your Health!” tele-consultation utilized a health kiosk to provide tele-podiatry consultations. Although the tele-consultations were only utilized by a small



number of participants, they received high levels of satisfaction, especially among women. Female participants reported that the tele-consultation was just as good as going to the doctor's office. Qualitative data showed that participants found the equipment easy to use and convenient. While project partners worried that privacy would be a concern in using the teleconsultation services, participants did not substantiate this concern.

Know Your Health! remote patient monitoring (RPM) used the health kiosks to allow participants to monitor chronic conditions such as diabetes or hypertension. From both survey data and focus group data, participants were highly satisfied with the RPM health kiosks, felt that they were better able to manage their health conditions, and reported being healthier after using the RPM health kiosk. These claims were validated through the finding that blood pressure decreased significantly over the course of the intervention.

“Pass on the Paper” supported the planning and implementation of EHR deployment at partner community clinics by connecting a college workforce development program with community clinics.

The MeHCA project required and promoted community involvement among participants, providers, and community institutions on multiple levels. The project's community health activities were conducted with diverse communities, and in English, Korean, American Sign Language, and Spanish. Over 20 technology companies, community health clinics, universities, senior centers, affordable housing communities, and other service providers formed a unique partnership under this project to address the barriers to care, health, and wellbeing for aging communities. These strong and lasting collaborations together with the positive outcomes of each activity area show promise for the future of the MeHCA project and future replication studies.



MeHCA Final Report

The Front Porch Center for Innovation and Wellbeing (FPCIW) established the Model eHealth Community for Aging (MeHCA) to introduce and implement technology tools and enhance health education and telehealth services for vulnerable seniors in Los Angeles. Funded by the UC Davis and the California Telehealth Network's Model eHealth Community grant program, MeHCA set out to 1) use broadband-enabled technologies to proactively support the health and wellness needs and improve access to care for underserved populations of seniors in the greater Los Angeles area, and 2) leverage this technology to empower a community of providers to extend existing business models and services to create a coordinated and comprehensive ecosystem of health and wellness resources.

With the initial support of aging services groups including AgeTech West, LeadingAge California, LeadingAge CAST, and Front Porch, MeHCA formed into a two-year, multi-intervention, multi-site project that addressed senior health and wellness needs through four activity areas from August 2011 to July 2013. These areas included:

- 1) "Self-Health Knowledge" - digital/computer health literacy and cognitive fitness. The project trained participants on navigating the Internet to locate and identify in-language, online health resources and information. It also deployed cognitive/memory fitness units to promote brain health.
- 2) "Big Screen Health" - video conference workshops to promote health and wellness education. These workshops were broadcast to participating partner locations from community health providers and experts, and covered a wide range of health and safety topics for senior audiences.
- 3) "Know Your Health!" - remote patient monitoring with health kiosks, and tele-podiatry consultations. These activities empowered community members to understand and manage their own healthcare needs through remote monitoring and tracking of health information, and with tele-podiatry consultations via video conference provided by a community clinic.
- 4) "Pass on the Paper" – coordinating EHR implementation support. The project also supported the planning and implementation of EHR deployment at partner community clinics by connect a college workforce development program with community clinics towards EHR deployment.

This report does not discuss outcomes from the Dakim fitness activity due to insufficient/incomplete data and participation. It also does not discuss activity area 4 ("Pass on the Paper"), which did not collect community participant data relevant to the project.

The MeHCA project promoted community involvement among participants, providers and community institutions on multiple levels. The project's community



health activities were conducted in English, Korean, American Sign Language, and Spanish with the support of partners, volunteer students and interns. Over 20 technology companies, community health clinics, universities, senior centers, affordable housing communities, and other service providers formed a unique partnership under this project to address the barriers to care, health, and wellbeing for aging communities. Following were some of the provider organizations that contributed health services and information throughout the MeHCA project:

- Advantage Home Telehealth
- Anti-aging Games
- Alzheimer's Association
- Argent Medical Group
- CARING Housing Ministries
- Central City Community Health Center
- Dakim Brain Fitness
- East Los Angeles College Health Information Technology
- Erasto R. Batongmalaque Foundation
- Heal One World
- Korean Health Education Information and Resource (KHEIR) Center
- Los Angeles County + USC Medical Center
- Los Angeles Department of Mental Health
- Law Offices of Jane Oak & Associates
- Pilgrim Tower
- St. Barnabas Senior Services Center
- University of California, San Francisco
- University of Southern California Davis School of Gerontology
- Vista Towers

The MeHCA project demonstrated a high level of engagement with community members and providers. During its first 2 years of implementation, 417 adults enrolled in a computer and health literacy workshop that trained community members on reputable health-based websites; 895 participants attended a video conference workshop on a number of topics that included cancer prevention, diabetes, chronic disease management, and depression; 91 seniors across 4 communities participated in a remote patient monitoring study; and 33 adults experienced a live tele-podiatry consultation with a specialist over video conference.

The below table lists the communities and populations that were targeted under the MeHCA project.

Table 1: MeHCA Target Communities

Community	Location	Population
Erasto R. Batongmalaque Foundation (ERB)	Carson, CA	Community senior services center serving Filipino seniors and veterans
Pilgrim Tower, CARING Housing Ministries	Los Angeles, CA	Affordable housing for seniors and deaf residents in Koreatown
St. Barnabas Senior Services	Los Angeles, CA	Community senior services center
Vista Towers, CARING Housing Ministries	Los Angeles, CA	Affordable housing for seniors in Koreatown

In collaboration with FPCIW and MeHCA partners, UC San Francisco researchers produced a study highlighting the impact of this project on the community and its participants. Using pre- and post-intervention survey tools, recorded vitals, and focus groups, the study's results indicate high acceptance rates and satisfaction with MeHCA interventions among participants. Surveys revealed significant increases in familiarity with and knowledge of MeHCA technology, and self-reported health. Additionally, vitals data revealed a significant decrease in blood pressure over the course of participation in remote patient monitoring. Overall, MeHCA exemplifies a collaborative, highly engaging, positively perceived, and beneficial intervention for older adults.

Study Design

Researchers used a quasi-experimental design to examine older adults utilization of several elements of the MeHCA project. A mixed-methods approach was taken, with both quantitative and qualitative data collected from surveys, health kiosks, and focus groups.

Instruments

Surveys were created by researchers at the University of California, San Francisco in consultation with FPCIW and community partners. The instruments varied by intervention, but all participants reported demographic data including age, gender, race/ethnicity, and primary language. Quality of life, self-reported health, medical services utilization, and satisfaction measured were also included in many of the instruments.

Self-Health Knowledge

Participants in 1-day computer workshops completed a survey after the class, which collected demographic data, and their satisfaction with the workshop. The survey also collected open-ended responses from participants on what other topics they would like to see covered in future computer workshops, and what they found most

and least helpful about the workshop. Participants in 4-6-week computer classes completed a baseline survey prior to participation, which collected data on demographics, quality of life, health and medical services utilization, and computer utilization and familiarity. Data on quality of life, health and medical services utilization, and computer utilization and familiarity were also collected in a follow up survey administered after the last class.

Big Screen Health

Participants attending videoconference sessions were asked to fill out a survey at the end of each session. They collected demographic data, satisfaction with the session, interest in other session topics, and what was most and least helpful about the videoconferencing session.

Know Your Health

Individuals who used the teleconsultation service to communicate with providers were asked to fill out a survey at the end of each session. The survey collected data on demographics, quality of life, health, medical services utilization, satisfaction with teleconsultation, and what was most and least helpful about teleconsultation. Participants in the remote patient monitoring services were given a baseline survey at enrollment, which collected data on demographics, quality of life, health and medical services utilization. After participation, surveys again collected data on quality of life and health and medical services utilization, as well as satisfaction with the remote patient monitoring services and the kiosk equipment. Participants were separated into 2 cohorts for the remote patient monitoring intervention, the first cohort participated for 8 months and the second participated for 5 months.

Table 1: Evaluation Measures

Quality of life (WHOQOL):

- How would you rate your quality of life?
- How often do you have negative feelings such as blue mood, despair, anxiety, or depression?

Health and Medical Services Utilization (US Census battery):

- Would you say your health in general is poor, fair, good, very good, or excellent?
- During the past 3 months, were you a patient in the hospital overnight or longer? If yes, how many nights?
- During the past 3 months, were you a patient in the hospital overnight or longer? If yes, how many times?

Satisfaction:

- What other topics would you like to see? (Qualitative)
- The most helpful thing has been: (Qualitative)
- The least helpful thing has been: (Qualitative)

Data Analysis

Quantitative and qualitative data from surveys, and from the remote patient monitoring kiosk were de-identified and sent electronically to researchers at UCSF. Quantitative data were analyzed using SPSS 20. Qualitative data were analyzed using Dedoose, online qualitative analysis software.

Quantitative data were broken into meaningful groups or dichotomous variables where appropriate to facilitate data analysis. After determining the ways in which participants, who dropped out of the study, differed from those who completed the study, incomplete cases were removed from the data set.

Quantitative analysis varied based on the data available, but often included, descriptive statistics, correlations, paired samples t-tests, one-way ANOVA, and repeated measures general linear modeling. Participant demographics were examined for correlations with other demographic data and independent variables. Repeated measures in baseline and follow-up survey data were tested for significant differences. Lastly, models were created to explore the participant demographics that could explain the variation in study outcomes.

Findings

Self-Health Knowledge: 1-day workshop

Enrollment and Attrition

While 174 people attended 11 different 1-day workshops, only 138 surveys were collected (79% response rate). There were 53 unique participants. Most of the surveys collected were from the ERB foundation (77%), while 12% were from St. Barnabas, and another 11% from Vista Towers. In order of attendance, the 1-day computer workshop topics included: Alzheimer's disease (32), diabetes (25), colon cancer (16), Medline Plus, a US government health website (14), hepatitis (13), cataracts (12), breast and prostate cancer (11), heart disease (10), and tuberculosis (5). Nine of the workshops were in English and two in Korean. Only 32 participants attended the workshops in Korean, which discussed diabetes and Alzheimer's disease.

Demographics

The average age of participants was 73 years old. A majority of participants were women (68%). Nearly all participants identified as non-Hispanic (98%). When asked, "what is your race?" 98.1% of respondents identified as Asian or Filipino. Since the population is nearly homogenous, race/ethnicity was not used in analyses. When asked what their primary language was, 43% of participants said English (23), 42% said Korean (22), 13% said Tagalog/Filipino (7), and one said Spanish.

Satisfaction

Participants were asked whether they felt more knowledgeable about their own health, whether they thought their ailments were better controlled than they were

when the study started, and whether being in the study was helpful to them (*strongly disagree, disagree, uncertain, agree, or strongly agree*). A majority of respondents either *agree* or *strongly agree* that they feel more knowledgeable about their own health after the workshop (89%), with one participant *uncertain*, three who *disagree*, and five who *strongly disagreed*. When asked if the workshop was relevant to them, most respondents either *agreed* (39%) or *strongly agreed* (49%). Still, four participants responded that they were *uncertain* and seven strongly *disagreed* that the workshop topic was relevant to them. Lastly, most participants either *agreed* (34%) or *strongly agreed* (57%) that the workshop was helpful to them. Again, seven participants strongly *disagreed* with one responding with *uncertain*. When asked what other workshop topics they would be interested in, responses included: arthritis, vision and healthy eyes, insomnia, memory loss, hearing loss, mental health, exercise, acid reflux, and Medicare. When asked what was the most helpful part of their workshop, responses varied depending on the workshop topic area. Of the different topic areas, the workshop on Medline plus scored the highest on participant satisfaction (M=3.87), followed by the workshops on heart disease (M=3.73), breast and prostate cancer (M=3.54), and colon cancer (M=3.44).

Self-Health Knowledge: 4-6 week Computer Class

Enrollment and Attrition

A total of 254 attendees were counted at all classes. Individual attendance at workshops were not recorded, making it impossible to know how often participants attended more than one class. However, since only 68 participants completed the baseline survey, it is likely that some individuals attended multiple sessions. Attrition was high (60%) with only 27 participants completing both baseline and follow up surveys.

Demographics

Participants were from the ERB foundation (30%), Pilgrim Tower (15%), St. Barnabas (33%), and Vista Towers (22%). The average age of participants was 71 years old. A majority of participants were women (56%). Nearly all participants identified as non-Hispanic (96%). When asked, "what is your race?" 96.3% of respondents identified as Asian or Filipino. Since the population is nearly homogenous by race/ethnicity, these variables were not used in further analyses on this data. When asked what their primary language was, 67% of participants said Korean (18), 15% said English (4), 15% said Tagalog/Filipino (4), and one said American Sign Language.

Quality of Life

When asked to rate their quality of life (*very poor, poor, neither good nor poor, good, very good*), nearly half of participants said *good* or *very good* at baseline with an average score of 2.54 (between *neither good nor poor* and *good*). At follow up, the average response was slightly better at 2.74 though the improvement was not significant. When asked how often they have negative feelings such as blue mood or

despair (*never, seldom, quite often, very often, or always*), most respondents said *never* or *seldom* (M=1.23, between *seldom* and *quite often*). At follow up, the mean was slightly lower, (M=1.15), meaning that, on average, participants reported less negative feelings at follow up than they did at baseline, though the difference was not significant. Lastly, when asked to rate their health in general (*poor, fair, good, very good or excellent*), less than half of respondents said their health was *good, very good, or excellent* (M=1.52, between *fair* and *good*). At follow up participants rated their health slightly better (M=1.74) and though the p-value was close to .05, this difference was also not significant (p=.056).

Health

Participants were asked if they had been diagnosed with any of the following conditions: heart disease, cancer, stroke, COPD, diabetes, kidney disease, liver disease, high blood pressure, Parkinson's disease, or Alzheimer's disease/dementia. At baseline, participants reported being diagnosed with high blood pressure (14), diabetes (7), heart disease (5), cancer (1), COPD (1), or kidney disease (1). All together, 78% of respondents (n=21) reported being diagnosed with at least one of the listed conditions, with six participants reporting two co-morbidities, and two reporting three comorbidities. Health did not change significantly at follow up, with 78% of respondents again reporting that they had been diagnosed with at least one condition: high blood pressure (15), diabetes (7), heart disease (3), cancer (1), COPD (1), kidney disease (1), or liver disease (1). Only five participants reported co-morbidities (19%) at follow up, with one of those reporting that they had been diagnosed with four co-morbidities. While we didn't expect much change here, we hoped that with increased access to information online, individuals could find out more about symptoms they are experiencing, possibly leading to earlier diagnosis by a physician or other health care professional. The changes we observed were not significant.

Medical Services Utilization

The intervention did not seem to have any effect on medical services utilization, although 6 weeks between the baseline and follow up surveys is not much time to expect an improvement in health. Both at baseline (2) and follow-up (3), few participants reported being a patient in the hospital overnight. At baseline, 56% of participants reported seeing a doctor or nurse in the past three months, while only 37% of respondents reported the same at follow up even though the questions were asked only 6 weeks later. Although these findings are inconclusive, our hope was that with increased access to information and advice, online participants may be better able to judge symptoms that merit utilization of health care services. Both at baseline (3) and follow up (4), few participants reported not having access to adequate health care. Those respondents reported financial and administrative barriers to receiving adequate health care.

Computer and Internet Usage

While only 13 participants reported having a computer they can use at home at baseline (48%), 16 reported the same at follow up (59%). Participants were asked

several questions about their use of computers and the internet. Questions were asked on a four-point scale with respondents answering with: *easily, after a few tries, with help, or not at all*. Giving each option a value of 0,1,2, or 3 respectively, the mean response was calculated at baseline and follow up for comparison. Slight, but significant improvements were seen between baseline and follow up on several of these items (Table 2).

Table 2: Comparison of Computer and Internet Usage Before and After Participation in a 6-week Computer Class.

	N	Mean		t	df	Sig. (2-tailed)
		Baseline	Follow Up			
I can turn the computer on and off	25	.92	.48	1.701	24	.102
I know how to use a mouse	24	.67	.29	1.619	23	.119
I know what the desktop is	21	1.48	.43	4.481	20	.000*
I know what an internet browser is	22	2.32	.91	5.594	21	.000*
I can look up health information using a search engine like google	23	2.22	1.04	4.249	22	.000*
I know how to send and receive email	25	1.92	1.24	2.971	24	.007*
I can browse the internet for sites that help me understand my health	23	2.17	1.09	4.204	22	.000*

*P<.05

Compared to baseline, participants at follow up were significantly more likely to report that they knew what a desktop and internet browser are, how to look up health information, how to send a receive email, and how to browse internet health sites. There were no observed interactions with these findings and gender or primary language spoken.

Satisfaction

Participants were asked whether they felt more knowledgeable about their own health, whether their think their ailments are better controlled now than they were then the study started, and whether being in the study has been helpful to them (*strongly disagree, disagree, uncertain, agree, or strongly agree*). No participant responded with *strongly disagree* or *disagree* to any of the satisfaction measures. The average participant either *agreed* or *strongly agreed* that they felt more knowledgeable about their own health (M=3.29), that their ailments are better controlled than when the study began (M=3.33), and that being in the study has been helpful to them (M=3.38). Participants were asked to report what was the least and most helpful part of the 6-week computer class. Few respondents noted what was least helpful to them: one said that they would still need help and a computer while another said that they still don't know how to use e-mail. Several

respondents noted that the courses helped them become more familiar with computers in addition to teaching them more about their own health: “Thank you very much for all the people [who] helped me in learning new things. [They] made me learn how to manage my health conditions and most especially learning how to use the computer.”

Big Screen Health: Video Conferencing

Enrollment and Attrition

Total attendance recorded was 895, though many participants attended multiple workshops. From 28 different videoconference workshops, 471 surveys were collected. Of the 28 different workshops, 11 were provided in English to 313 participants and seven in Korean to 167 participants. Twelve of the 28 workshops were also given in American Sign Language. Most of the surveys collected were from Pilgrim Tower (33%), followed by Vista Towers (25%), the ERB foundation (23%), and St. Barnabas (19%). In order of attendance, the 16 workshop topics included fall prevention (77), skin cancer (63), hypertension (40), bone health (36), podiatry (35), diabetes (30), medication management (29), maintaining mental health (25), good sleep (24), early signs of dementia (24), brain fitness (23), colon, breast and prostate cancer (21), cognitive behavioral therapy (18), Dakim Brain Fitness (17), health, body and brain (12), and holiday blues (7).

Demographics

The average age of participants was 75 years old. A majority of participants were women (66%). Nearly all participants identified as non-Hispanic (84%). When asked, “what is your race?” 60% of respondents identified as Asian, 17% as Filipino, 9% as white, 9% as other, 2% as Black or African America, and only one person identified as African American. When asked what their primary language was, 47% of respondents said Korean (108), 34% said English (77), 17% said Spanish (39), 9.2% said American Sign Language (21), and 7% said Tagalog/Filipino (16).

Satisfaction

Participants were asked whether they felt more knowledgeable about their own health, whether they think their ailments are better controlled now than they were when the study started, and whether being in the study has been helpful to them (*strongly disagree, disagree, uncertain, agree, or strongly agree*). A majority of respondents either *agree* or *strongly agree* that they feel more knowledgeable about their own health after the workshop (n=414, 86%), with a small number of respondents who *disagreed* or *strongly disagreed* (n=28, 5.8%), and 10 respondents who were *uncertain* (2.1%). When asked if the workshop topic was relevant to them, most respondents either *agreed* or *strongly agreed* (n=403, 83%), with a small number of respondents who *disagreed* or *strongly disagreed* (n=30, 6.2%), and 19 respondents who were *uncertain* (3.9%). Lastly, a majority of respondents either *agreed* or *strongly agreed* that the workshop was helpful to them (n=430, 89%), with a small number of respondents who *disagreed* or *strongly disagreed* (n=14, 2.9%), and 9 respondents who were *uncertain* (1.9%). When asked what other

workshop topics they would be interested in, responses included: arthritis, aging, lung disease, vision and healthy eyes, insomnia, nervousness, nutrition, osteoporosis, podiatry, obesity, skin care, fall prevention, first aid, memory loss, incontinence, hearing loss, mental health, exercise, health insurance, acid reflux, and Medicare. Of note, only 4 respondents felt that they could not hear or see the speaker well enough during the video conference, a complaint that we worried would be much more prevalent.

Know Your Health: Teleconsultation

Enrollment and Attrition

There were 33 participants who utilized the tele-podiatry consultation services at two different facilities. About half of the surveys collected were from Pilgrim Tower (54%) and the other half were collected from Vista Towers (46%).

Demographics

The average age of participants was 76 years old. A majority of participants were women (76%). All participants identified as non-Hispanic. When asked, “what is your race?” 79% of respondents identified as Asian or Filipino, and 6% as white. When asked what their primary language was, 61% of respondents said Korean, 24% said American Sign Language, and 21% said English.

Health

Participants were asked if they had been diagnosed with any of the following conditions: heart disease, cancer, stroke, COPD, diabetes, kidney disease, liver disease, high blood pressure, Parkinson’s disease, or Alzheimer’s disease/dementia. Participants reported having been diagnosed with high blood pressure (9), diabetes (5), heart disease (5), cancer (2), stroke (2), Alzheimer’s disease/dementia (2); kidney disease (1), and liver disease (1). All together, 81% of respondents (n=27) reported being diagnosed with at least one of the listed conditions. Nine participants reported two co-morbidities, and four reported having three co-morbidities.

Medical Services Utilization

Few participants reported being a patient in the hospital overnight (2) in the past 3 months, whereas a majority of participants (25) had seen or talked to a doctor or a nurse over the same amount of time. Only two participants reported not having access to adequate health care, with both citing lack of transportation as a barrier to receiving adequate health care.

Satisfaction

Participants were asked a series of question about their satisfaction with their teleconsultation. For each of these questions, participants could choose *no, definitely not, I don’t think so, maybe yes, maybe no, yes, I think so, or yes, definitely*. By allocating a value of 0, 1, 2, 3, or 4, respectively, to each of the available responses means were calculated and presented in Table 3 below.

Table 3: Mean Responses to Teleconsultation Satisfaction Measures

	N	Mean
a. The training and support team from MeHCA helped me understand the video teleconsultation session.	33	3.48
b. Since using the teleconsultation, I am more motivated to follow up with my health.	33	3.27
c. The teleconsultation helped me improve my health.	33	3.30
d. I was uncomfortable interacting with the doctor over video conference.	33	1.64
e. The teleconsultation was a convenient way to get answers to my health needs.	33	3.24
f. I worried about my privacy during the teleconsultation.	33	1.15
g. The care I received with the teleconsultation was just as good as going to the doctor's office.	33	2.97
h. I would recommend the teleconsultation to others.	32	3.41

The average response was either *yes, I think so*, or *yes, definitely* to statements about the training and support team, motivation, improved health and convenience. Few respondents worried about privacy during their teleconsultation. However, responses to the statement about being uncomfortable interacting over videoconference were between *I don't think so* and *maybe yes, maybe no*. Finally, participants, on average, responded *yes, I think so* to the statement that teleconsultation was just as good as going to the doctor's office, and most respondents said *yes, I think so* or *yes, definitely* to recommending teleconsultation to others. Interestingly, female respondents were more likely (n=25, M=3.16) than male respondents (n=8, M=2.38) to report that the care they received with the teleconsultation was just as good as going to the doctors office (p=.048). Women (n=24, M=3.67) were also more likely than men (n=8, M=2.63) to recommend teleconsultation to others (p=.005). While these differences are significant, the number of participants is small. Additional research should be done to substantiate the finding that women are more favorable to teleconsultation than men. There were no significant differences based on race or age. When asked what they liked most about teleconsultation, participants noted the convenience: "I didn't need to leave my building." Only one respondent noted what they liked least about the teleconsultation, "short consultation time." These findings lead us to believe that teleconsultation could be an appropriate, cost-effective, and accepted way for older adults to consult with health professionals.

Know Your Health: Remote Patient Monitoring

Enrollment and Attrition

Of the 91 participants who enrolled in the RPM intervention, 67 completed baseline surveys (74% response rate) and only 2 participants did not complete a follow-up survey (3% attrition rate). Participants were recruited from ERB Foundation (36%), St. Barnabas (33%), Pilgrim Tower (19%), and Vista Towers (13%).

Demographics

The average age of participants was 74 years old. A majority of participants were women (69%). A majority of participants identified as non-Hispanic (80%). When asked, “what is your race?” 64% of respondents identified as Asian or Filipino, 17% as White, 3% as Black or African American, and 10% said other. When asked what their primary language was, 50% of respondents said English, 28% said Tagalog/Filipino, 19% said Spanish, 17% said American Sign Language, and 14% said Korean.

Quality of Life

When asked to rate their quality of life (*very poor, poor, neither good nor poor, good, very good*), half of participants said *good* or *very good* at baseline ($M=2.95$). At follow up, the average response was slightly better though the improvement was not significant ($M=3.07$). When asked how often they have negative feelings such as blue mood or despair (*never, seldom, quite often, very often, or always*), most respondents said *never* or *seldom* ($M=.89$). At follow up, the mean was slightly higher ($M=1.00$), but the difference was not significant. Lastly, when asked to rate their health in general (*poor, fair, good, very good or excellent*) at baseline only 13 respondents said very good or excellent compared to 46 participants at follow up. Participants were significantly more likely to rate their health better at follow up ($M=2.61$) than they did at baseline ($M=1.95$)($p=.000$).

Health

Participants were asked if they had been diagnosed with any of the following conditions: heart disease, cancer, stroke, COPD, diabetes, kidney disease, liver disease, high blood pressure, Parkinson’s disease, or Alzheimer’s disease/dementia. At baseline, participants reported having been diagnosed with high blood pressure (30), diabetes (21), cancer (8), heart disease (6), stroke (3), Alzheimer’s disease/dementia (3), Parkinson’s (2), and kidney disease (2). All together, 72% of respondents ($n=46$) reported being diagnosed with at least one of the listed conditions. 22 participants reported two co-morbidities, and eight reported having three co-morbidities. At follow up, participants reported having been diagnosed with high blood pressure (37), diabetes (24), cancer (8), heart disease (6), stroke (4), Alzheimer’s disease/dementia (1), and kidney disease (2). While more participants reported having been diagnosed with at least one condition at follow up ($n=52$, 81%) than they did at baseline, the difference was not significant. Additionally, the increase in diagnoses was almost exclusively in high blood pressure and diabetes, which may be a result of the presence of the kiosk and a heightened awareness of those two conditions.

Medical Services Utilization

The intervention did not have a significant effect on medical services utilization. Both at baseline (3) and follow-up (4), few participants reported being a patient in the hospital overnight. Similarly, a majority of participants at baseline (66%) and follow up (63%) reported seeing a doctor or nurse in the past three months. Fewer

participants reported that they did not have access to adequate health care at follow up (3) than at baseline (7). At both baseline and follow-up, these participants noted financial, transportation, and language barriers to accessing adequate health care.

Satisfaction

Participants were asked a series of question about their satisfaction with remote patient monitoring. For each of these questions, participants could choose *no, definitely not, I don't think so, maybe yes, maybe no, yes, I think so, or yes, definitely*. By assigning a value of 0, 1, 2, 3, or 4, respectively, to each of the available responses, means were calculated and presented in Table 4 below.

Table 3: Mean Responses to Remote Patient Monitoring Satisfaction Measures

	N	Mean
a. The training and support team from MeHCA helped me understand how to operate the health kiosk.	64	3.44
b. The health kiosk was easy to use.	64	3.31
c. Since using the health kiosk I am more motivated to monitor my health.	63	3.46
d. The health kiosk helped me improve my health.	63	3.40
e. I was uncomfortable using the health kiosk technology.	63	1.06
f. The health kiosk equipment took too much time to use.	64	.67
g. I worried about my privacy with the health kiosk technology.	64	.75
h. The health kiosk helped me become more involved with my healthcare.	63	3.52
g. The care I received with the health kiosk was just as good as having the nurse come to my house.	62	3.32
h. I would recommend the health kiosk to others.	61	3.57

Most participants believed that the training and support team from MeHCA helped them understand how to operate the health kiosk: “the person was very attentive.” Few participants felt that the kiosk equipment was not easy to use, with only 5 respondents saying *no, definitely not* or *I don't think so*. When asked what they liked about using the health kiosk, a few participants said how easy it was to use: “Accurate, easy, and convenient.” However, some participants also noted that “Some equipment was easy to use, others complicated me,” and “there was some confusion on how to use the kiosk and at times it was not functioning correctly.” Few participants thought that the kiosk took too much time to use, and one said what that they liked the health kiosk because it was “very fast to operate and no more waiting in line at the hospital.”

Most participants also felt that the kiosk motivated them to monitor their health and helped them improve their health. A majority of responses to the question of what they liked most about using the health kiosk related to their ability to regularly get information on, and monitor their vitals. One participant said that, “taking my vitals

even once or twice a week gives me confidence about my blood pressure.” Another participant said, “I was able to avoid or prevent my blood pressure from rising because I am much informed.” When asked whether they worried about their privacy with the health kiosk technology, six participants said *Yes, I think so* or *Yes, definitely*. However, no participants mentioned privacy concerned in their open-ended responses.

Importantly, only four respondents said *No, definitely not* or *I don't think so* in response to the statement: The care I received with the health kiosk was just as good. Similarly, almost 70% of participants said *yes, definitely* to recommending the health kiosk to others. In fact, a couple of respondents said that they liked the health kiosk so much that “I wish I had one to use at home.”

Focus Groups

Survey data was further substantiated by focus groups with participants. In the focus groups, participants were asked what types of challenges they had monitoring their own health prior to participating in this project. One participant states that “Before RPM, every time I want to check my blood pressure, I had to commute from my place to Kaiser and it takes time and by the time I reach there, I am exhausted and then my blood pressure is high.” A majority of focus group members felt that using the RPM health kiosk helped them better monitor their health with one claiming that “I’m more aware of my health and what food I’m going to eat so I can keep my blood pressure normal.” Additionally, the focus group validated the survey finding that participants believe that using the RPM health kiosk improved their health: “Yes, this program has helped me to take control of my food intake and take action.” When asked whether they preferred using the kiosk or having a nurse take their vitals, participants noted that it would take too much time for the nurse to come visit, “I’ll take the technology any time.” Focus group participants reported that their physicians approved of and encouraged their participation in the project: “I told my doctor and he said to continue in this program, because I am healthier.”

Vitals

While the health kiosk recorded several types of vitals, this intervention targeted blood pressure levels and glucose levels as high blood pressure and diabetes are common among older adults. Additionally, blood pressure and glucose levels are responsive to patient’s behavioral modifications: diet, exercise, medication management, etc. While there was not enough data on glucose levels to conduct informative analyses, over 1200 readings of blood pressure were available for 70 participants. Participants recorded anywhere from 1 to 30 blood pressure readings during the 4-8 month intervention. Blood pressure readings were classified as normal, pre-hypertensive, hypertensive- stage 1, hypertensive- stage 2, and hypertensive crisis. Numerical values of 0, 1, 2, 3, and 4 were given to each classification, respectively. If one of the groups included fewer than 3 readings, the participants’ vitals data were dropped from further analyses. After removing participants with too few readings, the average blood pressure at T1 was compared to the average blood pressure at T2 for 54 participants. For example, the average

blood pressure reading for Participant A was 2.00 (hypertensive-stage 1) at baseline, and declined to 1.20 (between pre-hypertensive and hypertensive- stage 1) at follow up.

A generalized estimating equations (GEE) method of analysis was used to analyze the longitudinal data to determine if there was a significant difference in BP among participants and between T1 and T2. On average, women (M=1.25) had significantly higher BP than men (M=.91) at both baseline and follow up (p=.04) though there was no differential effect across time by gender. Overall, participant blood pressure at follow up (M=.98) was significantly lower than at baseline (M=1.17) (p=.006).

Given significant improvements in self-reported health and declines in blood pressure, we believe that remote patient monitoring kiosks in areas frequented by older adults can lead to better management of chronic conditions such as high blood pressure and better perceptions of one's health.

Discussion

The Self-Health Knowledge 1-day and 6-week computer workshops provided excellent information about the acceptability of the technology, high levels of satisfaction, and on the types of workshop issues that were of the most interest to participants. Additionally, participants reported significant improvements in the skills necessary to use computers and the internet to learn more about their health.

Big Screen Health videoconference workshops were highly attended and received positive feedback through participant surveys, with most participants reporting that the workshops were informative and useful. Participants also provided helpful feedback on topics of interest for future videoconference workshops. The videoconference workshops reached diverse populations, were offered in several different languages, covered numerous topics, and required significant participation from project partners.

Know Your Health teleconsultations were only utilized by a small number of participants, but received high levels of satisfaction, especially among women who were significantly more likely to report that the care they received through teleconsultation was just as good as going to the doctor's office and that they would recommend teleconsultation to others. Qualitative data showed that participants found the equipment easy to use and convenient. While project partners worried that privacy would be a concern in using the teleconsultation services, participants did not substantiate this concern.

Know Your Health remote patient monitoring (RPM) was perhaps the most intensive of the MeHCA interventions, but also produced the most interesting results. From both survey data and focus group data, participants were highly satisfied with the RPM health kiosks, felt that they were better able to manage their health conditions, and reported being healthier after using the RPM health kiosk. These claims were validated through the finding that blood pressure decreased significantly over the

course of the intervention. Project partners should further explore the finding that female participants reported higher blood pressure at both baseline and follow up. While we had hoped to assess additional data on vitals such as blood glucose levels, the kiosk either didn't report consistent findings, or too few participants utilized the blood glucose tests. Overall, the RPM health kiosks were a positive addition to their communities, increasing health monitoring capacity, improving perceived health, and lowering blood pressure.

Study Limitations

Some of the MeHCA interventions had small participation numbers, low response rates, and/or high attrition rates and will need additional research to evaluate their acceptability, satisfaction, and outcomes. As a result of the numerous partners in the study, there was likely significant variation in the experiences of participants. Future research should include a control group and/or attempt to standardize the interventions to limit this variability.

Future Research

The MeHCA project showed high acceptability among diverse populations of seniors and additional research should be done to verify the findings in additional communities. The collaborations developed in implementing this project were integral to the successful adoption of MeHCA interventions and should receive careful consideration in future replication efforts.

Conclusion

The MeHCA project is a valuable addition to existing literature on the use of technology to improve the health of older adults in community settings. The successful implementation of the project required active participation and perceived value of community partners, health care providers, researchers, and participants. With such a high participation rate and reported satisfaction, the MeHCA project has proven to be feasible, replicable, and scalable. The diverse population involved in the MeHCA project further supports the ability for the project to be successfully translated and implemented in diverse communities.