Final Progress Report

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Project Title: Increasing physical activity in Filipino Lay Leaders

University of Hawaii Systems

School of Nursing and Dental Hygiene
School of Nursing

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I. Inclusion of undergraduate and graduate students in the R15 research study

Over the three years of the study, we had 14 undergraduates and 32 graduate students involved in the R15 research activities (see Table 1). Many of the students were repeatedly involved in one or more of the 10 baseline assessments (over 2 years) conducted at churches in the community. For example, they were involved in fieldwork that included asking screening interviews of potential participants for eligibility to enroll them into the research study, providing participants with a consent form and explaining to them the key components of the study, checking the written baseline survey for omissions, explaining to persons, who were randomly selected, how long he/she should wear the accelerometer, where to place it (on their wrist), and how long to wear it (a week). Finally, they scheduled the participants' first condition-specific telephone call. The students were required to attend a training session prior to going into the field/community (see details below). The average number of miles traveled to and from the university campus to go to a community church was 21.3 miles, the farthest church was 37.6 miles from campus. The total number of miles traveled by all staff and students who went to the churches over the study period was 5,000 miles.

All student volunteers participated in a one-hour training sessions where they had to prepare, in advance, for the onsite visits by reading the screening protocols, be trained on how to reliably deliver the screening protocols, and practiced reading the screening protocols to a fellow student in order to learn how to respond to potential participants questions about the research project or any specific screening eligibility question. At the baseline visit the students spent from 1-2 hours at the church helping to set-up / take-down tables and research equipment/materials, assisted with baseline eligibility screening of potential participants, and other duties as needed. Three students (two graduate/one undergraduate) were part-time paid research assistants who were heavily involved in various activities (some daily) of the R15 grant over its 4 years: Tracy Canonizado, RN, a Doctorate in Nursing Practice/DNP nursing graduate student who worked on the R15 for 2.5 years, Uliana Kostareva, RN a PhD nursing graduate student who worked for one year, and Sarah Cain an undergraduate freshman nursing student from the Direct Entry in Nursing Program who worked for 1.5 yrs.

Ms. Canonizado was a telephone coach for the light-to-moderate physical activity and sedentary time (LMPA/ST) condition, she created data and educational materials for the group cohesion sessions, entered and verified survey data into a secure database, and actively participated in the baseline visits where she assisted in screening, consenting, survey edit checking, scheduling of Light-to-Moderate Physical Activity/ Sedentary Time (LMPA/ST) intervention telephone calls, and was trained to measure participants' height and weight. To serve as a telephone coach for LMPA/ST condition she was trained by Dr. Albright and Ms. Saiki to follow the telephone protocol in which she used motivational interviewing strategies to set PA and ST goals with participants while identifying and problem-solving any of their barriers to these two behavior changes. Tracy also helped participants keep track of their step counts to set PA goals based on daily step counts. She helped participants think about social support for PA and to set rewards to help them remain motivated and accountable to goals they were setting. Ms. Cain's main responsibility was conducting phone calls with participants in the Healthy Living / Delayed Treatment (HL/DT) condition to ask them about daily symptoms via a 27-item checklist. Her other duties included: enrollment /screening at the baseline visit, scheduling phone calls at the baseline visit, mailing/emailing National Institute on Aging (NIA) health materials (not on physical activity or sedentary time) to HL/DT participants, data entry, and attending/ taking minutes at weekly research team meetings. Ms. Kostareva participated in the project's data analysis meetings during which various study-related results, including survey data, were discussed for the final report. In addition, we had a visiting professor from the University of Maryland University College (Dr. AnneMarie Gumataotao) assisted with various project activities including weekly meetings as well as baseline visits in the community. She is not included in the tables below although she devoted many months of service to this project.

Table 1. Annual Participation of Graduate and Undergraduate students* (by compensation status)

Year	Graduate (all Nursing)		Undergraduate (by Major)	
	Compensated	Non-Compensated	Compensated	Non-Compensated
1	1 (DNP)	22 DNP	1 (nursing)	4 (3 nursing, 1 math)
2	1 (DNP)	6 (1 DNP, 5 PhD)	1 (nursing)	7 (6 nursing, 1 PH)
3	1 (DNP)	1 (PhD)		
TOTAL	3	29	2	11

* Not individual students. 3 DNP and 1 PhD students volunteered more than once

Thus, over the three years, we had a total of 45 students enrolled at UH Manoa (the majority from the School of Nursing and Dental Hygiene [SONDH]) who actively participated in this research project, some participated in more than one research activity over the years.

II. Study Design, Recruitment and Retention

A. <u>Study Design</u>

Figure 1 shows the sequences and time frame for the study's five phases. The cluster-randomized trial (including 36 weeks of follow up for each club randomized into the trial) was conducted from December 2017 through January 2020. Ten Filipino Catholic clubs from 10 parishes within the OCFCC were randomly assigned to one of two study conditions: Light-to-Moderate Physical Activity / Sedentary Time (LMPA/ST) or Healthy Living / Delayed Treatment (HL/DT) conditions. Half (5) of the clubs initially received the theoretically-based 12-week LMPA/ST telephone/group cohesion intervention designed to increase LMPA and reduce ST. Clubs were assigned to pairs, based on the maximum amount of distance (e.g., miles) between any two clubs to prevent contamination of study participants across the two conditions. For example, the shortest distance between two clubs paired together was 6.8 miles (St. Joseph and Our Lady of Perpetual Help) and the longest was 31.2 miles (Our Lady of the Mount and St. Roch). We wanted the clubs within a pair to consist of people who were not from adjacent parishes to reduce contamination of study intervention methods between conditions. However, such contamination is unlikely since each Filipino club was affiliated with its parish church and typically only people who live within a parish can be a member of that parish's church. Other than the distances between churches, we did not stratify the clubs because the majority were located in urban areas on the island of Oahu. Therefore, we didn't expect significant urban/rural differences between clubs. The club pairs were the unit of randomization. The order or sequence for when a pair began participation in the project was randomly determined (see the sequential implementation of the 5 pairs of clubs in Figure 1 below). Although the weather in Hawaii is temperate year-round, it was logistically and fiscally prohibitive for all the clubs to be randomized and, thus, all members of the clubs enrolled simultaneously. After both clubs within a pair completed baseline assessments, they were randomly assigned to one of the two study conditions.The baseline assessments were conducted in-person at the club's church; however, follow-up surveys were mailed.

Figure 1. Study Design and five phases of the grant from October 2017 to May 2021
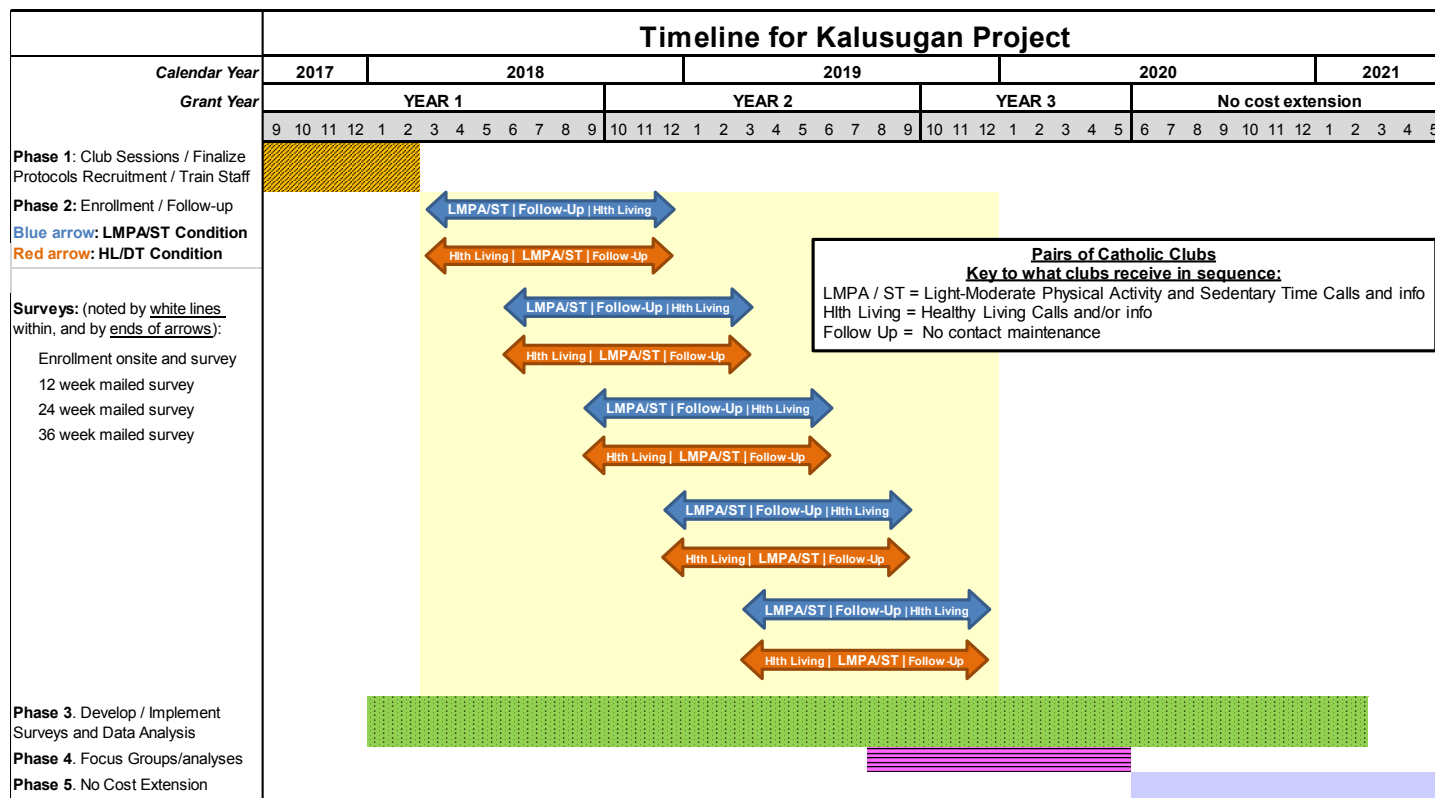
Table 2 shows when study measures were conducted across the 36-week study period. The baseline assessments were conducted in-person at the club's church; however, all follow-up surveys were mailed.

Table 2. Time points for study assessments collected over the 9-month period.

Measure	Time point			
	Baseline	12 weeks	24 weeks	36 weeks
Clinical Measures				
- Height, weight	X			
Fitness / Physical Activity Measure				
- Accelerometer (10% in each club)	X	X	X	X
Questionnaires				
- Medical history, health status	X	X	X	X
- Physical activity – CHAMPS*	X	X	X	X
- Sedentary behaviors/outcomes	X	X	X	X
- Process measures (compliance with intervention)		X	X	X
- Moderators (include gender, BMI, age neighborhood PA environment)	X	X	X	X
- Psychosocial measures (social support)	X	X	X	X

* CHAMPS = Community Health Activities Model Program for Seniors

Table 3 (on this page and page 5) lists the study sample, by race, ethnicity, gender and age. A majority of the sample was female (80%), Asian /Filipino (97%), and 71% were over the age of 60.

Table 3. Enrollment by race, ethnicity, gender and age.

Race	Ethnicity	Gender	Age	Age Unit
Other Pacific Islander	**Hispanic or Latino**	**Male**	64	Years
Asian	Not Hispanic or Latino	**Male**	57	Years
Asian	Not Hispanic or Latino	Female	62	Years
Asian	Not Hispanic or Latino	Female	71	Years
Asian	Not Hispanic or Latino	Female	65	Years
Asian	Not Hispanic or Latino	Female	68	Years
Asian	Not Hispanic or Latino	Female	71	Years
Asian	Not Hispanic or Latino	Female	75	Years
Asian	Not Hispanic or Latino	Female	62	Years
Asian	Not Hispanic or Latino	Female	73	Years
Asian	Not Hispanic or Latino	Female	75	Years
Asian	**Hispanic or Latino**	**Male**	72	Years
Asian	Not Hispanic or Latino	Female	60	Years
Asian	Not Hispanic or Latino	Female	64	Years
Asian	Not Hispanic or Latino	Female	63	Years
Asian	Not Hispanic or Latino	Female	61	Years
Asian	Not Hispanic or Latino	Female	56	Years
Asian	Not Hispanic or Latino	Female	72	Years
Asian	Not Hispanic or Latino	Female	58	Years
Asian	Not Hispanic or Latino	Female	56	Years
Asian	Not Hispanic or Latino	Female	66	Years

Asian	Not Hispanic or Latino	**Male**	56	Years
Asian	Not Hispanic or Latino	Female	63	Years
Asian	Not Hispanic or Latino	Female	73	Years
Asian	Not Hispanic or Latino	Female	69	Years
Asian	Not Hispanic or Latino	Female	66	Years
Asian	Not Hispanic or Latino	Female	67	Years
Asian	Not Hispanic or Latino	Female	55	Years
Asian	Not Hispanic or Latino	Female	56	Years
Asian	Not Hispanic or Latino	Female	57	Years
Asian	Not Hispanic or Latino	Female	73	Years
Asian	Not Hispanic or Latino	Male	66	Years
Asian	Not Hispanic or Latino	Female	64	Years
Asian	Not Hispanic or Latino	**Male**	59	Years
Asian	Not Hispanic or Latino	**Male**	59	Years

B. Recruitment and Retention

1. Recruitment of Catholic Clubs and study participants from the Clubs
   a) Recruitment of catholic clubs, pairing of clubs, randomization of pairs over 2 years
   In order to discuss the R15 study's purpose and goals, including the enrollment of the 10 Filipino Catholic Clubs on Oahu, Drs. Ceria-Ulep and Albright attended the first quarterly meeting of the Administrative Board of the Oahu Council of Filipino Catholic Clubs (**OCFCC**) held on Jan 13, 2018. The Administrative Board of the OCFCC is composed of its officers (president, vice president, secretary, and treasurer), committee chairpersons, and the presidents of the 10 clubs within the OCFCC. There were about 10-12 officers at the meeting, many of whom had signed a letter of support for the grant's NIH application.
   The secretary of the OCFCC provided Dr. Ceria-Ulep with a roster that listed the contact information for the 10 Filipino Catholic club Presidents and the addresses of all the churches. The roster noted which Sunday of the month each club met (i.e., on the first or second Sunday) and approximately how many members attended the monthly meeting (with estimates of how many were aged 55-75). The study design included sequential enrollment of 5 pairs of the 10 Filipino Catholic Clubs (FCC) over two years was presented to the Board. See Study Design – Figure 1, page 4. We did not inform the Board of the names of the paired clubs or when any one club would be enrolled in the project. We asked about weekends/dates over the year that would be too busy for the clubs. The Board members mentioned several church holidays or church events when a baseline should not be scheduled. The study's eligibility criteria were discussed (i.e., some people might need their physician's approval to join a physical activity study), and the logistics of informing the club members about the project and its goals were outlined (i.e., one month prior to baseline visit at the church, Drs. Ceria-Ulep or Albright would attend a club meeting to explain the study's purpose, eligibility criteria, timeline, and conditions' components including phone calls, mailed/emailed information, etc.) This brief "information session" one month prior to the baseline visit was approved by the Board. The OCFCC Board suggested various project names then they all voted on their favorite title. The title: "The Kalusugan Project" won, "Kalusugan" is the word for "health" in Tagalog (a Filipino national dialect). Thus, the translation is "The healthy living project". In addition, in order to maintain our collaboration with the OCFCC over the course of the study, Dr. Ceria-Ulep attended 12 monthly OCFCC General Membership meetings that included representatives from all 10 clubs. The OCFCC General Membership meetings were attended by club officers, committee chairs, presidents; and additional members from each club. During each meeting, the Kalusugan (Healthy living) project was on the agenda and allotted 2-3 minutes during which Dr. Ceria-Ulep, provided information on the purpose of the study; the names of churches that had enrolled, to provide updates on the research project, and to facilitate recruitment efforts for upcoming baseline assessments and cohesion sessions.
   b) Eligibility of study participants from Catholic Clubs (onsite in the community at their church)
   In order to comply with American College of Sports Medicine guidelines for screening older adults prior to advising them how to increase their LMPA, we had to ask potential participants 21 eligibility screening

questions to determine it was safe for them to increase their physical activity level. (Riebe, Ehrman, Liguori, & Magal, 2018) These questions were asked in–person at the community church typically after a Sunday service.See criteria listed on Table 4 on the next page.

   Eligibility criteria were designed to limit enrollment to lay leaders or members of the OCFCC who were between the ages of 55-75 years and did not already engage in purposeful, leisure time bouts of MVPA for > 60 min per week. Individuals were not eligible if they were planning on moving in 9 months, had a body mass index (BMI) <18 or $\geq$ 40, currently in treatment for cancer or physical therapy after having had a stroke or recent operation or surgical procedure in the last 6 months, recovering from a recent diagnosis of cancer, heart disease- had a heart attack, stroke, or been diagnosed with severe heart, lung, or chronic kidney disease in the last 6 months, used an assistive device like a cane or walker, or if a doctor recommended only medically supervised physical activity. A medical clearance (e.g., a note from their doctor) was needed to enroll if an individual had any of the following medical conditions: insulin-dependent Type 1 / Type 2 diabetes, blood glucose >235 mg/dl, diagnosis/treatment of cancer over the last 12 months, or a resting blood pressure $\geq$160/90 (without medications). Prior to the baseline visit, Drs. Ceria-Ulep and Albright held an informational session with each unit and explained the eligibility criteria as well as the requirement for a physician's note if they had specific medical conditions.

Table 4. Eligibility criteria for Kalusugan (R15) Project

Inclusion Criteria:
Member in one of 10 Filipino Catholic Clubs (within the Oahu Council of Filipino Catholic Clubs) on Oahu
Exclusion Criteria:
Age: less than 55 years OR older than 75 years of age
Planning to move (off the island of Oahu) in the next 9 months
Body Mass Index: If BMI is < 18.5 or > 40 (measured height and weight to determine BMI at enrollment)
Currently exercising: Regularly (weekly) active at a moderate intensity or higher >60 minutes a week
Currently in Treatment: Actively having cancer treatment or in physical therapy following surgery/stroke
A recent (in last 6 months) diagnosis of: Cancer, Heart disease, had a heart attack, Lung disease, Chronic Kidney Disease, Stroke, or underwent surgery
A physician recommends that they have only supervised physical activity (i.e., in a physical therapy setting)
Needs a cane or walker (or other assistive device) to walk especially outdoors on uneven surfaces
Conditional Eligibility: ***Needs to provide health care provider's approval/clearance before enrollment if potential participant had the following:***
Asthma or other respiratory disease made worse by exercise
A heart valve problem or is taking medications for a heart condition
Severe osteoarthritis
Insulin-dependent Type 1 or Type 2 diabetes (or often has a blood glucose > 235 mg/dl or 13mmol/L) (need MD clearance if do not know blood glucose)
Diagnosis/Treatment for Cancer over the last 12 months or had a Stroke in the past (> 6 months ago)
Resting blood pressure $\geq$ 160/90 (with or without medications) (need MD clearance if do not know BP)
Has chest pain when exercising or recently (last 4 weeks) developed any chest pain (i.e., when not exercising)
Has tendency to lose consciousness or collapse from dizziness
Has a bone or joint problem that could be aggravated by physical activity

2. Enrollment of club members from 10 Filipino Catholic Clubs

   From January 2018 through April 2019, study staff visited 10 different clubs within the OCFCC and gave presentations to the members explaining the purpose of the study and specific details related to enrollment. Of the 204 club members at these meetings, 135 (66%) were not interested or did not meet age criteria (i.e., most were older than 75y/o). Thus, 69 members (34%) were interviewed for eligibility with 35 (50.7%) of those interviewed being eligible and interested in participating and 34 (49.3%) of these individuals did not meet eligibility criteria. The most common reason for ineligibility was the person was too active (23 =67.6%), which

was defined as doing more than 60 minutes of purposeful MVPA per week. Thus, 35 individuals completed the baseline survey and were scheduled to begin their assigned condition's first phone call the following week (i.e., 5 clubs and 25 individuals into HL/DT condition and 5 clubs and 12 individuals into the LMPA/ST condition). Retention was tracked over 36 weeks at the 12, 24, and 36 week assessment points. Participants in both conditions received a total of $25 in gift cards to compensate for the time to complete surveys at baseline ($5), 12 weeks ($10), 24 weeks ($5), and 36 weeks ($5). All participants were also provided a pedometer (Accusplit) at the beginning of the LMPA/ST intervention.

3. <u>Attrition and Retention of consented participants over 9 months</u>
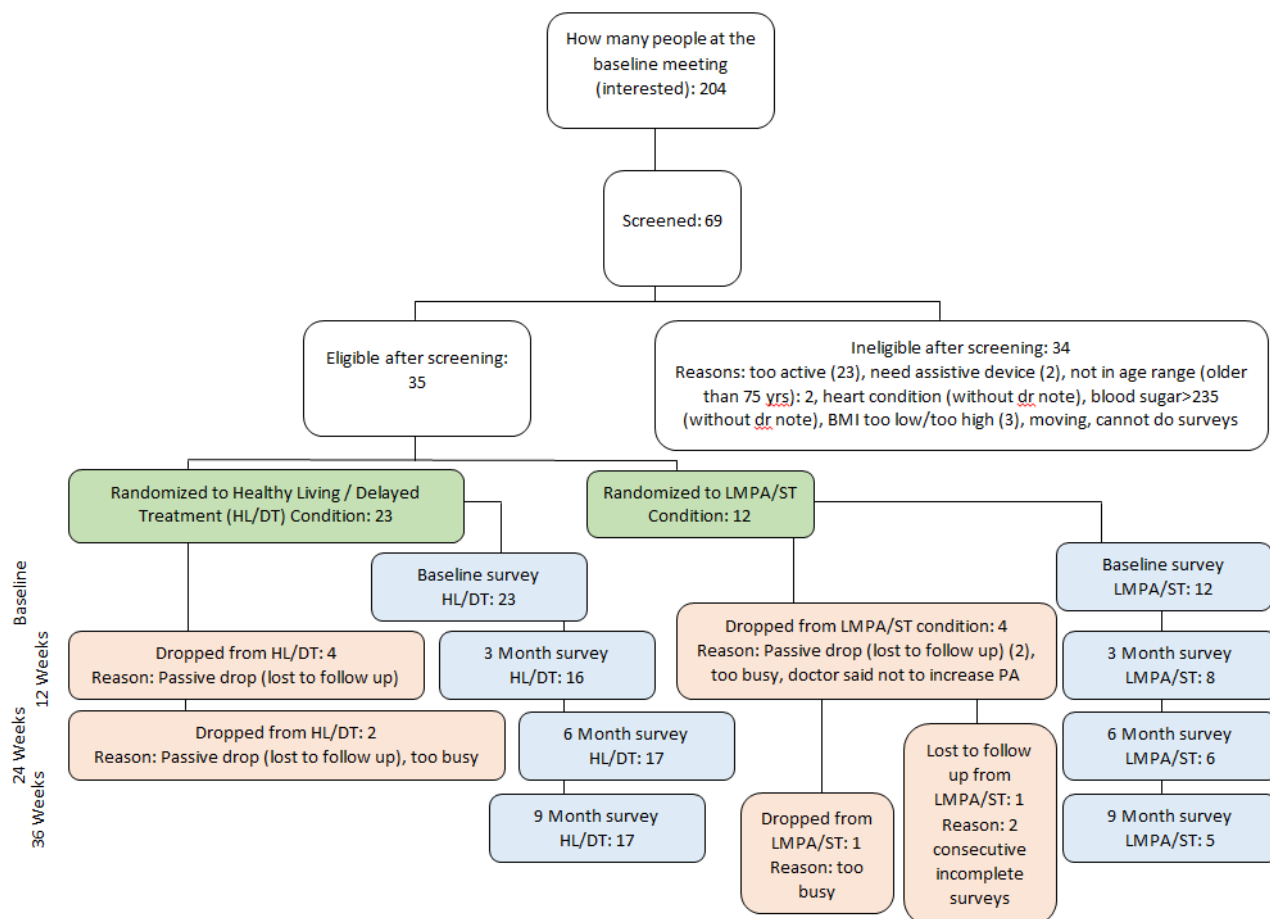
a.) Attrition - reasons for dropping out of study

Of the 35 participants randomized into the study, 12 (34.3%) participants were either dropped by investigators for not completing phone calls or they chose to leave the study. Eight (22.9%) participants, 5 from HL/DT and 3 from LMPA/ST condition were lost to follow up because they didn't answer 5 sequential calls (i.e., missed 5 calls over 5 weeks- 42% of dose) during the intervention period and were removed from the study by investigators (typically from 5 to 8 weeks after baseline, with the exception of one person who was lost to follow up 18 weeks after baseline) or because they didn't complete the last 2 surveys of the study (loss to follow-up). Three (8.6%) participants (2 from LMPA/ST and 1 from HL/DT condition) asked to dropped from the study because they were "too busy" and one from LMPA/ST condition (2.9%) reported her doctor told her not to increase her PA after she was enrolled.

b.) Retention

Retention rates of participants enrolled in the 9-month study were 76% HL/DT and 50% for LMPA/ST) and average completion rates for those participants who had not dropped and were mailed surveys over 9 months was high (94%). The average retention over the three follow-up surveys was 72.5% for HL/DT condition and 52.7% for LMPA/ST condition. Figure 2 is the consort figure showing recruitment and retention numbers for both studies over 9 months.

Figure 2. Consort Figure

C. Description of conditions' procedures and baseline sociodemographic characteristics by study condition
  1. Description of Light-to-Moderate-Physical Activity and Sedentary Time (LMPA/ST) Condition
  Those randomized into the LMPA/ST condition received 12 weekly, personalized phone calls from the research staff, who were trained as health coaches using motivational interviewing strategies to set realistic goals for gradually increasing LMPA and ST goals, problem-solving ways to reduce barriers to increasing PA and decreasing ST, and enlisting social support for LMPA/ST change from other club members, family, and friends. At the end of the call, staff asked if any adverse (health) events (e.g., any health issue/problem for which medical care, emergency room, or hospitalization was required) had occurred since the last call.

  Study staff emailed or mailed weekly resources that were specific to these goals and reduction of barriers. In addition, the PIs of the study attended up to 2 regular, monthly club meetings and held "group cohesion" sessions during the last 10-15 minutes of a meeting. The purpose of these sessions was to enlist social support within the club for changes in PA and ST. Participants' achievements related to pedometer steps and breaks in sitting time were accumulated to create group mileage totals (i.e., total combined miles walked to reach a destination such as another city in the state) and total number of seats filled in a theater/stadium (representing people standing up) were presented.

  After 12 weeks, participants then began a 12-week maintenance phase where there were no contacts other than a survey sent at 24 weeks. Over the final 12 weeks (i.e., from 24-36 weeks), these participants were emailed/mailed resources developed by the NIA, but were not given the symptom checker calls
  2. Description of Healthy Living / Delayed Treatment (HL/DT) Condition that received weekly telephone calls for symptoms and daily activities
  This condition received 12 weekly phone calls using a previously developed contact-matched protocol that included asking the person about 27 different physical symptoms and how much any reported symptoms affected their daily activities.(Winningham, 1993) It has been used for participants randomly assigned to a comparison condition or wait list control group.(Pinto, Rabin, Abdow, & Papandonatos, 2008) If they reported a new or unusual symptom and it more than moderately affected their daily activities, staff recommended participants to speak to their physician. Staff mailed or emailed healthy aging information developed by the NIA. Similar to the LMPA/ST condition, staff obtained specific information about any adverse events. After 12 weeks, those in HL/DT condition then received the LMPA/ST intervention calls and group cohesion sessions. Following that, at 24 weeks, those in the HL/DT condition entered the maintenance phase after completing the LMPA/ST intervention.

  3. Baseline Sociodemographics by study condition
  Table 5 (on this page and the next) lists the baseline characteristics of our study sample by condition. There were no significant differences in demographics between the two study conditions. The sample is largely female (80%), mean age was 64.4 years, 97.1% were Filipino, 77.1% were born in the Philippines, 45.7% are married, 85.3% never smoked, 71.4% are employed, mean BMI is 28.7 kg/m^2 and 42.9% are obese. There were also no differences between study conditions in the percent of people reporting specific health conditions (under control), including hypertension (60.0%), hyperlipidemia (40.0%); diabetes (31.4%); and arthritis (22.9%). The mean number of co-morbidities reported was about 2 for both conditions. The percent of participants who reported having two or more co-comorbidities at baseline was 52.2% for HL/DT condition and 58.3% for LMPA/ST condition.

Table 5. Baseline Sociodemographics by Study Condition

Characteristics	Total (n=35)	HL/DT (n=23)	LMPA/ST (n=12)	P*
Sex, Female	28 (80.0%)	18 (78.3%)	10 (83.3%)	1.00
Age (yrs.)	64.4 ± 6.2	63.8 ± 6.1	65.5 ± 6.6	0.46
Race, Filipino	34 (97.1%)	22 (95.7%)	12 (100%)	1.00
Birth Place, Philippines	27 (77.1%)	17 (73.9%)	10 (83.3%)	0.69
Education (yrs.)	14.1 ± 4.2	14.0 ± 4.4	14.5 ± 3.9	0.78
Marital Status: Married	16 (45.7%)	10 (43.5%)	6 (50.0%)	0.83
Smoking Status, Never smoked	29 (85.3%)	19 (82.6%)	10 (90.9%)	0.16
Employment: Employed	25 (71.4%)	17 (73.9%)	8 (66.7%)	0.71
Body Mass Index, Continuous	28.7 ± 4.7	27.7 ± 4.0	30.6 ± 5.7	0.10

Body Mass Index, Categorical				0.90
Normal	8 (22.9%)	6 (26.1%)	2 (16.7%)	
Overweight	12 (34.3%)	8 (34.3%)	4 (33.3%)	
Obese	15 (42.9%)	9 (39.1%)	6 (50.0%)	
Hypertension	21 (60.0%)	13 (56.5%)	8 (66.7%)	0.72
Hyperlipidemia	14 (40.0%)	9 (39.1%)	5 (41.7%)	0.88
Diabetes	11 (31.4%)	8 (34.8%)	3 (25.0%)	0.71
Arthritis	8 (22.9%)	3 (13.0%)	4 (41.7%)	0.09
Number of Comorbidities	1.9 ± 1.5	1.9 ± 1.2	2.0 ± 1.1	0.81
Number of Comorbidities				1.00
0	6 (17.1%)	4 (17.4%)	2 (16.7%)	
1	10 (28.6%)	7 (30.4%)	3 (25.0%)	
2+	19 (54.3%)	12 (52.2%)	7 (58.3%)	

n (%) or Mean ± SD. HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. * Fisher's exact test or chi-square test was used for categorical variables and two sample t test was used for continuous variables.

4. Baseline Results for Physical Activity / Sedentary time by study condition

Table 6 shows PA outcomes at baseline by study condition for the CHAMPS measures. Across the two conditions none of the PA outcomes were significantly different between the study conditions, although participants in the LMPA/ST condition reported slightly higher minutes of MVPA activity (180 min) versus HL/DT(171 min).

Table 6. Baseline Results comparing Physical Activity Outcomes by Study Condition

Variable	Total	HL/DT Condition	LMPA/ST Condition	P*
Frequency per week (All)	14.6 ± 10.3 (0 - 36)	14.6 ± 10.0 (1 - 36)	14.7 ± 11.2 (0 - 32)	0.98
Number of Minutes per week (All)	472 ± 348 (30 - 1,380)	456 ± 369 (30 - 1,380)	505 ± 316 (60 - 1,065)	0.71
Caloric Expenditure per week (All)	1517 ± 1134 (83 - 5,116)	1464 ± 1205 (83 - 5,116)	1630 ± 1013 (196 - 3,207)	0.70
Frequency per week (MVPA)	3.8 ± 4.2 (0 - 18)	4.1 ± 4.5 (0 - 18)	3.1 ± 3.4 (0 - 9)	0.51
Number of Minutes per week (MVPA)	174 ± 183 (0 - 690)	171 ± 175 (0 - 690)	180 ± 207 (0 - 675)	0.89
Caloric Expenditure (MVPA), per week	712 ± 696 (0 - 2,158)	704 ± 703 (0 - 2,158)	728 ± 714 (0 - 1,944)	0.93
Frequency per week (HiLi)	10.0 ± 7.5 (0 - 30)	9.2 ± 6.5 (1 - 23)	11.5 ± 9.4 (0 - 30)	0.42
Number of Minutes per week (HiLi PA)	370 ± 293 (30 - 1,140)	335 ± 300 (30 - 1,035)	445 ± 274 (135 - 1,140)	0.31
Caloric Expenditure per week (HiLi)	1060 ± 923 (83 - 3,511)	961 ± 971 (83 - 3,511)	1268 ± 815 (300 - 3,282)	0.37

Mean ± SD (Range). HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate-to-vigorous physical activity (note CHAMPS survey refers to this as MVI but MVPA has become the standard nomenclature). HiLi = High-light intensity per Hekler 2012. * Two sample t test was used.

Table 7 (on the next page) shows the results for baseline sedentary time outcomes by condition, the only significant difference between the two conditions was for number of breaks in sitting time at home (per hour), with the LMPA/ST condition had 2.5 mean number of breaks per hour (P = .01) while HL/DT had 1.1 breaks.

Table 7. Baseline Results by study condition for Sleep, Sitting Time, and Breaks in Sitting Time

Characteristic	HL/DT (n=23)	LMPA/ST (n=12)	*P**
Daytime sleep (hrs./day)	0.5 ± 0.6	1.0 ± 1.3	0.43
Nighttime sleep (hrs./day)	6.0 ± 0.9	7.1 ± 1.0	1.00
Total Sleep Time (hrs./day)	6.5 ± 1.0	7.1 ± 1.0	0.14
Total Sitting Time (hrs./day) [a]	6.3 ± 6.3	5.4 ± 4.9	0.96
# of Breaks Sitting per Hour at Home	1.1 ± 1.0	2.5 ± 1.7	**0.01**
# of Breaks Sitting per Hour at Work	1.5 ± 1.5	2.6 ± 1.8	0.09

Mean ± SD. HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. [a] Total sitting time=watching TV, using computer, reading, socializing with friends or family, driving or riding, hobby, and other activity. Driving, watching TV, and socializing with friends or family were the top three most commonly listed activities reported while sitting. * Two sample t test was used.

5. Comparison of baseline sociodemographic characteristics: study completers vs. dropouts by condition.

As seen in the Consort Figure 2 above, 23 out of 35 persons (66% retention rate) remained in the study over the entire 9 month period. We conducted statistical tests to determine if there were any statisticially signficiant differences in sociodemographic characteristics and study outcomes, by condition, between those who completed the study (completers) versus those who were dropouts or lost to follow up. Descriptive statistics were computed using mean and standard deviation for a continuous variable and frequency and percentage for a categorical variable. To test for significant differences between participants who dropped versus those who completed the study, we used Wilcoxon nonparametric test for continuous variables and chi-square tests or Fisher's exact tests for categorical variables, depending on the distribution of variables. Tables 8 - 11 below compares the baseline results for study outcomes/measures by condition and dropout status. There were no significant differences in baseline sociodemographics between study completers /dropouts by study condition.

Table 8. Baseline Sociodemographic Characteristics by Dropout Status: Total sample/ Conditions

Variable	Total Sample			HL/DT condition			LMPA/ST condition		
	Completed (n=23)	Dropout (n=12)	P	Completed (n=17)	Dropout (n=6)	P	Completed (n=6)	Dropout (n=6)	P
Sex, % Male	5 (21.7%)	2 (16.7%)	1.000	5 (29.4%)	0 (0%)	0.192	0 (0%)	2 (33.3%)	0.455
Age	63.6±5.7 (56-75)	66.0±7.2 (55-75)	0.320	62.6±5.7 (56-75)	67.3±6.4 (57-73)	0.145	66.3±5.2 (60-73)	64.7±8.2 (55-75)	0.639
Ethnicity, Hispanic	2 (8.7%)	0 (0%)	0.536	2 (11.8%)	0 (0%)	1.000	0 (0%)	0 (0%)	NA
Race, Filipino	22 (95.6%)	12 (100%)	1.000	16 (94.1%)	6 (100%)	1.000	6 (100%)	6 (100%)	NA
Born in Philippines	16 (69.6%)	11 (91.7%)	0.216	11 (64.7%)	6 (100%)	0.144	5 (83.3%)	5 (83.3%)	1.000
Years lived in HI	41.0±16.7 (15-75)	34.0±14.9 (13-59)	0.289	40.7±16.7 (19-75)	28.2±14.4 (13-49)	0.146	41.8±18.1 (15-64)	39.8±14.1 (18-59)	1.000
Years of education	15.3±3.0 (10-20)	12.1±5.2 (4-18)	0.173	15.2±3.3 (10-20)	10.5±5.4 (4-16)	0.116	15.4±2.2 (12-18)	13.7±5.0 (4-18)	0.715
Marital status:			0.606			0.392			1.000
Never married	5 (21.7%)	1 (8.3%)		4 (23.5%)	0 (0%)		1 (16.7%)	1 (16.7%)	
Married	11 (47.8%)	5 (41.7%)		8 (47.1%)	2 (33.3%)		3 (50.0%)	3 (50.0%)	
Divorced	2 (8.7%)	1 (8.3%)		2 (11.8%)	1 (16.7%)		0 (0%)	0 (0%)	
Widowed	5 (21.7%)	5 (41.7%)		3 (17.7%)	3 (50.0%)		2 (33.3%)	2 (33.3%)	
Never smoked	18 (81.8%)	11 (91.7%)	0.635	13 (76.5%)	6 (100%)	0.539	5 (100%)	5 (83.3%)	1.000
Employed	17 (73.9%)	8 (66.7%)	0.706	13 (76.5%)	4 (66.7%)	0.632	4 (66.7%)	4 (66.7%)	1.000
BMI	29.2±4.0 (22.1-37.8)	27.7±6.0 (21.6-39.3)	0.158	28.4±4.0 (22.1-37.8)	25.9±3.4 (21.6-30.9)	0.208	31.5±3.1 (28.4-36.4)	29.6±7.7 (21.8-39.3)	0.397
Normal (BMI<25)	3 (13.0%)	5 (41.7%)	0.159	3 (17.7%)	3 (50.0%)	0.299	0 (0%)	2 (33.3%)	0.481
Overweight (25≤BMI<30)	8 (34.8%)	4 (33.3%)		6 (35.3%)	2 (33.3%)		2 (33.3%)	2 (33.3%)	
Obese (BMI≥30)	12 (52.2%)	3 (25.0%)		8 (47.1%)	1 (16.7%)		4 (66.7%)	3 (33.3%)	

N (%) or Mean ± SD (Range). HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. BMI = Body mass index. NA = Non-applicable. * Fisher's exact test or chi-square test was used for categorical variable and two sample t test was used for continuous variable.

When we analyzed number of medical conditions for the total sample and for the two study conditions, there were no significant differences in the type and number of medical conditions reported at baseline by those who later dropped out versus those who completed the study.

Table 9. Baseline Medical Conditions by Dropout Status for Total sample and by Study Conditions

Variable	Total Sample			HL/DT Condition			LMPA/ST Condition		
	Completed (n=23)	Dropout (n=12)	P	Completed (n=17)	Dropout (n=6)	P	Completed (n=6)	Dropout (n=6)	P
Arthritis	4 (17.4%)	4 (33.3%)	0.402	1 (5.9%)	2 (33.3%)	0.155	3 (50.0%)	2 (33.3%)	1.000
Diabetes	8 (34.8%)	3 (25.0%)	0.709	5 (29.4%)	3 (50.0%)	0.621	3 (50.0%)	0 (0%)	0.182
Hypertension	15 (65.2%)	6 (50.0%)	0.477	10 (58.8%)	3 (50.0%)	1.000	5 (83.3%)	3 (50.0%)	0.546
Hyperlipidemia	10 (43.5%)	4 (33.3%)	0.721	6 (35.3%)	3 (50.0%)	0.643	4 (66.7%)	1 (16.7%)	0.242
# comorbidities:									
0	4 (17.4%)	2 (16.7%)	0.396	4 (23.5%)	0 (0%)	0.311	0 (0%)	2 (33.3%)	0.318
1	5 (21.7%)	5 (41.7%)		4 (23.5%)	3 (50.0%)		1 (16.7%)	2 (33.3%)	
2+	14 (60.9%)	5 (41.7%)		9 (52.9%)	3 (50.0%)		5 (83.3%)	2 (33.3%)	

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition.

When we tested the total sample and compared the two study conditions, there were no significant differences in any of the CHAMPS physical activity outcomes reported at baseline for those who later dropped out versus those who completed the study (Table 10).

Table 10. Baseline Physical Activity Outcomes by Dropout Status for Total sample and by Study Conditions

Variable	Total Sample			HL/DT condition			LMPA/ST Condition		
	Completed (n=23)	Dropout (n=11)	P	Completed (n=17)	Dropout (n=6)	P	Completed (n=6)	Dropout (n=5)	P
Frequency (All), per week	14.9±10.5 (0-36)	14.1±10.3 (0-31)	0.855	14.8±10.2 (1-36)	14.0±10.3 (3.8-28)	0.890	15.0±12.1 (0-32)	14.3±11.5 (3-31)	0.929
Number of Minutes (All), per week	470±347 (30-1380)	475±369 (90-1365)	0.942	429±331 (30-1380)	533±488 (90-1365)	0.809	588±396 (60-1065)	405±177 (195-585)	0.382
Caloric Expenditure (All), per week	1571±1201 (83-5116)	1405±1022 (259-3744)	0.688	1476±1223 (83-5116)	1430±1265 (259-3744)	0.809	1842±1203 (196-3207)	1375±782 (466-2224)	0.431
Frequency (MVPA)	3.9±4.1 (0-18)	3.6±4.5 (0-14)	0.712	4.0±4.3 (0-18)	4.3±5.6 (0-14)	0.754	3.3±4.0 (0-9)	2.8±3.1 (0-8)	1.000
Number of Minutes (MVPA), per week	172±178 (0-675)	177±203 (0-690)	0.956	158±142 (0-450)	208±263 (0-690)	0.945	213±268 (0-675)	141±116 (0-240)	1.000
Caloric Expenditure (MVPA)	722±709 (0-2158)	689±701 (0-2155)	0.869	697±675 (0-2158)	722±844 (0-2155)	0.808	793±861 (0-1944)	650±577 (0-1354)	0.788
Frequency (HiLi), per week	10.3±8.0 (0-30)	9.3±6.6 (1-21)	0.784	9.8±7.0 (1-23)	7.7±5.0 (1-15)	0.557	11.9±11.0 (0-30)	11.1±8.4 (1-21)	0.929
Number of Minutes (HiLi), per week	381±320 (30-1140)	348±238 (30-720)	0.971	328±309 (30-1035)	353±301 (30-720)	0.972	530±329 (165-1140)	342±167 (135-585)	0.338
Caloric Expenditure (HiLi), per week	1139±1049 (83-3511)	896±587 (93-1589)	1.000	1008±1071 (83-3511)	828±671 (93-1543)	1.000	1510±973 (491-3282)	977±532 (300-1589)	0.431

HL/DT = Healthy Living/Delayed treatment condition. . LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate-vigorous physical activity (note CHAMPS survey refers to this a MVI but MVPA has become the standard nomenclature) HiLi = High-light intensity.

Table 11 (see next page) presents number of breaks, environment and social support at baseline by study condition. In the HL/DT condition, there is a significant difference in total social support for physical activity between the participants who completed at least three surveys (n=17) and the participants who dropped out

from the study (n=6). Participants who completed the study had a higher total social support score than the participants who dropped out from the study (P=0.03). However, this difference was not significant for completers versus dropouts for the total sample. No other comparisons for sitting time, number breaks in sitting time, the PANES scores, or other social support outcomes were significantly different between completers and dropouts.

Table 11. Number of Sitting Breaks per Hour, Environment and Social Support at Baseline by Dropout Status for Total Sample and by Study Conditions

Variable	Total Sample			HL /DT condition			LMPA/ST Condition		
	Completed (n=23)	Dropout (n=12)	P	Completed (n=17)	Dropout (n=6)	P	Completed (n=6)	Dropout (n=6)	P
Total Sitting Time, hrs/day	6.9±6.5 (0.7-26.1)	4.2±3.7 (1.1-12.8)	0.460	7.4±7.0 (0.7-26.1)	3.2±1.3 (1.3-5.0)	0.558	5.6±5.1 (0.8-15.3)	5.1±5.1 (1.1-12.8)	0.697
# Breaks per hour at work	1.8±1.6 (0-6)	1.3±0.7 (1-3)	0.812	1.2±1.1 (0-4)	1.0±0.0 (1-1)	0.856	3.3±1.9 (1-6)	1.6±0.9 (1-3)	0.139
# Breaks per hour at home	2.0±1.9 (0-6)	1.6±1.2 (0-4)	0.670	1.6±1.6 (0-6)	1.0±0.8 (0-2)	0.622	3.7±2.1 (2-6)	2.0±1.4 (1-4)	0.318
PANES total	2.7±0.5 (1.6-3.6)	2.7±0.4 (1.9-3.4)	0.654	2.7±0.3 (1.9-3.3)	2.7±0.4 (2.2-3.1)	1.000	2.7±0.8 (1.6-3.6)	2.8±0.5 (1.9-3.4)	0.294
Family Rewards & Punishment	10.7±2.1 (3-15)	11.0±0.4 (10-12)	0.641	11.2±1.3 (9-15)	11.0±0.0 (11-11)	1.000	9.2±3.5 (3-11)	11.0±0.6 (10-12)	0.314
Family Support PA	13.1±6.2 (8-28)	12.1±5.0 (8-21)	0.602	14.5±6.6 (8-28)	10.2±3.7 (8-17)	0.103	8.8±1.8 (8-12)	14.0±5.7 (8-21)	0.166
Friend Support PA	11.3±4.5 (8-22)	11.1±5.0 (8-24)	0.877	11.7±4.8 (8-22)	8.8±1.2 (8-11)	0.279	10.2±3.5 (8-16)	13.3±6.4 (8-24)	0.409
Total Social Support PA	24.5±7.1 (16-40)	23.2±9.6 (16-45)	0.343	26.2±7.1 (16-340)	19.0±4.8 (16-28)	**0.030**	19.0±3.3 (16-24)	27.3±11.7 (16-45)	0.328

Mean ± SD (Range). HL/DT= Healthy Living/ Delayed treatment. LMPA/ST = Light-to-moderate physical activity/sedentary time. PANES = Physical Activity Neighborhood Environment Scale (range 1-4, with higher score representing more environmental support for physical activity, e.g., not much traffic, parks, maintained sidewalks, etc.). PA = Physical activity. * Two sample t test was used.

In conclusion, almost all of the comparisons of baseline measures between subjects who completed the study to those who dropped out were not significantly different. Thus, we concluded there were no inherent bias nor were there sociodemographic differences between subjects who dropped out of study and subjects who completed the 9 month study.

D. Delivery of Study Protocols to Participants and Staff's Fidelity to Study Protocols by Condition
 1. Completion of scheduled (per protocol) telephone calls by study condition.
  Of the 327 LMPA/ST intervention calls that were per protocol for subjects receiving this intervention (across both study conditions), 254 (77.7%) were conducted / completed. The average duration of each call was 15 min. If a participant was not reached at the scheduled call time, the health coach attempted a max of 2 calls before considering this call a missed call. There were 454 call attempts and a total of 73 missed calls.
  Of the 251 symptom checker calls planned per protocol for the HL/DT condition, 135 (53.8%) were conducted/completed. The average duration of each call was 8:75 min. There were 383 call attempts and 116 total missed calls.
  We also compared the delivery of LMPA/ST intervention calls made to all participants, from both study conditions (i.e., comparing the LMPA/ST condition that received intervention from baseline-3months to the HL/DT condition that received the same intervention from 3-6 months).There were total of 12 calls on physical activity and sedentary time during the 3-month intervention period. The six odd numbered calls (i.e., 1, 3, 5, 7, 9, 11) addressed physical activity goals and the six even numbered calls (i.e., 2, 4, 6, 8, 10, 12) discussed sedentary time goals. Two sample t tests were used for the following tables to compare completed /attempted/missed calls for persons who participated in the LMPA/ST intervention initially from baseline to 3 months for those in the LMPA/ST condition and for those participants randomly selected to receive the HL/DT condition's calls first then received the LMPA/ST intervention calls from 3 – 6 months. As presented in Table 12 (next page), there were no significant differences in the delivery of the LMPA/ST intervention to both study conditions for all measured factors including: the number of calls completed, duration of the call, the number of attempts to reach participant, and the average number of missed calls during the three month period.

Table 12. Receipt of Telephone Calls during LMPA Intervention Period by Study Condition

Call Type	Total	HL/DT Condition (3-6 month)	LMPA/ST Condition (base-3 month)	P*
Total Intervention Calls				
Number Calls completed	8.2 ± 4.2 (0 - 12)	8.5 ± 3.7 (1 - 12)	7.7 ± 5.0 (0 - 12)	0.59
Average call attempts	2.7 ± 2.9 (1 - 13)	2.6 ± 2.6 (1 - 12)	2.9 ± 3.6 (1 - 13)	0.75
Average call duration, min	14.1 ± 3.8 (4 - 24)	13.3 ± 4.1 (4 - 24)	15.5 ± 3.0 (11 - 20)	0.14
Average call missed	0.7 ± 1.4 (0 - 6)	0.6 ± 1.2 (0 - 5)	0.8 ± 1.8 (0 - 6)	0.73
Physical Activity Calls				
Number Calls completed	4.2 ± 2.0 (0 - 6)	4.4 ± 1.7 (1 - 6)	3.8 ± 2.6 (0 - 6)	0.44
Average call attempts	2.1 ± 1.4 (1 - 6)	2.1 ± 1.4 (1 - 6)	2.0 ± 1.5 (1 - 6)	0.78
Average call duration, min	15.9 ± 5.7 (4 - 33)	14.6 ± 5.0 (4 - 27)	18.3 ± 6.5 (11 - 33)	0.10
Average call missed	0.4 ± 0.6 (0 - 2)	0.4 ± 0.6 (0 - 2)	0.3 ± 0.6 (0 - 2)	0.58
Sedentary Time Calls				
Calls completed	4.1 ± 2.2 (0 - 6)	4.3 ± 2.0 (0 - 6)	3.8 ± 2.5 (0 - 6)	0.55
Average call attempts	2.1 ± 1.3 (1 - 6)	1.9 ± 0.9 (1 - 4)	2.3 ± 1.7 (1 - 6)	0.51
Average call duration, min	12.5 ± 4.4 (2 - 26)	12.5 ± 4.0 (9 - 26)	12.6 ± 5.3 (2 - 20)	0.99
Average call missed	0.4 ± 0.6 (0 - 2)	0.3 ± 0.4 (0 - 1)	0.5 ± 0.8 (0 - 2)	0.55

Mean ± SD (Range). HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. *Two sample t test was used.

Of those who started in the LMPA/ST condition, 5 of 12 (41.7%) received all 12 LMPA/ST calls in the intervention of those in the HL/DT condition none received all 12 symptom checker calls and 6 of 23 (26%) of those in HL/DT received all 12 LMPA/ST calls in the intervention.
 2. Fidelity to the LMPA/ST intervention calls and HL/DT symptom checker calls

All telephone calls to study participants were recorded in order to assess fidelity to the condition-specific protocols. Fidelity of the staff delivering the telephone protocols were checked (via audiotaped recordings) for 12.6% of LMPA/ST and 21.5% of symptom checker calls. These recorded counseling calls were randomly selected, and no health coach reviewed their own calls. Fidelity to the key intervention components (e.g., goal setting, barrier resolution, resources) was 97.8% for the LMPA/ST intervention calls. Fidelity to all items of the symptom checker and the dissemination of healthy aging resources was 97.5% for the symptom checker calls.

 3. Attendance of Group Cohesion Meetings
A total of 12 group cohesion meetings were held. If there was only 1 participant in the club, a group cohesion session was not held. The one participant randomized in Club 6 dropped before the first meeting. See Table 13 on next page for attendance across clubs. The first meeting was discussed combined step counts for all the members (e.g. enough combined step/miles to have walked to a neighboring island) and the second meeting discussed sedentary time.

See Table 13 on the next page

Table 13. Attendance at Group Cohesion meetings by Club during LMPA/ST intervention

Club #	PA Group Cohesion (in attendance)	ST Group Cohesion (in attendance)
Club 1	3	3
Club 2	3	2
Club 3	2	2
Club 4	n/a	n/a
Club 5	8	7
Club 6	n/a	n/a
Club 7	n/a	n/a
Club 8	2	n/a
Club 9	2	2
Club 10	2	n/a

4. <u>Completion of study surveys</u>

Of the 10 clubs randomized, one was lost to follow up before 12 weeks. Survey completion for all participants was tracked for each of the four time points: Baseline, 12 weeks, 24 weeks, and 36 weeks.

At Baseline (see Table 14), 35 (100%) surveys were completed, 12 from LMPA/ST and 23 from the HL/DT condition. At 12 weeks, we received 24/35 surveys (68.8%) with 8 coming from LMPA/ST and 16 surveys being done by the HL/DT condition. At 24 weeks, we received 23 surveys (65.7%) with 6 being done by the LMPA/ST group condition and 17 from HL/DT. Finally, at 36 weeks, 22 of 35 surveys (62.9%) were received, with 5 coming from LMPA/ST and 17 coming from the HL/DT condition. See table below for summary of survey completions over time.

Table 14. Survey Completion (for those enrolled in study) over 4 Assessment Points by Study Condition

Condition	Survey Completion			
	Baseline	**12 Weeks**	**24 Weeks**	**36 Weeks**
LMPA/ST	12	8/12 (66.7%)	6/12 (50.0%)	5/12 (41.7%)
HL/DT	23	16/23 (69.6%)	17/23 (73.9%)	17/23 (73.9%)
TOTAL	35	24/35 (68.6%)	23/35 (65.7%)	22/35 (62.9%)

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition.

Compliance to wearing the accelerometer ranged from 55.6% to 100% across the 4 time points (Table 15). Across all time points 15/20 or 81.3% of persons in HL/DT condition returned the accelerometer with valid days and 13/16 or 75% of those in LMPA/ST condition returned accelerometer with valid days.

Table 15. Accelerometer Compliance over 36 weeks by Study Condition

Condition	Accelerometer Compliance			
	Baseline	**12 Weeks**	**24 Weeks**	**36 Weeks**
LMPA/ST (those with valid days)	5 (out of 5)	4 (out of 4)	2 (out of 4)	2 (out of 3)
HL/DT (those with valid days)	5 (out of 5)	3 (out of 5)	3 (out of 5)	4 (out of 5)
Total Returned/Distributed	10/10 (100%)	8/9 (88.9%)	5/9 (55.6%)	6/8 (75%)

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition.

III. Measurements / Survey Schedule and Instruments

Anthropometric data (height and weight) were collected, onsite at the church, during the baseline visit. The survey schedule included a survey in person at the baseline and via mail at 12 weeks, 24 weeks, and 36 weeks. Participants were reminded via email and by phone once the survey was mailed out. If study staff didn't receive a survey after 5 days, they made one more reminder attempt via email. After 9 days without receiving a survey, staff mailed out a shorter outcomes-only survey that included only the primary outcome questions (CHAMPS questionnaire and breaks in ST) and the adverse events question. A total of 8 participants completed these shorter Outcome-Only surveys (2 at 3 mo- both HL/DT, 4 at 6 mo- 3 HL/DT and 1 LMPA/ST, and 2 at 9 months- both HL/DT). At each timepoint, one participant in each club (approximately 10% of the club members) was randomly chosen to wear a wrist worn accelerometer (GENEActiv) for 7 days at each of measurement time points (i.e. baseline, 12, 24, and 36 weeks). Using the same cut-off points of CHAMPS metabolic equivalent for PA, we determined low-light intensity (LoLi) PA, high-light (HiLi), and MVPA. Sedentary time was not directly reported in GENEActiv accelerometer so it was estimated by subtracting all PA (LoLi PA, HiLi PA, and MVPA) and bed time.

Study surveys included standardized instruments for physical activity/breaks in sitting that had been developed and validated in studies with older adults (e.g., CHAMPS, MOST, etc.). (Gardiner, Clark, et al., 2011; Gardiner, Eakin, Healy, & Owen, 2011; Stewart, Mills, et al., 1997; Stewart, Verboncoeur, et al., 1997) In addition, we used validated instruments to assess neighborhood environment's walkability (PANES) (J. F. Sallis et al., 2010) and social support for physical activity (GRAD) (C. L. Albright et al., 2012; R. K. Oka, King, & Young, 1995; R. Oka, King, & Young, 1993). The baseline survey assessed standard demographics including the following: age, where they were born and how long they have been in Hawaii, ethnicity/race, education, marital status, smoking status, employment status, caregiving status, comorbidities.

A. Anthropometric Measurements

Weight (HoMedics Model SC-476, Commerce Charter Twp, MI) and height (Portable Stadiometer Height-Rod Seca 213, Thousand Oaks, CA) were measured without shoes or heavy clothing, following previously used protocols. (C.L. Albright et al., 2012)

B. Accelerometer Measurement of Physical Activity

GENEActiv is a waterproof accelerometer that could be worn 24 hours a day, measuring activity continuously for up to one month without needing to be recharged. The first accelerometer was given out at the baseline visit. However, all future accelerometers were sent via USPS mail to the participant who was randomly assigned to wear it and they returned it to us via USPS mail. We tracked who wore and returned an accelerometer, as well as how many valid days it was worn. Valid day criteria included: 1) wear time >10 hours, 2) wear 5 consecutive days, and 3) no zeroes for all of the physical activities of sedentary activity, low-light intensity activity, high-light intensity activity, and MVPA.

C. Primary Outcomes: Assessment of MVPA

The Community Health Activities Model Program for Seniors (CHAMPS) survey was used to assess a variety of self-reported PA "in a typical week during the past 4 weeks." (Stewart, Verboncoeur, et al., 1997) Over the last 19 years during which this measure was used in numerous intervention studies with older adults, its validity, test-retest reliability, and sensitivity to change were found to be excellent. (Castro, Pruitt, Buman, & King, 2011; Wilcox et al., 2013) (A.C. King et al., 2000; Stewart, Mills, et al., 2001; Stewart, Verboncoeur, et al., 2001; Stewart, Mills, et al., 1997) (Hekler et al., 2012) (Cyarto, Marshall, Dickinson, & Brown, 2006; A. C. King, Baumann, O'Sullivan, Wilcox, & Castro, 2002; Moore et al., 2008). Participants reported the number of times/week they do a specific physical activity, and then choose one of 6 time ranges that represented the amount of time they did that activity, from less than 1 hr/week to 9 or more hrs/week. Hekler, et al., modified the CHAMPS survey to measure high-light intensity (HiLi) (>2 and <3 Metabolic Equivalents (METs)) and MVPA activity (>3 METs). Frequency per week, number of minutes per week, and caloric expenditure per week was calculated by summing specific CHAMPS items to assess overall PA, HiLi, MVPA (Table 16 lists how these outcomes were defined using CHAMPS questions and Hekler questions). The surveys were administered at baseline, 12, 24, and 36-weeks post baseline.

The CHAMPS survey measured a variety of self-reported PAs done "in a typical week during the past 4 weeks." Over the last 23 years during which this measure was used in numerous intervention studies with adults, including older adults, its validity, test–retest reliability, and sensitivity to change have been found to be

excellent. Participants report the number of times/week they do a specific PA, and then choose one of 6 time frames that represent the amount of time they did that activity, from less than one hr/week to 9 or more hours/week. For example, as done in other faith-based organization studies, MVPA will be the sum of six CHAMPS items that assessed moderate or higher intensities: walking (i.e., walking fast, walking for leisure, dog walking), bicycling, and jogging or running for leisure, while light-to-moderate activity included certain household and gardening activities along with walking for leisure and dog walking. The definitions for the primary outcomes using the CHAMPS PA questions are listed in Table 16. Physical activities were presented by frequency, number of minutes, and caloric expenditure of all, moderate and vigorous intensity (MVPA), and high-light intensity (HiLi) physical activities (PA) per week using the Community Health Activities Model Program for Seniors (CHAMPS) (Stewart, Verboncoeur, et al., 2001) and Hekler et. al. 2012 HiLi outcomes. (Hekler et al., 2012). Missing weight in a specific survey was imputed by the participant's objective baseline weight. Caloric expenditure defined as MET*3.5*60*(Weight in lbs)*0.45359/200 (see Table 17 next page).

Table 16. Questions used for specific CHAMPS physical activity measures

Variable Label	Question Nos.	Coding Algorithms
Caloric expenditure/week in all exercise-related activities	7, 9, 10, 14–16, 19–35, 37–40	For each activity 1. Create new duration variables for each activity recorded as follows: 1=0.5, 2=1.75, 3=3.75, 4=5.75, 5=7.75, 6=9.75; if duration variable is not answered, score=0. Duration is hours/week. 2. For each recoded duration variable, create new weighted duration variable for each activity by multiplying duration variable (no. 1) by corresponding MET value (see Table 17). 3. For each weighted duration variable, create caloric expenditure per week variable for each activity by multiplying weighted duration variable (no. 2) by 3.5 and by 60 (to convert METs/minute to METs/hour) and by (weight in kg/200). 4. Sum caloric expenditure per week variables across activities to create caloric expenditure/week.
Caloric expenditure/week in moderate-intensity exercise related activities	7, 9, 14-16, 19, 21, 23-26, 29-33, 37, 38, 40	Same as above, subset of activities with MET values ≥3.0
Hekler's Caloric expenditure/week in high-light-intensity exercise related activities	3, 10, 13, 20, 27, 28, 34, 35, 39, Other (Dog walking)	Same as above, subset of activities with MET values between 2 and 3 (exclusive)
Frequency/week of all exercise-related activities	7, 9, 10, 14-16, 19-35, 37-40	Sum frequency scores/week for each of the activities (allow those with missing data on frequency to be included in the sum)
Frequency/week of moderate-intensity exercise-related activities	7, 9, 14-16, 19, 21, 23-26, 29-33, 37, 38, 40	Sum frequency scores/week for each of the activities (allow those with missing data on frequency to be included in the sum)
Hekler's Frequency/week of high-light-intensity exercise-related activities	3, 10, 13, 20, 27, 28, 34, 35, 39, Other (Dog walking)	Sum frequency scores/week for each of the activities (allow those with missing data on frequency to be included in the sum)

MET = Metabolic equivalent.

Table 17. Summary of metabolic weights for selected items to adjust for older adults completing the CHAMPS physical activity questionnaire

Item #	Question Item	Metabolic Weight	Category
3	Do volunteer work	2.25	HiLi
7	Dance	4.5	MVPA
9	Play golf, carrying or pulling your equipment	5.0	MVPA
10	Play golf, riding a cart	2.0	HiLi
13	Shoot pool or billiards	2.5	HiLi
14	Play singles tennis	8.0	MVPA
15	Play doubles tennis	6.0	MVPA
16	Skate (ice, roller, in-line)	7.0	MVPA
19	Do heavy work around the house (such as washing windows, cleaning gutters)	4.5	MVPA
20	Do light work around the house (such as sweeping or vacuuming)	2.5	HiLi
21	Do heavy gardening (such as spading, raking)	4.4	MVPA
22	Do light gardening (such as watering plants)	2.25	LoLi
23	Work on your car, truck, lawn mower, or other machinery	3.0	MVPA
24	Jog or run	7.0	MVPA
25	Walk uphill or hike uphill (count only the uphill part)	6.0	MVPA
26	Walk fast or briskly for exercise (do not count walking leisurely or uphill)	3.5	MVPA
27	Walk to errands (such as to/from a store or to take children to school (count walk time only))	2.5	HiLi
28	Walk leisurely for exercise or pleasure	2.5	HiLi
29	Ride a bicycle or stationary cycle	5.0	MVPA
30	Do other aerobic machines such as rowing or step machines	7.0	MVPA
31	Do water exercises	4.0	MVPA
32	Swim moderately or fast	8.0	MVPA
33	Swim gently	6.0	MVPA
34	Do stretching or flexibility exercises	4.0	HiLi
35	Do yoga or Tai Chi	4.0	HiLi
37	Do moderate to heavy strength training	7.0	MVPA
38	Do light strength training	3.0	MVPA
39	Do general conditioning exercises, such as light calisthenics or chair exercises	4.5	HiLi
40	Play basketball, soccer, or racquetball	7.1	MVPA
41	Other (Walk your dog)	2.5	HiLi

HiLi = High-light intensity. MVPA = Moderate-to-vigorous physical activity. Reference:
Stewart AL, Mills *Med Sci Sports Exerc*, 2001 Jul; 33(7): 1126-1141.Hekler EB, *J Phys Act Health*. 2012 Feb; 9(2): 225-236.

D. Primary Outcomes: Assessment of Sedentary Behaviors

Sedentary behaviors was measured via the Measure of Older Adults' Sedentary Time (**MOST**), a validated survey with good test-retest reliability and results from ST interventions have found it sensitive to change. (Gardiner, Clark, et al., 2011; Gardiner, Eakin, et al., 2011) The survey asked respondents to report the amount of time they spent doing 7 different types of tasks/activities (over last week) while sitting or lying (other than sleeping/napping/ill in bed) including: (1) TV or video/DVD watching, (2) other screen use/internet use: computer/tablet/Smartphone, (3) reading, (4) socializing with friends or family (in-person or when talking on phone), (5) driving/riding in car or city bus, (6) doing hobbies, and (7) any other activities. The total amount of

time spent sitting for each task/activity and total across all tasks were calculated. To assess the use of intervention strategies such as "breaking up" time spent sitting, we used an item from the Workplace Sitting Breaks Questionnaire (SITBRQ) that inquired about the past 7 days, how many breaks from sitting taken in an hour at work/home. This could include standing, stretching, or taking a short walk. Participants were asked to not count lunch breaks/coffee breaks at work (or breaks to prepare meals at home)." Similar to Sudholz et al., to manage extreme outliers reported for number of sitting breaks will be capped at 6 breaks per hour at work. (Sudholz et al., 2018)

E. Environmental and Psychosocial Measures

   Neighborhood environment was measured using a standardized scale, the Physical Activity Neighborhood Environment Scale-PANES. (Becerra, Herring, Marshak, & Banta, 2015; J. F. Sallis et al., 2010) This was a measure of environmental barriers that prevented or limited the opportunity to walk in a person's neighborhood, defined an area within a 10-15 minute walk from their home. The PANES assesses land use mix, housing density, street connectivity, pedestrian infrastructure, accessibility to public transport systems, and perceived safety from traffic/ crime. (J. F. Sallis et al., 2010) Based on Sallis et al. (2010), average PANES score was computed by taking a mean of 16 items including pedestrian safety and crime safety in the neighborhoods. The PANES score has a range of 1 to 4, with higher values indicating greater environmental support for PA.

   Since social support measures related specifically to PA are strong predictors of exercise adherence, (C.L. Albright et al., 2012; R. K. Oka et al., 1995; R. Oka et al., 1993) we used Sallis' Family/Friend Support for Exercise Habits Scales (J.F. Sallis, Grossman, Pinski, Patterson, & Nader, 1987), to assess social support for physical activity. It had a minimum test-retest reliability of .77 and internal consistency of .89 (alpha coefficient). Participants reported support from family/friends with a higher value indicating more social support. We have separated social support ratings for family/friends who attend church with participants versus those outside of church. Participants report support on a 5-point Likert scale (1=never, 5=very often), for family/friends, and a total of all items is calculated, with a higher value indicating more social support. There are 4 scores - total participation, family participation, friend participation, and rewards & punishment.

F. Process Evaluation Questions

   Process outcomes were collected and quantified the delivery of the intervention strategies by staff, the participants' adherence to minutes of LMPA and intervention strategies over time, and participants' opinions about and satisfaction with achieved LMPA/ST and intervention methods.

IV. Data Safety Monitoring Board (DSMB) and Adverse events.

A. DSMB Members
   DSMB members consisted of three members who had conducted faith based behavior change trials:
 1. Sara Wilcox, PhD (Chair). Professor in the Department of Exercise Science and the Director of the Prevention Research Center within the Arnold School of Public Health
 2. Melissa Bopp, PhD Associate Professor in the Department of Kinesiology in the College of Health and Human Development at Pennsylvania State University.
 3. Brooke Harmon, PhD. Assistant Professor Division of Social and Behavioral Sciences, School of Public Health, University of Memphis

B. DSMB Meetings
   The DSMB met approximately every six months to discuss recruitment/accrual, adverse events, and preliminary data analyses and results by condition.
 1. Approved DSMB plan (January 9, 2018, approved by IRB Oct 4, 2018)- the plan was submitted each year with study's IRB renewal (See Appendix for DSMB Plan)
 2. Five Meeting dates: January 8, 2018, July 10, 2018, Jan 30, 2019, July 10, 2019, and March 25, 2020
 3. Duties: DSMB met every 6 months to review condition specific data for LMPA and adverse events collected at 12, 24, and 36 (DT condition only) weeks post baseline (prior to and after participation in the intervention), to determine if there were differential increases in risk (including number of adverse events) between the two conditions and if participants with any health problems or injuries related to the intervention were being adequately referred and followed by a physician. The DSMB also provided input and feedback on study recruitment methods and retention rates, safety precautions, study eligibility

determination issues, quality assurance and safety issues related to the protocols, as well as data handling activities.

C. DSMB Agenda for meetings
  1. Open Session: discuss study data such as recruitment progress, baseline sociodemographics, compliance study protocols/surveys, Pre-Post analyses, adverse events reported
  2. Closed session: Study outcomes by condition, Only DSMB and Statistician
  3. Executive Session: Only DSMB members (led by Chair) discuss adverse events/outcome by condition
  4. Debriefing session: Recommendations to MPIs

D. Adverse Events:
   Six adverse events in total were reported by five individuals (one person reported two different adverse events). Number Severe Adverse events = 1/6 (appendicitis) = 16%, Number /percentage that were possibly related to study intervention = 1/6 (knee pain) = 16%.
   Only one adverse event was considered severe and was reported to the IRB. The participant's appendix was removed due to appendicitis, subject was admitted to the hospital and stayed overnight. The IRB ruled it was not related to the study's intervention. The event was reported to DSMB on May 15, 2018. The DSMB recommended the participant obtain a note from a physician before continuing physical activity. However, the participant dropped out of the study before a note was obtained.
   Remaining five events were ruled not serious adverse events
  1. Knee pain from walking, DSMB ruled this was possibly related to PA so recommended the participant reduce walking goal until pain free.
  2. Neck stiffness and pain caused from looking at computer screen too long, participant reported going to the emergency room (no overnight stay). DSMB ruled this injury was not related to study intervention.
  3. While driving, a participant's car was rear ended, the participant did not go to emergency room or see a physician; reported feeling fine, the DSMB ruled this injury was not related to study intervention, recommended to decrease or postpone physical activity goal if felt pain later from accident.
  4. Participant stood up and twisted a knee (with related pain), the DSMB ruled this accident was not related to study interventions and recommended to reduce step count goals until pain free.
  5. Same participant who reported a twisted knee later walked through pepper spray residue and was hospitalized briefly but released. The DSMB ruled this injury was not related to the study interventions.

V. Statistical Analyses and Results
   All analyses in this section were conducted in SAS version 9.4 (SAS Inc., Cary NC) and P-value less than 0.05 was considered statistically significant.

A. Analyses and Results for Specific Aim 1 - Change in Primary Outcomes – Physical Activity and Sedentary Time

> **Specific Aim 1.** Determine efficacy of 12 week personalized telephone calls and group-facilitated LMPA/ST intervention, designed to increase LMPA min/week and decrease ST min/week in lay leaders (55-75 years) from Filipino Catholic clubs. Hypothesis: Clubs randomly assigned to the LMPA/ST will have significant changes in LMPA/ST min/week after 12 weeks, demonstrating higher adoption of LMPA/less ST, compared to clubs in HL/DT.

  1. Physical Activity
     a) Statistical Analysis Specific Aim 1
   Descriptive statistics were reported using means and standard deviations (SDs). Two outliers larger than 3 SD of the CHAMPS data were excluded from further analyses. We explored intraclass correlation coefficients within each church club at baseline. Intraclass correlation coefficients (ICCs) of baseline characteristics were relatively low (<0.2). To evaluate the effectiveness of the 12-week intervention from baseline, we conducted multilevel modeling for the repeated measures comparing the two conditions over time. In the multilevel models, the participants are nested within Catholic Clubs, adjusting for within-club and within-subject correlations. However, tests for within-club level correlation were not significant for all the outcomes. Because of low ICCs and insignificant club level correlations, we did not include within-club correlation in the final model. The model includes group, time, and the interaction between group and time, adjusting for within-subject

correlation. If necessary, variables were transformed using log or squared root to satisfy the model assumption. For each group, effect size was computed using Cohen's d based on Wilcox et al. (2020) (Wilcox, Jake-Schoffman, et al., 2020; Wilcox, Saunders, Jake-Schoffman, & Hutto, 2020), i.e., difference between two time points in least square mean divided by standard deviation at baseline. For transformed variables, Cohen's d was computed using back-transformed values. Cohen's d can be interpreted as 0.2 small, 0.5 medium, and 0.8 large effect.

To report whether a participant met 150 min per week of MVPA at each time point, frequency and percentage were used. Then, repeated measures analysis using generalized linear model with logit link was conducted to evaluate to investigate the effects of time, group, and their interaction in rate of meeting the recommended PA, adjusting for within subject correlation. P-value less than 0.05 was considered statistically significant and all analyses were implemented using SAS version 9.4 (SAS Inc., Cary NC).

   b)   Results for Physical Activity outcomes after 12-week intervention

Table 18 reports descriptive analysis at baseline and 12 weeks and repeated measures analyses for the PA outcomes. Number of minutes were significantly different between baseline and 12 weeks for all PA (P=0.014) and HiLi PA (P=0.006). Caloric expenditure was significantly different between baseline and 12 weeks for all PA (P=0.004), MVPA (P=0.019), and HiLi PA (P=0.011). Thus, these two physical activity outcomes increased from baseline to 12 weeks in both HL/DT and LMPA/ST conditions with no significant interaction between the two conditions over time (e.g., the participants in the LMPA/ST condition did not have greater increase in PA compared to HL/DT). For the PA outcomes that had a significant time effect, the effect sizes of both groups were medium or large, ranging from 0.52 to 0.95, but interestingly, the effect sizes of HL/DT condition were greater than those of LMPA/ST condition. The HL/DT group had a relatively high effect size comparable to LMPA/ST group. The possible explanation is that participants in HL/DT group may have been affected perhaps because these participants knew they were in a research study designed to address physical activity (e.g., evidence of a Hawthorne effect or placebo effect).

Table 18 Physical Activity Outcomes by Study Condition (Mean ± SD (Range)

Variable	HL/DT			LMPA/ST			P*		
	Baseline	12 Weeks	Cohen's d	Baseline	12 Weeks	Cohen's d	Group	Time	Int
Number of Minutes per week (All PA)	456 ± 369 (30 - 1380)	734 ± 403 (135 - 1275)	0.74	505 ± 316 (60 - 1065)	699 ± 329 (300 - 1095)	0.52	0.88	**0.01**	0.53
Caloric Expenditure per week (All PA)	1464 ± 1205 (83 - 5116)	2554 ± 1584 (489 - 5556)	0.89	1630 ± 1013 (196 - 3207)	2546 ± 1355 (833 - 4327)	0.82	0.92	**<0.01**	0.68
Number of Minutes per week (MVPA)	171 ± 175 (0 - 690)	308 ± 268 (0 - 840)	0.65	180 ± 207 (0 - 675)	238 ± 191 (0 - 480)	0.23	0.52	0.09	0.46
Caloric Expenditure per week (MVPA)	704 ± 703 (0 - 2158)	1368 ± 1325 (0 - 4691)	0.95	728 ± 714 (0 - 1944)	1195 ± 954 (0 - 2510)	0.61	0.77	**0.02**	0.60

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate and vigorous intensity. HiLi = high-light intensity. PA = Physical Activities. Int = Interaction. * Mixed effect model was conducted with group (between-subject), time (within-subject), and their interaction, adjusting for within-club and within-subject correlations. Cohen's d was computed by difference between two

Table 19 shows PA outcomes at pre- and post-intervention for both conditions. Since the participants in the HL/DT condition received group-facilitated LMPA/ST intervention between 12 and 24 weeks their pre-intervention baseline was at 12 weeks and their post-intervention was at 24 weeks. No significant effects were found for all of the PA outcomes.

Table 19. Pre- and Post-Intervention Physical Activity Outcomes over 12 weeks by Study Condition

Variable	HL/DT, Mean ± SD (Range)			LMPA/ST, Mean ± SD (Range)			P*		
	Pre: 12 Weeks	Post: 24 Weeks	Cohen's d	Pre: Baseline	Post: 12 Weeks	Cohen's d	Group	Time	Int
Frequency per week (All PA)	13.5 ± 11.3 (0 - 31)	17.7 ± 13.0 (0 - 43)	0.40	14.7 ± 11.2 (0 - 32)	14.2 ± 10.8 (0 - 31)	0.01	0.86	0.31	0.33
Number of Minutes per week (All PA)	734 ± 403 (135 - 1275)	747 ± 434 (165 - 1755)	0.06	505 ± 316 (60 - 1065)	699 ± 329 (300 - 1095)	0.52	0.31	0.25	0.38
Caloric Expenditure per week (All PA)	2554 ± 1584 (489 - 5556)	2718 ± 1720 (723 - 7398)	0.13	1630 ± 1013 (196 - 3207)	2546 ± 1355 (833 - 4327)	0.83	0.28	0.16	0.38
Frequency per week (MVPA)	4.1 ± 4.4 (0 - 12)	6.3 ± 6.5 (0 - 23)	0.52	3.1 ± 3.4 (0 - 9)	4.0 ± 4.2 (0 - 9)	0.26	0.35	0.17	0.54
Number of Minutes per week (MVPA)	308 ± 268 (0 - 840)	331 ± 260 (0 - 1005)	0.14	180 ± 207 (0 - 675)	238 ± 191 (0 - 480)	0.22	0.12	0.42	0.83
Caloric Expenditure per week (MVPA)	1368 ± 1325 (0 - 4691)	1517 ± 1288 (0 - 5136)	0.50	728 ± 714 (0 - 1944)	1195 ± 954 (0 - 2510)	0.61	0.23	0.27	0.63
Frequency per week (HiLi PA)	8.9 ± 7.8 (0 - 24)	10.6 ± 8.1 (0 - 28)	0.26	11.5 ± 9.4 (0 - 30)	10.9 ± 8.8 (0 - 23)	0.00	0.55	0.44	0.42
Number of Minutes per week (HiLi PA)	493 ± 330 (30 - 1230)	504 ± 430 (60 - 1515)	-0.08	445 ± 274 (135 - 1140)	626 ± 271 (315 - 1125)	0.55	0.68	0.30	0.13
Caloric Expenditure per week (HiLi PA)	1441 ± 1155 (98 - 4743)	1497 ± 1521 (179 - 5896)	0.01	1268 ± 815 (300 - 3282)	1820 ± 848 (656 - 3153)	0.53	0.99	0.22	0.25

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate and vigorous intensity. HiLi = high-light intensity. PA = Physical Activities. Int = Interaction. * General linear model was conducted with group (between-subject), time (within-subject), and their interaction, adjusting for within-club and within-subject correlations. Cohen's d was computed by difference between two time points in least square mean (from the model) divided by standard deviation at baseline.

Table 20 (see next page) reports frequency and percentage meeting 150 min/week of MVPA (national recommended amount of MVPA for adults). The rates of meeting this recommendation increased from baseline to 12 weeks and from pre-intervention to post-intervention in both study conditions, but, the increases were not significant.

Table 20. Percentage Meeting Recommended Physical Activity Level at Baseline and 12 Weeks

Comparison	HL/DT, n/N (%)		LMPA/ST, n/N (%)		P		
	Time 1	Time 2	Time 1	Time 2	Group	Time	Int
Baseline vs. 12 weeks	9/23 (39.1%)	10/16 (62.5%)	6/11 (54.5%)	5/7 (71.4%)	0.529	0.163	0.781
Pre vs. Post-Intervention	10/16 (62.5%)	14/17 (82.4%)	6/11 (54.5%)	5/7 (71.4%)	0.523	0.187	0.791

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. Time 1 = Baseline or Pre-Intervention. Time 2 = 12 Weeks or Post-Intervention.

2. Total Sitting Time and Number of Breaks in Sitting Time
   a) Statistical Analysis

Similar to the above LMPA outcomes, we reported descriptive statistics using means and SDs on total sitting time and breaks in sitting and conducted repeated measures analyses of variance to assess efficacy of LMPA/ST intervention with the effects of group, time, and their interaction, adjusting for within-subject correlation. In addition, effect size was computed using Cohen's d for each group.

   b) Results for Total Sitting time and Number of Breaks per hour at home and at work

Table 21 reports analyses from baseline to 12 weeks for sitting time and breaks in sitting. The average number of breaks at **home** significantly increased from baseline to 12 weeks (P=0.01) for both groups and average number of breaks for both at home and at work for those in LMPA/ST condition were significantly higher than those in HL/DT condition (p< 0.01 and p<0.02) over 12 weeks. Total sitting time had no changes over time or differentially by condition.

Table 21 Sitting Time and Number of Breaks/ Hour in Sitting by Condition and Time point

Variable	HL/DT, Mean ± SD (Range)			LMPA/ST, Mean ± SD (Range)			P*		
	Baseline	12 Weeks	Cohen's d	Baseline	12 Weeks	Cohen's d	Group	Time	Int
Total sitting time, hrs/day	6.3 ± 6.3 (1 - 26)	6.5 ± 5.1 (1 - 19)	-0.04	5.4 ± 4.9 (1 - 15)	5.4 ± 3.9 (1 - 10)	-0.07	0.59	0.77	0.97
# Breaks per hour at home	1.1 ± 1.0 (0 - 4)	1.7 ± 1.4 (0 - 6)	0.50	2.5 ± 1.7 (1 - 6)	4.6 ± 1.5 (3 - 6)	1.13	<0.01	<0.01	0.20
# Breaks per hour at work	1.5 ± 1.5 (0 - 6)	1.4 ± 1.7 (0 - 6)	-0.12	2.6 ± 1.8 (1 - 6)	4.2 ± 1.3 (3 - 6)	0.56	0.02	0.43	0.20

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate and vigorous intensity. HiLi = high-light intensity. PA = Physical Activities. Int = Interaction. * General linear model was conducted with group (between-subject), time (within-subject), and their interaction, adjusting for within-club and within-subject correlations. Cohen's d was computed by difference between the two time points in least square mean (from the model) divided by standard deviation at baseline.

Table 22 (on the next page) shows total sitting time and number of breaks (i.e., break up sitting by standing) at pre- and post-intervention for both conditions (i.e., after period where HL/DT received the intervention). Significant time and group effects were found in number of breaks at home and work. Compared to pre-intervention, participants in both conditions reported a higher number of breaks after the intervention both at home and at work, indicating that regardless of study condition over time, both conditions reported more breaks in sitting time (P=0.01 and P=0.03). In addition, we found group effect in breaking up sitting time for home and work; thus, the mean increase in number of breaks at home and at work in the LMPA/ST condition was higher than those of HL/DT condition (P= 0.01 and P=0.02). Thus, the LMPA/ST intervention encouraged significant increases over time in number of breaks at home and at work.

Table 22. Pre- and Post- Intervention Hours per day of Sitting Time and Number of Breaks per Hour by study condition

| Variable | HL/DT, Mean ± SD (Range) | | | LMPA/ST, Mean ± SD (Range) | | | P* | | |
	Pre: 12 Weeks	Post: 24 Weeks	Cohen's d	Pre: Baseline	Post: 12 Weeks	Cohen's d	Group	Time	Int
Total sitting time, hrs/day	6.5 ± 5.1 (1 - 19)	5.9 ± 4.2 (1 - 16)	-0.20	5.4 ± 4.9 (1 - 15)	5.4 ± 3.9 (1 - 10)	-0.07	0.47	0.45	0.71
# Breaks per hour at home	1.7 ± 1.4 (0 - 6)	2.8 ± 1.8 (1 - 6)	0.74	2.5 ± 1.7 (1 - 6)	4.6 ± 1.5 (3 - 6)	1.16	**0.01**	**0.01**	0.54
# Breaks per hour at work	1.4 ± 1.7 (0 - 6)	2.3 ± 1.6 (1 - 6)	0.66	2.6 ± 1.8 (1 - 6)	4.2 ± 1.3 (3 - 6)	0.83	**0.02**	**0.03**	0.97

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate and vigorous intensity. HiLi = high-light intensity. PA = Physical Activities. Int = Interaction. * General linear model was conducted with group (between-subject), time (within-subject), and their interaction, adjusting for within-club and within-subject correlations. Cohen's d was computed by difference between two time points in least square mean (from the model) divided by standard deviation at baseline.

B. Analyses and Results for Specific Aim 2 - Maintenance

Specific Aim 2. Determine efficacy of 12week intervention to encourage maintenance of LMPA/ST changes over an additional 12 weeks follow-up with no calls (CHAMPS maintenance 12-24 weeks, 24-36 weeks).

1. Maintenance of Physical Activity
   a) Statistical Analysis for Specific Aim 2
   Similar to the above Section A, we conducted repeated measures analyses of variance with the effects of group, time, and their interaction on PA outcomes at post-intervention and maintenance, adjusting for within-subject correlation and computed Cohen's d for each group.
   b) Results for CHAMPS Physical Activity outcomes during maintenance period
   Table 23 shows PA outcomes at post-intervention and maintenance. No significant difference (increases or decreases) were found between post-intervention and maintenance in all of the PA outcomes. This might indicate that the 12 weeks intervention also encouraged maintenance of those changes in PA outcomes over the additional 12 weeks follow-up with no intervention calls.

Table 23 (on this page and page 24). Maintenance in Physical Activity Outcomes following intervention by Study Condition and Timepoint

| Variable | HL/DT, Mean ± SD (Range) | | | LMPA/ST, Mean ± SD (Range) | | | P* | | |
	Post: 24 Weeks	Maintenance : 36 Weeks	Cohen's d	Post: 12 Weeks	Maintenance : 24 Weeks	Cohen's d	Group	Time	Int
Frequency per week (All PA)	17.7 ± 13.0 (0 - 43)	17.0 ± 11.0 (0 - 33)	-0.06	14.2 ± 10.8 (0 - 31)	18.6 ± 12.6 (0 - 37)	0.40	0.83	0.59	0.45
Number of Minutes per week (All PA)	747 ± 434 (165 - 1755)	829 ± 467 (210 - 1620)	0.18	699 ± 329 (300 - 1095)	735 ± 458 (255 - 1590)	0.05	0.76	0.51	0.68
Caloric Expenditure per week (All PA)	2718 ± 1720 (723 - 7398)	3031 ± 1827 (828 - 6456)	0.18	2546 ± 1355 (833 - 4327)	2391 ± 1425 (863 - 5078)	-0.11	0.57	0.78	0.46
Frequency per week (MVPA)	6.3 ± 6.5 (0 - 23)	6.3 ± 5.9 (0 - 17)	0.00	4.0 ± 4.2 (0 - 9)	3.4 ± 4.9 (0 - 13)	0.00	0.35	1.00	1.00

Number of Minutes per week (MVPA)	331 ± 260 (0 - 1005)	354 ± 227 (0 - 765)	0.11	238 ± 191 (0 - 480)	155 ± 203 (0 - 555)	-0.25	0.11	0.62	0.29
Caloric Expenditure per week (MVPA)	1517 ± 1288 (0 - 5136)	1617 ± 1216 (0 - 4381)	0.08	1195 ± 954 (0 - 2510)	639 ± 636 (0 - 1809)	-0.54	0.20	0.40	0.22
Frequency per week (HiLi PA)	10.6 ± 8.1 (0 - 28)	9.8 ± 6.5 (0 - 23)	-0.10	10.9 ± 8.8 (0 - 23)	14.7 ± 11.8 (0 - 30)	0.39	0.44	0.57	0.36
Number of Minutes per week (HiLi PA)	504 ± 430 (60 - 1515)	550 ± 461 (60 - 1590)	0.11	626 ± 271 (315 - 1125)	695 ± 408 (330 - 1485)	0.05	0.34	0.59	0.76
Caloric Expenditure per week (HiLi PA)	1497 ± 1521 (179 - 5896)	1666 ± 1625 (218 - 6048)	0.11	1820 ± 848 (656 - 3153)	2090 ± 1399 (694 - 4740)	0.18	0.62	0.41	0.97

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate and vigorous intensity. HiLi = high-light intensity. PA = Physical Activities. Int = Interaction. * Mixed effect model was conducted with group (between-subject), time (within-subject), and their interaction, adjusting for within-club and within-subject correlations. Cohen's d was computed by difference between two time points in least square mean (from the model) divided by standard deviation at baseline.

2. <u>Maintenance in Changes in Sitting time/ breaks in sitting over 12 weeks (post intervention)</u>
    a) Statistical Analysis
  Similar to the above, we conducted repeated measures analyses of variance with the effects of group, time, and their interaction on PA outcomes at post-intervention and maintenance, adjusting for within-subject correlation and computed Cohen's d for each group.
    b) Results for maintenance of Sitting time and Number of Breaks per hour at Home and at Work
  Table 24 shows sitting time and breaks in sitting from post-intervention to maintenance (from 24 to 36 weeks for HL/DT and from 12 weeks to 24 weeks for LMPA/ST). Significant time and group effects were found in number of breaks at home and work. Compared to post-intervention, participants in both conditions reported a higher number of breaks in the maintenance phase both at home and at work, indicating that regardless of study condition over time, both conditions reported more breaks in sitting time (P=0.01 and P=0.02). We also found group effect in breaking up sitting time for home and work; and average number of breaks at home and at work for those in LMPA/ST condition were significantly higher than those in HL/DT condition (P=0.01 and P=0.03).

Table 24. Maintenance in Sitting Time and Number of Breaks per Hour by Timepoint and Condition

Variable	HL/DT, Mean ± SD (Range)			LMPA/ST, Mean ± SD (Range)			P*		
	Post: 24 Weeks	Maintenance: 36 Weeks	Cohen's d	Post: 12 Weeks	Maintenance: 24 Weeks	Cohen's d	Group	Time	Int
Total sitting time, hrs/day	6.5 ± 5.1 (1 - 19)	5.9 ± 4.2 (1 - 16)	-0.20	5.4 ± 4.9 (1 - 15)	5.4 ± 3.9 (1 - 10)	-0.07	0.47	0.45	0.71
# Breaks per hour at home	1.7 ± 1.4 (0 - 6)	2.8 ± 1.8 (1 - 6)	0.74	2.5 ± 1.7 (1 - 6)	4.6 ± 1.5 (3 - 6)	1.16	**0.01**	**0.01**	0.54
# Breaks per hour at work	1.4 ± 1.7 (0 - 6)	2.3 ± 1.6 (1 - 6)	0.66	2.6 ± 1.8 (1 - 6)	4.2 ± 1.3 (3 - 6)	0.83	**0.02**	**0.03**	0.97

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. MVPA = Moderate and vigorous intensity. HiLi = high-light intensity. PA = Physical Activities. Int = Interaction. * Mixed effect model was conducted with group (between-subject), time (within-subject), and their interaction, adjusting for within-club and within-subject correlations. Cohen's d was computed by difference between two time points in least square mean (from the model) divided by standard deviation at baseline.

C. Accelerometer Data: Compare survey PA to accelerometer PA

 1. Statistical Analysis

   First, we screened the accelerometer data because participants could not wear it at all, might take it off during the day, or wear the GENEActive accelerometer on different days. For our analyses, we also wanted to only include days with valid information. The criteria for being a valid day are: i) wear time > 10 hours, and ii) wear 5 consecutive days, and iii) no zero values for all of the physical activities: LoLi PA, HiLi PA and MVPA. Three participants' data were excluded because they did not meet these criteria. Then, Pearson's correlation coefficients were computed to compare the levels of PA measured between self-report and the GENEActiv accelerometer.

 2. Results for comparing Accelerometer with CHAMPS survey data

   Table 25 presents Pearson's correlation between CHAMPS survey and accelerometer. Significant associations were found between the subjective and objective measures. Correlations between CHAMPS MVPA and Accelerometer MVPA were 0.40 for frequency, 0.39 for number of minutes, and 0.37 for caloric expenditure. Correlation between subjects' reported (survey) total sitting time and objective sedentary time (r = 0.49) and between survey reported total sleep time and objective bed time (r = 0.58).

Table 25. Pearson's correlation between Surveys and Accelerometer

Comparison	Pearson's Correlation
CHAMPS vs. Accelerometer	
Frequency of moderate or vigorous intensity physical activity	**0.40***
Number of Minutes of moderate or vigorous intensity physical activity	**0.39***
Caloric expenditure of moderate or vigorous intensity physical activity	**0.37***
Frequency of high-light intensity physical activity	-0.27
Number of Minutes of high-light intensity physical activity	-0.34
Caloric expenditure of high-light intensity physical activity	**-0.37***
Survey vs. Accelerometer	
Total Sitting time vs. Sedentary time	**0.49****
Total sleep time vs. Bed time	**0.58****

* P < 0.05; ** P < 0.01. N = 27.

D. Pedometer assessment of physical activity

 1. Statistical Analysis

   Two-sample t tests or Chi-squared tests were used to compare pedometer data between two study conditions. Then, Pearson's correlation coefficients were computed to assess the levels of LMPA measured by CHAMPS or accelerometer with pedometer.

 2. Results

   About 60% of the participants in both conditions wore the pedometer during the intervention period and they wore it on average for three days (Table 26 below and on next page). The mean number of steps per day was about 9.000 with no difference between conditions.

Table 26. Pedometer Use by Study Condition

Variable	Total (N=35)	HL/DT (N=23)	LMPA/ST (N=12)	*P**
# People who wear pedometer at least one day	21 (60%)	14 (60.9%)	7 (58.3%)	0.88
Average number of times of wearing a pedometer in 42 days (i.e., 6 weeks)*	17.5 ± 10.2 (4 – 40)	15.6 ± 8.2 (4 – 31)	21.3 ± 13.3 (7 – 40)	0.24

	2.9 ± 1.7 (0.7 – 6.7)	2.6 ± 1.4 (0.7 – 5.2)	3.5 ± 2.2 (1.2 – 6.7)	0.24
Average number of times of wearing a pedometer per week[a]	2.9 ± 1.7 (0.7 – 6.7)	2.6 ± 1.4 (0.7 – 5.2)	3.5 ± 2.2 (1.2 – 6.7)	0.24
Average number of steps per day[a]	8867 ± 2417 (4006 – 13356)	8798 ± 2158 (4006 – 11469)	9006 ± 3057 (5461 – 13356)	0.86

n (%) or Mean ± SD (Range). HL/DT = Healthy Living/Delayed Treatment. LMPA/ST = Light or Moderate Physical Activity/Sedentary Time. [a] Among people who reported pedometer data (14 for HL/DT condition, 7 for LMPA/ST condition). * Two sample t test or Chi-square test was conducted.

Average number of steps per day were significantly correlated with moderate physical activity: 0.44 with the number of minutes and 0.46 with caloric expenditure (Table 27). Thus, the number of minutes of moderate to vigorous physical activity as reported on the CHAMPS survey were significantly correlated with average number of steps as measured on the pedometer.

Table 27. Pearson's correlation with Pedometer at Post-Intervention

CHAMPS	Pedometer	
	Average # of times of wearing a pedometer per week	Average number of steps per day
Frequency of all physical activity	0.04	0.02
Number of Minutes of all physical activity	0.28	0.31
Caloric expenditure of all physical activity	0.22	0.36
Frequency of moderate or vigorous intensity physical activity	0.19	0.32
Number of Minutes of moderate or vigorous intensity physical activity	0.28	**0.44***
Caloric expenditure of moderate or vigorous intensity physical activity	0.21	**0.46***
Frequency of high-light intensity physical activity	-0.06	-0.17
Number of Minutes of high-light intensity physical activity	0.22	0.06
Caloric expenditure of high-light intensity physical activity	0.18	0.05

* P < 0.05. N = 21.

E. Analyses and Results for Secondary Specific Aims

Secondary Specific Aims. Mediator/Moderator analyses: Investigate whether key demographic, psychosocial, neighborhood environment, and group cohesion factors act as mediators (Social support) or moderators (age, gender, BMI, # health conditions) of change in LMPA/ST (e.g., hypothesizing increases in social support for PA/ST will mediate increase in LMPA, especially for those in LMPA/ST intervention).

1. Moderator Analysis

We investigated whether key demographic and physiological factors acted as moderators of the intervention. The following baseline variables were potential moderators: age (≥65 years vs. <65 years), obesity (BMI ≤ 29 vs ≥30, years of education (≤12 years vs. >12 years), work status (retired, working), number of chronic conditions (≥2 vs. 0-1) and PANES neighborhood environment score at baseline (>2.7 [median] vs. ≤2.7).

a) Statistical Analysis

We evaluated the effect of the intervention within subgroups defined by important potential moderators, to determine if the intervention was particularly successful for persons with specific moderators listed in the above. Moderation effect was assessed by the F test of the 3-way interaction parameter for moderator level, time, and study condition. The model includes each of the potential moderator, time, and survey condition, and their interactions as fixed effects and a random subject effect. The adjusted mean and 95% confidence interval were estimated from the model. Because of a wide standard error, there were some cases with negative lower confidence limit. The negative values were replaced with zero.

b) Results

Among the potential moderators, only one was significant. Age was a significant moderator for number of breaks in sitting per hour at home (Table 28). On average, all participants increased their number of breaks in sitting at home. Interestingly, the participants aged 65 years or older in LMPA/ST condition reported larger increases in the number of breaks in sitting from baseline (mean=2.17) to 12 weeks (mean=5.59), but the increase in the other condition (HL/DT) was relatively small.

Table 28. Adjusted Mean (95% CI) of Number of Breaks per Hour in Sitting at Home and at Work from Baseline to 12 weeks by Study Condition and Potential Moderator

| Moderators | Number of Breaks at Home | | | | | Number of Breaks at Work | | | | |
| | HL/DT Mean (95% CI) | | LMPA/ST Mean (95% CI) | | | HL/DT Mean (95% CI) | | LMPA/ST Mean (95% CI) | | |
	Baseline	12 Weeks	Baseline	12 Weeks	*P* *	Baseline	12 Weeks	Baseline	12 Weeks	*P* *
Age, years					**0.04**					0.31
< 65	1.25 (0.46, 2.04)	2.00 (1.13, 2.88)	3.00 (1.78, 4.22)	3.47 (2.15, 4.80)		1.71 (0.50, 2.91)	1.38 (0.11, 2.65)	3.11 (1.20, 5.01)	3.63 (1.65, 5.69)	
≥ 65	0.94 (0.03, 1.86)	1.02 (0, 2.16)	2.17 (1.05, 3.28)	5.59 (3.87, 7.32)		1.69 (0, 3.60)	1.91 (0, 3.89)	2.33 (0, 4.74)	4.39 (1.63, 7.15)	
BMI, kg/m²					0.99					0.31
25-29	1.04 (0.23, 1.85)	1.56 (0.56, 2.56)	2.50 (1.31, 3.69)	4.29 (2.35, 6.24)		1.33 (0.05, 2.61)	1.40 (0.05, 2.75)	2.75 (0.64, 4.86)	2.98 (0.48, 5.49)	
≥ 30	1.25 (0.22, 2.28)	1.80 (0.63, 2.97)	2.60 (1.29, 3.91)	4.09 (2.65, 5.52)		2.42 (0.69, 4.14)	1.86 (0.08, 3.64)	2.67 (0.50, 4.83)	4.08 (1.92, 6.24)	
Education < College graduate	0.83 (0, 1.98)	1.07 (0, 2.61)	3.67 (2.05, 5.29)	4.15 (2.22, 6.07)	0.26	1.50 (0, 3.07)	1.41 (0, 3.16)	Non-Est -	3.00 (0, 7.16)	0.92
≥ College graduate	1.23 (0.51, 1.96)	1.83 (1.01, 2.66)	2.13 (1.13, 3.12)	4.20 (2.86, 5.53)		1.88 (0.56, 3.21)	1.63 (0.26, 3.00)	2.86 (1.28, 4.43)	3.93 (2.18, 5.68)	
Employment Paid part/full time	1.13 (0.40, 1.87)	1.76 (0.92, 2.60)	2.43 (1.35, 3.51)	3.75 (2.51, 5.00)	0.47	1.82 (0.77, 2.89)	1.61 (0.52, 2.71)	3.00 (0, 7.07)	3.76 (2.12, 5.40)	NE
Not paid	1.08 (0, 2.25)	1.30 (0, 2.87)	2.75 (1.32, 4.18)	5.89 (3.24, 8.54)		NE	NE	NE	NE	
Comorbidity 0-1	1.05 (0.14, 1.96)	1.50 (0.49, 2.50)	2.00 (0.56, 3.44)	4.10 (2.14, 6.05)	0.87	1.06 (0, 2.54)	0.88 (0, 2.40)	3.00 (0.92, 5.08)	3.25 (0.71, 5.79)	0.46
≥2	1.18 (0.31, 2.05)	1.87 (0.74, 3.01)	2.86 (1.77, 3.95)	4.19 (2.80, 5.58)		2.32 (0.92, 3.73)	2.11 (0.51, 3.65)	2.41 (0.26, 4.55)	3.85 (1.70, 5.99)	
Neighborhood Score Low (<2.7)	1.38 (0.60, 2.17)	1.73 (0.75, 2.70)	2.75 (1.33, 4.17)	3.70 (2.09, 5.31)	0.55	1.94 (0.66, 3.22)	1.75 (0.36, 3.14)	1.69 (0, 4.23)	3.69 (1.14, 6.23)	0.35
High (>2.7)	0.69 (0, 1.69)	1.54 (0.40, 2.68)	2.43 (1.35, 3.50)	4.64 (3.07, 6.20)		1.33 (0, 3.05)	1.14 (0, 2.88)	3.20 (1.32, 5.08)	3.76 (1.67, 5.85)	

CI = Confidence Interval. HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. NE = Non-estimable. * Treatment effect was assessed by the F test of the 3-way interaction parameter for moderator level, time, and study condition. The model includes each of the potential moderator, time and survey condition, and their interactions as fixed effects and a random subject effect. The adjusted mean and 95% confidence interval (CI) were estimated from the model. Because of a wide standard error, there were some cases with negative lower confidence limit. The negative values were replaced with zero.

Neighborhood score was a significant moderator on caloric expenditure per week for all PA activities, minutes per week for all activities (Table 29, next the page), and caloric expenditure per week for MVPA (Table 30 on pages 30-31). Caloric expenditure per week for all PA increased from baseline to 12 weeks in HL/DT condition (although not significantly); however, participants with high neighborhood score (i.e., meaning greater environmental support for PA) in LMPA/ST condition had significant reductions in total PA minutes (e.g., from 525min/wk at baseline to 323 minutes at 12 weeks, see Table 29 on the next page). A similar trend was found caloric expenditure per week of MVPA with those in LMPA/ST condition with high neighborhood score/environmental support for PA having reductions in MVPA from baseline to 12 weeks (see Table 30 on next pages).

Table 29. Adjusted Mean (95% CI) for Physical Activity (All Activities) from Baseline to 12 Weeks by Study Condition and Potential Moderators

Moderators	All PA Caloric Expenditure per Week					All PA Minutes per Week				
	HL/DT Mean (95% CI)		LMPA/ST Mean (95% CI)			HL/DT Mean (95% CI)		LMPA/ST Mean (95% CI)		
	Baseline	12 Weeks	Baseline	12 Weeks	P*	Baseline	12 Weeks	Baseline	12 Weeks	P*
Age, years					0.88					0.88
< 65	1521 (740, 2301)	2535 (1699, 3372)	1953 (694, 3211)	2431 (1049, 3813)		438 (218, 658)	699 (462, 936)	555 (200, 910)	641 (249, 1033)	
≥ 65	1,389 (499, 2280)	2,587 (1386, 3787)	1361 (211, 2510)	2572 (1022, 4121)		479 (228, 729)	829 (484, 1173)	463 (139, 786)	723 (279, 1168)	
BMI, kg/m²					0.80					0.42
25-29	1308 (561, 2056)	2622 (1723, 3522)	1342 (201, 2484)	2051 (516, 3586)		470 (262, 679)	859 (606, 1113)	425 (107, 743)	579 (144, 1014)	
≥ 30	1705 (773, 2638)	2462 (1428, 3497)	1974 (724, 3225)	2822 (1451, 4194)		433 (174, 693)	588 (298, 878)	600 (252, 948)	753 (368, 1137)	
Education					0.33					0.16
< College graduate	1600 (921, 2279)	2894 (2127, 3661)	1420 (460, 2381)	2386 (1222, 3570)		498 (309, 687)	837 (623, 1052)	407 (140, 674)	686 (356, 1016)	
≥ College graduate	1152 (125, 2179)	622 (233, 2845)	2188 (619, 3756)	2645 (781, 4509)		360 (75, 645)	462 (94, 830)	765 (329, 1201)	644 (121, 1167)	
Employment					0.56					0.67
Paid part/full time	1293 (620, 1966)	2587 (1834, 3340)	1795 (746, 2844)	2633 (1423, 3842)		421 (231, 611)	768 (553, 982)	514 (218, 811)	715 (369, 1060)	
Not paid	1948 (815, 3081)	2254 (725, 3783)	1340 (0, 2728)	2090 (217, 3964)		555 (235, 875)	606 (165, 1047)	488 (95, 880)	576 (36, 1116)	
Comorbidity					0.27					0.43
0-1	1428 (589, 2268)	2843 (1895, 3792)	1909 (516, 3301)	1450 (0, 3285)		470 (233, 708)	823 (551, 1095)	533 (139, 926)	381 (0, 914)	
≥2	1496 (692, 2300)	2241 (1301, 3181)	1470 (418, 2523)	2818 (1620, 4016)		443 (215, 670)	662 (292, 933)	489 (191, 786)	779 (436, 1123)	
Neighborhood Score					**0.02**					**0.04**
Low (<2.7)	1110 (427, 1792)	2176 (1399, 2954)	1573 (297, 2850)	3517 (2240, 4794)		325 (131, 518)	651 (428, 875)	469 (107, 831)	919 (557, 1281)	
High (>2.7)	2014 (1163, 2866)	3134 (2137, 4131)	1662 (697, 2627)	996 (0, 2358)		660 (419, 901)	888 (600, 1175)	525 (252, 798)	323 (0, 721)	

CI = Confidence Interval. HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. * Treatment effect was assessed by the F test of the 3-way interaction parameter for moderator level, time, and study condition. The model includes each of the potential moderator, time and survey condition, and their interactions as fixed effects and a random subject effect. The adjusted mean and 95% confidence interval (CI) were estimated from the model. Because of a wide standard error, there were some cases with negative lower confidence limit. The negative values were replaced with zero.

Table 30. Adjusted Mean (95% CI) of Caloric Expenditure per Week (Moderate or Vigorous Physical Activities) from Baseline to 12 Weeks by Study Condition and Potential Moderator

Moderators	HL/DT Mean (95% CI)		LMPA/ST Mean (95% CI)		
	Baseline	12 Weeks	Baseline	12 Weeks	P*
Age, years					0.977
< 65	790 (224, 1356)	1439 (832, 2047)	693 (0, 1606)	1105 (102, 2108)	
≥ 65	592 (0, 1237)	1255 (382, 2129)	757 (0, 1590)	1234 (106, 2361)	
BMI, kg/m²					0.984
25-29	595 (54, 1135)	1297 (644, 1951)	539 (0, 1365)	898 (0, 2016)	
≥ 30	874 (200, 1548)	1480 (730, 2230)	954 (49, 1859)	1397 (403, 2391)	
Education					0.388
< College graduate	722	1562	644	942	

	(225, 1220)	(1001, 2123)	(0, 1348)	(83, 1801)	
≥ College graduate	662 (0, 1414)	807 (0, 1762)	951 (0, 2101)	1717 (353, 3081)	
Employment					0.523
Paid part/full time	574 (87, 1061)	1426 (882, 1970)	721 (0, 1479)	1226 (352, 2099)	
Not paid	1072 (253, 1892)	1052 (0, 2155)	740 (0, 1744)	999 (0, 2350)	
Comorbidity					0.196
0-1	792 (206, 1378)	1882 (1216, 2549)	893 (0, 1864)	745 (0, 2044)	
≥2	623 (62, 1184)	865 (203, 1527)	633 (0, 1367)	1313 (471, 2155)	
Neighborhood Score					**0.029**
Low (<2.7)	548 (44, 1051)	1100 (526, 1673)	614 (0, 1556)	1856 (914, 2798)	
High (>2.7)	946 (318, 1575)	1818 (1083, 2554)	793 (80, 1505)	179 (0, 1183)	

CI = Confidence Interval. HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/sedentary time condition. * Treatment effect was assessed by the F test of the 3-way interaction parameter for moderator level, time, and study condition. The model includes each of the potential moderator, time and survey condition, and their interactions as fixed effects and a random subject effect. The adjusted mean and 95% confidence interval (CI) were estimated from the model. Because of a wide standard error, there were some cases with negative lower confidence limit. The negative values were replaced with zero.

2. Mediation Analysis: Social Suppor*t* for physical activity

    a.) Statistical Analysis

Due to small sample size in this study, we could not conduct a structural equation model to identify psychosocial mediators for any intervention effect as proposed in the grant. Instead, we conducted casual mediation analyses using PROC CAUSALMED in SAS to investigate mediation effect of social support on change.

    b) Results

No significant mediation effects were found for change in PA or ST outcomes (results not shown). However, sample size determination is not straightforward for mediation analysis and the total sample size of this study was too small to conduct reliable mediation analyses. Future studies in a large scale are needed to evaluate mediation effects of social support on PA.

3. Analyses of Process Evaluation Questions

    a) Statistical Analysis

Fisher's exact test was conducted to compare responses on satisfaction and process evaluation questions between two study conditions.

    b) Results

There was no statistical differences between the study conditions in participant's ratings of the helpfulness of the various LMPA/ST intervention components (e.g., step counter, telephone calls, setting goals, etc.), satisfaction with LMPA/ST time spent on intervention telephone calls, and the perceived time burden associated with participation in the intervention and assessments, or how likely they were to continue or increase LMPA/ST, and general issues (shared study information, talked to others). We compared process evaluations following the LMPA/ST intervention (12 wks for LMPA condition (n=7), and 24 wks for HL/DT condition (n=12)) to determine differences between when the intervention was delivered to the two study conditions (see Table 31 on the next page). A large majority (>90%) rated the components of the LMPA intervention as "very helpful" (e.g., setting goals, using step counter, telephone calls with coach, etc.).

Participants' ratings of satisfaction with the amount of time spent talking to the coach, and progress towards achieving LMPA and Sedentary Time goals were high (> 85% very satisfied) (see Table 32 on the next page).

Table 31. Helpfulness Survey Post-Intervention

Question	HL/DT (24 Weeks) (n=12)	LMPA/ST (12 Weeks) (n=7)	P *
How helpful was it to set physical activity goals with The Kalusugan Project's lifestyle coach?			
Very helpful	12 (100.0%)	7 (100.0%)	NA
How helpful was it to set goals around breaking up sedentary time/sitting time with The Kalusugan Project's lifestyle coach?			
Very helpful	11 (91.7%)	7 (100.0%)	1.00
Somewhat helpful	1 (8.3%)	0 (0%)	
How helpful was it to use the step counter to monitor your total number of steps per day?			
Very helpful	12 (100.0%)	7 (100.0%)	NA
How helpful were the telephone calls from The Kalusugan Project's lifestyle coach?			
Very helpful	12 (100.0%)	6 (100.0%)	NA
How helpful were the email contacts/text contacts from The Kalusugan Project's lifestyle coach?			1.00
Very helpful	11 (91.7%)	6 (100.0%)	
Somewhat helpful	1 (8.3%)	0 (0%)	
How helpful were the weekly resources (sent to you via email or US mail)?			1.00
Very helpful	11 (91.7%)	5 (83.3%)	
Somewhat helpful	1 (8.3%)	1 (16.7%)	
Did you read the weekly resources?			NA
Yes	13 (100.0%)	7 (100.0%)	
If yes, how many did you read?			0.31
A few (1-4)	0 (0%)	1 (14.3%)	
Some (5-8)	5 (41.7%)	1 (14.3%)	
Most of them (9-12)	7 (58.3%)	5 (71.4%)	

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/Sedentary time condition. * Fisher's exact test was conducted.

Table 32. Satisfaction Survey Collected Post-Intervention

Question	HL/DT (24 Weeks) (n=12)	LMPA/ST (12 Weeks) (n=7)	P *
How satisfied were you with the amount of time The Kalusugan Project's lifestyle coach spent discussing physical activity with you?			1.00
Somewhat satisfied	2 (16.7%)	1 (14.3%)	
Very satisfied	10 (83.3%)	6 (85.7%)	
How satisfied were you with the amount of time the Kalusugan Project's lifestyle coach spent discussing breaking up sed/sitting time with you?			1.00
Somewhat satisfied	2 (16.7%)	1 (14.3%)	
Very satisfied	10 (83.3%)	6 (85.7%)	
Overall, how satisfied were you with The Kalusugan Project?			1.00
Somewhat satisfied	1 (8.3%)	1 (14.3%)	
Very satisfied	11 (91.7%)	6 (85.7%)	
How satisfied were you with the progress you made with physical activity/ sedentary time over the past 3 months of The Kalusugan Project?			1.00
Somewhat satisfied	1 (8.3%)	1 (14.3%)	
Very satisfied	11 (91.7%)	6 (85.7%)	

How satisfied were you with the amount of time The Kalusugan Project's lifestyle coach spent discussing physical activity with you?			1.00
Somewhat satisfied	2 (16.7%)	1 (14.3%)	
Very satisfied	10 (83.3%)	6 (85.7%)	
How satisfied were you with the amount of time The Kalusugan Project's lifestyle coach spent discussing breaking up sed/sitting time with you?			1.00
Somewhat satisfied	2 (16.7%)	1 (14.3%)	
Very satisfied	10 (83.3%)	6 (85.7%)	
Overall, how satisfied were you with The Kalusugan Project?			1.00
Somewhat satisfied	1 (8.3%)	1 (14.3%)	
Very satisfied	11 (91.7%)	6 (85.7%)	

HL/DT = Healthy Living/Delayed treatment condition. LMPA/ST = Light-to-moderate physical activity/Sedentary time condition. * Fisher's exact test was conducted.

VII. Phase 4 Specific Aim: Reporting trial's findings to leaders of state-wide Diocesan Congress of Filipino Catholic Clubs (DCFCC) to discuss feasibility of adapting LMPA/ST so lay leaders act as change agents for their parishioners / church members on rural islands across the state of Hawaii

A. Qualitative Methods and Theme analyses (Years 2 and 3)

We conducted two types of focus groups. One with previous participants in the trial to obtain their input on "what worked" and what could be improved to meet their needs (conducted last August 2019). We also conducted focus groups with leaders of the Filipino Catholic Clubs (FCC) clubs who are members of the Diocesan Congress of Filipino Catholic Clubs (DCFCC) from across the state (Maui, Big Island, and Kauai) who met once a year for an annual convention. We presented our study results to them and discussed how their church club might include LMPA/ST as part of the club's goals for members in the future.

Recruitment for the August 2019 focus group (for persons who had enrolled in the study) consisted of emails we sent to the presidents of the first 5 clubs that were enrolled in the study and to participants who had completed the study by that point. This included a total of 19 people. Of these 19, 10 people responded they would attend and all 10 attended the focus group. Following the completion of the randomized trial, we also conducted focus groups with participants who had not participated in the study but were leaders from the Filipino Catholic Clubs on neighbor islands, particularly from the Big Island, Maui, and Kaua`i. This focus group session was scheduled in Year 03 on November 9, 2019 during an annual meeting of all the clubs across the state of Hawaii (N = 23 clubs).

For the November 9, 2019 focus groups, individuals were recruited through email contact. Council Presidents (n=3) were asked to provide email addresses of Unit Presidents so they could be contacted about the opportunity for the focus groups. Presidents provided the Kalusugan's project director with the emails and/or phone numbers of 24 members/leaders who were scheduled to attend the annual meeting. The project contacted 22 of them with working emails/numbers and sent an email that included information about the duration of the focus group, location of the session, and incentives which would be provided to participants in the focus group session. Those who were interested were asked to email the Kalusugan Team at the University of Hawaii to confirm their participation in the focus group. Reminder calls and emails were sent directly to individuals who reported interest in attending the focus group prior to the date of the session. There were 21 people who confirmed they would attend. On the day of the focus group, 20 of the 21 who RSVP'd attended. One of those who reported he/she could attend became ill on the day of the focus group, but another member of the same unit said he/she would attend instead. Thus, we had 21 club leaders attend the focus group. There were two focus groups simultaneously conducted consisting of approximately 10-11 participants per group. One group was conducted by a Co-Investigator (Dr. Felicilda-Reynaldo) and the other group was conducted by a Multiple Principal Investigator (Dr. Albright). Group sizes were limited to these numbers to ensure active and equal participation from individuals. Participants were asked to complete an anonymous demographic survey and sign a consent form prior to the start of the focus group session informing them that the session would be audio recorded. The participant demographics can be found in Table 33 below. These sessions provided key feedback on how receptive members of FCC clubs who did not participate in the current study would be "change-agents" for their club's members and for other parishioners in the church.

Table 33. Socio-demographics for Focus group participants (August = previous study participants and November = DCFCC club leaders

Variable	Total (n=31)	August (n=10)	November (n=21)	P-value
Categorical, n (%)				
Sex				0.141
Male	6 (19.4%)	0 (0.0%)	6 (28.6%)	
Female	25 (80.7%)	10 (100.0%)	15 (71.4%)	
Birth Place				1.000
Hawaii	3 (9.7%)	1 (10.0%)	2 (9.5%)	
US	2 (6.4%)	1 (10.0%)	1 (4.8%)	
Other (Philippines)	26 (83.9%)	8 (80.0%)	18 (85.7%)	
Hispanic				1.000
Yes	1 (3.9%)	0 (0.0%)	1 (5.9%)	
No	25 (96.1%)	9 (100.0%)	16 (94.1%)	
Race, most				
Filipino	31 (100.0%)	10 (100.0%)	21 (100.0%)	NA
Race, mixed with Filipino				
White	1	0	1	
Chinese, White	1	1	0	
Chinese	2	1	1	
Portuguese	1	0	1	
Marital Status				**0.017**
Never married	2 (6.5%)	2 (20.0%)	0 (0.0%)	
Married	24 (77.4%)	5 (50.0%)	19 (90.5%)	
Divorced	1 (3.2%)	1 (10.0%)	0 (0.0%)	
Widowed	4 (12.9%)	2 (20.0%)	2 (9.5%)	
Age				0.704
45-64 years	16 (51.6%)	6 (60.0%)	10 (47.6%)	
≥65 years	15 (48.4%)	4 (40.0%)	11 (52.4%)	
Hawaii residency				0.434
<45 years	16 (55.2%)	7 (70.0%)	9 (47.4%)	
≥45 years	13 (44.8%)	3 (30.0%)	10 (52.6%)	
, Mean + SD (range)				
Age	65.2 ± 6.6 (56 - 81)	63.3 ± 5.1 (56 - 73)	66.1 ± 7.1 (56 - 81)	0.267
Hawaii residency in years	41.1 ± 13.8 (18 - 69)	37.2 ± 16.4 (18 - 65)	43.2 ± 12.1 (18 - 69)	0.275

B. Focus Groups Theme analyses

Project staff first identified themes mentioned throughout the focus groups (eight themes for August session and 7 themes for November sessions) that were applicable to each focus group (resources, support, barriers, etc.). Two staff independently coded the August focus group with lay leaders who had participated in The Kalusugan Project and found their interrater reliability was (91.4%). In this focus group, staff coded 114 independent statements into 8 themes. Of the 8 themes, the top three most commonly mentioned were: (a) Examples (e.g., Zumba, standing during commercials), (b) perceived benefits, and (c) study related tasks (i.e., follow up calls, surveys). The two staff then identified themes similar, but not identical, in the November focus group with neighbor island church leaders who had not participated in The Kalusugan Project. When looking at transcripts from the November focus groups, project staff coded 191 independent statements into seven themes. Of the seven themes, the top three most commonly mentioned were: (a) resources (have vs. need), (b) support (social support), and (c) barriers/challenges to changing physical activity and sedentary time.

C. Resources (Haves and Needs)

Participants were asked what types of resources they have on site at their church and what resources they would need in order to facilitate being more active and sitting less. The participants came up with 37 subthemes for this category between the two focus groups.

Most participants reported that they would need music as well as financial resources to purchase exercise equipment to assist with becoming active. However, it was pointed out that the club might not want to take on the responsibility of fundraising for exercise equipment or taking on the responsibility of cleaning/maintaining/storing any the purchased equipment. Others indicated that cooperation and commitment

from team members as well as educational resources from the University of Hawai'i would be great resources to have along with training on how to become more physically active and sit less. Numerous participants specified that they would need types of physical activities provided to them in the form of videos or in-person classes Zumba, Cha-cha, aerobics, or yoga to help club members engage in PA.

Participants were also able to identify many environmental resources within their church and in its surrounding neighborhood that could be used to increase LMPA and decrease ST such as having a yard to walk around, sidewalks around the church, church parking lot, cafeteria, pool, jungle gyms, and various other environmental resources they could use. Some even mentioned having technological resources like televisions and Wi-Fi that could be used with permission from the Pastor.

D. Social Support/Support

An overwhelming number of responses from participants indicated that by having less gatherings or meetings centered around food or having healthier food options available could help in increasing PA and decreasing ST since eating requires them to sit for long periods. Another commonly mentioned form of support participants thought would drive change was providing motivation for each other and having self-motivation. This included encouraging and participating in group exercises and walking "marathons" together, participate in PA as a group before or after FCC meetings, remind others to stand, motivate others to purchase workout equipment, and provide transportation if they did not have a ride to get to an exercise class. As mentioned in the previous section, offering classes such as Zumba would be a form of support these individuals' identified to be helpful for increasing PA and decreasing ST. Individuals also mentioned that friendly competition between groups to lose weight could serve as another form of support while some mention that by making the activities fun and offering rewards or incentives would be helpful.

E. Barriers/Challenges to Physical Activity and Sedentary time

Across the two focus groups, members reported lack or conflict with time and full schedules as being the number one barrier or challenge to increasing PA and decreasing ST. Being tired or having lack of motivation, as well as lack of cooperation and lack of interest, were the second most mentioned barriers or challenges. Presumably with the idea of purchasing PA equipment on their mind, participants also mentioned that the cost of resources was a barrier. Being "too old" was the third most mentioned subtheme. Lastly, uncertainty of where to start and lack of training to do a specific type of exercise was also mentioned as a barrier.

Through thematic analysis of our focus group results, similarities and differences from previously completed qualitative work can be identified. Similar to previous work, our focus groups found that the number one barrier to change in PA habits was the lack of time. (Ceria-Ulep, Tse, & Serafica, 2011; Pobutsky et al., 2015; Schwingel & Galvez, 2016) Pobutsky et al. (2015) specifically mentions that time constraints are due to socioeconomic factors, such as the need to work more than one job, resulted in very little priority given to PA while Schwingel et al. (2015) mentioned that time was consumed by caring for family members such as getting grandchildren ready for the day and participation in church activities. In our focus group, individuals mentioned that they just lacked the time to change their PA habits. Another barrier to changing PA habits mentioned in our focus group was "being too old" which mirrors findings from Ceria-Ulep, Tse & Serafica (2011) who reported that interfering health conditions deter individuals from engaging in structured exercise.

Resources available and needed for changing PA and ST behaviors were also major factors that can motivate or deter change. One subtheme mentioned was the need for more PA resources like Zumba classes, dance classes, and other activities to reduce ST and increase PA which supports the data collected by Pobutsky et al. (2015) indicating that chronic health issues are a direct consequence of the lack of PA and increased ST. Alternatively, participants in our focus groups listed various resources available to them for walking such as the parking lots at their church and the sidewalks around their church that could indicate a strong intention to walk which was the preferred method of exercise in the previous FBO focus group done in 2011 by Ceria-Ulep, Tse & Serafica. The lay leaders in these church clubs, as well as other qualitative studies, strongly believed the most effective way to motivate older adults to be active was when PA was incorporated directly into on site church activities.(Schwingel & Galvez, 2016)

Support for motivating PA changes also paralleled responses from previous work that linked PA to changes in dietary habits. We found that participants believed the best form of support would be to have less food at gatherings or healthier food options where Pobutsky et al. (2015) indicated that their participants felt that it would also be helpful to have access to general health information and more education on healthy eating.

(Pobutsky et al., 2015) Other forms of support mentioned by our focus group participants were to form exercise groups /walking groups, participate in marathons / races and in group physical activities with a focus on "making it fun." Other researchers also found participants wanted to have community activities, group exercises and creative ways to exercise such as walking or going to the beach.(Pobutsky et al., 2015) Lastly, incorporating PA around time the time they spend at church or while they completed other church activities was mentioned as a way to support PA. See Tables 34-36 on pages 34 -36 for specific themes.

Table 34. Former Participants in the Kalusugan Project: August Focus Group Findings by Themes most frequently mentioned (n=10)

Themes	Subthemes related to Physical Activity and Sedentary Time	# of times mentioned
Examples of PA/ST		
	1. Stretching while watching TV/Commercials and also at school with coworkers and with students	3
	2. Exercise 10 min, 2 times a day with coworkers	1
	3. Line dancing	3
	4. Zumba (Example, mentioned Lani as leader)	2
	5. Stair climbing (work with coworkers and mall with siblings, lighten load to walk up stairs)	3
	6. Examples from benefits: limit sitting, mobile	2
	7. Volunteer to perform (dancing) and practice before performance	2
	8. Hiking with students (Camp Erdman)	1
	9. Cleaning church 1 time a month	1
	10. Walked with siblings in neighborhood and mall	1
	11. Swimming	1
	12. Ballroom dancing	1
Perceived benefits of PA/ST		
	1. Health benefits (If I change/lost weight and became more active)	2
	2. Health benefits (Better labs, lost weight)	2
	3. Reward for PA - Eating	1
	4. "Take care of health and self and it will perpetuate into family life"	1
	5. "More bonding"/"Spending time together"	2
	6. "Motivate each other"	1
	7. Shared it with siblings and got together more	1
	8. Increased communication when spending time together doing PA, childhood memories, venting, catching up	5
	9. Time passes quickly when bonding	1
	10. Exercise promotes a clear mind	1
	11. Feeling happy/positive attitude	1
	12. "Don't need knee brace as often"	1
Study related tasks (e.g., follow up calls, surveys)		
	1. Follow up calls (keeping on track, encouragement)	2
	2. Brochures	1
	3. Emails	1
	4. Incentives (Longs GC)	1
	5. Stickers	1
	6. Team distance	1
	7. Surveys (didn't like, need it for data, time frame issues x2, hard, guilt/felt bad x4	9

Table 35. Interrater reliability for seven main themes August focus group

Themes	Coder 1 Count	Coder 2 Count	Total	Agreed upon	Number differed	Interrater reliability for Oahu focus group
Perceived benefits (i.e., what others get from PA/ST)	22	27	49	22	3	
Barriers/challenges (weather, want to relax)	4	4	8	4	0	
Support (social support)	18	19	37	18	1	
Technology (pedometer, phone)	13	16	29	13	3	
Resources (haves vs needs)	18	15	33	15	3	
Examples (Zumba, standing during commercials)	21	23	44	21	2	
Study related tasks (follow up calls, brochure, surveys)	8	13	21	8	5	
Total	104	117	221	101	17	
Interrater reliability OAHU focus group						0.91

Table 36. DCFCC church leaders from across the state (n=21): November Focus Group Findings by Themes most frequently mentioned

Themes	Subthemes related to Physical Activity and Sedentary Time	# of times mentioned
Resources (have vs. need) *Subtheme Resource Need* *Subtheme Resource Have*		
	1. Need music/radio, CD	5
	2. Need money to purchase exercise equipment such as treadmill, elliptical machine, lifting machine, bicycle, rowing machine.	4
	3. Have a yard to walk around which is attached to a school	4
	4. Need cooperation and commitment from team members	3
	5. Need encouragement, coaching and partner	3
	6. Need more dancing in general such as Cha-cha	3
	7. Need Zumba (at least 10 minutes before meeting)	3
	8. Need self-commitment, good leadership	2
	9. Need an instructor who knows how to do exercises safely	2
	10. Need a projector to show videos from cell phone	2
	11. Have a parking lot to walk	2
	12. Have sidewalks around the church to walk around	2
	13. Do not want responsibility for equipment, money. Unable to fundraising.	2
	14. Need to offer incentive with musical chairs	2
	15. Have a television but want to take it away to stand more	2
	16. Have Wi-Fi	2

	17. Have a meeting room for potential exercise class	1
	18. Have a nearby park	1
	19. Have a playground	1
	20. Have a church	1
	21. Have an art room	1
	22. Have Nun's room, rectory	1
	23. Have a cafeteria	1
	24. Have a pool	1
	25. Need to create motivational items	1
	26. Need to organize a committee	1
	27. Need support from the University of Hawaii	1
	28. Have a basketball court and equipment	1
	29. Need mats	1
	30. Have TV/DVD in halls	1
	31. Need approval from Pastor to use DVD player	1
	32. Need opportunities for stretching	1
	33. Need aerobic classes	1
	34. Need yoga	1
	35. Have a hall to do exercises in	1
	36. Have a jungle gym	1
	37. Need a trainer to train them	1
Support (Social support)/group based activities		
	1. Less foods at gathering, healthier food options	13
	2. Be an example to motivate others	4
	3. Join an exercise group/walking group such as American Heart walks or marathons	4
	4. Participate in physical activity as a group with planned times either before or after meetings	3
	5. Offer classes such as Zumba, dance classes (line dance) to exercise together	3
	6. Participate in physical activity with retired members after mass	2
	7. Remind others to stand	2
	8. Motivate others to buy workout equipment such as treadmills	2
	9. Create competitions for weight loss with incentives and challenge each other as groups	2
	10. Make it fun	1
	11. Include stretching in fellowship as a group	1
	12. Be self-motivated	1
	13. Encourage unit members by offering treats	1
	14. Give out rewards (ex: if a person loses 10 lbs., go shopping)	1
	15. If they don't have a ride, pick them up	1
	16. Set a group goal	1
Barriers/Challenges to physical activity and sedentary time		
	1. Full schedules, time conflicts, lack of time	17
	2. Tired or lack of motivation	4
	3. Lack of cooperation /lack of interest	4
	4. Cost of resources	2
	5. Too old	2
	6. Unsure where to start	1
	7. Lack of training	1

VII.   Key achievements (papers presentations).

  Published abstract from Conference presentation March, 2019: Ceria-Ulep C, Albright CL, Saiki K, Felicilda-Reynaldo, RFD, Lim E, Gumataotao A, Canonizado T, Cain, S. (2019) Moving More and Sitting Less: The Kalusugan / Healthy Living Project with Filipino Catholic Clubs in Hawaii. *Annals of Behavioral Medicine.* March, 53 (Suppl 1), S104

  Published abstract from Conference in April, 2020: Ceria-Ulep CD, Albright CL, Saiki K, Felicilda-Reynaldo RFD, Lim E, Gumataotao A, Canonizado T, Cain S. (2020) Results of a Randomized Trial to Modify Physical Activity and Sedentary Time in Filipinos. Western Institute of Nursing, Communicating Nursing Research; 20/20 and beyond: envisioning the future of nursing research, practice, and education. Section: Better Together: Community Partnerships. Vol 53, P20.

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