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PlanYourLifeSpan.org – an intervention to help seniors make choices for their fourth quarter of life: Results from the randomized clinical trial

Lee A. Lindquist^{a,*}, Vanessa Ramirez-Zohfeld^a, Priya D. Sunkara^a, Chris Forcucci^b, Dianne S. Campbell^c, Phyllis Mitzen^d, Jody D. Ciolino^{a,e}, Dyanna Gregory^f, Gayle Kricke^g, and Kenzie A. Cameron^{a,e}

^aDivision of General Internal Medicine and Geriatrics, Department of Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL, USA

^bAging and In-Home Services of Northeast Indiana, Fort Wayne, IN, USA

^cThe Village Chicago, Chicago, IL, USA

^dSkyline Village Chicago, Chicago, IL, USA

^eDepartment of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL, USA

^fDivision of Gastroenterology-Hepatology, Northwestern University Feinberg School of Medicine, Chicago, IL, USA

^gCenter for Healthcare Studies, Northwestern University Feinberg School of Medicine, Chicago, IL, USA

Abstract

Objective: Few older adults contemplate their home support and health needs that may be required for aging-in-place. We sought to assess the efficacy of PlanYourLifeSpan.org (PYL), in influencing seniors' planning behaviors, perception of the importance of planning, and confidence accessing services.

Method: Randomized controlled trial, of adults, age 65 years in urban, suburban, rural areas of Texas, Illinois, Indiana.

Results: Among 385 participants, mean age was 71.9 years, 79.5% female. Between baseline and one-month follow-up, average planning behavior score increased 0.22 points in the PYL arm when compared to the attention control (AC) arm. After controlling for baseline, mean one-month planning behavior score was significantly higher in the PYL arm than in the AC arm (1.25 points, CI 0.37–2.12, $p = 0.005$). Secondary analyses via longitudinal linear mixed modelling suggested a study arm-by-time interaction effect for both planning behavior ($p = 0.047$ and perception of importance ($p = 0.05$). Significant baseline covariates included self-efficacy, education, perceived social support, power of attorney, and history of stroke.

*Corresponding Author at: Division of General Internal Medicine and Geriatrics, Northwestern University Feinberg School of Medicine, 750 N. Lake Shore Drive, 10th floor Chicago, IL 60611 USA., LAL425@northwestern.edu (L.A. Lindquist).

Conclusions and Practice Implications: PlanYourLifeSpan.org demonstrated efficacy in helping seniors plan for and communicate their health support needs. This free, nationally available tool may help individuals understand, plan, and communicate their options for their future support needs.

Keywords

Aging-in-Place; Seniors; Home support needs

1. Introduction

Aging in place is a priority for many older adults. [1–3] Seniors frequently state that they wish to live in their own homes, often without any help, until their death [4]. While ideal, this scenario is often unrealistic as seniors experience an increased prevalence of physical disability, co-morbidities, and cognitive issues, which leads to increasing rates of dependence over time. [5–10] As a result of these increasing morbidities, seniors often face health crises or advanced life events, such as hospitalizations, falls, or Alzheimer's, which may impact their ability to remain independent in their own homes in their "Fourth Quarter" of life, a time period focusing on the ten to twenty years prior to death. [11]. A common fear among seniors is their loss of independence and removal from their homes with placement in nursing homes. [12,13]

Although this concern is recognized by many seniors, few consider what resources they will need in order to remain in their own homes and often fail to plan for their lifespan. People do not know how to access home-based resources or what is available in their areas. [14–16] Consequently, when seniors become sick and are hospitalized, families often must react to the emergency. [17] While the senior is hospitalized, families often select sub-acute rehabilitation facilities, consider placement in long term institutions, or hire caregivers. [18–21] Families make decisions without the knowledge of the senior's preferences as they have never had specific discussions about their future needs. Subsequently, seniors may have little or no voice in their future.

PlanYourLifeSpan.org (PYL) was created as an interactive tool to assist seniors and their families with understanding, accessing, and planning for future home and health-related needs. This type of planning is different from end-of-life planning as it focuses on the Fourth Quarter of life where these needs may arise. To our knowledge, no prior interventions have addressed the health decisions, planning, and resources needed during this period of life as people age into their 70s, 80s, and 90s. We sought to test the comparative effectiveness of PlanYourLifeSpan.org to improve the planning for health and home-based needs of seniors during the Fourth Quarter of life.

2. Methods

2.1. Content of PlanYourLifeSpan.org (PYL)

Previously, we conducted focus groups with seniors about home support needs, aging-in-place, and planning for these needs. [11] Major themes of what advanced life events would

impact aging-in-place were identified as: hospitalizations, falls, and Alzheimer's. We organized PYL around these three health-related advanced life events. Additionally, a section on financing services and support was included as there were a number of concerns and misconceptions presented by participants. The themes that emerged from the focus groups were each discussed by a multidisciplinary team which included senior patient partners, caregivers, social workers, geriatricians, home caregiver agency leadership and representatives from Villages, nonprofit, grassroots, membership organizations that are redefining aging by being a key resource to community members wishing to age in place, and an Area Agency on Aging, to determine how to best present those needs within PYL. Based on the team's input, focus groups, and pilot-testing of the website, it was decided that each section would start with a video of a senior discussing their real-life personal experiences of the advanced life event, with subsections providing interactive information on what seniors can expect, types of resources available, and decisions to be made. For example, by entering a zip code, the user can identify the closest Area Agency on Aging or which home caregiver agencies exist in the area. (Fig. 1)

Users can save their preferences and revisit their choices. To facilitate communication between seniors and loved ones, a summary of their choices, with specifics on accessing resources, can be printed or emailed to others. As inadequate health literacy and cognitive impairment is prevalent among seniors, PYL presents information understandable at all levels of health literacy and sensitive to cognitive load. [22] The tool uses simplified, large-font, less dense text without scrolling and although it targets people in the United States, other tool information may be useful to seniors from other countries.

2.2. Study design

To test the intervention, we conducted a two-armed (attention control [AC] and PlanYourLifeSpan.org [PYL]) intervention, parallel, randomized controlled trial (Fig. 2).

2.3. Study participants

The trial was conducted from October 2014 to September 2015, in Chicago, Illinois, Fort Wayne, Indiana, and Houston, Texas. Inclusion criteria were: age ≥ 65 years, English-speaking, scoring at least four questions correctly on the Brief Cognitive Screen, [23] and current self-reported use of a computer with internet. Participants were excluded if they had previously participated in the PYL-building focus groups or beta testing of the PYL website.

Community-based patient/stakeholder partners drove subject recruitment in their communities through word-of-mouth, email bursts, newsletters, and flyers. At the Area Agency on Aging and community centers where services such as food vouchers and case management are provided, potential participants were recruited on-site where they were provided a flyer about the study. At clinical sites, staff were informed about the study and referred potential participants. Study materials such as flyers and information sheets were also located in the clinic waiting rooms. The Villages, heavily relied on electronic recruitment using their regular e-newsletters and email lists to recruit potential participants. Potential subjects were also recruited by having study flyers at local senior centers and senior housing buildings.

Interested older adults contacted research staff who then reintroduced the study and assessed their eligibility. The screener was administered over the phone and if eligible, subjects were scheduled for a face-to-face study interview which took place at the preferred site of the participant since participants were older adults many whom had issues with transportation and mobility. For this study interviews took place either at the recruitment site (e.g. at the agency or center); a community setting (e.g. library) and a few interviews were completed during in-home visits (this was conducted with participants that were already receiving in-home services).

2.4. Randomization and intervention

Participants were randomly assigned to one of the two conditions via a pre-generated central randomization list using equal (1:1) allocation and random permuted block design with block size equal to six participants. Blinding and allocation concealment was not possible given the nature of the interventions. However, the statistician generated the randomization scheme independently of the team and uploaded the pre-generated list such that staff involved in consenting did not have access to the list. The AC condition exposed participants to the National Institute on Aging website, Go4Life.nia.nih.gov, an educational website on physical activity relevant to seniors. This website has comparable design and layout to PYL but does not include information about advanced planning. The AC condition controlled for the possibility that regular contact with the study team may improve outcomes in participants randomized to the intervention.

At the face-to-face encounter, participants gave written informed consent, completed a baseline questionnaire, and underwent randomization to either arm. Subsequently, study staff introduced participants to either website and provided instructions. Staff were present to assist with questions as needed on navigation but did not assist with decision making. A minimum of 15 min and a maximum of 45 min was allotted for navigating either website. After the allotted time, participants were administered an immediate post-test survey. One and three months after the face-to-face encounter, staff contacted participants over the phone to complete a follow-up survey. If participants could not be reached, staff made up to three phone call attempts before considering participants lost to follow-up. Data were housed in Research Electronic Data Capture (REDCap) survey software. [24] This study was approved by the Northwestern University Institutional Review Board.

2.5. Statistical analysis

2.5.1. Planning behavior and communication of plans—The primary endpoint for this study was the score of an internally-developed assessment on planning behavior and communicating about future preferences for hospitalizations, falls, and Alzheimer's/memory loss (range = 5 to 25 points, treated as a continuous measure for the purposes of these analyses). At baseline, one month, and three months, participants indicated agreement with five statements: 1.) I have made a new plan or changes to an existing plan for an unexpected hospitalization. 2.) I have made new plans or changes to existing plans to make changes to my home to decrease my risk of falls. 3.) I have communicated my preferences for my future health care to people who may need to make decisions for me. 4.) I have communicated my preferences about issues related to Alzheimer's to people who may need to make decisions

for me. 5.) I have communicated my preferences about issues related to memory loss to people who may need to make decisions for me. Respondents answered on a five-point Likert scale ranging from strongly disagree to strongly agree. Scores were calculated as the sum of the five questions [each scored from 1 (e.g. strongly disagree) to 5 (e.g. strongly agree) points], creating a range of scores from 5 to 25, with higher scores indicating better planning and communication behavior.

Without prior knowledge of the distributional properties of the primary outcome, we used Cohen's *d* to estimate the detectable effect size given the predicted accrual. With an overall recruitment goal of 600 subjects and an 85% retention rate (i.e., 510 study completers with 255 in each arm), we anticipated being able to detect a small to moderate effect size (0.25) with 80% power, assuming a 5% type I error rate. We planned a single interim analysis for primary outcome after enrollment and one-month follow-up of approximately half (300) of the target sample size. We used an O'Brien-Fleming type alpha spending function, and if the calculated test statistic at the interim analysis surpassed the required threshold (associated with 0.5% level of significance) according to the O'Brien-Fleming criterion, we considered early termination of the study. Further, we adjusted final primary outcome analysis significance level to approximately 4.5% to account for this interim look.

2.5.2. Perception of importance of planning—To determine participants' perception about the importance of planning, they indicated perceived importance for five statements, answering on a five-point Likert scale ranging from not at all important (1) to completely important (5): 1.) It is important that I plan for an unexpected hospitalization, 2.) It is important that I make changes to my home to decrease my risk of falls. 3.) It is important that I communicate my preferences for my future healthcare to people who may need to make decisions for me, 4.) It is important that I communicate my preferences about issues related to Alzheimer's to people who may need to make decisions for me, 5.) It is important that I communicate my preferences about issues related to memory loss to people who may need to make decisions for me. Perception of the importance of planning scores were calculated as the sum of the five questions. This score ranged from 5 to 25 with higher scores indicating increased perception of importance.

2.5.3. Confidence in accessing home services—Study stakeholder partners felt it was important to capture any changes in confidence in accessing home services. To assess this, participants were asked five statements at baseline, immediate post-test, one month, and three-month follow-up time points and asked if they strongly disagree, disagree, are neutral/unsure, agree, or strongly agree. The statements were 1.) I am confident that I know how to contact my local Area Agency on Aging, 2.) I am confident that I can find a senior Village in my area, 3.) If needed, I am confident that I can find a paid caregiver or hire a caretaker to help me in my home, 4.) I am confident that I know where I can receive physical therapy after a hospitalization, and 5.) I am confident that I will know how to access home services if I need them in the future. These statements were developed by the study stakeholder partners and study staff. Confidence in accessing home services scores were calculated as the sum of the five questions [each scored from 1 (e.g. strongly disagree) to 5 (e.g. strongly agree) points] with a possible range of 5 to 25.

2.5.4. Covariates—Demographic information, self-reported health, importance of religion, and existence of a power of attorney, living will, advanced directive (e.g., POLST) were obtained via self-report at baseline from each participant. General and social self-efficacy were measured using the Self-efficacy Scale [25] and social support was measured with the Lubben Social Network Scale-6 (LSNS-6). [26] Health literacy was assessed with the Rapid Estimate of Adult Literacy in Medicine (REALM) – Short Form. [27] Comorbidities were measured using a nine-item dichotomous response questionnaire.

2.5.5. Analysis—Data analysis was conducted on baseline, one, and three month time points. Primary endpoint analyses were conducted using an analysis of covariance (ANCOVA), comparing mean planning behavior assessment score at one month post-intervention/attention control while controlling for baseline planning score. Secondary analyses employed longitudinal linear mixed modelling to assess a time-by-arm interaction, both unadjusted and adjusted for potentially confounding factors. A series of post hoc ANCOVAs also explored the primary endpoint results at three months along with relevant secondary outcomes: perception of importance of planning score and confidence in accessing home services. Additional secondary endpoint analyses of these two outcomes also utilized longitudinal linear mixed modelling. These models included fixed arm, time, and time-by-arm effects and a random participant effect to account for within participant associations over time. Fixed baseline variable (current utilization of services, physical function, co-morbidities, and social support, health literacy, self-efficacy, and socio demographics) effects were compared with each outcome (one-at-a-time). Those with a significant association with outcome in these longitudinal models were considered for inclusion in the overall model selection process. A backward stepwise model building procedure determined an overall parsimonious, adjusted model for each outcome.

Analyses were conducted as intention-to-treat on complete cases. All randomized participants with a complete planning behavior and communication score at the one month time point were included in the one month analyses; those with a complete planning behavior and communication score at either one or three months were included in the three month analyses. There were no corrections made for multiple hypothesis tests, and model assumptions were assessed as appropriate.

3. Results

The study was stopped early following the planned interim analysis due to significance on the primary outcome according to pre-specified stopping criterion ($p = 0.0051$). Among 470 participants screened for eligibility, 385 were randomized (Fig. 3). All were included in intention-to-treat analysis. Of the 191 participants allocated to the AC group, one participant partially received the [PlanYourLifeSpan.org](https://www.planyourlifespan.org) intervention. The mean age of participants was 71.9 (SD = 5.6), 79.5% were female; 62.9% identified as White and 37.1% as Non-White (Table 1). Baseline characteristics were similar in both of the groups.

3.1. Primary outcome

3.1.1. ANCOVA results at one month—Mean baseline planning behavior and communication score overall was 16.88 (SD = 4.48), with comparable scores across arms.

Between baseline and one-month follow-up, planning behavior score decreased on average by 0.37 points, with the AC group having an average decrease of 0.92 points and the [PlanYourLifeSpan.org](https://www.planyourlifespan.org) arm having an average increase of 0.22 points. After controlling for baseline planning behavior score, mean planning behavior score at one month was significantly higher in the [PlanYourLifeSpan.org](https://www.planyourlifespan.org) arm than in the AC arm (1.25 points, CI 0.37–2.12, $p = 0.0054$). Though marginally significant ($p = 0.0444$), similar results were observed at the three-month follow-up time point (Table 2).

3.1.2. Longitudinal analysis of planning behavior score, controlling for baseline covariates—There were 10 baseline covariates that were significant on one-to-one comparison (power of attorney, importance of religion, history of lung disease, history of stroke, education, marital status, presence of living will, presence of an advanced directive, self-efficacy score, and support score). However, the power of attorney, living will, and advanced directive variables were highly correlated and therefore the model selection process was performed using the power of attorney variable. After model selection, there were five significant baseline covariates: self-efficacy score ($p = 0.0072$), support score ($p = 0.0095$), power of attorney ($p = 0.0002$), education ($p = 0.0059$), and history of stroke ($p = 0.0051$). Higher self-efficacy score, higher support score, having a power of attorney, lower levels of education, and history of stroke were associated with higher planning behavior scores. Table 3 illustrates longitudinal model results (up to three months post intervention) both failing to control and controlling for these variables. In each instance, there is a marginally significant (unadjusted model $p = 0.0470$, adjusted $p = 0.0637$) time-by-arm effect, suggesting that the active intervention arm tended to have an increased mean slope in planning behavior score over time.

3.2. Secondary outcomes

3.2.1. Perception of importance of planning—Tables 2 and 3 also present ANCOVA and longitudinal modelling results, respectively, for the two secondary outcomes: participants' perception of the importance of planning and confidence in accessing home services scores. Though not significant, the intervention arm demonstrated a mean overall increase at both follow-up time points when compared to the attention control arm. Perception score in the intervention arm was on average 0.60 (CI -0.06 – 1.27 , $p = 0.0766$) and 0.56 (CI -0.12 to 1.25 , $p = 0.1074$) points higher in the intervention arm when compared to the attention control arm (Table 2). Further, mean slope in perception score over time was on average 0.24 points ($p = 0.0522$) higher in the intervention arm. Significant baseline covariates for this outcome included: self-efficacy score ($p = 0.0381$, higher score was associated with higher perception score), history of stroke ($p = 0.0135$, with stroke history associated with higher perception scores), gender ($p = 0.0285$, with males having lower scores on average), and importance of religion ($p = 0.0015$, with importance associated with higher scores). Controlling for these variables, the treatment effect on change over time (interaction) remained marginally significant ($p = 0.0471$).

3.2.2. Confidence in accessing home services—Results for the confidence in accessing home services illustrate the same direction of intervention effect; however, ANCOVA results at the one- and three-month time points are marginally ($p = 0.0683$) and

not significant ($p = 0.1175$), respectively (Table 2). Covariates deemed influential upon exploratory analyses of this outcome were: self-efficacy score ($p < 0.0001$), social support ($p = 0.0027$), comfort using the internet ($p < 0.0001$), and racial minority group membership ($p = 0.0017$). Increased efficacy, support, and comfort using the internet were all associated with higher confidence scores, while minorities tended to exhibit lower confidence scores. Adjusting for these influential baseline variables, there was no significant difference in confidence trajectories over time across the two arms ($p = 0.4230$). However, further post hoc analyses (removing time-by-arm interaction term; complete model results omitted here) suggest a marginally significant ($p = 0.0549$) intervention effect on mean score (adjusted model estimate: 0.47, CI -0.01 to 0.94). This suggests that while slope of Confidence in Accessing Home Services does not appear to differ between arms, we have marginal evidence that the mean score differs across arms.

4. Discussion and conclusion

4.1. Discussion

Lifespan planning is fairly new in comparison to other fields, such as end-of-life planning. [28–30] Planning for ones' Fourth Quarter is about giving a voice to seniors during a vital span in their life and helping families facilitate these goals. To our knowledge, this is one of the first websites and trials devoted to planning for a senior's health trajectory as they age into their 70's, 80's, 90's, and 100's.

PlanYourLifeSpan.org was created to provide information and connect seniors to resources that may be needed over the course of their lifespan. Nationally available to the public, with links to local resources, and free-to-use, PYL demonstrated utility in helping seniors plan for their future home support and health needs as measured by the planning behavior outcome score. In addition, our results identified that seniors who had higher self-efficacy, support systems, and had already established powers of attorneys were more likely to plan and communicate for their lifespan.

We did not however observe any significant effect on confidence in accessing home services between the groups. While participants did demonstrate increased planning behavior, perhaps this demonstrates that there is supplementation that needs to happen and the intervention website is not the end-all, be-all to planning and may need more guidance and information to access resources.

Seniors who completed powers of attorney had previously thought about their future goals. Thus, planning for their health trajectory may have become an extension of planning for end-of-life. The connection between end-of-life planning and planning for a lifespan can create a unique opportunity for clinicians. Clinicians regularly discuss code status and powers of attorney during their end-of-life discussions with patients. [31–33] To facilitate lifespan planning, we encourage clinicians to ask patients, "What about the 10–20 years before you die, have you considered what you will do if you get sick or need help at home?" Clinicians can then refer to PlanYourLifeSpan.org and recommend that they discuss their choices with loved ones.

Barriers to lifespan planning from prior research showed that seniors did not wish to be a burden on their offspring [34]. PlanYourLifeSpan.org provides an opportunity for seniors to proactively make plans and communicate their goals to their families, which has the potential to alleviate seniors concerns of being burdensome to their loved ones.

A major strength of this project was our strong community partnerships. PlanYourLifeSpan.org was developed with significant input from our patient partners and stakeholders, which included seniors, senior community group leaders, Area Agencies on Aging, Villages, nurses, caregiver agency leaders, and clinicians. This patient and stakeholder engagement enabled us to create a website that was fully senior-centric, focusing specifically on what was important to seniors. Community-based recruitment facilitated a true community representation, allowing us to reach individuals who may not normally participate in research studies. An additional strength was that recruitment occurred at multiple sites, including rural and urban locales.

As with all studies, limitations existed. While using a validated outcome measure would have been ideal, none existed that assessed whether or not a person understood their future needs or could plan to make use of available resources. As a result, the primary and secondary outcomes measures were created with the input of our patient partners/stakeholders, but not validated prior to starting this trial. As well, a limitation is that the clinical significance of these measures is undetermined. However, post hoc Cronbach's alpha calculations illustrated reasonable reliability for these scales (alpha = 0.82 for behavior, alpha = 0.82 for perception, and alpha = 0.73 for confidence).

The trial was also limited by the short follow-up. With the one and three month follow-up, it was rare that a person had actually acted on the plans they had created on PYL. Future studies with longer follow-up are needed to determine if the plans are utilized and improve the confidence in accessing home services or make a difference in the care of the senior. Another limitation was the potential for cross-contamination across the two study arms. Even though the PYL website was secure during the trial, we observed more individuals (685 new users) accessing the site during the trial than those that were randomized to that arm. We suspect that users randomized to the intervention arm found the site useful and provided other seniors with the link. However, we have no evidence that the individuals randomized to the AC group accessed PYL and significant differences observed between the groups remained, suggesting that our estimates may be conservative. A final limitation relates to the generalizability of the results; our sample had limited diversity among participants, although it was implemented in three distinct geographical areas. Future studies should focus on the inclusion of more racially/ethnic, socioeconomically diverse study participants and the inclusion of additional study sites.

4.2. Conclusion

PlanYourLifeSpan.org demonstrated utility in helping seniors plan for their health and support needs that typically occur in the fourth quarter of life. This free, nationally available tool may help individuals understand, plan, and communicate their options for their future support needs.

4.3. Practice implications

Potential implications of planning for a senior's lifespan are expansive. If hospitalized seniors knew their preferred skilled nursing facility for sub-acute rehabilitation on the first day of their hospitalization, hospital lengths of stay would potentially be reduced. If families knew which caregiver agencies, area agency on aging, or community group that their senior wished to use and how to contact the resources, obtaining services would be easier to accomplish. PlanYourLifeSpan.org can effectively facilitate these decisions and ultimately, provides seniors a voice in their future.

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The figure displays three sequential screenshots of the PlanYourLifespan.org website layout, illustrating the user interface for planning healthcare and social needs.

Top Screenshot: Introduction
 The top navigation bar includes links for Hospitalizations, Falls, Memory Loss & Alzheimer's, Talking to Others, and Finances. The main content area is titled "Most Hospitalizations are Unplanned" and features a video of Catherine discussing her experience with rehabilitation after a hospitalization. A transcript on the right reads: "I think an important part of balance is really good physical therapy- to maintain balance, to keep it from deteriorating, and to improve it. Starting last January I went twice a week, in the bitter cold, to a really fine hospital and got physical therapy to improve my balance. I feel it's made a difference for me." The bottom navigation bar shows "Welcome, Lee" with "4% complete" and buttons for "PLAN YOUR LIFESPAN", "Home", "About", "Help", "Summary", "Save & Exit", and "Previous".

Middle Screenshot: More local resources
 This section provides information on state and local government resources for older adults who cannot afford services. It includes a search for an agency near you by entering a ZIP code (60611) and a "Sumit" button. Below this, it lists preferred choices for services, including the Chicago Department of Family & Support Services (312) 744-4016, the Illinois Department on Aging (217) 524-6911, and One Natural Resources Way in Springfield, IL 62702.

Bottom Screenshot: Summary
 The summary page shows a list of topics: Hospitalizations, Falls, Memory Loss & Alzheimer's, and Talking to Others. The "Hospitalizations" section is expanded, showing a list of pages (Page 1, Page 2, Page 3, Page 4, Page 5) and a "Falls" section. The "Falls" section includes a form for "If I need help in my home, I would like to use:" with a dropdown menu showing "Angelus Caregiving Agency" and a form for "If I need help in the home, I would like this group to be contacted:" with a dropdown menu showing "Lincoln Park Village".

Fig. 1.
 Snapshot of PlanYourLifespan.org Layout.

Fig. 2.
Randomized Controlled Trial Design.

Fig. 3.
CONSORT Diagram.

* Analyzed: All participants with any follow-up data were included in the longitudinal analyses (179 [PYL] +183 [AC]). The one-month ANCOVA models included 167 [PYL] + 179 [AC], three-month ANCOVA models included 152 [PYL] +162 [AC]. These analyses only included participants with data at their respective time points.

Table 1**Participant Baseline Characteristics.**

	Treatment Arm				p-value
	Attention Control		PLAN YOUR LIFESPAN		
	N = 191	%	N = 194	%	
Mean Age ($\pm$ SD) Sex Female	72.1 (5.6) 157	82.2	71.7 (5.6) 149	76.8	0.51 0.19
Male	34	17.8	45	23.2	
Race					
White	125	65.4	117	60.3	0.30
Non-White	66	34.6	77	39.7	
Marital Status					
Single, never married	27	14.1	23	11.9	0.58
Married	75	39.3	85	43.8	
Widowed	44	23.0	36	18.5	
Divorced/separated	45	23.6	50	25.8	
How would you rate your health?					
Poor	4	2.1	4	2.1	0.78
Fair	22	11.5	18	9.3	
Good	76	39.8	81	41.7	
Very Good	62	32.5	70	36.1	
Excellent	27	14.1	21	10.8	
Do you have a Power of Attorney?					
No	88	46.1	99	51.0	0.26
Yes	102	53.4	91	46.9	
Don't Know	1	0.5	4	2.1	
Do you have a living will?					
No	88	46.1	92	47.4	0.68
Yes	102	53.4	98	50.5	
Don't Know	1	0.5	4	2.1	
Do you have an advanced directive (such as a DNR, POLST, Code Status)?					
No	91	47.6	107	55.2	0.2
Yes	88	46.1	80	41.2	
Don't Know	12	6.3	7	3.6	
Household Income					
Less than \$20,000	45	23.6	43	22.2	0.90
\$20,000–\$40,000	50	26.2	54	27.8	
\$40,001–\$60,000	31	16.2	27	13.9	
\$60,001–\$80,000	25	13.1	26	13.4	
\$80,001–\$100,000	19	10.0	17	8.8	
More than \$100,000	13	6.8	18	9.3	
Don't Know	4	2.1	2	1.0	
Prefer not to say	4	2.1	7	3.6	

	Treatment Arm				p-value
	Attention Control		PLAN YOUR LIFESPAN		
	N = 191	%	N = 194	%	
Education					
High school or less	33	17.3	40	20.6	0.57
Some college	55	28.8	59	30.4	
College graduate	103	53.9	95	49.0	
How important is religion in your life?					
Not at all important	15	7.9	14	7.2	0.99
Not very important	15	7.8	16	8.3	
Somewhat important	34	17.8	34	17.5	
Very important	59	30.9	64	33.0	
Extremely important	67	35.1	65	33.5	
Not sure/Don't know	1	0.5	1	0.5	
REALM Score					
Third grade and below	1	0.5	0	0.00	0.85
Fourth to sixth grade	2	1.1	1	0.5	
Seventh to eighth grade	29	15.2	28	14.4	
High school	159	83.3	165	85.1	
Have you or a member of your household been hospitalized in the past 3 years?					
No	104	54.5	96	49.5	0.31
Yes	86	45.0	98	50.5	
Don't know	1	0.5	0	0.00	
With whom do you live?					
Live alone	104	54.5	94	48.5	0.36
Live with one other person	75	39.3	90	46.4	
Live with multiple other people	12	6.3	10	5.1	
If yes, with whom do you live? Spouse	73	38.2	86	44.3	0.2
Son/daughter	15	7.9	16	8.3	0.89
Other relative	10	5.2	10	5.2	0.97
Friend	1	0.5	0	0.0	0.50
Other	1	0.5	1	0.5	0.50
High blood pressure No	71	37.2	62	32.0	0.28
Yes	120	62.8	132	68.0	
Diabetes No	152	79.6	155	79.9	0.98
Yes	38	19.9	39	20.1	
Don't know	1	0.5	0	0.0	
Lung Disease such as emphysema or chronic bronchitis No	178	93.2	170	87.6	0.11
Yes	13	6.8	22	11.4	
Don't know	0	0.0	2	1.0	
Asthma No	167	87.4	162	83.5	0.27
Yes	24	12.6	32	16.5	

	Treatment Arm				p-value
	Attention Control		PLAN YOUR LIFESPAN		
	N = 191	%	N = 194	%	
Stroke No	169	88.5	177	91.2	0.27
Yes	20	10.5	14	7.2	
Don't Know	2	1.0	3	1.6	
Cancer No	144	75.4	141	72.7	0.60
Yes	47	24.6	52	26.8	
Don't Know	0	0.0	1	0.5	
Kidney Disease No	179	93.7	185	95.4	0.32
Yes	11	5.8	7	3.6	
Don't Know	1	0.5	2	1.0	
Heart Failure No	176	92.1	181	93.3	0.50
Yes	13	6.8	10	5.2	
Don't Know	2	1.1	3	1.5	
Arthritis No	72	37.7	66	34.0	0.47
Yes	116	60.7	124	63.9	
Don't Know	3	1.6	4	2.1	
How comfortable are you using the Internet?	3.6 (1.0)		3.8 (0.8)		0.12
Self-Efficacy Score	68.2 (8.0)		67.4 (7.9)		0.35
Social Support Score	6.4 (2.1)		6.3 (2.1)		0.66

Table 2

Summary Outcome Statistics and ANCOVA Results.

Outcome Measure	Time Point	Overall	Attention Control	PLAN YOUR LIFESPAN	Arm Effect Estimate (95% CI) ^a	P-value
Planning Behavior	Baseline	16.88 (4.48)	16.80 (4.58)	16.97 (4.38)		
	One Month	16.51 (4.56)	15.88 (4.56)	17.19 (4.48)	1.25 (0.37, 2.12)	0.0054
	Three Months	17.95 (4.46)	17.55 (4.41)	18.40 (4.48)	0.91 (0.02, 1.79)	0.0444
Perception	Baseline	19.95 (3.84)	20.14 (3.64)	19.75 (4.02)		
	One Month	20.51 (3.65)	20.29 (3.61)	20.75 (3.69)	0.60 (−0.06, 1.27)	0.0766
	Three Months	20.97 (3.55)	20.81 (3.56)	21.14 (3.55)	0.56 (−0.12, 1.25)	0.1074
Confidence	Baseline	20.75 (3.33)	20.68 (3.40)	20.81 (3.27)		
	One Month	21.45 (2.79)	21.19 (2.93)	21.74 (2.62)	0.47 (−0.04, 0.97)	0.0683
	Three Months	21.93 (2.54)	21.70 (2.71)	22.17 (2.33)	0.39 (−0.10, 0.89)	0.1175

^aFrom ANCOVA model for the given follow-up time point, adjusted for the respective baseline outcome score.

Table 3

Longitudinal Mixed Model Results.

Outcome Measure	Effect	Unadjusted Estimate (95% CI)	p-value	Adjusted Estimate (95% CI)	p-value
Planning Behavior ^a	Time	0.282 (−0.071, 0.634)	0.1173	0.322 (−0.035, 0.680)	0.0771
	Arm	0.282 (−0.617, 1.181)	0.5379	0.547 (−0.334, 1.428)	0.2231
	Interaction	0.512 (0.007, 1.017)	0.0470	0.486 (−0.028, 0.999)	0.0637
Perception ^b	Time	0.215 (0.048, 0.383)	0.0116	0.225 (0.057, 0.393)	0.0088
	Arm	−0.038 (−0.754, 0.677)	0.9163	0.094 (−0.608, 0.797)	0.7927
	Interaction	0.237 (−0.002, 0.476)	0.0522	0.244 (0.003, 0.485)	0.0471
Confidence ^c	Time	0.318 (0.189, 0.447)	< 0.0001	0.331 (0.201, 0.460)	< 0.0001
	Arm	0.349 (−0.235, 0.934)	0.2413	0.357 (−0.186, 0.901)	0.1972
	Interaction	0.088 (−0.096, 0.273)	0.3480	0.075 (−0.109, 0.260)	0.4230

^a Adjusted estimate corresponds to model controlling for self-efficacy score, education, perceived support, power of attorney, and history of stroke.

^b Adjusted estimate corresponds to model controlling for self-efficacy score, history of stroke, gender, and importance of religion in the participant's life.

^c Adjusted estimate corresponds to model controlling for self-efficacy score, perceived support, comfort using the internet, and minority membership.