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Lessons Learned: Recruiting Aging Adults for Research

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Lessons Learned: Recruiting Aging Adults for Research

Introduction

Older adults are the fastest growing population in the United States (US).[1] As of 2060, persons 65^{+} years will make up 24% of the US population.[1] At the same time, it is essential that all aging adults (age 40 years and older) have access to evidence-based food and nutrition programs so they have access to food that will promote optimal health and nutrition, physical and cognitive functioning and quality of life.[2] This aging of the US will drive change in the nutrition profession as nutrition and dietetics professionals try to coordinate and manage continuous assessment and documentation of nutrition and food program outcomes for aging adults.[3] Additionally, one of the Healthy People 2020 objectives is to increase the number of health care professionals who have geriatric certification, with registered dietitians as one of the target professions.[4]

Though more research is needed to address the general health care needs and specifically the nutritional needs of aging adults, current literature shows that recruiting aging adults for research has multiple challenges.[5-8] These recruitment challenges, such as multiple chronic health conditions, cognitive issues, polypharmacy, time burden and transportation, are part of the reason that older adults are not well represented in health care research.[6,9] This is a concern as much of the evidence used to make decisions for older adult care, is based on a younger population.[9] This can lead to nutrition and food practice and policy decisions for older adults that are based on persons with fewer co-morbidities, take fewer drugs, have less disability and more resources than the target population has.[6,9]

The United States Department of Agriculture-funded multistate project, Changing Health Trajectory for Older Adults through Effective Diet and Activity Modifications (NE1439), is addressing this research shortage in aging adults in order to determine best practices based in science to help adults age successfully and healthfully. This NE1439 project recruits aging adults

for a variety of studies from cross-sectional research[10] to focus groups[11] to intervention studies.[12-16] This article will focus on the lessons learned from recruiting aging adults into nutrition-related interventions. We present short vignettes from three universities that utilized various recruitment strategies to reach different audiences to illustrate the many challenges that may occur and the strategies used to enhance recruitment efforts. Each vignette discusses the recruitment issues experienced using three different approaches: health-care provider assisted recruitment, hospital-based recruitment, and community-based recruitment.

West Virginia University: Recruiting in a Rural Community for Weight-related Intervention Research

West Virginia (WV) is a mostly rural state that lies 100% within the Appalachian region. West Virginians have the highest rates of diet-related chronic conditions including obesity, diabetes, and hypertension,[17] and the poorest intakes of fruits and vegetables[18] in the nation. Middle-aged adults (45- to 64-year-olds), which include most of the Baby Boomer generation, are at most significant risk. They have higher rates of obesity than children, younger adults or older adults[17] and are entering retirement age in poorer states of health than previous generations.[19] One in five already has two or more chronic conditions.[20] This is particularly concerning in WV where middle-aged adults make up nearly 30% of the population.[21] As this large cohort grows older, the number of people with multiple chronic conditions and associated disabilities is expected to increase substantially.[22] Thus, there is a need to develop interventions to improve diet and reduce chronic disease in high-risk populations like middle-aged West Virginians.

Our overarching aim was to develop, and pilot test a telenutrition intervention to deliver as a referral service from the primary care setting. A survey of WV primary care physicians had indicated a need for diet counseling and weight loss services to which they could refer patients.[23]

We conducted two formative studies to help inform the telenutrition intervention development. The three studies for which recruitment experiences are described were conducted in the same geographical location in north central West Virginia. These two counties were chosen because they were near the University and they were not statistically different than the state average regarding their rates of fruit and vegetable intake and obesity and diabetes rates, major risk factors for heart disease.

Study 1. The purpose of this focus group study was to to determine gender-specific motivators and barriers to adopting healthful diets and losing weight among middle-aged West Virginians with risk factors for cardiovascular disease. The focus groups were conducted in a community setting in the geographical area we intended to offer the tele-delivered intervention. Sessions were held on select Saturdays in a hotel conference room. We sought to recruit 50 participants for the study. To be eligible, participants were required to be 45 to 64 years of age, have body mass index (BMI) ≥ 25 kg/m^2, to be residents in one of two counties, to be married or living with a companion, and have one of the following cardiovascular risk factors: high blood pressure, diabetes, pre-diabetes, high cholesterol, or high triglycerides. Participants received a $30 gift card for participation.

We recruited using both passive and active methods. Passive recruitment methods included placing an advertisement in the newspaper, distributing flyers to churches, schools, community organizations, businesses and libraries, and participant word-of-mouth. Active methods included in-person advertising at employee health fairs and community events and presenting to local organizations' group meetings.

After five months of recruitment efforts, we had officially screened 48 potential participants who contacted the study staff after hearing about the study. Of those screened, 77% (n=37) were eligible and scheduled to attend a focus group session. Of those, 30 (18 men and 12 women) attended a focus group session. Thus, we met only 60% of our recruitment goal. We amended the recruitment strategy throughout the duration. Initially, we recruited residents from our primary county of interest, but after a few months added an adjacent neighboring county to increase recruitment. We also added recruitment sites throughout the recruitment process and scheduled sessions based on having have at least three participants per session instead of the originally planned minimum of five. The time involved for study staff to travel and participate in recruitment efforts was substantial for this project. Although the groups and total sample size were smaller than had been planned, we reached data saturation (no new themes or insights emerged from the final male and female focus groups).

Overall, 23 of the 30 participants reported hearing about the study by word-of-mouth from a family member or friend. Only a few attended based on other types of passive recruitment or even the active community in-person recruiting at health fairs or community groups. Those who did not attend mostly cited competing time demands on the weekends as their rationale. From this experience, we began to develop a database to ask current participants if we could contact them to participate in future studies in order to have a direct way to contact previous participants. Additionally, we learned that recruitment by word-of-mouth was the most successful recruitment method.

Study 2. The purpose of this cross-sectional cardiovascular risk assessment study was to learn about the diet and lifestyle patterns of middle-aged adults in the same targeted geographical location as study one. We aimed to recruit and enroll 100 men and women. Due to recruitment

challenges and findings from the first study, we amended our recruitment strategy to include primary care physician offices and gave advertisement cards to participants at their in-person visits and asked them to share them with people they knew to enhance word-of-mouth recruitment. We also distributed flyers to churches, schools, community organizations, and local businesses, and used active recruiting such as in-person advertising at employee health fairs and community events.

The study required participants to complete three dietary assessment phone calls, complete an online survey and attend an in-person health assessment visit where anthropometric data were measured and blood was drawn for laboratory analysis. In-person sessions were held on select Saturday mornings as this was the only day and time a central location could be obtained, and participants in study 1 indicated that weekends were preferred over weekdays. Participants received a $100 gift card and a report of the results from their diet assessment and laboratory tests. To be eligible for this second study, individuals had to be 45-64 years of age, non-smokers, and live in one of the two counties in our target area. Participants were excluded if they self-reported having had surgery the previous 6 months, a defibrillator or pacemaker, having a diagnosis of heart, liver or kidney disease or cancer, took anticoagulant or anti-inflammatory medications, abused alcohol or other substances, had a major change in diet or appetite in the previous three months, or did not have a telephone.

After 5 months, we recruited 96 participants (96% of goal). One-hundred and seventeen potential participants met the screening criteria and indicated they were interested in taking part in the study. Of those, 18 did return the signed consent form and three signed the consent form but did not participate (n=1 changed their mind, n=1 could not make the date of the in-person assessment and n=1 had a change in status in which they no longer meet the inclusion criteria).

We extended the study an additional month and added an in-person data collection date to allow for additional participants. While we nearly met our recruitment goal, a majority of participants had incomes greater than $50,000 (67%) and had a college education (57%), both higher demographics than the state averages. Of the 96 who participated, a large majority (n=71) indicated they learned about the study from a family member or friend, 16 learned about it from participating in another study, and the remainder (n=9) heard about it from a flyer in the community or doctor's office.

Study 3. The purpose of this pilot randomized controlled intervention study was 1) to evaluate feasibility and acceptability in terms of recruitment, retention, adherence and satisfaction, and 2) to assess the effectiveness of the male-only telenutrition program compared to enhanced usual care regarding changes in weight and caloric reduction. We chose to target men for the intervention because men in WV have higher rates of overweight and obesity than those in any other state; nearly 75% are overweight or obese. Middle-aged men in WV are disproportionately affected by obesity and men are understudied subpopulation at-risk for costly weight-related comorbidities.[24] We aimed to recruit 60 participants from four primary care physician offices that were located in the target county. Participants were randomized to receive either an intervention group or an enhanced usual care group for 12 weeks. Both groups received diet-related educational materials, but only the intervention group participants received weekly support from a registered dietitian nutritionist via tele-conferencing. A $100 gift card was provided to participants who completed the study.

Participants were men, 40 to 70 years of age, who had a BMI $\geq$ 30 and a diagnosis of at least one of the following conditions: hypertension, hyperlipidemia, pre-diabetes and/or diabetes. They were included if they were married or living with a companion. They were not eligible if they

reported any of the following; 1) having a diagnosis of kidney disease, liver disease, celiac disease or cancer (except skin or prostate); 2) having had major surgery or cardiovascular event (e.g., stroke or heart attack) in the past six months; 3) using insulin, steroids, blood thinners requiring consistent vitamin K intake or anti-obesity medications; 4) drinking >2 alcoholic beverages daily; 5) already following a diet to lose weight or weight loss of ≥ 10 pounds in past 6 months; and 6) did not have a home computer with high-speed internet service.

Male patients 40 to 70 years with a BMI ≥ 30 and a diagnosis of at least one of the qualifying diagnoses provided above were mailed an invitation letter from their primary care physician (n=961). Nearly 13% (n=123) of those who were mailed letters were screened for eligibility. Of those, 64% (n=59) were eligible and 85% of those eligible (n=67) consented to participate.[24] Seven declined participation post-consent and one was excluded due to an existing diagnosis that precluded participation. Recruitment took 8 weeks and ended when the desired number of participants who scheduled their first in-person assessment visit.

Of the series of studies, this study yielded the most participants over the shortest amount of time. After 8 weeks, we met our recruitment goal of 60 participants. One person declined post consent due to a health condition. Three who started the study dropped out at or before the 6-week time point (mid-way). Thus, we retained 95% (56 participants completed the study) of the study population which is higher than the 80% we anticipated. We demonstrated that we could enroll and retain participants in the study and that collaborating with primary care providers improves participant recruitment. In fact, when participants were asked what their main reason was for participating in research study: 36.4% indicated it was because their doctor recommended it, 40% said it was because they had been wanting to lose weight but were not sure what to do. No one indicated that it was for the $100 gift card. Overall, the recruitment was deemed successful;

however, most of the participants in our sample had incomes greater than $50,000 and nearly half were college graduates. In future studies, efforts will be improved to reach a greater portion of low-income participants.

XXXX XXXX University: Discussion from Recruitment Challenges

This series of studies demonstrates that recruitment of rural aging adults with multiple chronic conditions is challenging as has been previously reported. Nested within our aging adult population are several factors known to impact recruitment efforts including: 1) rurality;[25] 2) Appalachia region residence;[26] and 3) disproportionate rates of obesity and poor eating habits. Cultural characteristics, geographical barriers and lack of trust of outside scientific investigators have been cited as factors contributing to poor recruitment in rural Appalachia.[26] The time and cost demands of recruiting an adequate number of study participants from rural Appalachia and in health disparate areas should be considered in grant proposals. In our studies, the most successful approaches to recruitment were word-of-mouth by participants and collaborations with primary care physicians. Both of these methods relate to having someone who participants know and trust to recommend the study. Building trusting and collaborative relationships with providers who refer patients for nutrition care may be a key factor in improving patient participation and compliance with nutrition care in rural Appalachia whether in research or practice settings.

XXXX XXXX University: Recruiting in the Hospital for Community-based Intervention Research

Alabama (AL) and Mississippi (MS) are primarily rural states in the deep south. Both states have counties that are a part of the Appalachian region and the Delta region. These two states vie for the 'first in the worst' of health outcomes, including among diet-related chronic conditions noted

above. Older adults in Alabama and Mississippi bear the weight of a lifetime of poor health conditions and, while obesity and associated conditions are of grave concern, some also are at risk of undernutrition. This may be especially true for older adults who are already ill and hospitalized. Thus, there is a need to develop interventions that ensure adequate nutrition for this subset of the population.

Toward that end, in Alabama and Mississippi, we (co-authors Buys and Locher) have been actively engaged in randomized control trials to test interventions for people recently discharged from the hospital. While extant literature suggests that scientists in many fields face challenges recruiting participants for research studies, our experiences suggest that this may be even of greater significance when recruiting participants for studies of this type. Our experiences with these projects have highlighted some particular barriers and challenges to recruiting participants in a hospital setting for community-based nutrition interventions, and that is the focus of this section. We will discuss experiences from three studies in two hospitals, one in Alabama and one in Mississippi.

Beginning in 2008, our team (XXX, XXX, and others) began conducting randomized controlled trials to assess the feasibility and efficacy of providing nutrition-related interventions to aging adults after discharge from the hospital. We were motivated by findings from epidemiological studies that show that undernutrition or malnutrition in aging adults is a precursor to poor outcomes, and that undernutrition maybe associated with hospitalizations or illnesses which precipitated the hospital admission.[27-32] Therefore, we argue that the transition from hospital to home is a particularly important leverage point for addressing nutrition-related needs.

Study 1. In the initial randomized controlled trial, Behavioral Nutrition Intervention for Community-dwelling Elders (B-NICE), we sought 120 participants aged 65^{+} years who were at risk for or experiencing undernutrition. Our multi-component behavioral nutrition intervention was implemented in a community-based, home setting with the goal of assessing a multilevel self-management intervention to improve nutritional status in a group of high-risk aging adults. Participants randomized to the intervention arm were given a list of options for behavioral interventions designed to increase their caloric intake with a goal of either maintaining or gaining weight; intervention examples included increasing the number meals they ate with another person, adding higher fat content to their diets or increasing the number of snacks they ate each day, in addition to more than a dozen other options. We recruited, among other settings, in a hospital on a geriatric-specific general medicine floor, that had a full-time nurse-coordinator, social worker, and a dedicated geriatrician, where we encountered many challenges to the success of the study.[33]

Participants were required to be Medicare-eligible individuals, 65 or older, who were receiving skilled home health care. To be eligible for the study, individuals had to be able to communicate or have a caregiver who was able to communicate, live in a private residence, have an acute illness or chronic condition, and undereating. We defined undereating as "consuming insufficient calories to maintain current body weight; a caloric intake of 5% or more below the estimated energy requirement, and/or having an unintentional body weight loss of 2.5% during the previous 6 months."[33(p1676)] Some individuals were excluded from the study if they had cognitive impairment, as noted with a score on the Short Portable Mental Status Questionnaire of less than 8 of 10 if living alone or without a caregiver or less than 5 of 10 if living with someone or having a caregiver present.[34] Individuals were also excluded if they had a "terminal illness, cancer

diagnosis within past 5 years, end-stage renal disease, any tube feedings, or ventilator dependence." [33(p1676)]

While we sought participants directly from home health agencies, a primary recruitment source was the University hospital's geriatrics unit. We attended daily, multidisciplinary rounds and met with the social worker to determine which patients would be discharged with home health services; then we would visit them in their room, present the study to them, and invite them to be a part of the study. Our recruitment efforts were insufficient to meet enrollment goals, with us only reaching approximately 50% of our targeted enrollment during a 2-year project period. We noted that Sahyoun and colleagues[35] reached 50% of their targeted enrollment in the Community Connections Demonstration Project, a study funded by the Administration on Aging that recruited from a similar population and from comparable sources.[36]

Recruitment among these populations may be difficult because participants perceive more involvement than they or their families are willing or able to offer, given the burden of their illness.[35, 36] Lending support to this hypothesis, Villareal in a randomized control trial[37] of weight loss in aging adults enrolled almost the same number as we did. In our case, it may be that we experienced limited referrals from discharge planners, home health nurses, case managers, and social workers for the study because of bureaucracy in the local agency or hospital or uncertainty over who was responsible for providing referrals. Also, as noted in previous research, much of this work is assigned to social workers, who already have many responsibilities without adequate time to give to projects like this.[38-40] Beyond barriers to referral, we observed that potential participants were resistant to enrollment after learning that a goal of the study was to ensure weight maintenance or promote weight gain, depending on the needs of the participant. We

surmise that this type of recruitment may be an unfortunate unintended consequence of the anti-obesity public health messages.

Ultimately, we found that participants who received the intervention did consume more calories per day than those who received usual care (1,620 vs. 1,527, $p<0.05$). However, the participants enrolled in that arm indicated that the behavioral intervention was burdensome. Because of these challenges, recruiting, enrolling, and retaining participants in the study, we determined that in future work, we would promote "improved nutritional intake or energy intake" or a "healthy diet" in future research, and that we would test interventions that were less burdensome on participants and their families.

Study 2. Due to recruitment challenges, and general outcomes and findings from the first study, our team sought to transition our work from the multi-component behavioral intervention approach to providing a direct service of meal delivery to the same population of patients to provide them with added calories and nutritious food after discharge. Specifically, we tested a 10-day meal-delivery intervention in which a local non-profit agency prepared 3-meals per day and delivered them Monday-Friday, with enough for the weekend on Friday. We named this study Meals Enhancing Nutrition after Discharge (MEND) and anticipated that the challenges to recruitment would be less profound. However, we encountered similar barriers.[13]

Our recruitment strategy was very similar to the B-NICE study with the exception of the following: we recruited exclusively from the University hospital's geriatrics unit as we described above. We sought 24 participants 65^{+} years or older; at risk for malnutrition; cognitively intact; able to communicate; and being discharged to a place where the patient or family was responsible for preparing meals. We specifically sought participants diagnosed with congestive heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, or pneumonia;

these diagnoses are ones for which 30-day hospital readmissions are penalized. Participants randomized to the intervention group received 10 days of home-delivered meals and nutrition education; the control group received usual care and nutrition education. We were interested in the feasibility of a larger randomized controlled trial to explore the impact of interventions on hospital readmissions and caloric intake. We also evaluated satisfaction with the intervention.

We met our recruitment goals and technically demonstrated that we could enroll and retain participants in the study and that collaborating with a small non-profit organization to provide meals to older adults being discharged to home is feasible. We also found that participants in the intervention group consumed 1,595 kcal during the 10-day post-discharge intervention period compared with a 1,235 kcal ($p<0.05$) for those in the control group. However, we found that it took much longer than anticipated to complete the study (13 months vs. 6 months as planned). We had to screen 155 patients to enroll the required 24; some participants were not eligible, some were generally resistant to participating in research, and others were specifically uninterested in interventions that might lead to weight gain. Finding participants required that we have a staff member attending rounds each day, which presented a major burden on our team. We also noted that collaboration with a non-profit organization located many miles away from our offices and which had limited capacity to deliver meals highlighted the importance of working with many organizations rather than just one.

Because of these challenges, we re-evaluated our needs and goals and decided that addressing the logistical challenges of providing meal delivery may be insurmountable in tailoring for a narrow population. In contrast, Meals on Wheels and associated programs are operated for aging adults who are more broadly at nutritional risk. Therefore, we sought to test alternative approaches to providing the nutritional care that patients need after discharge.

Study 3. As a result of the logistical challenges associated with providing meal delivery, we sought an opportunity to partner with a large nutrition services provider operating in a hospital to test meal services provided for patients after hospital discharge. We also had an interest in testing out similar interventions in community hospitals, so we implemented this study exploring the feasibility and efficacy of providing a 10-day supply of frozen meals on discharge in such a hospital- a small, rural hospital, in a different town and state (Mississippi).

In this study, we sought 24 participants to be randomized to one of two arms: 1) a nutrition intervention arm, sending 10 days of meals with the patients at discharge, along with nutrition education materials and 2) the control group that would receive usual care and nutrition education materials. Inclusion and exclusion criteria were identical to those in Study 2.

For the recruitment process, the study staff worked with the two registered dietitians at the local hospital who knew the patients in the hospital and were able to access the electronic medical record. The dietitians contacted the study team when a patient was admitted who was eligible for the study since they did not have a geriatrics-specific rounds as the university-based hospital did.

Despite having a direct connection to the registered dietitians to assist with recruitment, we experienced significant difficulty enrolling participants and never achieved our goals. We screened over 50 participants, consented 25 and actually enrolled 20; however, only 9 completed the 45-day follow-up data collection. We believe that this was largely due to a lack of familiarity with research in this community-based hospital. Similar to the other studies,[37-40] participants were concerned about how much work would be required by them. They particularly did not want to respond to 24-hour food recalls; and in fact, many refused to participate after learning

about the recalls. Even of those who did consent, of those matriculating through the study, we had less than 50% of the participants who finished the 45-day follow-up calls.

We recognize the need for an opportunity to better communicate with community members about why research is important and why people may want to get involved, including for their own benefits and for the good of others beyond the timeframe of the study at hand. We also see an opportunity to engage more community-based registered dietitians in research, including training them on how to conduct joint research projects.

XXXX XXXX University: Discussion from Recruitment Challenges

The key lessons learned from these three studies, each with different aims and in two different cities and settings, were that one must have a contingency plan and adapt along the way. Recruiting hospitalized and frail aging adults for randomized controlled trial interventions is challenging. Staffs in hospitals are well-intentioned and excellent colleagues; however, they may have little extra time to assist with study recruitment. Furthermore, aging adults, especially those who are frail and ill, are concerned about participating in what they deem is a high-burden study including 24-hour food recalls. In the future, we should engage in evaluation and assessment that is more comprehensive prior to launching a research project- even a pilot research project- to better gauge the readiness of the stakeholders for participation. Specifically in this case, we should have conducted interviews with recently discharged older adults from this or similar hospitals, and we should have assessed the feasibility of the process more clearly with the local registered dietitians.

XXXX XXXX University: Recruiting for Community-based Nutrition Education Programs

In Iowa, adults age 60 years and older make up 16.4% of the total state population, with 55.6% being female.[41] Iowa has its own strengths and challenges with a growing aging adult population.

In comparison to the rest of the U.S., Iowa's aging adult population ranks low in prevalence of poverty (7.0%) and food insecurity (10.6%).[42] However, compared to the national average Iowa experiences higher obesity rates (31.1% versus 27.6%).[42] Over three-quarters 975.4%) of Iowans age 65 to 74 years and nearly two-thirds (65.9%) of Iowans age 75 years and older are classified as overweight or obese.[43] In addition, Iowa's 2016 16.2% of Iowans aged 65-74 years and 22.7% of those aged 75 years and older rated their health as "fair or poor."[43]

Two lifestyle interventions were pilot-tested as part of NE:1439 Project in Iowa. These interventions included one statewide exergaming pilot study[14, 44] and a whole grains curriculum pilot project that took place in Iowa and New Hampshire.[10] Both studies were implemented at the community level and pilot tested among adults aged 60 years and older. The exergaming program, Living (well through) Intergenerational Fitness and Exercise (LIFE Program) was implemented entirely through Extension.[14, 44] The "Is it Whole Grains?" curriculum was implemented by trained research staff with nutrition education experience.[10] Below we will discuss the recruitment successes and challenges toward these community-based lifestyle interventions.

Study 1. Given low rates of physical activity among older Iowans, the LIFE Program was implemented within rural Iowa counties by trained Extension staff (henceforth referred to as program manager) as a 24-week intergenerational exergaming intervention.[14,44,45] The first eight weeks consists of twice-weekly exergaming sessions facilitated by a younger adult trainer. The remaining 16-weeks were comprised twice-weekly sessions facilitated by a peer-leader (who was trained by the younger adult trainer) and a mailed wellness newsletter. In addition to the 24-week intervention, participants completed comprehensive paper/pencil questionnaires comprised of validated tools measuring outcomes such as sociodemographic questions, self-efficacy, and

physical activity readiness to change at Weeks 1, 8 and 25. To participate in the LIFE Program, participants needed to be: aged 60^{+} years, able to take part in a physical activity program as indicated by the Physical Activity Readiness Questionnaire (PARQ),[46] be able to function independently, and be able to communicate their needs and comprehend instructions.[44] Participants were excluded if they were younger than age 60 years of age, required a proxy to gather information, or were deemed unable to take part in a physical activity program by either the PARQ or their physician.[44]

Recruitment efforts focused on community locations serving older adults. These included senior centers, congregate meal sites, community centers, apartments included with the Housing Voucher Program (previously known as Section 8 senior housing) and retirement communities.[44] Both active and passive recruitment methods were utilized to enroll 265 older adults into the LIFE program across 31 Iowa counties over a two-year period. The active recruitment strategy for this study was in-person presentations.

Passive recruitment entailed flyers placed at local venues (e.g. grocery stores, Extension offices, community centers, etc.), press releases in local papers and newsletters, and participant word-of-mouth. We found the active and word-of-mouth recruitment approaches to be most successful. Therefore, as recruitment efforts struggled, the design of the flyers and press releases were modified to include testimonials in an effort to make them more appealing to prospective participants and have an aspect of word-of-mouth from past and current participants.[14] The in-person presentations provided prospective participants the opportunity to meet the program manager, learn about the expectations for them and to ask questions. Very few participants were recruited via the indirect methods of flyers and press releases. Two factors that adversely

affected a prospective participant's decision to enroll was the length of time of the program (24 weeks total) and the request to complete questionnaires at three points in time.

From the perspective of the program manager, the greatest challenges towards LIFE implementation were the identification of a location to host the LIFE Program and the recruitment of participants.[14] Although congregate meal sites are commonly viewed as a logical location for aging adult programming, scheduling restraints dictated by the time of meal service limits scheduling flexibility. During this pilot program, LIFE Program managers found working with senior apartments and retirement communities easier as it reduced the transportation burden of participants, altered scheduling restrictions, and increased the availability of a room conducive to a physical activity program.[14] Staff were more supportive for programs at the apartments and retirement communities versus congregate meal sites.[14] LIFE Program managers reported a main barrier for the participants was the evaluation component.[14] When those who completed the LIFE Program were compared to those who did not, those age 84 years and younger were found to be more likely to complete the program ($p=0.016$).[44]

Study 2. The Is it Whole Grains? curriculum was developed by the NE:1439 multistate project team. It is a three week program that meets for one hour that focuses on what a whole grain is, how to identify a whole grain and incorporates taste testing.[10] The pilot programs were held in mostly apartments that were part of the Housing Voucher Program, retirement communities, and congregate meal sites.[10] Inclusion criteria included being age 60^{+} years and English-speaking.[10] Participants were asked to complete an 8-page questionnaire at the start of Session 1 and at the end of Session 3.

The curriculum was pilot tested by community nutrition researchers in Iowa and in New Hampshire.[10] These researchers were experienced in identifying programming locations and comfortable in explaining research procedures, which may have helped the recruitment process. Active recruitment was completed via short in-person presentations that outlined the program and participant expectations.[10] Indirect recruitment methods included flyers, word of mouth of participants and program announcement cards.[10] Over almost a year, 174 older adults enrolled in the study and 157 attended all three sessions (90.2% completion rate).[10] The attributes likely contributing to the high completion rate was the amount of time required by the participants (3 weeks, 3 hours total time) and the inclusion of hands-on activities that made the program more interactive.

Similar to what was found in the LIFE Program, active recruitment efforts were more successful than the indirect methods. This provided the opportunity for prospective participants to meet with the person who would be leading the sessions. The short time frame (3 weeks) was viewed as "doable" for older adults and the request to complete pre- and post-questionnaires did not appear to adversely affect a person's decision to enroll.

XXXX XXXX University: Discussion from Recruitment Challenges

The key lessons we learned from the LIFE program and the Is it Whole Grains? program were to: 1) work with facilities serving older adults that have a flexible schedule, especially if there is an intergenerational component; 2) conduct active recruitment efforts as well as encourage word of mouth by participants; and 3) recognize the time commitment of participants.

Summary of Lessons Learned

As research scientists, we must continue to test interventions that have promise for improving the quality of life and the health span of aging adults and it is critical that we respond to recruitment

barriers. NE1439 project members have found recruitment of older adults to be challenging but attainable when applying lessons learned from previous research and perhaps most important, incorporating a contingency plan. Having a contingency plan and being able to adapt, within study parameters, allows for a better chance of success. In the above cases, the researchers progressively adapted and responded to the recruitment difficulties faced, and in each case there were both similar challenges and new ones that emerged. For example, XXX added another county that had similar health issues and the target population rather than staying with just one county.

In addition, the participants and program managers must not view the time and effort required of the participant as too burdensome. For example, program evaluation should not be overemphasized during recruitment efforts, but rather mentioned such as "during the program, you'll be asked to complete a few questionnaires." For the LIFE Program, the 10-page questionnaire was viewed by many participants and program managers to be too time consuming. It was also heavily emphasized during the recruitment presentations made by program managers. Thus, the overemphasis of the questionnaires during recruitment and the LIFE Program managers' hesitation about the evaluation tool may have adversely affected the participants' receptivity toward completing it rather than the length of the PARQ as the barrier. The Is it Whole Grains? program evaluation, on the other hand, was not over emphasized during recruitment. It was just stated that participants would be asked to complete pre and post questionnaires. This was still a lengthy questionnaire (8 pages) but was administered by experienced researchers who did not report participant resistance toward evaluation completion.

Working with other institutions and health care professionals can provide access to larger numbers of aging adults but the various settings may present additional barriers. The advantages XXX experienced working with retirement communities and apartments that were part of the Housing Voucher Program was the staff support in recruiting/encouraging residents to take part in the programs (e.g. activity directors, social workers), the reduced transportation barrier for participants and the availability of private meeting space. Whereas, working with congregate meal sites had the challenge of finding adequate programming space that did not compete with the meal, limited hours of operation, and needing to schedule the program around both the meal and bus schedules. Also, when XXX relied on hospital staff for recruitment, many of the staff didn't have the time and possibly a thorough understanding of the project to recruit for the study.

As other researchers have reported, face-to-face recruiting by study staff has been shown to work better than some of the more passive or other indirect recruitment methods.[5] Others have reported that word-of-mouth is the most effective recruitment tool.[6, 47] For the NE1439 studies, active recruitment and word-of-mouth recruitment, were the most successful recruitment methods. People were most likely to participate if they heard about the study by someone they knew such as a family member or friend, or their primary care physician.

In order to promote successful recruitment for research studies and community-based nutrition and wellness programs, more qualitative work should be done. First, focus group discussions (online or in-person) with members of the target audience would be helpful in learning the motivators and barriers they experience on whether to participate. The findings from this work can inform researchers and practitioners on the best practices to implement to overcome participation barriers by focusing on the motivators. Secondly, given the prevalence of social media promotion opportunities, it would be beneficial to gain a better understanding of the

target audience's current social media usage both in frequency and purpose (e.g., socialization, community activities, etc.). Doing so would help researchers and practitioners develop targeted social media recruitment campaigns.

A limitation of the studies presented is that they all used convenience-based sampling for participant recruitment. Convenience-based sampling may lead to a higher likelihood of including participants with greater internal motivation to join in the program and limit racial and socioeconomic status diversity. Therefore, generalizability of program application is limited due to the relatively homogeneous sample that is likely to be recruited.

Conclusion

Aging adults are the fastest growing population in the US and they are not well represented in the research literature. This is partially due to the challenges researchers can face when trying to recruit older adults for health-based research. However, with careful planning and use of resources such as the Academy of Nutrition and Dietetics' Nutrition Research Network (AND NRN), nutrition and food professionals can increase research participation of aging adults and therefore the evidence-based recommendations that are developed for aging adults. The AND NRN is especially helpful for clinical and community dietitians who want to complete research with aging adults and need to develop more fluency with research terms and expectations. Also the AND NRN can help researchers communicate the need for research and outcomes in a clearer and more engaging way that can motivate more aging adults to become involved.

There are some important things to consider when planning a study with aging adults. First, carefully assess the time and effort burden for the participants, as the benefit to burden ratio is very important to minimize for older adults.[9] Also, consider the location, both the geography and culture as well as use of institutions or organization. Distinct geographies and

cultures can impact recruitment as these factors can impact transportation and, in some cultures there may be less trust of those outside their community.[26] Relying on other health care professionals at other organizations and institutions can be challenging as they may not have the time to put into recruitment or the same investment as the research team. Direct recruitment methods, with the research team interacting with possible participants and word-of-mouth recruitment seem to be the best ways to recruit aging adults. And, maybe the most important of all strategies, is when planning the research design, inclusion/exclusion criteria and recruitment, researchers should think through all possible recruitment challenges for solutions and contingency plans.[9] Being able to adapt and make changes when possible to recruit the target aging adults are necessary to obtain the sample size needed to make evidence-based decisions that other nutrition and health professionals can adapt and use in the provision of nutritional care.

References

1. Colby SL, Ortman JM. Projections of the size and composition of the U.S. Population: 2014 to 2060. *Current Population Reports*. 2015
2. Saffel-Shrier S, Johnson MA, Francis SL. Position of the academy of nutrition and dietetics and the society for nutrition education and behavior: Food and nutrition programs for community-residing older adults. *J Nutr Educ Behav*. 2019;51(7):781-797.
3. Rhea M, Bettles C. Future changes driving dietetics workforce supply and demand: Future scan 2012-2022. *J Acad Nutr Diet*. 2012;112:S10-24.
4. Office of Disease Prevention and Health Promotion. Healthy People 2020 Objectives. US Department of Health and Human Services: Washington DC. Website: https://www.healthypeople.gov/2020/topics-objectives/topic/older-adults/objectives . Accessed July 6 2019.
5. Auster J, Janda M. Recruiting older adults to health research studies: A systematic review. *Australas J Ageing*. 2009;28:149-151
6. Piantadosi C, Chapman IM, Naganathan V, Hunter P, Cameron ID, Visvanathan R. Recruiting older people at nutritional risk for clinical trials: What have we learned? *BMC Res Notes*. 2015;8:151
7. Nkimbeng M, Roberts L, Thorpe RJ, Jr., Gitlin LN, Delaney A, Tanner EK, Szanton SL. Recruiting older adults with functional difficulties into a community-based research study: Approaches and costs. *J Appl Gerontol*. 2018: doi: 10.1177/0733464818786612.

8. Anderson C, Seff LR, Batra A, Bhatt C, Palmer RC. Recruiting and engaging older men in evidence-based health promotion programs: Perspectives on barriers and strategies. *J Aging Res*. 2016; doi: 10.1155/2016/8981435.

9. Mody L, Miller DK, McGloin JM, Freeman M, Marcantonio ER, Magaziner J, Studenski S. Recruitment and retention of older adults in aging research. *J Am Geriatr Soc*. 2008;56:2340-2348.

10. MacNab L, Davis K, Francis SL, Violette C. Whole grain nutrition education program improves whole grain knowledge and behaviors among community-residing older adults. *J Nutr Gerontol Geriatr*. 2017;36:189-198.

11. Jiang Q, Cohen NL, Marra MV, Woolf K, Gilbride J, Francis SL. Community priorities for healthy eating in older adults. *J Nutr Gerontol Geriatr*. 2017;36:75-91.

12. Buys DR, Flood KL, Real K, Chang M, Locher JL. Mealtime assistance for hospitalized older adults: A report on the spoons volunteer program. *J Gerontol Nurs*. 2013;39:18-22.

13. Buys DR, Campbell AD, Godfryd A, Flood K, Kitchin E, Kilgore ML, Allocca S, Locher JL. Meals enhancing nutrition after discharge: Findings from a pilot randomized controlled trial. *J Acad Nutr Diet*. 2017;117:599-608.

14. Sowle A, Francis SL, Margrett J, Franke W. Utility of the living (well through) intergenerational fitness and exercise (life) program as a county-delivered extension program. *Journal of Extension*. 2016;54:Article 4RIB5.

15. Cottell KE, Dorfman LR, Straight CR, Delmonico MJ, Lofgren IE. The effects of diet education plus light resistance training on coronary heart disease risk factors in community-dwelling older adults. *J Nutr Health Aging*. 2011;15:762-767.

16. Avila JJ, Gutierres JA, Sheehy ME, Lofgren IE, Delmonico MJ. Effect of moderate intensity resistance training during weight loss on body composition and physical performance in overweight older adults. *Eur J Appl Physiol*. 2010;109:517-525.

17. Robert Wood Johnson Foundation. The State of Obesity. Robert Wood Johnson Foundation: Princeton NJ. Website: https://www.stateofobesity.org/ . Accessed March 23 2019.

18. Lee-Kwan SH, Moore LV, Blanck HM, Harris DM, Galuska D. Disparities in state-specific adult fruit and vegetable consumption - united states, 2015. *MMWR Morb Mortal Wkly Rep*. 2017;66:1241-1247.

19. King DE, Matheson E, Chirina S, Shankar A, Broman-Fulks J. The status of baby boomers' health in the united states: The healthiest generation? *JAMA Intern Med*. 2013;173:385-386.

20. Freid VM, Bernstein AB, Bush MA. Multiple chronic conditions among adults aged 45 and over: Trends over the past 10 years. *NCHS Data Brief*. 2012;100:1-8.

21. United States Census Bureau. American Factfinder – Community Facts. US Department of Commerce. Website https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml . Accessed June 7 2019.

22. Leveille SG, Wee CC, Iezzoni LI. Trends in obesity and arthritis among baby boomers and their predecessors, 1971-2002. *Am J Public Health*. 2005;95:1607-1613.

23. Abruzzino B, Marra MV. Primary care providers' perceived barriers to referring patients to registered dietitian nutritionists for weight loss counseling in west virginia. *J Acad Nutr Diet*. 2015;115:A32.

24. Marra MV, Lilly C, Nelson K, Woofer D, Malone J. A pilot randomized controlled trial of a telenutrition weight loss intervention in middle-aged and older men with multiple risk factors for cardiovascular disease. *Nutrients*. 2019;11:229.

25. Young L, Montgomery M, Barason S, Schmidt C, Do V. A conceptual framework for barriers to the recruitment and retention of rural cvd participants in behavior intervention trials. *GSTF Journal of Nursing and Health Care*. 2015;2:19-24.

26. Leach CR, Schoenberg NE, Hatcher J. Factors associated with participation in cancer prevention and control studies among rural appalachian women. *Fam Community Health*. 2011;34:119-125.

27. Bartali B, Frongillo EA, Bandinelli S, Lauretani F, Semba RD, Fried LP, Ferrucci L. Low nutrient intake is an essential component of frailty in older persons. *J Gerontol A Biol Sci Med Sci*. 2006;61:589-593.

28. Bengle R, Sinnett S, Johnson T, Johnson MA, Brown A, Lee JS. Food insecurity is associated with cost-related medication non-adherence in community-dwelling, low-income older adults in georgia. *J Nutr Elder*. 2010;29:170-191.

29. Buys DR, Roth DL, Ritchie CS, Sawyer P, Allman RM, Funkhouser EM, Hovater M, Locher JL. Nutritional risk and body mass index predict hospitalization, nursing home admissions, and mortality in community-dwelling older adults: Results from the uab study of aging with 8.5 years of follow-up. *J Gerontol A Biol Sci Med Sci*. 2014;69:1146-1153.

30. Locher JL, Ritchie CS, Robinson CO, Roth DL, Smith West D, Burgio KL. A multidimensional approach to understanding under-eating in homebound older adults: The importance of social factors. *The Gerontologist*. 2008;48:223-234.

31. Millen BE, Silliman RA, Cantey-Kiser J, Copenhafer DL, Ewart CV, Ritchie CS, Quatromoni PA, Kirkland JL, Chipkin SR, Fearon NA, Lund ME, Garcia PI, Barry PP. Nutritional risk in an urban homebound older population. The nutrition and healthy aging project. *J Nutr Health Aging*. 2001;5:269-277.

32. Sharkey JR. The interrelationship of nutritional risk factors, indicators of nutritional risk, and severity of disability among home-delivered meal participants. *The Gerontologist*. 2002;42:373-380.

33. Locher JL, Vickers KS, Buys DR, Ellis A, Lawrence JC, Newton LE, Roth DL, Ritchie CS, Bales CW. A randomized controlled trial of a theoretically-based behavioral nutrition intervention for community elders: Lessons learned from the behavioral nutrition intervention for community elders study. *J Acad Nutr Diet*. 2013;113:1675-1682.

34. Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *J Am Geriatr Soc*. 1975;23:433-441.

35. Sahyoun NR. Expanding opportunities for registered dietitians in the health care system. *J Am Diet Assoc*. 2011;111:813-815.

36. Locher JL, Wellman NS. "Never the twain shall meet:" Dual systems exacerbate malnutrition in older adults recently discharged from hospitals. *J Nutr Gerontol Geriatr*. 2011;30:24-28.

37. Villareal DT, Chode S, Parimi N, Sinacore DR, Hilton T, Armamento-Villareal R, Napoli N, Qualls C, Shah K. Weight loss, exercise, or both and physical function in obese older adults. *N Engl J Med*. 2011;364:1218-1229.

38. Locher JL, Bales CW, Ellis AC, Lawrence JC, Newton L, Ritchie CS, Roth DL, Buys DL, Vickers KS. A theoretically based behavioral nutrition intervention for community

elders at high risk: The b-nice randomized controlled clinical trial. *J Nutr Gerontol Geriatr*. 2011;30:384-402.

39. Sahyoun NR, Akobundu U, Coray K, Netterville L. Challenges in the delivery of nutrition services to hospital discharged older adults: The community connections demonstration project. *J Nutr Elder*. 2009;28:127-142.

40. Sahyoun NR, Anyanwu UO, Sharkey JR, Netterville L. Recently hospital-discharged older adults are vulnerable and may be underserved by the older americans act nutrition program. *J Nutr Elder*. 2010;29:227-240.

41. Administration for Community Living, Administration on Aging. 2017 Profile of Older Americans. Washington DC: U.S. Department of Health and Human Services, 2018. Web. https://acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2017OlderAmericansProfile.pdf .

42. United Health Foundation. America's Health Rankings: Senior Report 2017. Minnetonka, MN: United Health Foundation. 2019. Web. *https://www.americashealthrankings.org/learn/reports/2017-senior-report/executive-summary*.

43. Iowa Department of Public Health. Health in Iowa BRFSS Annual Report from the Iowa 2016 Behavioral Risk Factor Survey. Des Moines: Iowa Dept. of Public Health, 2017. Web. http://www.idph.iowa.gov/brfss.

44. Sowle AJ, Francis SL, Margrett JA, Shelley MC, Franke WD. A community-based exergaming physical activity program improves readiness-to-change and self-efficacy among rural-residing older adults. *J Aging Phys Act*. 2017;25:432-437.

45. Strand KA, Francis SL, Margrett JA, Franke WD, Peterson MJ. Community-based exergaming program increases physical activity and perceived wellness in older adults. *J Aging Phys Act*. 2014;22:364-371.

46. Thomas S, Reading J, Shephard RJ. Revision of the physical activity readiness questionnaire (par-q). *Can J Sport Sci*. 1992;17:338-345.

47. Rodriguez MD, Rodriguez J, Davis M. Recruitment of first-generation latinos in a rural community: The essential nature of personal contact. *Fam Process*. 2006;45:87-100.