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Reach Out to Enhance Wellness in Older Cancer Survivors (RENEW): Design, Methods and Recruitment Challenges of a Home-based Exercise and Diet Intervention to Improve Physical Function among Long-term Survivors of Breast, Prostate, and Colorectal Cancer

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Abstract

Objective—Cure rates for cancer are increasing, especially for breast, prostate, and colorectal cancer. Despite positive trends in survivorship, a cancer diagnosis can trigger accelerated functional decline that can threaten independence, reduce quality-of-life and increase health care costs, especially among the elderly who comprise the majority of survivors. Lifestyle interventions may hold promise in reorienting functional decline in older cancer survivors, but few studies have been conducted.

Method—We describe the design and methods of a randomized controlled trial, RENEW (Reach out to ENhance Wellness), that tests whether a home-based multi-behavior intervention focused on exercise, and including a low-saturated fat, plant-based diet, would improve physical functioning among 641 older, long-term (≥ 5 years post-diagnosis) survivors of breast, prostate, or colorectal cancer. Challenges to recruitment are examined.

Results—20,015 cases were approached, and screened using a two-step screening process to assure eligibility. This population of long-term, elderly cancer survivors had lower rates of response ($\sim 11\%$) and higher rates of ineligibility ($\sim 70\%$) than our previous intervention studies conducted on adults

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with newly diagnosed cancer. Significantly higher response rates were noted among survivors who were white, younger, and more proximal to diagnosis and breast cancer survivors (p -values < 0.001).

Conclusions—Older cancer survivors represent a vulnerable population for whom lifestyle interventions may hold promise. RENEW may provide guidance in allocating limited resources in order to maximize recruitment efforts aimed at this needy, but hard-to-reach population.

Keywords

cancer; oncology; exercise; diet; randomized controlled trial

There are over 10.5 million cancer survivors in the United States, and 61% are at least 65 years of age [1]. Survivors of colorectal, breast and prostate cancer comprise the majority of survivors since these are the most common forms of invasive carcinoma, and if detected early, these cancers have excellent 5-year cure rates (cure rates for localized colorectal, breast and prostate cancer are 90%, 98% and nearly 100%, respectively) [2]. Given advances in early diagnosis and treatment, coupled with the aging population, the number of elderly cancer survivors is expected to double from 1.3 M currently, to 2.6 M over the next 50 years [3].

Despite the growing rates of survivorship, cancer and/or its treatment sequelae are associated with significant morbidity that may impair function and result in disability. [4–7]. Functional decline is common among older adults, with risk of decline is even greater for those diagnosed with cancer [8–10]. Further, the presence of other medical conditions (common in older cancer survivors) may increase the odds of having functional limitations [10], thus when further functional decline occurs, independence is often lost, resulting in reduced quality-of-life and increased healthcare costs [9,11,12].

Physical activity (PA) can boost independence and reduce several chronic health conditions [13–16]. Exercise interventions have the potential to reorient the trajectory of functional decline among older cancer survivors and improve outcomes [17]. Evidence supports that such interventions may be even more powerful if combined with strategies to improve diet, since eating more vegetables and fruit (V&F) and less fat [18], and achieving a healthy weight [19] may have a positive and independent effect on physical function.

The RENEW (Reach out to ENhance Wellness) study is a randomized controlled trial (RCT), utilizing a mixed modality approach of telephone prompts and counseling, and mailed print materials to deliver a multi-behavior intervention focused on exercise and dietary change (low-saturated fat, plant-based diet) to 641 older, long-term (≥ 5 years post-diagnosis) survivors of breast, prostate, or colorectal cancer. The trial has accrued its full sample and is currently in the field, collecting data to determine if this intervention is effective in reducing functional decline (primary endpoint), and if it has a positive influence on other health outcomes. The purpose of this paper is to report the design, methods and recruitment challenges encountered during the implementation of this trial.

Trial Design and Methods

Overview

The RENEW trial aims to improve physical activity and dietary behaviors among overweight, older, long-term breast, prostate, and colorectal cancer survivors, and ultimately test if these lifestyle improvements will positively reorient trajectories of physical function. At one-year follow-up, we hypothesize that the experimental intervention arm will report higher levels of physical function than the control (wait-listed) arm. At two-year follow-up, assessment will occur to determine if these changes in function are sustained after the intervention concludes and if the control arm is able to improve functional status after being wait-listed for one year

(i.e., if “catch-up” is possible). Changes in secondary endpoints such as diet quality, physical activity, body mass index, quality-of-life, and perceived health, will be assessed during the two-year study period and between the two arms. Potential effect modifiers such as social support, gender, comorbidity, and self-efficacy will be evaluated to determine whether the intervention is more effective among subsets of survivors.

Inclusion and exclusion criteria

Inclusion criteria include overweight or obese (body mass index: 25–39.9) elders (at least 65 years of age (no upper limit) five or more years post-diagnosis (no upper limit) for breast, prostate or colorectal cancer and who were found to have no evidence of malignancy in the past five years, i.e., individuals who are considered “cured” of their cancer. Breast, prostate, and colorectal cancers were selected because these are the most commonly diagnosed cancers with cure rates of 90% or higher [1]. Further, all three cancers share similar health promotion guidelines post-diagnosis (i.e., healthy weight, moderate exercise and low saturated fat, plant-based diet) [20].

Individuals self-reporting exercise at a moderate intensity of 150 minutes per week or more were deemed ineligible based on specific exercise items (e.g., walking, aerobic-training, etc) from the Community Health Activities Model Program for Seniors (CHAMPS) questionnaire [21,22]. Also excluded were individuals for whom unsupervised exercise (i.e., angina, recent heart attack, congestive heart failure, plan to have a hip or knee replacement, walker or wheelchair use, recent stroke resulting in walking or speaking problems, or chronic obstructive pulmonary disease) is contraindicated. Additionally, individuals on warfarin or dialysis were excluded because of contraindications to eating a diet high in V&F. Individuals unlikely to comprehend or benefit from a telephone and mail-based intervention (i.e., hearing impaired, non-English speaking or writing, mentally incompetent, or residing in a skilled nursing facility) were excluded.

Randomization

Potentially eligible subjects completed two baseline telephone surveys and if eligible, were block randomized to either the experimental intervention (delivered in year-1) or delayed intervention (control wait-listed arm delivered intervention in year-2). Subjects were randomized according to the following strata: cancer type (breast, prostate, or colorectal); race (white or non-white); and gender (male or female-for colorectal cancer only). Randomization was conducted by a statistician who had no subject contact.

Sample Size and Power

Sample size calculations were based on the t-test for an arm difference in change in the SF Physical Function subscale from baseline to year-1. Only subjects with non-missing data at year-1 will be used in the primary analysis; the dropout rate is expected to be at most 15%. With 640 accrued patients, the t-test (2-sided alpha of 0.05) has at least 80% power to detect a standardized arm difference of 0.24. A difference of 0.23 was observed in an intervention development study entitled Project LEAD [23].

Sample identification and recruitment

Many researchers utilize cancer registries as a resource for identifying cancer survivors for research studies [24,25]. For RENEW, we ascertained cases from the North Carolina Central Cancer Registry (NCCCR) and Duke Cancer Registry. This trial complied with Health Insurance Portability and Accountability Act (HIPAA) guidelines and was approved by the institutional review boards at both Duke University Health System and NCCCR. The cancer registries identified breast (female), prostate, and colorectal cancer cases at least five years out

from diagnosis (Figure 1) with no evidence of malignancy. Physician codes associated with each case were requested, and individual hospital registries were contacted to translate physician codes. Identified physicians were asked for written permission to contact their patients for participation in the trial.

Several self-referrals were directed from fliers posted to websites, physicians' offices, national meetings and NexCura, Inc (Thompson Company, Seattle, WA) an electronic mail posting to cancer registrants. Although self-referral networks were productive for use in previous studies targeting all ages of cancer survivors, more proximal to diagnosis [26], the self-referral process did not work as effectively in this population of older, long-term cancer survivors (8% of the sample was accrued via self-referrals).

Primary challenge to recruitment

Five months into study recruitment, we had approximately 50 subjects enrolled and had exhausted the contact of identifiable physicians listed for each case. Due to a large number of missing or unidentifiable physician codes, we obtained a waiver to notify survivors about the study. Potential participants with unidentified physicians were sent a letter providing information about how their contact information was obtained and a flier listing study information. Interested individuals were encouraged to call a toll-free study telephone number to obtain further information. If the individual did not contact the study, no further contact was permitted. Survivors expressing interest were sent a consent form and enrollment mailing.

Consent and enrollment

Enrollment mailing included a: 1) letter from the principal investigator; 2) study flier; 3) consent form; 4) screening survey; 5) felt-tipped marker to enhance survey completion; and 6) preaddressed, postage-paid return envelope. First class postage and return service from the US Postal Service were used to provide the study with address updates and forwarding for undelivered mailings. For undelivered mailings, local and national Internet-based public directory information sources (e.g., www.whitepages.com and the search engine Google™) were used in an attempt to obtain updated address and telephone information. Within two weeks, survivors were called to review the consent form and answer study-related questions. After four weeks, if no response was received, potential participants were mailed a reminder postcard. Returned paperwork was checked for completeness and scanned. If deemed ineligible, a thank you letter and a National Cancer Institute (NCI) "Cancer Information Service" card (NCI Z575) were mailed. Potentially eligible subjects were mailed a letter informing them that they would be contacted for telephone surveys; response cards (survey scale anchors), and a poster depicting 2-dimensional representations of food portions (2D Food Portion Visual, Nutrition Counseling Enterprises, Framingham, MA) to facilitate baseline surveys.

Intervention materials

Materials developed for the intervention and the telephone scripts used to guide counseling, were based primarily on Social Cognitive Theory [27], where the key concepts of behavioral capacity, expectancies, self-control, reinforcement, and self-efficacy were operationalized (see Telephone Counseling). Print materials also drew on the theoretical framework offered by the Transtheoretical Model to develop introductory messages aimed at engaging the participant [28].

Participants assigned to the RENEW experimental intervention arm received a personalized workbook (their name is on the front cover and accompanying materials) of exercise and diet information. Their current exercise and dietary behaviors were compared to national guidelines [29,30,31] and feedback provided. Specifically, the first few pages of the book were tailored

according to data collected from the baseline survey to show current status for the following: 1) strength exercise minutes (goal = at least 15 minutes, every other day); 2) endurance exercise minutes (goal = at least 30 minutes a day); 3) average daily V&F intake (goal = 7 servings for women and 9 servings for men); 4) average daily saturated fat intake (goal = < 10% total calories from saturated fat); and 5) weight (goal = BMI <25 with realistic goal set at 10% weight loss over one year). Given that RENEW was aimed at improving physical functioning and that expected improvements would be mediated primarily through increased aerobic and strength-training exercise, intervention participants received a pedometer (Accusplit®, Pleasanton, CA), and three levels (red, green, blue) of Thera-bands® (The Hygenic Corporation, Akron, OH). Participants also received an exercise poster depicting six lower extremity strength exercises including colored illustrations and instructions; the intervention was focused on improving strength in the lower body since these muscle groups largely drive physical functioning [32]. Additional equipment included Portion Doctor® tableware (to guide food portion sizes) (Portion Health Products, St. Augustine Beach, FL), the T-Factor 2000 Fat gram book (to assist with self-monitoring of fat intake) (W.W. Norton & Company, New York, NY), a pocket magnifier (to assist with reading any materials or devices using small print) (UltraOptix®, East Haven, CT), and personalized record logs (to guide daily exercise and diet self-monitoring).

Telephone counseling

To establish rapport and enhance social support, participants were assigned a counselor at the beginning of the intervention and remained with that counselor for the duration of the study. Weekly counseling sessions were scheduled during the first three weeks, followed by two semi-weekly sessions (interspersed with tailored telephone prompts), and then monthly sessions for the remainder of the intervention period (interspersed with telephone prompts or tailored progress reports) (Figure 2). Each telephone session was 15–30 minutes in duration. During each session, the counselor engaged the participant using SCT to develop strategies to overcome barriers and achieve incremental behavioral goals, monitor progress, provide reinforcement upon attainment of those goals, field questions, and direct participants to appropriate workbook pages [23,33,34]. In order to standardize the data collection and message delivery, the four counselors were provided computer-assisted templates with branching algorithms to guide counseling sessions.

Telephone Prompts

Telephone prompts were used intermittently throughout the intervention as a means of providing additional reinforcement, e.g., “Hello, I’m Dr. Demark, from Duke University Medical Center and I’m so happy that you’re part of the RENEW study! We hope the materials and the counseling calls will motivate you to exercise more and eat healthier foods. Keep in mind – you don’t need to achieve your exercise and diet goals overnight, but over time, as you work with your personal trainer, the work should really pay off! Good bye for now & welcome to RENEW.”

Tailored Progress Reports

To provide participants with visual reinforcement and printed motivational messages, participants were mailed a tailored progress report every 12 weeks. The progress report consisted of a two-page, fold-out newsletter with a motivational greeting (tailored on stage of readiness), a graph comparing participant’s behavioral change over time in five distinct areas, i.e., strength exercise; endurance exercise; grams of saturated fat; servings of V&F and use of portion size tableware. These were accompanied by a motivational sign-off message (tailored to stage of readiness). A RENEW magnet was provided for subjects to display progress reports on their refrigerator, providing reinforcement and an environmental cue.

Delayed intervention

In previous studies, we found that the use of an attention control arm served as a potential barrier to recruitment, a problem that has been reported by others who have conducted research in cancer survivor populations [35]. To minimize this effect, a delayed intervention (wait-list for one year) was the control arm.

Study Measures (baseline, quarterly, one- and two-year follow-up)

Two telephone surveys (45–60 minutes) were conducted at baseline, one- and 2-year follow-up. Brief (5–10 minutes) surveys were conducted quarterly throughout the two year study.

Primary outcome: functional status

Functional status was our primary endpoint. The physical function subscale of the Short-Form-36 (SF-36) served as our primary measure of functional status [36]. This 10-item self-report of functional status was selected because it is widely used, well-tested, validated and considered reliable in both healthy and chronically ill adults and is sensitive to change [36]. This subscale was administered at all time points, including quarterly surveys. At baseline, one- and two-year follow-up the SF-36 was administered in its entirety and included the following subscales: role limitations due to physical problems; bodily pain; social functioning; general mental health; role limitations due to emotional problems; vitality, energy or fatigue; and general health perceptions. In addition, two physical function subscales (basic and advanced lower extremity function) from the Late Life Function and Disability instrument were used to assess lower extremity function [37] at all time points.

Secondary outcomes

Physical activity

Physical activity was measured using CHAMPS, a questionnaire developed for use in older adults and tested in home-based interventions [21,22]. This measure was selected because it has good construct validity and reliability, and is sensitive to change. There are two scores produced by the CHAMPS questionnaire: 1) frequency per week of all physical activities and 2) minutes of all physical activity per week, which can be used to calculate caloric expenditure. A subset of CHAMPS items was included as part of the quarterly surveys to assist in measuring the success of the intervention over time, e.g., walk or hike uphill; walk fast or briskly; and moderate strength training.

Dietary Intake

Dietary intake data are averaged from two, random, 24-hour recalls at baseline, one- and two-year follow-up; recalls were performed by trained interviewers at the Diet Assessment Center at Pennsylvania State University using the interactive Nutrition Data System-Revised (NDS-R) software (NCC Food and Nutrient Database System Version 2006, Nutrition Coordinating Center, Minneapolis, MN). Overall diet quality was calculated using the revised Healthy Eating Index (HEI) [38].

Weight status

Self-reported height was collected only at baseline. Self-reported body weight was collected at baseline, one- and two-year follow-up. Body mass index (kg/m^2) was calculated and change estimated over time.

Self-efficacy

Self-efficacy, measured at all time points, was assessed for exercise as confidence in the ability to do strength training for 15 minutes three or more days per week and to walk 30 minutes five or more days per week [39]. Self-efficacy also was assessed for diet as the confidence in the ability to eat a low saturated fat diet with at least 7 or 9 daily servings of V&F and to regularly limit calories by reducing portion size.

Co-morbidity

To assess both the effect of comorbid conditions on function and the potential effect of the intervention on symptom severity, six medical conditions (arthritis or rheumatism; high blood pressure; heart trouble; circulation trouble in arms or legs, including varicose veins; osteoporosis; and cataracts) and 22 symptoms were assessed using a survey previously developed by our research center [40]. Medical conditions were assessed only at baseline, but symptoms along with one open-ended item (“Do you currently have any other illnesses or conditions that interfere with your activities?”) were collected at all time points.

Social support

Data on social support were captured at baseline using the Duke Social Support Index (DSSI), a validated 11-item short form measure with excellent psychometric properties [41]. The short form was selected to capture the essential components of social support related to mental health outcomes and use of health services in elderly individuals. Support specifically for exercise and dietary change was assessed at all time points using two items: 1) “To what extent would your friends and family support your efforts to increase your amount of exercise?” and 2) “To what extent would your friends and family support your efforts to improve your diet?” (Responses included: not at all; a little; somewhat; very much; and extremely, coded from 1–5, respectively).

Additional items

Income, smoking status, alternative contact, cancer treatment history (yes or no responses for all cancers - radiation, hormonal, chemotherapy, surgery, other; prostate cancer only - brachytherapy, active surveillance), adherence, and process questions (post intervention delivery) were collected. To enhance study completion, small incentives were provided throughout the study; i.e., 30 minute phone cards for quarterly surveys and \$10 for annual surveys.

Health events

Changes in health status were monitored throughout the study. Participants receiving the intervention were asked for any health issues that kept them from exercising or eating a healthy diet. Participants not currently receiving the intervention were instructed to call a toll-free study number to report health problems. Clearance was sought from the participant’s physician in cases where exercise was contraindicated (e.g., recent injury, surgery, heart condition, etc.) At both follow-up surveys, structured questions gathered information to ascertain if participants had any serious health event for which they sought medical attention. For each event, participants provided a date, event description and if hospitalization occurred.

Data Analysis

The general linear model will be used to test for arm differences in change in the primary and secondary endpoints from baseline to Year-1. Effect modifiers will be tested in this model by including terms for their interaction with arm. In sensitivity analyses (intent-to-treat), the impact of missing values will be studied by using a range of imputed change scores for missing

values, and by analyzing only those subjects who provide complete data. The mixed linear model will be used to estimate the trajectory of physical function across time, using measures collected quarterly from baseline to Year-2.

Results

As indicated in Figure 1, NCCCR provided a total of 67,054 breast, prostate, and colorectal cancer cases. After excluding decedents, duplicates, second primaries, or insufficient contact information, 37,830 cases remained. Additional decedents (expired after recruitment commenced) and cases for whom the physician denied contact were removed ($n = 11,692$). The final number of registry cases deemed eligible for mailing was 26,138 (39% of those initially identified). Of these, 6,230 cases were deemed undeliverable, i.e., the study invitation was returned with “addressee unknown”. Additional study participants self-referred from other sources ($n = 107$).

Table 1 describes the total pool of potential participants contacted ($n = 20,015$) and characterized according to a positive response to full study enrollment. From the initial study invitation letter and flier, we received a preliminary response from 2156 survivors who called-in for more information (11% response rate). Upon receiving more comprehensive study enrollment information, a positive response was determined by a completed screener and signed consent form ($n = 1208$, 6% response rate). Compared to non-respondents, cancer survivors who responded with interest were significantly younger and more proximal to diagnosis, and greater proportions were white and female breast cancer survivors. Most survivors were diagnosed initially with localized disease. Subjects deemed initially eligible for participation according to the screener ($n = 753$) completed the two baseline surveys where additional screening on BMI and/or 150 minutes of moderate to vigorous exercise per week rendered an additional 112 subjects ineligible. Ultimately, 641 participants were enrolled into RENEW. At present, approximately half of participants are receiving the intervention and completing follow-up.

Discussion

To our knowledge, this is the first home-based exercise and diet trial among older, long-term cancer survivors, a population that has been specifically identified for study [7,20]. A recent analysis by Blanchard et al. (2008) examined the clustering of physical activity, V&F intake, and smoking across six cancer survivor groups and found that up to 12.5% of cancer survivors do not practice any lifestyle behavior recommendation, and less than 10% adhere to two or more recommendations [42]. In their conclusion, these researchers voice the need for multi-behavior interventions, noting that while this approach is more challenging, it may produce greater improvements in health outcomes. The RENEW trial should provide valuable information to begin to fill the current void in this area.

With RENEW in the field, our largest accomplishment to date relates to accrual of our targeted sample. In doing so, we identified and screened a large number of potential cancer survivors in order to identify a select group of elderly participants who may benefit most from a distance-based exercise and diet intervention that ultimately could improve functional status. Although a number of survivors were excluded from enrollment based on exclusionary criteria (i.e., medical or physical reasons, not overweight or obese, or practicing 150 minutes or more per week of exercise), this RCT demonstrates that conducting trials with older, long-term survivors is feasible, but requires a considerable amount of personnel time and study resources to recruit and enroll subjects. In this trial, over 26,000 letters were posted and more than 2000 initial telephone calls were made in order to reach our accrual target. This initial telephone time alone conservatively equated to nine full time equivalent work weeks. Similarly, Tercyak et al.

(2006) reported that recruitment calls for a health promotion RCT among a potential pool of 244 adolescent childhood cancer survivors took two full work weeks of telephone time [43]. Thus, the resources needed to conduct such studies are substantial and should be considered in planning such trials. Furthermore, as suggested by the comparison of RENEW with previous studies in younger patients more proximal to diagnosis, the resource requirements to accrue older patients who are further-out from diagnosis may be even larger. The lack of current contact information represents a key obstacle in identifying long-term survivors.

Although we used first class postage, which provided mail forwarding and address correction, this is only effective if the participant has a known address or has moved recently [44]. In RENEW, we employed search engines such as Google™ and the online white pages with reverse look-up features to locate addresses of survivors whose initial letters were posted to inactive addresses.

While the use of more than one recruitment method has been key in helping us achieve our accrual targets in previous studies (26,45) and has been endorsed by others [46,47], our attempts in trying to attract self-referred subjects to this trial via physician offices, advertisements and the Internet was relatively non-productive. These results are similar to a study of 509 older long-term breast cancer survivors in which the majority of women were recruited using the cancer registry as compared to recruitment from community resources [48]. Given that long-term survivors are not likely to have continued contact with their oncologist, innovative recruitment strategies are needed that do not rely on oncology offices or networks [49]. Although recruiting via cancer registries requires sufficient manpower, we do encourage researchers to consider this as a potential recruitment avenue for long-term survivors both within and across state registries.

Various methods of recruitment to research studies have been studied, including the use of cancer registries in cancer survivorship [24]. State cancer registries have varying policies for contacting survivors [25]. While we were successful in identifying a number of physicians coded in the registry through the assistance of individual hospitals, much of this information was missing. Also, these survivors were a minimum of 5-years out from diagnosis and the institution may or may not have been required to report physician information during that timeframe. Even so, in the instances where physicians were identified, approval was obtained for only about half of these long-term cases. Smith and colleagues (2007) report similar observations, noting that active physician consent is more difficult to obtain as survivors move beyond treatment and stop follow-up with the physician listed in the registry [50]. Thus, obtaining a waiver that enabled a direct mailing not only improved our ability to increase subject accrual; it also allowed us to cast a wider net across North Carolina, and allowed us to offer this intervention to a greater number of rural-dwelling and minority-group elders. Institutional constraints for the one-time contact kept us from following-up with the participants who did not respond to the study invitation. One suggestion might be to provide two toll-free numbers for response – one number for survivors requesting more information and a separate number that allows participants to key their study ID number and a reason that they do not wish to participate might be useful in understanding why a segment of this population is not participating in such trials.

Although 56% of elders returned a screener and consent form to participate, several survivors called in to the study number reporting that they were ineligible (17%) or too busy (9%) with about 18% never responding. Reminder cards did improve screener returns by 5%, but a follow-up call might to assess interest/eligibility might be more productive. Since these elders have hit the “5-year” mark, they may have a false sense of security that they are “cured”, and hold the belief that follow-up and prevention is no longer helpful [49]. Other reasons that older adult survivors may elect not to participate could be similar to those reported in trials that target

older populations in general, e.g., fear of injury with exercise; physician advice to limit exercise; attitudinal barriers, such as perceived lack of ability and beliefs about exercise; and illness and injury [51].

The lessons learned in implementing this RCT may be useful in the design of other lifestyle intervention studies. Certainly, there is a tremendous need to develop effective lifestyle interventions in cancer survivors and this need may be even further exacerbated among those who are elderly. Data from RENEW may assist other researchers who are dedicated to this goal and provide guidance for designing and implementing such studies, especially in a climate of limited resources.

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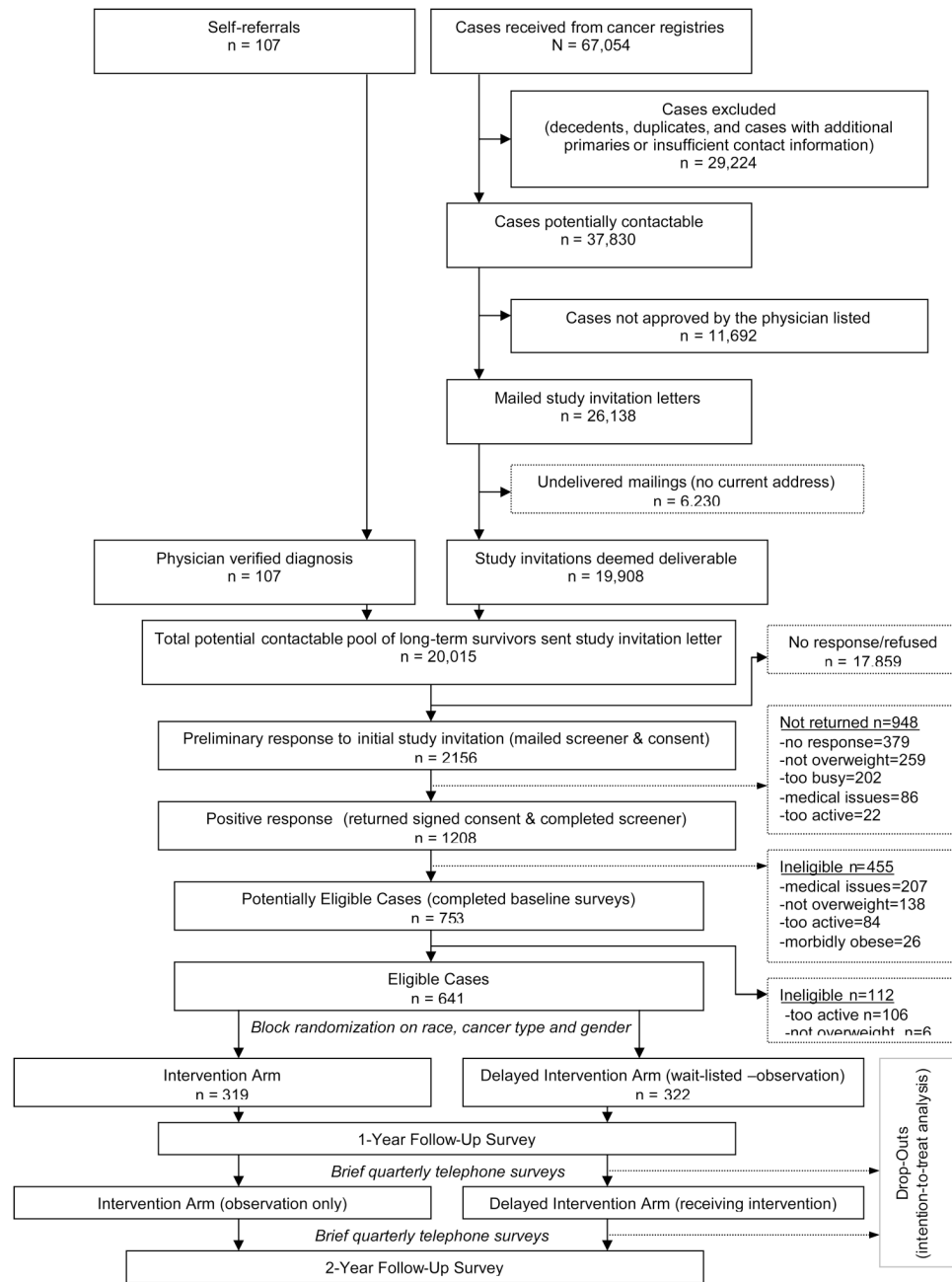
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Figure 1. RENEW (Reach out to ENhance Wellness in Older Cancer Survivors) study flow

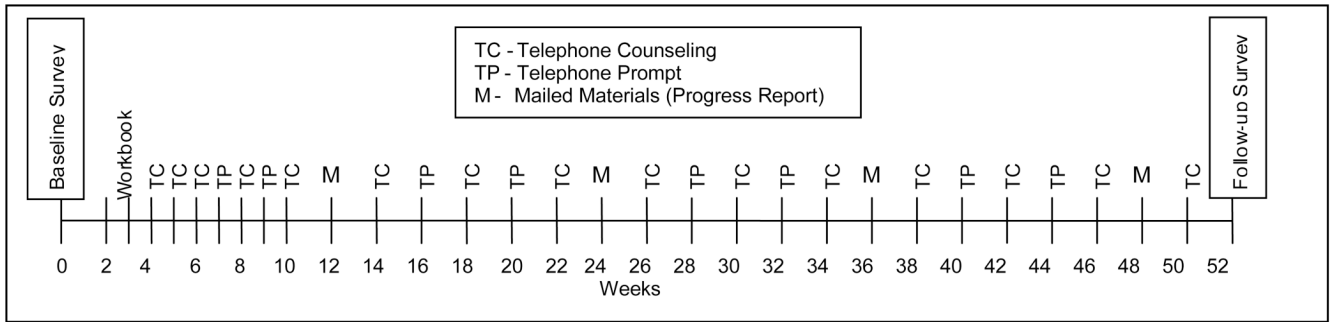


Figure 2.
Specific intervention elements and their timing over the 50-week intervention period.

Table 1
 Non-respondent and respondent characteristics of older cancer survivors approached to participate in RENEW (Reach out to ENhancE Wellness in Older Cancer Survivors).

	Non-Respondents (n = 18,807)	Respondents (n =1208)	<i>p</i>
Age (years)			
Mean (sd)	76.2 (5.9)	73.4 (5.4)	<.0001
Range	65–97	65–91	
Race			
White	82.8	87.5	<.0001 (white vs others)
African American	15.3	11.3	
Other/unknown	1.9	1.2	
Sex % (n)			
Female	44.9%	50.1%	.0004
Male	55.1%	49.9%	
Years post-diagnosis			
Mean (sd)	9.5 (2.4)	8.7 (2.8)	<.0001
Distribution % (n)			
5 to 10 years	67.2%	77.0%	
> 10 years	32.8%	23.0%	
Cancer Type % (n)			
Breast	34.7%	40.1%	.0003
Prostate	44.7%	42.5%	
Colorectal	20.6%	17.4%	
Cancer Stage			
In situ	0.06%	0.6%	.07 (Localized vs others)
Localized	72.0%	69.5%	
Regional	23.9%	26.1%	
Unknown	4.1%	3.9%	

Note. All data represent invitations deemed posted and received.