University of Kansas Medical Center
RESEARCH PROTOCOL INVOLVING HUMAN SUBJECTS
TEMPLATE WITH GUIDANCE

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Study Title: Brain Healthy Soul Food Diet Intervention Among Older African Americans (Aim 2-3)

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I. Purpose, Background and Rationale

A. Aim and Hypotheses

As the older adult population in the United States continues to rapidly grow, Alzheimer's Disaese (AD) poses a major public health crisis, especially among African Americans (AA) who are disproportionally burdened by AD. AA are up to 3 times more likely to develop AD compared to non-Hispanic Whites and AD is the 4th leading cause of death among AA.[1] Emerging evidence suggests that up to half of AD cases are a result of modifiable cardiovascular (CV) risk factors related to poor diet such as elevated blood pressure (BP), arterial stiffness, obesity, and diabetes, all of which disproportionately affect AA. Furthermore, current evidence indicates that CV risk factors represent a precursor to cognitive decline among older adults, which contributes to racial/ethnic disparities seen within AD. Given the high prevalence of CV risk factors related to AD among AA, prevention strategies may play a critical role in reducing AD risk for AAs.

The primary goal of this project is to evaluate feasibility and acceptability of the MIND+SOUL diet and its implementation. Secondary goals of this project are to evaluate cardiometabolic risk profile, nutritional health status, and cognition in relation to the MIND+SOUL diet intervention.

The **overall objective** of this proposed study is to pilot test an adapted brain-healthy diet and test acceptability, adherence, CV risk profiles related to AD (e.g. blood pressure, cholesterol, body composition), nutritional health status, and cognition.

Aim 1: Assess feasibility and acceptability of the adapted brain-healthy diet intervention in a single arm pilot trial

To address Aim 1, we will conduct a purposive sampling and recruit participants (n=30) through the KU Alzheimer's Disease Research Center (KU ADRC) AA Clinical Cohort and the community and screen for study eligibility. Additionally, participants will be recruited from flyers and announcements at distributed by community partners (Black Health Care Coalition and New Bethel Church Community Development Corporation). Inclusion criteria for eligible participants include 1) self-identifying as AA or Black, 2) aged 55 years and older, 3) English speaking, 4) cognitively normal with an Eight-item Interview to Differentiate Aging and Dementia (AD8) < 2, 5) 1 or more cardiovascular risk factors 6) females of child-bearing potential (i.e., pre-menopausal) must have a negative urine pregnancy test at the screening visit and must agree to use of contraception throughout the trial. The approved methods of contraception are abstinence, the consistent use of an approved oral contraceptive (birth control pill or "the pill"), an intrauterine device (IUD), hormonal implants, contraceptive injection, double barrier method (diaphragm with spermicidal gel or condom with contraceptive foam).Using a small single arm

trial we will test the community-informed culturally tailored diet and education plan that was developed in a previous study (IRB #00146894) with a primary goal of evaluating feasibility and acceptability of the diet and its implementation.

Aim 2: Explore cognitive functions associated with the brain-healthy soul food diet intervention as preliminary data to design a RCT.

To address aim 2, we will assess change in cognition among AA in a single arm trial. Participants will be scheduled to complete a cognitive measurement session (approximately 30 minutes) at the KU ADRC at the baseline and 12 week mark. The NIH Toolbox will be used to assess cognition using one test in each of the following domains: memory, language, reading, vocabulary, processing speed, and executive function. [2] Specifically the following tests will be administered: NIH-TB List Sorting Working Memory Test, NIH-TB Picture Vocabulary Test, NIH-TB Oral Reading Recognition Test, and the NIH-TB Pattern Comparison Processing Speed Test, and NIH-TB Flanker Inhibitory Control and Attention. Between group differences will be analyzed using ANOVA.

Primary Outcome
Feasibility and Acceptability Data Collection:
Feasibility will be assessed by 1) collecting measures including cardiometabolic risk (e.g. blood pressure and blood draw – lipid profile, inflammation), body composition (DXA), dietary assessments (NHANES diet screening questionnaire and skin carotenoid assessment), and cognitive assessments (NIH toolbox), 2) recruitment throughout the intervention including reasons for refusal to participate and 3) retention rates including attrition (80% compliant) rate of completion of the intervention (i.e. number/percentage of participants who complete all aspects of the intervention including cooking classes and coach directed dietary call support).

Acceptability will be assessed post-intervention using two REDCap online surveys,[3] that will capture the overall experience and perception of the MIND+SOUL diet. For the first survey acceptability will be evaluated on the theoretical framework of acceptability and evaluate the following constructs[4]: affective attitude (how an participant feels about the MIND+SOUL intervention), burden (perceived amount of effort required to participate in the MIND+SOUL intervention), ethicality (extent to which the intervention has good fit with the participants value system), perceived effectiveness (extent to which the intervention is perceived as likely to achieve its purpose), and self-efficacy(participants confidence that they can perform the behaviors required to participate in the intervention). The second survey will evaluate satisfaction with the MIND+SOUL diet using a visual analog scale.

Secondary Outcomes
Data from our secondary outcomes will form the basis of estimating power and sample size for a future randomized controlled clinical trial.

Baseline descriptive statistics including demographic, psychosocial, dietary and behavioral characteristics will be measured.

Cardiometabolic risk: Cardiometabolic risk will be measured by 2 items; blood pressure and blood draw. Blood pressure will be measured using the Omron 5 series blood pressure monitor.[7] Blood draw will be administered to collect measurements of lipid profile, glucose metabolism, inflammation, APOE-

ε4 genotyping, and other AD related fluid cardiometabolic biomarkers. All cardiometabolic risk assessments will be collected at baseline and at the 12-week mark.

Body Composition: Body composition will be measured using dual energy x-ray absorptiometry (DXA)[5,6] , height, weight, and waist circumference. Body composition will be collected at baseline and at the 12-week mark. Using DXA we will specifically be focusing on changes in fat tissue from baseline to the 12-week mark of the MIND+SOUL intervention.

Nutritional health status: Nutritional health status change will be measured using the NHANES dietary screener questionnaire and the skin carotenoid assessment (Veggie Meter).[9] Using the dietary screener questionnaire, we will specifically be focusing on changes in fruit and vegetable consumptions. Using the veggie meter, we will specifically be focusing on changes in skin carotenoid levels. Nutritional health status change will be measured at baseline and at the 12-week mark.

Cognitive function: Cognitive function will be measured using the NIH Toolbox to assess the following domains: memory, language, reading, vocabulary, processing speed, and executive function. [2] Specifically the following tests will be administered: NIH-TB List Sorting Working Memory Test, NIH-TB Picture Vocabulary Test, NIH-TB Oral Reading Recognition Test, and the NIH-TB Pattern Comparison Processing Speed Test, and NIH-TB Flanker Inhibitory Control and Attention. For cognitive function we will be specifically focusing on changes in executive function. Cognitive function assessments be conducted at baseline and at the 12-week mark.

B. Background and Significance

Knowledge regarding dietary prevention of AD is based almost exclusively on studies involving non-Hispanic Whites resulting in limited generalizability of findings for older adults who belong to underrepresented and understudied racial/ethnic groups. [10] Dietary intervention studies that demonstrate preliminary or cursory ability to protect against cognitive decline, including among AA, have demonstrated low adherence and acceptability due to perceived lack of social support, social contexts (i.e. cost of healthy foods, reduced access to healthy and diverse food options due to low socioeconomic status), strong cultural influence on food preferences and preparation, and perceived less appealing taste of low fat foods.[11-13] Previous research has indicated that modifying soul food or traditional AA recipes to better meet nutritional guidelines would be more effective than suggesting that such foods be eliminated from a healthy diet altogether. [14] For example, culturally adapted diets have resulted in AA participants lowering BMI, A1C, reducing body weight and waist circumference.[15,16] It is important to note that traditional soul food includes healthy dietary components, [17] such as fruits and vegetables (e.g. collard greens, sweet potatoes, okra, and blueberries), which are linked to improved cardiovascular risk markers and slower cognitive decline. [18,19] Moreover, such dietary interventions developed for AA have been guided by community participation.[20] These elements are consistent with our emerging understanding of what makes up a brain healthy diet. Therefore, a need for a novel culturally relevant and adaptable dietary intervention to effectively address barriers to adoption.

C. Rationale

There is a **critical need for the development of a culturally adapted brain healthy diet that is congruent with mainstream AA cultural values and preferences.** This project incorporates the adoption of a community engaged research approach to address critical challenges associated with health disparities research in aging among older AA. The project is novel in its approach to both design and implementation of the soul food brain healthy diet intervention, which is informed by the local AA community's attitudes, beliefs, values, and cultural dietary practices. Additionally, this

project addresses known challenges often associated with dietary interventions among minorities including perception of losing one's culture, cost, and geographical access.

MIND stands for Mediterranean-DASH Intervention for Neurodegenerative Delay. The MIND diet aims to reduce the risk of dementia and the decline in brain health that often occurs as people age. The MIND diet is a combination of two well-known eating patterns: the Mediterranean diet and the Dietary Approaches to Stop Hypertension (DASH) diet. The Mediterranean diet is inspired by the traditional eating habits of people in Mediterranean countries. It emphasizes eating healthy fats such as extra-virgin olive oil and nuts, fresh fruits and vegetables, and whole grains and legumes while limiting consumption of red meat and added sugars. Like the Mediterranean diet, the DASH diet centers around fruits, vegetables, whole grains, and lean meats. Because it was developed to treat hypertension, it also limits daily sodium intake. What makes the MIND diet unique is that it focuses on the specific foods and nutrients that have been shown to boost and protect brain health and reduce the risk of Alzheimer's disease and dementia. For example, while the Mediterranean diet includes a general recommendation to eat more fruit, the MIND diet specifically recommends eating berries several times per week because research has shown a link between eating berries and having better cognitive function. Previous research has shown that adherence to the MIND diet reduced risk of AD by 53% among participants who rigorously followed the diet and by 35% among participants who followed the diet moderately well over 4.5 years. [29] Moreover, adherence to the MIND diet has been found to reduce the risk of CVD by up to 65%.[30]Findings from this proposed study will be significant in advancing AD lifestyle prevention knowledge in the field of Alzheimer's Disease and Related Dementia (ADRD) and will provide fundamental new knowledge regarding the impact of a healthy diet has on ADRD cardiovascular risk factors and cognition among older AA. Furthermore, findings from the proposed study will advance knowledge regarding approaches to deliver a culturally acceptable brain healthy diet intervention, framing future ADRD lifestyle prevention.

II. Research Plan and Design

A. Study Objectives:

Aim 1: Assess feasibility and acceptability of the adapted brain-healthy diet intervention in a single arm pilot trial. A purposive sample (n=30) aged 55 years and older who self-identify as African American or Black will participate in a single arm dietary intervention trial to evaluate feasibility and acceptability of the diet and its implementation.

Aim 2: **Explore cognitive functions associated with the brain-healthy soul food diet intervention as preliminary data to design a RCT**. We assess change in cognition among AA in a single arm trial.

B. Study Type and Design:

This is a single arm trial designed to pilot test an adapted brain healthy diet intervention among older AA (n=30). Specifically, this study aims to evaluate the feasibility and acceptability of the brain healthy soul food diet intervention. As secondary outcomes, this study aims to assess body composition, cardiometabolic risk, nutritional health status, and changes in cognition among older AA to form the basis of estimating power and sample size for a future full-scale randomized controlled clinical trials.

Study visit summary

In Year 1, we will conduct purposive sampling and recruit participants (n=30) through the KU ADRC AA Clinical Cohort and KU ADRC recruitment database, through partnership with our community partners Ms. Briana Bright (CEO of Bright Business Solutions), Ms. Melissa Robinson (Executive Director of Black Health Care Coalition), Mr. Harry Evans (CEO of Black Men HEAL) and through the delivery of Aging With Grace; a culturally tailored dementia prevention curriculum within the community. Additionally, participants will be recruited from flyers distributed by consultants.

The study team will phone pre-screen potential participants prior to scheduling an in-person baseline evaluation. The phone pre-screen will assess inclusion and exclusion criteria using a brief telephone interview guide to screen for dementia using the AD-8 assessment and for depresson using the PHQ9 assessment, as well as demographics. If it has been more than 60 days (+/- 2 weeks) since the AD-8 and PHQ9 have been completed and the date of the baseline visit, an additional AD-8 and PHQ9 will be done within the prescreening period to ensure there is no more than 60 days between screening with AD-8 and PHQ9 and the baseline visit. Individuals deemed eligible who consent to participate in the study will be placed into 1 of the 3 trial cohorts. Cohort 1 will include 10 people, cohort 2 will include 10 people, and cohort 3 will include 10 people. All participants will be asked to provide informed consent before compleing any baseline assessments. Baseline evaluations will include body composition, cardiovascular assessments, dietary assessments, and cognitive assessments.

Baseline evaluation: The baseline evaluation will consist of a 1-day visit to the University of Kansas Alzheimer's Disease Research Center (KU ADRC). Participants will typically be consented in person the day of the baseline evaluation by study staff. In certain circumstances, in which the participant needs a shortened length of time spent at the clinic for the baseline visit, remote consent may be conducted within a few days prior to the baseline visit. Prior to completion of any baseline procedures, study staff will first review the inclusion and exclusion criteria and confirm that the participant meets eligibility.

Participants will then complete the dietary assessments, body composition assessment, cardiometabolic risk assessments, and cognitive assessment at the KU ADRC.

The baseline visit will include:

1. *Informed Consent:* The participant will be provided with a copy of the consent form at least one day prior to the consenting session, either via mail, email, or REDCap. A member of the study team will review the consent form, in its entirety, with the patient, typically in person at the baseline visit. In some instances, a participant may request to conduct the consenting session remotely and prior to the baseline visit, to keep the time in clinic to a minimum, or if other obligations (such as work commitments) limit their availability. The study team will answer all questions before obtaining the participant's written or electronic signature (via REDCap) indicating their consent. Once the consent form is also signed by the person obtaining consent, a copy of the fully signed document is returned to the participant. If consent was conducted remotely, a copy of the fully signed consent form may be returned to the participant in person at the baseline visit, or through email via REDcap.
2. *Medical History:* The medical history information that was gathered from the participant during the phone pre-screen to determine eligibility will be reviewed and updated if necessary. The study team will also record participant's current medications.
3. *Final Review of Eligiblity:* As all eligility criteria were assessed during the phone screen, with the exception of Exclusion Criterion (f): *uncontrolled blood pressure, blood pressure will be checked first (using the Omron 5 series blood pressure monitor[7])*. In addition, the study team will review all other eligibility criteria with the participant to ensure there have been no changes in eligibility status since the phone pre-screen. The PI will confirm the participant meets all eligilbity criteria before proceeding with the rest of the baseline measures.
4. *Dietary assessments:* Nutritional health status change will be measured using the NHANES Dietary Screener Questionnaire and the skin carotenoid assessment (Veggie Meter).[9]
5. *Body composition:* Body composition will be measured using dual energy x-ray absorptiometry (DXA)[5,6], weight, and waist circumference.
6. *Cardiometabolic risk:* Blood pressure will be measured immediately following informed consent, as described above in #2. Blood draw will be administred to collect measurements of lipid profile, glucose metabolism, inflammation, APOE-ε4 genotyping, and other AD related fluid cardiometabolic biomarkers.
7. *Cognitive assessment:* NIH Toolbox will be used to assess the following cognitive domains: memory, executive function, language, reading, vocabulary, and processing speed.[2]

12-week evaluation: All participants will return to complete all in-person evaluations identical to the baseline evaluation in addition to completing acceptability surveys.

MIND+SOUL Single Arm

Education: Participants will receive educational training including ongoing skill building cooking classes (see below), sample weekly menu plans (breakfast, lunch, dinner, snacks), recipe cards (simple recipes), culturally tailored recipe books/handounts, online cooking resources (i.e. preparation videos), grocery shopping guides, faith component (i.e. scripture readings, health devotionals), healthy eating culturally tailored devotional books/handounts (i.e. Healthy Eating, God's Way: Weight Loss Devotional and Challenge: Calm Your Cravings, Overcome Obsessing, Hone Healthy Habits, and Build Biblical Boundaries (Healthy by Design)), affirmations for eating healthy, and a manual that is the basis of the MIND+SOUL diet. The manual includes specific MIND+SOUL diet goals (i.e. specific food group goals).

Skill-Building Health Education/Cooking Classes will be held at the KU ADRC. The group classes will be held once a week for the first 6-weeks of the MIND+SOUL diet intervention. Behavioral strategies shared during the skill-building health education/cooking classes, which are guided by the principles of Capability, Opportunity and Motivation Behavioral Change Model, are designed to provide participants will knowledge and skills (psychological and physical) to improve dietary consumption and adherence to the MIND+SOUL diet.

Counseling: Counseling: Counseling will consist of one-on-one sessions with a health coach who will provide MIND+SOUL diet continued education and on-going support throughout the diet intervention. This support will consist of education and recommendations specific to the participant's needs, preferences, and local context. The health coach will help participant set dietary goals in relation to the MIND+SOUL diet, help participants develop an action plan for certain situations (i.e. holiday parties, vacations), and provide encouragement in regards to the formation of healthy eating habits. Zoom conference calls will occur bi-weekly for 12-weeks. Each Zoom conference (6 total per participant) is anticipated to last 15-20 minutes each time, with exception to the first Zoom conference call which is anticipated to up to 30 minutes.

Financial support: To improve adherence to the MIND+SOUL diet each participant will receive weekly groceries worth up to $50 per week (total average of $600) that will be provided to each participant for 12-weeks. Groceries will be limited to foods within the 10 distinct food groups of the MIND+SOUL diet. These foods will be selected from each week from a community supermarket.

C. Sample size, statistical methods, and power calculation

Single arm: Participants will be in a single arm trial using 3 cohorts (cohort 1 – 10 people, cohort 2 – 10 people, cohort 3 – 10 people). Rationale: Use of a single arm trial will allow for assessment of feasibility and acceptability of the MIND+SOUL diet. Additionally, use of 3 cohort will allow for an opportunity to make revisions between each cohort to further enhance feasibility and acceptability of the MIND+SOUL diet.

Individuals deemed eligible will be placed into 1 of 3 cohort.

Sample Size: A total of 30 participants will be enrolled in the pilot study. Cohort 1 will consist of 10 participants, cohort 2 will consist of 10 people, and cohort 3 will consist of 10 people.

D. Subject Criteria:

1. Inclusion Criteria

a. Identify as African American or Black
b. Age 55 and older
c. English Speaking
d. 1 or more of the following CVD risk factors (high blood pressure, high cholesterol, controlled type 2 diabetes overweight/obesity with a BMI of 25 or more as calculated from weight and height at baseline visit)
e. Cognitively Normal with an AD8 <2 (normal cognition)
f. Females of child-bearing potential (i.e., pre-menopausal) must have a negative urine pregnancy test at the screening visit and must agree to use of contraception throughout the trial. The approved methods of contraception are abstinence, the consistent use of an approved oral contraceptive (birth control pill or "the pill"), an intrauterine device (IUD), hormonal implants, contraceptive injection, double barrier method (diaphragm with spermicidal gel or condom with contraceptive foam).

2. Exclusion Criteria

a. No CVD risk factors
b. AD8 equal to or greater than 2
c. Diagnosed with type 1 diabetes
d. Uncontrolled diabetes type 1 or type 2
e. Existing diet plan that subject is unable to pause during trial
f. No internet connection
g. Uncontrolled hypertension, by history, or as indicated by sitting systolic blood pressure >165 mmHg or diastolic blood pressure >95 mmHg at the baseline visit. If an initial blood pressure reading is higher than this, an additional attempt (at this visit or on another day) could be used before excluding a patient for uncontrolled hypertension
h. Neurological diseases that impact cognition
i. Other medical conditions likely to be negatively impacted by a diet change or that could confound the study data (i.e. Celiac Disease, Ulcerative Colitis)
j. Unable or unwilling to provide written consent
k. PI determination that study is unsafe or unsuitable for the participant
l. Active depression as determined by a score of 5 or above on the PHQ9 and deemed to be clinically significant by the medical monitor

3. Withdraw/Termination criteria:

a. There is no withdraw or termination criteria
b. Participants are allowed to participate in other observational studies during their enrollment period, but not interventional trials

Total enrollment is anticipated to last between 3-4 months total, with 1-1.5 months of recruitment per cohort.

E. Specific methods and techniques used throughout the study

This study will require two study visits. Outcome data will be collected at baseline and at the 12 week mark (+/- 2 weeks). The total time commitment for visit 1 is 2.5 hours and visit 2 is 2.5 hours.

Visit 1 – Baseline Evaluation

Estimated duration: 2.5 hours

The baseline evaluation will consist of one visit to the KU ADRC to perform the following outcome assessments (laboratory test details provided below) within 30 days prior to the start of the diet intervention: review of medical history, blood draw, blood pressure, DXA scan for body composition, height, weight, waist circumference, NHANES dietary screener questionnaire, skin carotenoid assessment, cognitive testing, and survey completion (demographic data).

Informed Consent: The participant will be provided with a copy of the consent form at least one day prior to the consenting session, either via mail, email, or REDCap. A member of the study team will review the consent form in its entirety with the patient, typically in person at the baseline visit. In some instances, a participant may request to conduct the consenting session remotely prior to the baseline visit, to keep the time in clinic to a minimum, if other obligations (such as work commitments) limit their availability. The study team will answer all questions before obtaining the participant's written or electronic signature (via REDCap) indicating their consent. Once the consent form is also signed by the person obtaining consent, a copy of the fully signed document is returned to the participant. If consent was conducted remotely, a copy of the fully signed consent form may be returned to the participant in person at the baseline visit, or through email via REDcap.

Urine Pregnancy Test: Female participants who are still of child-bearing potential must undergo a urine pregnancy test at the screening visit. Any participant with a positive pregnancy test will not be eligible for the trial.

Medical History (15 minutes): The study team will review and ensure all of the participant's medical conditions and current medications, along with approximate start dates, are recorded.

Blood draw (10 minutes): We will draw ~10cc of blood into an EDTA vacutainer tube at 2 timepoints at baseline and 12 weeks (± 2 weeks). Blood will be processed for platelet rich plasma (PRP) and platelet free plasma (PFP) and will be stored for analysis. After initial analyses, remaining PRP and PFP will be stored in a locked freezer in Dr. Morris' laboratory (2nd floor Hemenway, badge access area).

Blood pressure (10 minutes): will be measured with an automated sphygmomanometer (DinaMap ProCare 100). We will use the NHANES protocol[22] and the recommendations of the American Heart Association.[23]

Body Composition (30 minutes): At baseline and 12 weeks (± 2 weeks), dual energy x-ray absorptiometry (GE Lunar iDXA) will be used to determine fat-free mass, fat mass, and percent body fat. DXA uses very low X-ray doses (0.02mREM) to detect changes in body composition on the order of 1.6-3.8%. Body weight, height and waist circumference will be recorded at baseline and at the 12 week mark (± 2 weeks). Weight will be obtained using a digital scale (± 0.1 kg; Befour Inc model #PS6600, Saukville, WI) and height will be measured using a stadiometer (Model PE-WM-60-84, Perspective Enterprises, Portage, MI). Body mass index (kg/m^2) will be calculated. Waist circumference will be obtained using a calibrated tape.[21]

Dietary Screener Questionnaire (30 minutes): Nutritional health status change will be measured using the NHANES Dietary Screener Questionnaire administered by study personnel.

Skin Carotenoid Content (10 minutes): is a validated, biomarker of fruit and vegetable intake.[24-26] The "Veggie meter" (Longevity Link Corporation) uses Resonance Raman spectroscopy to non-invasively measure skin carotenoid content. Three measurements will be taken on the fingertip and averaged (total time ~1 minute) by study personnel.

Cognition (30 minutes): Participants will complete a cognitive measurement session at the KU ADRC at the baseline and at the 12-week mark. The NIH Toolbox to assess the following domains: memory, language, reading, vocabulary, processing speed, and executive function. [2] Specifically the following tests will be administered: NIH-TB List Sorting Working Memory Test, NIH-TB Picture Vocabulary Test,

NIH-TB Oral Reading Recognition Test, and the NIH-TB Pattern Comparison Processing Speed Test, and NIH-TB Flanker Inhibitory Control and Attention. Test will be administered by a psychometrician.

Visit 2 – 12-week Evaluation

Estimated duration: 2.5 hours

At 12 weeks (± 2 weeks), participants will return to complete blood draw, blood pressure, DXA scan for body composition, height, weight, waist circumference, dietary screener questionnaire, skin carotenoid assessment, cognitive testing, a check for adverse events, and survey completion (acceptability surveys).

Check for Adverse Events (5 minutes): At the Week 12 Visit, study staff will query the participant for any new health conditions that may have arisen since the Baseline Visit. Adverse event information will be collected and recorded as described in section K. Assessment of Subject Safety and Development of a Data and Safety Monitoring Plan below.

Acceptability surveys (30 minutes): Participants will complete 2 acceptability surveys at the 12 weeks (± 2 weeks). The first survey is a structured survey using 5-point Likert Scale (domains: affective attitude (how an participant feels about the MIND+SOUL intervention), burden (perceived amount of effort required to participate in the MIND+SOUL intervention), ethicality (extent to which the intervention has good fit with the participants value system), perceived effectiveness (extent to which the intervention is perceived as likely to achieve its purpose), and self-efficacy (participants confidence that they can perform the behaviors required to participate in the intervention). The second survey is a satisfaction with MIND+SOUL diet survey using a visual analog scale.

Post Intervention

Focus Group: Upon completion of cohort 1 and cohort 2 a subset of participants will participate in one of two focus group discussions to further capture feasibility and acceptability of the MIND+SOUL intervention. We will hold two 30-minute virtual semi-structured focus group discussions (n=2-3 participants per focus group) to capture feasibility and acceptability of MIND+SOUL intervention. Focus group participants will receive a $25 Visa gift card for their participation.

	Baseline Visit (-30 Days)	Week 1-Week 6 (Day 0)	Week 7-Week 11	Week 12 Visit (+/- 2 weeks)
Informed Consent	X			
Urine pregnancy test, as needed	X			
Medical History/ Current medications	X			
Blood Pressure	X			X
Verification of Eligilbity	X			
DXA Scan	X			X
Height / Weight/Waist circumference	X			X
Blood Draw	X			X
NHANES Dietary Screener Questionnaire	X			X
Skin Carotenoid Content	X			X
NIH Toolbox Cognitive Battery	X			X
Acceptability Surveys (structured survey and Visual Analog Scale)				X
Adverse Event Check				X
Skill Building Health Education/Cooking Classes 1x week		x		
Health Coaching 2x Month		x	x	

Testing Results

The participant may be given a copy of their results related to their blood pressure, blood draw results, and body composition if they request it. The data will not be reviewed by the research team or a physician for the presence of clinically relevant abnormalities.

F. Risk/benefit assessment:

1. Physical risk
    a. Blood draw: Participants May feel soreness, swelling, and bruising at the puncture site during the blood draw. This should go away within a day. Good clinical practice guidelines will be followed for biospecimen sampling.
    b. DXA: There is always a slight chance of cancer from excessive exposure to radiation. However, given the small amount of radiation used in medical imaging, the benefit of an accurate diagnosis far outweighs the associated risk.
    c. Food consumption: There is a chance that participants may experience gastrointestinal symptoms when consuming foods on the MIND+SOUL diet including but not limited to: nausea, vomiting, diarrhea, acid reflux, heartburn, indigestion, bloating/excess gas, hiccups, halitosis, cramping, abdominal pain, irritable bowel syndrome, constipation, change in bowel movements, and hemorrhoids, gallstones.
2. *Psychological risk*. There is minimal risk for psychological distress due to the nature of the research topic.
3. *Social risk.* There is minimal risk due to the nature of the research topic.
4. *Economic risk*. There is minimal risk due to the nature of the research topic. Participants

will receive up to $50 worth of groceries each week ($600 total) for 12 weeks during the study to offset the cost of healthy foods. Focus group participants will receive a $25 Visa gift card for their participation.

5. Potential benefit of participating in the study
    a. Individuals participating in this study may feel empowered and valued as part of Alzheimer's prevention in the African American community
    b. To the field of Alzheimer's prevention, community participation of this study will help guide future research in the development of culturally appropriate dietary intervention strategies aimed to reduce the risk of cognitive decline specifically for African Americans

G. Location where study will be performed:
Laboratory tests, educational sessions, and skill-building health education/cooking classes, will take place at the KU ADRC. Counseling sessions will take place via Zoom.

H. Collaboration (with another institution, if applicable):
There are no collaboration efforts with another institution.

I. Community-Based Participatory Research

The KU ADRC has been successful in building community partnerships to bring awareness and enhance diversity in clinical trials. The KU ADRC has built partnerships with the Black Health Care Coalition (BHCC) and New Bethel Church Community Development Corporation (NBCCDC) to identify community centers and churches for recruitment in clinical trials aimed to improve health among AAs. Our partners have served as advisers, providing input about the study design, measures, and educational materials. For this study, we are partnering with the BHCC and NBCCDC to support recruitment efforts into the study.

Heal Black Men, Black Health Care Coalition, and New Bethel Church Community Development Corporation will all serve as community engagement and outreach consultants and will provide recruitment support into the MIND+SOUL intervention and will help interpret the focus group findings to further inform the MIND+SOUL intervention.

Recruitment methods for this study are being adapted to address community needs through collaboration with experts in community based participatory research and with those who identify as community champions. They offer multiple perspectives necessary to ensure proper communication is being delivered with regards to community recruitment and though established relationships in the community we can develop greater capacity and success in research participant recruitment. Cultural and community attitudes will help provide insight from the perspective of this underserved population by gaining a better understanding of their experiences, attitudes, and perspectives for what a brain healthy diet should include and how it should be delivered from the community's standpoint.

The research question came from the team who identified that there is limited research that addresses dietary health disparities for ADRD risk reduction among AAs. Further, the KU ADRC, "Aging With Grace" curriculum; designed to provide culturally-specific dementia prevention education to the AA community has sparked interest along with interest in lifestyle related trials. There are no cultural risks for the community anticipated in the study. The PI identifies as AA and has had previous experience working with the community to deliver ADRD prevention information and conducting clinical research.

Research results will be shared with the community through a powerpoint or poster presentation at a conference and via a letter with a summary of study findings, which will be mailed to participants at the end of the study. Further, study findings will be posted on social media outlets such as Facebook and Twitter. To sustain a research relationship with the AA community we plan to continue to pursue collaborative projects aimed specifically towards focusing on the needs for the community. Upon completion of this project we plan to expand this project on a larger scale by designing an AA culturally MIND+SOUL diet intervention for implementation as a future R01 scale clinical trial.

K. Assessment of Subject Safety and Development of a Data and Safety Monitoring Plan

1. Elements of the plan include:
    a. **Persons/groups who will review the data (study team; independent safety monitor)**: PI: Ashley Shaw, PhD, Medical Monitor: Ryan Townley, MD, and independent safety monitor
    b. **Plan for safety monitoring and review:**

    <u>Adverse Event Definitions and Collection</u>
    In this trial, an adverse event (AE) is defined as any untoward or unfavorable medical occurrence in a human subject participant, including any abnormal sign, symptom, or disease, temporally associated with the participant's involvement in the research, whether or not considered related to participation in the research.

    A serious adverse event (SAE) is defined as any adverse event that results in:
    - Death
    - Life-threatening even, a condition that places the study participant at immediate risk of death if they do not seek medical treatment
    - Inpatient hospitalization, or prolongation of existing hospitalization
    - Permanent disability, defined as the interruption of a study participant's ability to conduct normal life functions

    AE's will be collected from the time of consent until the final study visit and will be recorded on an Adverse Event Report Form. At each study visit, study staff will query the participant for any new AE's that may have occurred since the last study visit and will check on the status of any AE's that have not previously resolved.

    <u>Adverse Event Assessment</u>
    A qualified study clinician will assess all AE's for severity, causality, and expectedness. This assessment will be documented with the medical monitor's signature and date.

    The PI will review all AE assessments and will follow up to obtain any further information necessary prior to approving the report. PI approval of the AE report will be indicated with her signature and date.

    Severity will be assessed using the following guidelines:
    - Mild-The adverse event may or may not be noticeable to the participant and does not significantly impact the participant's ability to complete activities of daily living (ADL's).
    - Moderate- The adverse event is noticeable and causes some inconvenience and impact on the ability to complete ADL's.
    - Severe-The adverse event has a very significant impact on the participant's ability to complete ADL's.

    Causality, or relatedness to study intervention or procedures, will be categorized as:

- Definitely Related: The adverse event is clearly related to the study intervention / procedure – i.e., an event that follows a reasonable temporal sequence from administration of the study intervention, follows a known or expected response pattern to the suspected intervention, that is confirmed by improvement on stopping and reappearance of the event on repeated exposure and that could not be reasonably explained by the known characteristics of the subject's clinical state.
- Probably Related: The adverse event is more likely than not attributable to study intervention or procedures. i.e While other causes of the event may be possible, the temporal relationship of the event to the study intervention or procedure and other factors lead to the conclusion that the most likely cause is the study intervention/procedure.
- Possibly Related: An adverse event that follows a reasonable temporal sequence from administration of the study intervention and follows a known or expected response pattern to the suspected intervention, but that could readily have been produced by a number of other factors.
- Not Related: The adverse event is clearly not related to the study intervention /procedure - i.e., another cause of the event is most plausible; and/or a clinically plausible temporal sequence is inconsistent with the onset of the event and the study intervention and/or a causal relationship is considered biologically implausible.

Expectedness refers to the whether the AE is anticipated based on current knowledge of the nature, severity, and frequency of the risks of the study intervention, as defined in the protocol and in the informed consent form. Thus, an event may be listed as a known potential risk, but if the event occurs in a more severe intensity or occurs more frequently than what is known, the event would be considered unexpected.

Adverse Event Reporting

The PI will ensure that all AE's that meet reportability criteria will be reported to the IRB within the expedited IRB-specified timeframe. The KU IRB requires reporting of AE's (whether serious or non-serious) that are determined to be related or probably related to study participation and that were unexpected. The timeframe for reporting AE's/ SAE's that meet these criteria is within five working days of the PI learning of the event. An exception to this timeframe is the reporting of deaths that are determined to be related or probably related to study participation. These must be reported within 24 hours by phone or email, with a full adverse event report submitted within five working days.

Any SAE that is related or probably related to study participation and that is unexpected will also be reported expeditiously to the NIA program officer and to the independent safety officer, within 48 hours of knowledge of the SAE. However, SAE's that result in death that are determined to be related to the study will be reported to the NIA program officer within 24 hours of learning of the event.

A summary of all AE's/ SAE's will be reported to the NIA program officer on a quarterly basis. The PI and medical monitor will also review all AE's/ SAE's on quarterly basis as described below in the Data and Safety Monitoring Plan.

Data and Safety Monitoring Plan

The data and safety monitoring plan consists of oversight by an independent safety monitor.

At the conclusion of each cohort of the study intervention, the study team will provide a report to the independent safety monitor detailing all AE's that have occurred to date. Following the review of safety data, the safety monitorr will document his assessment of safety and his determination to: 1) continue the study without any modifications, 2) continue the study, but

only with additional monitoring or other specified modifications to the protocol or 3) discontinue the study due to safety issues.

III. Subject Participation

A. Recruitment: The PI and the Outreach and Recruitment Core at the KU ADRC will contact potential participants through the Clinical Cohort registry via recruitment letter, email, and phone. Secondly, Dr. Shaw and support personnel will recruit through the delivery of Aging With Grace educational curriculum to faith-based and AA serving organizations and will distribute flyers during each presentation. Lastly, Dr. Shaw's community partners (Bright Business Solutions, BHCC, and Heal Black Men) and consultants will each help recruit AAs through their personal connections and resources. BHCC, Bright Business Solutions, Health Black Men, and consultants will be provided with flyers about the study to provide to their personal connections. Community members who are interested in participating in the study will reach out to the PI or support personnel via email or phone.

B. Screening Interview/questionnaire: The PI or support personnel will provide details regarding the nature of the study, and will conduct an interview to screen for eligibility for the study, following verbal consent from the participant to proceed with the screening questions. This interview will include a review of medical conditions, the completion of the AD8 measure to screen for cognitive impairment, the completion of the PHQ9 measure to screen for active depression, and a review of all eligibility criteria that can be completed prior to baseline to determine eligibility. One eligibility criterion that cannot be completed prior to baseline is Exclusion (f): Uncontrolled hypertension, by history, or as indicated by sittingsystolic blood pressure >165 mmHg or diastolic blood pressure >95 mmHg at the baseline visit. If an initial blood pressure reading is higher than this, an additional attempt (at this visit or on another day) could be used before excluding a patient for uncontrolled hypertension. Individuals deemed eligible via the phone screen will be placed into 1 of 3 cohorts, provided the participant does not meet exclusion criterion (f) at the baseline visit.

C. Alternatives to Participation: none

D. Costs to Subjects: There is no cost to subjects for participation in this study.

E. How new information will be conveyed to the study subject and how it will be documented: No information regarding cardiometabolic health, nutritional status, or cognition will be conveyed to the participant.

F. Payment, including a prorated plan for payment: Each participant will receive groceries worth up to $50 per week (average total of $600) that will be provided weekly for 12 weeks. Groceries will be limited to foods within the 10 distinct food groups of the MIND+SOUL diet. These foods will be selected each week from a community supermarket and ordered by the research team. Focus group participants will receive a $25 Visa gift card for their participation.

G. Payment for a research-related injury: The likelihood for research-related injury is extremely low and there will be no payment to the study participant for such injury. We will include the following text in the consent form: "If you have a physical injury as a result of participating in this study, treatment will be provided for you at the usual charge. Treatment

may include first aid, emergency care and follow-up care, as needed. Claims will be submitted to your health insurance policy, your government program, or other third party. You will be billed for the costs that are not covered by the insurance. You do not give up any legal rights by signing this form."

IV. Data Collection and Protection

A. Data Management and Security: Information from these tests will be entered into a research database. The PI and SC will supervise the data acquisition. Data will be coded for confidentiality and only the PI, study team, and statistician will have access to the code. Hard copies of study files are kept in a dedicated, locked cabinet in a badge-access area. Subject data will be coded prior to sending it to the statistician for statistical analyses.

B. Sample / Specimen Collection: N/A

C. Tissue Banking Considerations: N/A

D. Procedures to protect subject confidentiality: Much of the study data will be direct entered (entered as it is collected and not first recorded on paper forms) onto custom developed electronic source document forms created in Research Electronic Data Capture (REDCap). Exceptions to this direct entry method include the cognitive testing scores, which will be retrieved from the NIH Toolkit portal. Other measures may be recorded on paper forms in the event access to the REDcap database is disrupted for any reason.

REDCap is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. REDCap on the KUMC campus sits on a HIPAA compliant, password protected server. The KU ADRC has extensive experience building and maintaining REDCap databases, including those used for the preliminary data in this application. Confidentiality is strictly safeguarded by HIPAA-compliant standards.

E. Quality Assurance / Monitoring: The study team will perform source data verification and self-assessment of records at the completion of each cohort of the intervention to ensure that data are accurate.

V. Data Analysis and Reporting

A. Statistical and Data Analysis: Information from these tests will be entered into a research database. The PI, SC, and study team will supervise the data acquisition. Data will be coded for confidentiality and only the PI, SC, study team and statistician will have access to the code. Hard copies of study files are kept in a dedicated, locked cabinet in a badge-access area. Subject data will be coded prior to sending it to the statistician for statistical analyses.

Using an ANOVA model, 10 samples per time point (total 3 time points) will achieve 80% of power to detect a maximum change of the standardized measurement (raw measurement divided by its standard deviation) across the 3 time points with a magnitude 1.3 (A

magnitude <1 will mean the change is less than the noise level. I would consider a magnitude of 1.3 a subtle or a medium sized change.).

Focus group data will be analyzed using the constant comparative coding analysis.[27] Specifically, we will assess if the emerged themes were consistent across the two groups. The analysis will occur in three stages.[28] During the first stage of open coding, data will be placed into small units and will be coded for each unit. Axial coding will occur during the second stage in which the codes will be grouped into categories. Selective coding will occur during the third stage in which the PI will construct themes that express the content of each of the identified grouped categories.

B. Outcome: We expect to determine feasibility and acceptability of the MIND+SOUL diet. Feasibility will be assessed by 1) collecting measures including body composition (DXA), cardiometabolic risk factor assessments (blood pressure and blood draw), dietary assessments (NHANES dietary screener questionnaire and skin carotenoid assessment), and cognitive assessments (NIH toolbox), 2) recruitment throughout the intervention including reasons for refusal to participate and 3) retention rates including attrition (80% compliant) rate of completion of the intervention (i.e. number/percentage of participants who complete all aspects of the intervention including cooking classes and coach directed dietary call support). Acceptability will be assessed post-intervention using two REDCap online surveys, (see attachments) that will capture the overall experience and perception of the MIND+SOUL diet. For the first survey, acceptability will be evaluated on the theoretical framework of acceptability and evaluate the following constructs: affective attitude (how an participant feels about the MIND+SOUL intervention), burden (perceived amount of effort required to participate in the MIND+SOUL intervention), ethicality (extent to which the intervention has good fit with the participants value system), perceived effectiveness (extent to which the intervention is perceived as likely to achieve its purpose), and self-efficacy(participants confidence that they can perform the behaviors required to participate in the intervention). The second survey will evaluate satisfaction with the MIND+SOUL diet using a visual analog scale.

C. Study results to participants: A letter will be mailed to study participants at the end of the study to provide information on the general results of the study.

D. Publication Plan: Publication of the results of this study will be governed by the policies and procedures developed by the study team.

APPENDIX I: VULNERABLE POPULATIONS

I. The study does not include vulnerable populations

II. Cognitively or decisionally impaired individuals: N/A

III. Children: N/A

IV. Pregnant women: N/A

V. Prisoners: N/A

VI. Students and/or Employees: N/A

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