Official Title:

A Personalized Trial for Testing the Effects of a Mind-Body Intervention (MBI) on Sleep Duration and Quality in Middle-Aged Women Working in Health Care

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Northwell Health

RESEARCH PROTOCOL

Protocol Title:	A Personalized Trial for Testing the Effects of a Mind-Body Intervention (MBI) on Sleep Duration and Quality in Middle-Aged Women Working in Health Care
Principal Investigator:	Karina W. Davidson, PhD, MASc
Primary Contact Name:	Challace Pahlevan-Ibrekic, MBE, CIP
Primary Contact Phone:	347-751-2306
Primary Contact E-mail:	cpahlevanibr@northwell.edu
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Guidelines for Preparing a Research Protocol

Instructions:

- You do not need to complete this document if you are submitting an *Application for Exemption* or *Application for a Chart Review*.
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  - Your study involves an FDA regulated product. In this case, use the *Clinical Trial Protocol Template.*
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1. PREVIOUS STUDY HISTORY

Has this study ever been reviewed and rejected/disapproved by another IRB prior to submission to this IRB?

☒ No ☐ Yes – if yes, please explain:

2. BRIEF SUMMARY OF RESEARCH

- *The summary should be written in **language intelligible to a moderately educated, non-scientific layperson**.*
- *It should contain a clear statement of the rationale and hypothesis of your study, a concise description of the methodology, with an emphasis on what will happen to the subjects, and a discussion of the results.*
- *This section should be ½ page*

This pilot study will utilize a Personalized Trials model to evaluate an individual participant's experience with a Mind-Body Intervention (MBI) strategy for self-reported perceived stress and short sleep duration of at least 3 months duration. Components of the MBI include mindfulness, yoga and guided walking, each assigned in 2-week block sequences for a total period of 12 weeks. MBI components will be delivered via 30-minute videos and will be accessed three times per week. Participants will be sent a Fitbit device to track their sleep and activity. Participants will be asked several questions a day sent via text message about their sleep quality, as well as bi-weekly questions about their health including stress, fatigue, concentration, confidence, mood, and pain levels to demonstrate relevant secondary impacts of sleep quality. Stress, anxiety and depression will be measured using validated assessments. Following 12 weeks of intervention, participants will continue to have their sleep duration monitored for a two-week follow-up period. After the end of the 16-week trial, participants will receive a summary of their observed data in a personalized report.

Results from this pilot study will inform the future development of N-of-1 methodology in the research and clinical space aimed at addressing the health and wellness needs of adults biologically assigned female at birth who are 40-60 years of age.

3. INTRODUCTION/BACKGROUND MATERIAL/PRELIMINARY STUDIES AND SIGNIFICANCE

- *Describe and provide the results of previous work by yourself or others, including animal studies, laboratory studies, pilot studies, pre-clinical and/or clinical studies involving the compound or device to be studied.*
- *Include information as to why you are conducting the study and how the study differs from what has been previously researched, including what the knowledge gaps are.*
- *Describe the importance of the knowledge expected to result*

This project represents a pilot project under the funding umbrella of the NIA-funded grant establishing the Roybal Center for Personalized Trials at Northwell Health. The Center's mission is to test use cases appropriate for N-of-1 methodology and develop promising, innovative behavioral interventions along the NIH Stage model pathway, with a focus on addressing the health and wellness needs of an aging population.

Right now, clinicians are engaging in clinical encounters in which they are trying to determine the best therapy for individual patients. These encounters are likely to be unsuccessful. Clinicians rely on the best available evidence (e.g., results from parallel group, phase III randomized clinical trials; RCTs) for recommending therapies to a patient. Yet, conventional, between-group RCTs only provide estimates of the effect of therapies on the hypothetical 'average' patient in those trials. Individual patients, however, often respond differently than the hypothetical average patient in the phase III RCTs, and thus, heterogeneity of therapy response plagues clinical decisions made for an individual patient every day.

The most scientifically rigorous — and potentially transformative — method for determining optimal therapy for a patient is a single-patient (N-of-1) trial. N-of-1 trials are multiple crossover trials, usually randomized, and often masked, conducted within a single patient, with data collected objectively, continuously, and in the real-world, for a sufficient time period to determine whether the therapy is optimal for a particular patient. In many ways, Personalized or N-of-1 Trials are the foundational design for a truly patient-centered approach by serving as a clinical decision tool for patients. Historically, in introducing evidence-based medicine, Guyatt and others have described Personalized Trials as the pinnacle of the evidence-based design pyramid[1]. Clinicians can use these techniques to monitor and make treatment decisions in chronically ill patients[2], of whom 25% experience adverse treatment effects[3]. Personalized Trials are specifically designed to help patients and their clinicians make healthcare decisions that are informed by high-integrity, evidence-based information uniquely relevant to the outcomes and values important to them[4]. In post-mortem assessments as to why Personalized Trials had yet to become commonly employed, proponents concluded that they were insufficiently appealing to patients or clinicians to justify the cost and effort needed to design and implement them[5,6]. Specifically, Personalized Trial design specifications had mostly been driven by clinicians or researchers [7,8], with little input from patients.

Rationale for Selecting Sleep Duration as a Personalized Trial

Sleep is an important and complex physiological process for maintaining optimal health. The National Sleep Foundation recommends ≥7h of sleep per night on a regular basis for adults aged 18-60 years[9] During the first two COVID-19 pandemic waves, findings indicated a high prevalence of both poor sleep quality and moderate-severe stress in healthcare workers (HCWs) (either at the frontline or not)[10,11], and especially amongst women[12]. Studies conducted in a cohort of New York City HCWs (80% women, >50% nurses, median age of 36 years) showed that during the pandemic, the rates of insomnia symptoms (e.g., short duration, poor quality sleep) were approximately 20% higher than rates reported in 2018[13,] and revealed an association between poor sleep quality and a higher prevalence of psychological distress[14]. Thus, evidence suggests that sleep may be a target intervention to decrease psychological distress among HCWs. While some mitigation interventions (e.g., reducing workload) have been proposed to address stress/burnout on HCWs[15] very few have focused on women in healthcare and specifically targeted sleep as a symptom of stress. The primary goal of this pilot study is to determine if a personalized trial (N-of-1) employing a Mind-Body Intervention (MBI) can produce a meaningful increase in sleep duration among women 40-60 years of age and older working at Northwell Health. N-of-1 studies are single-patient crossover trials, where individual patients are given candidate treatments in a random sequence of alternating periods to determine the most effective treatment for that patient. In contrast to randomized controlled trials, which provide evidence on a population level, N-of-1 trials provide a method to determine what works best for the individual directly[16,17]. Up to 65 women with a history of short sleep duration (defined as an average <7h per 24-h period for at least three months)[18] will be enrolled (randomized) over a period of two years. Participants will complete a 2-week run-in period with no intervention, for baseline data collection, including bi-weekly surveys and Fitbit-derived sleep and activity data. Those who are deemed eligible and achieve at least 80% adherence of Fitbit wear and survey submission will be randomized to Arm 1 (N=30) or Arm 2 (N=30). Each arm will receive a personalized intervention comprised of three components: mindfulness, yoga and guided walking assigned in 2-week block sequences for a total period of 12 weeks. Following the intervention, all participants will be assessed over a 2-week follow-up period. Changes in average daily sleep duration will be calculated for each participant based on daily measurements between the run-in and each treatment period. The Fitbit devices will also record sleep quality components (sleep onset, sleep staging, and overall sleep score) and physiological factors (resting heart rate, heart rate variability (HRV) and activity). **We will also examine the direct and indirect relationships between perceived stress, anxiety and depression, and sleep quality assessed pre, during (bi-weekly), and post MBI**.

Participant report of poor sleep duration meets all of our criteria for selection as a use case as outlined in our umbrella grant: it has high public health burden; high heterogeneity of therapy response; multiple, evidenced-based treatments; and is high priority for a Personalized Trial approach as determined by previously interviewed clinicians and patients. A recent study of US workers found the prevalence of short sleep duration to be 37.6% and poor sleep quality to be 19.2%,

supporting the need for innovative treatments[19]. This instance will adapt our N-of-1 trial platform to be able to deliver a three component Mind-Body Intervention with the goal of meaningfully increasing average daily sleep duration as compared with the baseline period.

Rationale for MBI Intervention Components:
The three techniques included in the personalized intervention have been shown to be safe and effective in addressing sleep problems and reducing stress in middle aged women[20] . Prior studies examining the effects of mediation[21], yoga[22], and physical activity[23] for stress reduction found that all three interventions were associated with significant reductions in self-reported measures of stress and/or physiological measures of stress. Each of these promising behavioral interventions are theorized to improve sleep quantity and quality through targeting multiple cognitive and emotional processes that will be tested repeatedly in this proposed trial. However, stress and sleep reduction interventions often have high levels of heterogeneity of treatment effects (HTE). This personalized trial will allow us to evaluate the HTE and determine which treatment will be most effective for an individual participant.

As this is a digital (virtual) intervention, the maintenance of fidelity to the intervention delivery is expected to be identical to that found in research settings as the interventions will be delivered by a secure link to videos created by our wellness provider, Zeel. These videos have been previously used in other studies conducted by our Center, such as IRB # 21-0968 “Personalized Trial of Stress Management”.

4. OBJECTIVE(S)/SPECIFIC AIMS AND HYPOTHESES

- *A concise statement of the goal(s) of the current study.*
- *The rationale for and specific objectives of the study.*
- *The goals and the hypothesis to be tested should be stated.*

The goal of the Roybal Center for Personalized Trials is to focus on innovative, behavioral interventions aimed at promoting and improving the overall health and well-being of older adults through the conduct of fully powered, meaningful, personalized trial pilots. The goal of this project is to evaluate the effects of a combined Mind-Body Intervention on increasing sleep duration in middle aged women working in health care, and to determine which intervention component proved most effective for each individual participant

Thus, the aims of this pilot study are :
Primary Aim: Determine if a personalized trial testing a Mind-Body Intervention (MBI) can produce a meaningful increase in the average daily sleep duration among women 40 – 60 years of age working in healthcare.
Exploratory Aim 1: Evaluate the effect of the MBI on sleep quality and other physiological factors.
Exploratory Aim 2: Explore the role of anxiety and depression as a potential mediator between perceived stress and sleep quality before, during, and after the MBI.

5. RESOURCES AVAILABLE TO CONDUCT THE HUMAN RESEARCH

- *Explain the feasibility of meeting recruitment goals of this project and demonstrate a potential for recruiting the required number of suitable subjects within the agreed recruitment period*
    - *How many potential subjects do you have access to?*
- *Describe your process to ensure that all persons assisting with the trial are adequately informed about the protocol and their trial related duties and functions*

We have planned for a broad base of recruitment efforts to potentially recruit a diverse representation of this population.

Northwell employs over 79,000 individuals with strong representation by women in clinical, clerical, and administrative capacities. Northwell employs more than 19,000 nurses. National statistics report that 90.6% of nurses are women and that the average age of a nurse in 2021 was 52 years of age. We believe we have an adequate population from which to recruit up to 65 participants for this study

Institute of Health System Science staff must meet certain eligibility criteria before assisting with this pilot study. All staff members must be listed on the IRB protocol submission and be up to date with trainings and attestations as required by the Northwell Health Human Research Protection Program. Additionally, staff will be required to participate in biweekly meetings with the Principal Investigator, and an additional weekly meeting with the Project Manager, in order to stay informed about the study protocol, staff duties and functions, and to answer any questions that come up within the group. Staff will have daily access to the Project Manager, Director of Clinical Research, and Principal Investigator to answer any protocol questions they may have outside these established weekly meetings.

6. RECRUITMENT METHODS

- *Describe the source of potential subjects*
- *Describe the methods that will be used to identify potential subjects*

- *Describe any materials that will be used to recruit subjects. A copy of any advertisements (flyers, radio scripts, etc.) should be submitted along with the protocol.*
- *If monetary compensation is to be offered, this should be indicated in the protocol*

Since the proposed study will take place virtually, potential participants are not required to reside within travelling distance of Northwell Health.

Potential participants will be recruited via the following avenues:

- E-mail advertisement through Northwell employee communication channels
- E-mail advertisement through existing email lists from those who have previously expressed interest in participation in a Personalized Trial or who have screen failed for other Institute-led research, but who have been informed their data will be retained for future research.
- Online research listings, such as the Feinstein Institutes for Medical Research clinical trials listing (https://www.northwell.edu/clinical-trials) and ClinicalTrials.gov (https://www.clinicaltrials.gov/)
- Recruitment posts on Northwell Health Facebook page
- Electronic and social media communications serving Northwell affiliates
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Potential participants will self-identify as having a minimum threshold of poor sleep duration over the last 3 months and interest in participating in a Personalized Trial.

Participants will be able to keep their Fitbit activity tracker (value $150) as compensation for participation in the baseline period. Additionally, participants who are 80% complaint with Fitbit wear and survey responses are eligible for a weekly lottery ($50 award). Adherent participants are eligible to win a maximum of eight times ($400) during the 14 week intervention and follow-up periods. Upon completion of all study activities, participants will receive a $50 clincard.

7. ELIGIBILITY CRITERIA

- *Describe the characteristics of the subject population, including their anticipated number, age, ranges, sex, ethnic background, and health status. Identify the criteria for inclusion or exclusion of any subpopulation.*
- *Explain the rationale for the involvement of special classes of subjects, such as fetuses, pregnant women, children, prisoners or other institutionalized individuals, or others who are likely to be vulnerable. You cannot include these populations in your research, unless you indicate such in the protocol*

- *Similarly, detail exclusionary criteria: age limits, special populations (minors, pregnant women, decisionally impaired), use of concomitant medications, subjects with other diseases, severity of illness, etc.*

Up to 65 participants will be randomized to receive this pilot study protocol. We aim to recruit a diverse pool of participants with varied ethnic and racial backgrounds.

Inclusion:
- Age 40 – 60 years
- Sex assigned at birth-female
-Northwell employee or affiliate
- Self-reported history of short sleep duration (<7h per 24-h period) for at least 3 months
-After a 2-week run-in, Fitbit verified short sleep duration, and ≥80% adherence of Fitbit wear and survey submission
-Self-report of perceived stress ≥18 using the Perceived Stress Scale (PSS)
-Owns and can regularly access a smartphone capable of receiving text messages
-Owns and can regularly access an e-mail account
- Willingness to wear a Fitbit device

Exclusion:
- Age < 40 or > 60 years old
-Sex assigned at birth- male
-Not a Northwell employee
-No history of short sleep duration or non-adherent to the Fitbit wear and survey submission
-Self report of perceived stress <18 using the Perceived Stress Scale (PSS)
- Women who are pregnant or breastfeeding
- Does not own or cannot regularly access a smartphone capable of receiving text messages
- Does not possess or cannot regularly access an email account
- Deemed unable to complete the study protocol as a result of cognitive impairment, severe medical or mental illness, or active or prior substance abuse
- Planned surgeries within 6 months from study start date
- Participants who have been previously told by a clinician they have mobility limiting health conditions and/or not to engage in walking for 30 minutes, three times per week or yoga

Planned travel outside the United States within participant's intervention period will be determined on a case-by-case basis so as not to exclude interested and able participants from enrolling in the study.

Since this study will take place virtually, potential participants are not required to reside within travelling distance of Northwell Health. Therefore, the exclusion criteria do not preclude those living outside of New York State from passing

screening. Individuals who reside outside New York State will be recruited after there is an awareness of applicable human research protection laws that may apply to the research. Individuals who do not live in a reviewed state will have their enrollment workflow paused and may be removed from the waitlist if their state is reviewed in the future and provided there are no HSP laws that preclude their enrollment. In that instance, the protocol and/or consent form may require revision to meet the state of interest's requirements.

8. NUMBER OF SUBJECTS

- *Indicate the total number of subjects to be accrued locally. If applicable, distinguish between the number of subjects who are expected to be pre-screened, enrolled (consent obtained), randomized and complete the research procedures.*
- *If your study includes different cohorts, include the total number of subjects in each cohort.*
- *If this is multisite study, include total number of subjects across all sites.*

Up to 1000 potential participants may be screened for study eligibility. Up to 65 participants will be randomized until 60 (30 participants in each arm) complete research procedures with any data (Fitbit or survey) post- randomization. Eligible participants will be randomized (1:1) into Arm 1 or Arm 2. In Arm 1 (N=30), participants will receive a personalized intervention comprised of three components delivered in a ABCCBA sequence over a total period of 12 weeks, where A-mindfulness, B-yoga, and C-guided walking. During each 2-weeks block, participants will be prompted to complete 3 x 30-minute intervention sessions weekly. In Arm 2 (N=30), participants will receive a personalized intervention comprised of the same three components delivered in a CBAABC sequence over a total period of 12 weeks. Prompts will be delivered weekly to Arm 2 as well.

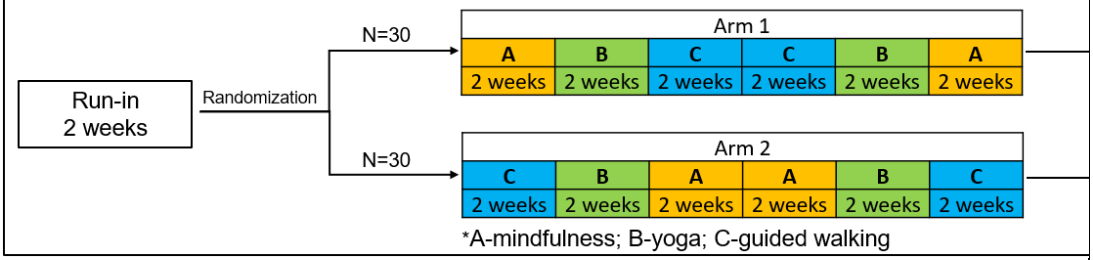
9. STUDY TIMELINES

- *Describe the duration of an individuals participation in the study*
- *Describe the duration anticipated to enroll all study subjects*
- *The estimated date of study completion*

The study will take place over the course of 16 weeks.
Participants will begin the trial with a 2-week run-in period during which their baseline sleep duration and adherence to the Fitbit wear and survey submission will be assessed. Following the 2-week run-in period, participants deemed eligible and achieved at least 80% adherence of Fitbit wear and survey submission will be randomized to one of the two intervention arms. Interventions will be delivered by a virtual link to online videos recorded by an experienced Zeel wellness provider. Participants will be limited to three views of the study-provided intervention content each week. During the intervention participants will be asked to wear their

Fitbit device each *day and night*. They will also complete sleep diaries and have their physiological factors assessed using Fitbit devices each day. Participants' perceived stress will be measured using the ecological momentary assessment (EMA); screening for anxiety and depressive symptoms will be assessed using the patient health questionnaire (PHQ-4), a self-report version of the Primary Care Evaluation of Mental Disorders (PRIME-MD)[15]. Both EMA and PHQ-4 will be evaluated pre-intervention, bi-weekly during the intervention, and post-intervention. After 12 weeks of receiving the MBI, participants will enter the two-week follow up period to allow for a personalized report of their observed data to be generated.

Fig1. Trial Design



*A-mindfulness; B-yoga; C-guided walking

Potential participants will have the opportunity to provide preferences of start dates during their enrollment process. The study team will confirm applicability of the chosen start dates before confirming with a participant, so that no more than 20 potential participants will begin their baseline period on the same day and every baseline period begins on a Monday. Leading up to baseline start date, participants will receive messages from the study team with instructions preparing them for the study, including setting up their Fitbit devices and reminding them of their upcoming start date. Enrollment will be ongoing until 60 participants have been randomized and provide any data post-baseline. We estimate that the final participant will be randomized by September 30, 2023, and data collection will cease by January 15, 2024.

10. ENDPOINTS

- *Describe the primary and secondary study endpoints*
- *Describe any primary or secondary safety endpoints*

This study is a minimal risk pilot whose primary objective is to assess a meaningful increase in the average sleep duration of women 40 – 60 years of age working in healthcare.

11. RESEARCH PROCEDURES

- *Include a detailed description of all procedures to be performed on the research subject and the schedule for each procedure.*

- *Include any screening procedures for eligibility and/or baseline diagnostic tests*
- *Include procedures being performed to monitor subjects for safety or minimize risks*
- *Include information about drug washout periods*
- *If drugs or biologics are being administered provide information on dosing and route of administration*
- *Clearly indicate which procedures are only being conducted for research purposes.*
- *If any specimens will be used for this research, explain whether they are being collected specifically for research purposes.*
- *Describe any source records that will be used to collect data about subjects*
- *Indicate the data to be collected, including long term follow-up*

Potential participants who self-identify as having poor sleep duration (<7 hrs per 24hrs) will be directed to a study information site with details about the pilot study. Those who are interested in participating in this pilot study will be directed to sign a HIPAA Authorization form before completing an initial screening survey process. The HIPAA Authorization will be electronically signed via RedCap. The initial screening process includes questions pertaining to inclusion and exclusion criteria and administration of the Perceived Stress Scale (PSS). Consenting coordinators will review these data and determine whether a potential participant is eligible to participate. Those who are eligible will receive a link to a short video about key details from the consent form, as well as an electronic copy of the consent form. Potential participants will also be given the option to set up a 30-minute phone call with a research coordinator, where the research coordinator will describe the study process and offer an additional opportunity for the potential participant to ask any questions. After completing or opting out of the phone call, the potential participant will be sent a link to view and electronically sign the consent form in RedCap. Before being able to sign and submit the consent form, potential participants must demonstrate their understanding of the protocol by correctly answering 4 questions pertaining to the information presented in the consent form.

This study is funded by the National Institute of Aging (NIA) and a requirement of funding is to collect extensive demographic data during the screening process (prior to consent) on eligible participants, and to report this data to the NIA monthly on an individual level by study ID. The intended aim of this requirement is to ensure that funded projects are enrolling diverse populations and that screening does not systematically exclude members of underrepresented groups. These questions have been separated out from demographic data pertinent to the study aims and participants are informed in both the consent and on the study document that they have the option to decline responding to the questions without jeopardizing their ability to participate in the study.

Once potential participants successfully submit their signed consent form, they will receive an onboarding questionnaire to collect more information, including a home address. A Consenting Coordinator will review this information and send the potential participant a message which will include a confirmation of the start date

of their baseline period, and information about what to expect during onboarding to the study. They will receive an initial study kit including a Fitbit device via mail and will receive a copy of their electronically signed HIPAA authorization and consent form with a URL to view the informed consent video that they watched previously.

All baseline periods will begin on a Monday. The baseline period will take place over the course of 2 weeks. Participants will be instructed to continue treating their sleep quality issues as they normally would and not to participate in yoga, mindfulness exercises or walking bouts.

Each morning, baseline participants will receive a survey asking a few questions about their sleep quality the previous night using a modified version of the Consensus Sleep Diary, as well as factors that may have contributed to any sleep issues

During the baseline period, potential participants will be asked to wear their Fitbit all day and night, even while they are sleeping. Participants will be asked to download the Fitbit app to their smart phone. Baseline participants will be instructed to sync their Fitbit device by opening the Fitbit app on their phone at least every two days and to charge their device at least every four days.

Ten days into the baseline period, a Consenting Coordinator will review individual adherence to Fitbit wear and survey responses. Adherence to Fitbit wear will be defined as recorded activity of greater than 12 hours a day, and recorded sleeping activity greater than 180 minutes in total. Survey adherence will be defined as submission of a given survey. Baseline participants who do not achieve at least 80% adherence of Fitbit wear and survey submission during the first 10 days of the baseline period will be given until day 14 of the trial to obtain 80% adherence. Those who still do not meet 80% adherence by day 14 will be withdrawn from the study. Those participants who do maintain at least 80% adherence during the baseline period will be randomized to one of two intervention sequences in the pilot study. Participants who are randomized to receive intervention sequences will receive confirmation including their protocol timeline. Enrollment will continue until up to 65 participants have been randomized overall, with the goal of reaching 60 participants who complete research procedures with any post-randomization data: 30 participants randomized to receive ABCCBA and 30 participants randomized to receive CBAABC.

Each intervention sequence is made up of six 2-week periods assigning yoga, mindfulness or guided walking. Participants will be limited to 3 (30 minute) intervention sessions each week. During all intervention weeks (12 weeks total), participants will be asked to continue wearing their Fitbit device each day and night. They will continue to receive EMA surveys bi-weekly with questions about their health such as pain, fatigue, concentration, confidence, mood, and stress at that current moment, as well as a daily morning text asking them to report on their

sleep duration and quality the previous night, using a modified Consensus Sleep Diary. At the end of each intervention period on Sunday evening (every two weeks), participants will also receive the PHQ-4 and Perceived Stress Scale (PSS). A study phone number and email address will be available as part of each survey to contact the study team if a participant is concerned about any side effects they are experiencing. Participants will be instructed to contact 911 or go to the nearest emergency room in the event of a medical emergency.

Participants may receive additional messages to those outlined above with important reminders about their protocol (e.g., transition to a new intervention period), or to remind participants to sync their data or charge their devices. We will send a maximum of 5 text message surveys per day during the study, as well as text messages of these reminders and other important study communications.

In the event of an unanticipated circumstance that temporarily prevents a participant from completing study activities (illness, injury, death in the family, travel, etc.), the participant will have the option of pausing their study to resume once their circumstance has been positively resolved.

Participants will complete remote data monitoring after they have gone through one baseline period (two weeks), 6 intervention periods (two weeks each), and two weeks of follow-up), or 16 weeks total. Alternatively, a participant may choose to withdraw from the study, or be withdrawn from the study by the research team. Upon completion of data monitoring, participants will be given instructions on how to un-link their Fitbit from the study account.

We will compile the self-reported data from questionnaires, side effects, health assessments such as pain, fatigue, concentration, confidence, mood, and stress assessments, as well as information from the Fitbit regarding activity (steps, heart rate, flights climbed and intensity) and sleep (duration, estimated sleep stages, sleep score) for each individual participant. We will analyze this data and create a summary report of the participant's observed data over the study period, in relation to the intervention components

The participant will be sent this report in an encrypted email by our study team. Participants will also be sent links to several online videos explaining the terms and data visualizations available in their summary report. These videos will be general to the template report and will not contain any individual results or health information.

After being sent their report, participants will be asked to complete a satisfaction survey and offered the option to participate in a virtual follow-up interview (such as a video call over Microsoft Teams) with a member of our study team to talk about their experience as a research participant in this study. Participants will be asked several questions about what it was like to participate in the study. Participants will also be asked about their opinion on Personalized Trials. All

interviews will be audio-recorded and transcribed via Microsoft Teams (or equivalent program) to ensure full capture of information provided during the discussion. Participants will be informed that the session will be recorded prior to initiating the interview. If the participant declines to be recorded, they may still participate in the interview and the study team will take notes of the conversation. Audio and transcription files will be stored securely on the PHI-approved SharePoint server. Data collected from the satisfaction survey and the virtual follow-up interview will be used to inform future Personalized Trials designed by the investigator.

Participants will be able to keep their Fitbit activity tracker (value $150) as compensation for participation. Additionally, participants who are 80% complaint with Fitbit wear and survey responses are eligible for a weekly lottery ($50 award) during the intervention and follow-up periods. Adherent participants may be selected a maximum of eight times ($400) during the 14 week intervention and follow-up periods. Participants who complete all study activities will receive a $50 clincard as compensation for their participation.

12. STATISTICAL ANALYSIS

- *Describe how your data will be used to test the hypotheses.*
- *State clearly what variables will be tested and what statistical tests will be used.*
- *Include sample size calculations.*
- *If this is a pilot study, state which variables will be examined for hypothesis generation in later studies.*

Sample size justification:
The primary aim of this study is to evaluate the effect of a personalized MBI on increasing the average daily sleep duration in working at Northwell Health. A sample size of 30 participants per arm achieve 80% power to detect a a minimum effect size of 0.7 expected by one of the three Aim 2 interventions. Calculations were based on GEE tests for repeated measures considering a total of 28 daily measurements (4 weeks) per intervention, at a significance level of 0.05. The within subject standard deviation σ is anticipated to be maximum 2h, with an auto-regressive AR(1) base correlation of 0.95 taken at two successive timepoints. Estimated effect size and correlation values were derived from a previous fatigue study that employed similar intervention/design and collected sleep duration as exploratory endpoint.

The **randomization schedule** will be set up by a member of the Institute of Health System Science data team and provided to the data analyst assigned to this trial.. Randomization will occur with a fixed seed value for the purposes of repeatability and auditability, and the list of participants will be split into two groups using a

random shuffle function that takes that seed as input. The order in which an individual becomes eligible for one of these randomizations will determine the placement given (i.e. the first person eligible will be randomized to the intervention order given to participant 1 and continue sequentially). Eligibility is obtained by a participant maintaining at least 80% adherence of survey response, Fitbit wear ≥ 12 hours a day 80% of days, and 80% sleep data ≥ 180 minutes available through the baseline run-in period. The data analyst will alert the research coordinator of the assigned randomization once a participant becomes eligible during the baseline run-in period. As this pilot is not blinded to study coordinators, this concealed allocation involving the data analyst alerting the study coordinator of intervention assignment will be used to prevent bias by blinding the sequence up until time of randomization.

Analytical Plan

Primary Outcome – Mean Within-Subject Difference in daily sleep duration during 3 treatment periods from baseline. Participant's sleep duration will be measured objectively using Fitbit devices and by self-reported questionnaires. The Fitbit devices will collect information continuously that will be stored in Fitabase, a secure, online portal. Participant sleep activity will be aggregated by day.

Analysis of Primary Outcome: The effect of the personalized MBI intervention on individual's sleep duration will be assessed in each arm separately. Individual changes in the average daily sleep durations between the run-in and each treatment period will be reported using mean (95% confidence intervals CIs). Bland-Altman plots will be constructed to visualize the agreement between the Fitbit reported and self-reported sleep duration. The effects of treatment on sleep duration will be assessed using generalized estimating equations (GEE) with an unstructured variance-covariance matrix for measures on the same day to that night's sleep. This model accounts for possible autocorrelation and linear trends between sleep duration across time. The GEE models will include time of day of treatment exposure (AM versus PM) as a covariate.

Exploratory Aim 1 Outcomes - Mean Within-Subject Difference in daily sleep quality and other physiological factors during 3 treatment periods from baseline. This aim will explore the effects of the personalized intervention on sleep quality components (sleep onset, sleep staging, and overall sleep score) and physiological factors (breathing/resting heart rate, heart rate variability (HRV) and physical activity). All these measurements will be recorded and aggregated daily by the Fitbit device.

Analysis of Exploratory Aim 1 Outcome: The effect of the personalized MBI intervention on individual's sleep quality and physiological factors will be assessed in each arm separately. Individual changes in the average daily sleep quality (e.g., score), heart rate and daily average number of steps between the run-in and each treatment period will be reported using means (95% CIs. GEE models will be employed to test the effect of the intervention of sleep quality and physiological factors.

Exploratory Aim 2 Outcomes – Mean Within-Subject Difference in perceived stress, anxiety and depression scores measured objectively during 3 treatment

periods from baseline. Participants' perceived stress score will be measured using the EMA questionnaire and PSS; anxiety and depressive disorder scores will be assessed using the PHQ-4 questionnaire. EMA , PSS and PHQ-4 will be evaluated pre-intervention (run-in), bi-weekly during the intervention, and post-intervention. Analysis of Exploratory Aim 2 Outcomes: To explore the role of anxiety and depression as a potential mediator(M) between perceived stress (X) and sleep quality (Y) we will employ three mixed effects regression models (Fig 2).

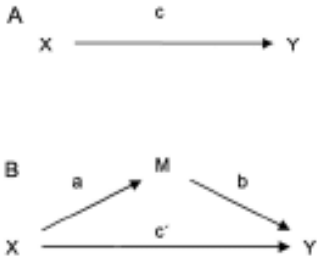


Figure 2 Mediation Model

We will estimate the (c'), the indirect effect (ab), and the total effect of perceived stress quality (c=ab+c').

13. SPECIMEN BANKING

- *If specimens will be banked for future research, describe where the specimens will be stored, how long they will be stored, how they will be accessed and who will have access to the specimens*
- *List the information that will be stored with each specimen, including how specimens are labeled/coded*
- *Describe the procedures to release the specimens, including: the process to request release, approvals required for release, who can obtain the specimens, and the information to be provided with the specimens.*

N/A

14. DATA MANAGEMENT AND CONFIDENTIALITY

- *Describe the data and specimens to be sent out or received. As applicable, describe:*
  - *What information will be included in that data or associated with the specimens?*
  - *Where and how data and specimens will be stored?*
  - *How long the data will be stored?*
  - *Who will have access to the data?*
  - *Who is responsible for receipt or transmission of data and specimens?*
- *Describe the steps that will be taken to secure the data during storage, use and transmission.*

Fitbit®

This pilot study uses non-NFC, Fitbit devices to remotely monitor participant activity and sleep. All enrolled participants will be provided with instructions to create a study account . The email address of the study account contains a unique identifier (e.g., northwellpt25). Data collected will include daily steps, floors climbed, activity intensity, sleep duration, and estimated minutes in sleep stages. The list linking this unique identifier to the participants' name or any other information that could identify him/her will be maintained in REDCap with limited view access and controls. Coded data from Fitbit will remain stored in a Northwell-approved drive indefinitely.

Fitabase

This pilot study will use Fitabase to retrieve Fitbit data from participants. Fitabase is a secure, online portal. The Fitbit study account provided to the participants will be linked to an identification number in the Fitabase system (e.g. FLT01). No information that could be used to identify a participant will be stored on Fitabase. Only the research team will have access to data that will be able to connect a research participant to their Fitabase ID. Data collected will include last sync date, battery charge status, daily steps, floors climbed, activity intensity, sleep duration, and estimated minutes in sleep stages. Additional Fitbit data (e.g., breathing rate, temperature, oxygen saturation) will be collected and potentially used to help explain the outcome of interest. Fitabase will stop tracking participant data at the trial end date selected by the research coordinator. As an added measure, participants will be instructed to remove the Fitbit study account from their device if they plan on keeping the Fitbit.

Eligibility, Consent, and Survey Data

Screening and consenting takes place in RedCap. Northwell security-review approved system for collecting and storing research data, including PHI. The study team will have access to all data, including PHI, throughout the study. C Data analysis will be done by unique identifier. Coded reports will be given back to the study team, who will identify the document before sending to the participant via encrypted messaging.

The study team takes data confidentiality very seriously. Data collected for this research will be maintained on a HIPAA-compliant Northwell-approved SQL database. All members of the research team with access to identifiable and coded data will be trained and included on the IRB submission for approval. Regular meetings will take place with the PI and other members of the study team to ensure protocol adherence and data accuracy. Data collected for this study will be maintained in its original and unaltered source data state in a Northwell-approved SQL database on a Northwell-approved drive to store PHI indefinitely. Data collected under this research may be used for future research in coded format without additional consent as per the consent form participants sign and with

appropriate IRB approval as required. Any additional data that must be shared will be done so according to the consent form participants signed. Only research staff listed within this IRB submission will have access to identifiable information. Anonymized data may be stored indefinitely for reference following the conclusion of the study. The participant will be made aware of all data collected in the consenting process.

This research is funded by the NIA, thus a Certificate of Confidentiality has been issued for this research. Certificates of Confidentiality (CoCs) protect the privacy of research subjects by prohibiting disclosure of identifiable, sensitive research information to anyone not connected to the research except when the subject consents or in a few other specific situations.

15. DATA AND SAFETY MONITORING PLAN

A specific data and safety monitoring plan is only required for greater than minimal risk research. For guidance on creating this plan, please see the Guidance Document *on the HRPP website.*

Part I – this part should be completed for all studies that require a DSMP.
Part II – This part should be completed when your study needs a Data and Safety Monitoring Board or Committee (DSMB/C) as part of your Data and Safety Monitoring Plan.

Part I: Elements of the Data and Safety Monitoring Plan

- *Indicate who will perform the data and safety monitoring for this study.*
- *Justify your choice of monitor, in terms of assessed risk to the research subject's health and well being. In studies where the monitor is independent of the study staff, indicate the individual's credentials, relationship to the PI, and rationale for selection*
- *List the specific items that will be monitored for safety (e.g. adverse events, protocol compliance, etc)*
- *Indicate the frequency at which accumulated safety and data information (items listed in # above) will be reviewed by the monitor (s) or the DSMB/C.*
- *Where applicable, describe rules which will guide interruption or alteration of the study design.*
- *Where applicable, indicate dose selection procedures that will be used to minimize toxicity.*
- *Should a temporary or permanent suspension of your study occur, in addition to the IRB, indicate to whom will you report the occurrence.*

Part II: Data and Safety Monitoring Board or Committee

- *When appropriate, attach a description of the DSMB.*
- *Provide the number of members and area of professional expertise.*
- *Provide confirmation that the members of the board are all independent of the study.*

Dr. Chiuzan, will be responsible for ensuring participants' safety on a daily basis. As the proposed project is a Stage 2 study of the effectiveness of MBIs to achieve improved sleep quality, and these MBIs have been implemented with health care workers in other personalized trials, the level of risk appears to be that of those experienced in everyday life. Dr. Chiuzan, the study coordinator, and Ms. Duer-Hefele will regularly monitor participant safety evaluate the progress of the study, review procedures for maintaining the confidentiality of data, review the quality of data collection, management, and analyses at weekly team meetings.

To assure data accuracy, the Data Manager will process monthly reports to search for errors and generate basic reports for dissemination at regular meetings. Protocol compliance will be reviewed during regular meetings between Dr. Chiuzan, Ms. Duer- Hefele and the research team. Finally, Ms. Duer-Hefele will perform a random audit of 5% of enrollments, and provide continual feedback to improve the quality of informed consent and data collection.

Dr. Chiuzan and Ms. Duer-Hefele will convene no less than monthly to comprehensively review participation in the study. As this is a minimal risk study, no safety officer has been appointed for this study. The study team will regularly convene to share safety reports with Dr. Chiuzan. All collected data will be stored in the RedCAP program, a Northwell IRB and Research IT security approved location, housed on the Northwell IT approved server. All data will be de-identified before analysis and before being made available for data sharing. Following the onset of data collection, the Data Manager will provide this group with biweekly reports of the aggregate data, progress of the study, including participant accrual, protocol compliance, and problems encountered.

16. WITHDRAWAL OF SUBJECTS

- *Describe anticipated circumstances under which subjects will be withdrawn from the research without their consent*
- *Describe procedures for orderly termination*
- *Describe procedures that will be followed when subjects withdraw from the research, including partial withdrawal from procedures with continued data collection.*

Circumstances under which participants will be withdrawn from the research without their consent include not meeting objective verification of short sleep duration (<7 hrs per 24hr periods during 2 week run-in as measured by a Fitbit activity tracker), failure to maintain protocol adherence, and self-reported adverse side effects to interventions. A potential participant will not be randomized to receive the intervention protocol until he/she has demonstrated at least 80% adherence to continuous Fitbit monitoring (activity recorded > 12 hours/day, and

recorded sleep activity >180 minutes) and response to survey questionnaires during the baseline period.

Potential participants will be notified of the possibility of being removed from the study before intervention randomization due to adherence issues in the informed consent. Participants who fail to maintain minimum adherence during baseline will be notified by the research team in the first 10-14 days of baseline participation. These participants will stop receiving notifications and survey prompts and will receive instructions to un-link their Fitbit device.

Participants who fail to maintain protocol during the intervention period will be contacted by a member of the study team with a reminder of the study protocol and will be informed that this may impact their continued study eligibility. If it is determined that the participant will be withdrawn from the study, the participant will be notified of their withdrawal from the study by the research team. The participant will stop receiving notifications and survey prompts and will be sent instructions to un-link their Fitbit device. The participant will be able to keep their Fitbit device.

Should a participant choose to withdraw from research, they will be instructed to send a letter or e-mail to the attention of the Principal Investigator at our 130 East 59th Street office, or to email **p30mbi@northwell.edu**, an e-mail account monitored by IRB-approved members of the research team. Participants will be contacted by a member of the research team confirming their study withdrawal, and to answer any questions the participant may have. The participant will stop receiving notification and survey prompts and will be sent instructions to un-link their Fitbit device. They will be able to keep their Fitbit device. Data collection will stop the business day the letter or e-mail is received. All data up until the receipt date of the letter or e-mail will be included in the research study.

17. RISKS TO SUBJECTS

- *Describe any potential risks and discomforts to the subject (physical, psychological, social, legal, or other) and assess their likelihood and seriousness and whether side effects are reversible. Where appropriate, describe alternative treatments and procedures that might be advantageous to the subjects.*
- *Include risks to others , like sexual partners (if appropriate)*
- *Discuss why the risks to subjects are reasonable in relation to the anticipated benefits and in relation to the importance of the knowledge that may reasonably be expected to results*
- *Describe the procedures for protecting against or minimizing any potential risks, including risks to confidentiality, and assess their likely effectiveness.*

This study poses no greater than minimal risk to participants. Monitoring for adverse side-effects will be performed during the N-of-1 trial. Participants will be encouraged to adhere to the protocol but will also be told that they can discontinue intervention at any time.

It is not uncommon for participants to experience temporary soreness and/or fatigue following low-intensity physical activity (walking) or stretching (yoga). There is always a risk that physical activity can result in musculoskeletal injury. Mindfulness meditation may include experiences that are pleasant, unpleasant, or neutral. It can lead to states of ease, joy, relaxation, peace and a sense of wellbeing. Unpleasant experiences such as agitation, physical discomfort, sleepiness, sadness and anger are also common. Such experiences are usually temporary.

If participants experience discomfort during their intervention sessions, they will be instructed to immediately stop the activity and contact a research coordinator.

There is always a risk of potential emotional distress in answering survey questions examining one's stress levels.

There is also the potential risk of loss of privacy of information pertaining to research material collected by the study. Yet, we will take precautions, described below, to minimize these risks.

We will emphasize to subjects in the intervention arm that they can withdraw from the N-of-1 trial completely at any point, particularly if they experience any concerning side-effects. Participants will be instructed to contact 911 or go to the nearest emergency room in the event of a medical emergency. Adverse events will be reported to the PI, IRB and sponsor as outlined in the DSMP.

Surveys
Should a participant report emotional distress in responding to survey questions, the research coordinators will refer to Dr. Chiuzan, who is responsible for overseeing participants' safety and who will recommend follow-up.

Fitbit
There is no additional risk with using a Fitbit activity monitor for research as compared to using the device as a consumer, including mild skin irritation (i.e. contact dermatitis) which occurs among a small proportion of users. Participants will be instructed via the consent form on methods to reduce irritation (e.g. keep the band clean and dry) and that they can remove the band for a short period of time.

Loss of Confidentiality or Privacy
All subjects will be informed that their responses are confidential and that they may refuse to participate in the project or withdraw at any time without explanation, and that such action will not affect their future interactions with their health care

providers, employment, educational studies, or the research study. The risk of loss of confidentiality will be minimized by securely storing data including PHI in a Northwell-approved database and minimizing the use of PHI. To ensure confidentiality, all data containing personal identifiers, and used to track contact with patients, will be kept in a secure, password-protected, encrypted Northwell-approved database. No paper documents with personal identifiers will be kept. The PI will be responsible for ensuring that the confidentiality of the data is maintained at all times. All data will be obtained specifically for research purposes.

Personal or identifiable information is not stored on any of the devices used in this study. No information about the participants or the participants' health history will be shared with Fitbit, except for the information the participants directly share themselves should they choose to use the device for personal use at the conclusion of the study. There is no additional risk with using Fitbit as part of this research study as compared to using the device as a consumer.

18. RESEARCH RELATED HARM/INJURY

- *Describe the availability of medical or psychological resources that subjects might need as a result of anticipated problems that may be known to be associated with the research.*
- *If the research is greater than minimal risk, explain any medical treatments that are available if research-related injury occurs, who will provide it, what will be provided, and who will pay for it.*

Research-related injuries are not expected for this "no greater than minimal risk" project.

19. POTENTIAL BENEFIT TO SUBJECTS

- *Explain what benefits might be derived from participation in the study, noting in particular the benefit over standard treatment (e.g. a once-a-day administration instead of four times a day, an oral formulation over an IV administration).*
- *Also state if there are no known benefits to subjects, but detail the value of knowledge to be gained*

Although not a primary endpoint, participants randomized to the intervention may receive an indirect benefit, i.e., they may gain a better understanding of MBI components impact their sleep duration, and the impact of perceived stress levels on their sleep duration. This may result in their being more satisfied with their

sleep quality wellness regimen and in achieving reduced sleep disturbance symptoms. Through pooling N-of-1 trial data, a greater understanding of the effectiveness of MBI on sleep duration. This knowledge may contribute to the incorporation of N-of-1 trials into the clinical practice of sleep quality management. Additionally, the information collected from participant involvement will inform the development of future personalized trials to help other research participants and eventually patients discover which wellness options are best for them as an individual.

20. PROVISIONS TO PROTECT PRIVACY INTERESTS OF SUBJECTS

- *Describe the methods used to identify potential research subjects, obtain consent and gather information about subjects to ensure that their privacy is not invaded.*
- *In addition consider privacy protections that may be needed due to communications with subjects (such as phone messages or mail).*

Names and email addresses from potential study participants will not be collected until they have read through web information explaining the research study and protocol and indicated their interest in the study. This information will be stored in a Northwell-approved database drive to store PHI, and it will only be accessible to research staff listed on the approved IRB protocol. Names or other identifying information will not be shared with those outside the research team, except as indicated in the "Data Management and Confidentiality" section above for the purposes of sending research communications. Phone numbers and email will only be used for study-related communications, and employees will be contacted outside the study for future research opportunities only as indicated in the consent document.

21. COSTS TO SUBJECTS

- *Describe any foreseeable costs that subjects may incur through participation in the research*
- *Indicate whether research procedures will be billed to insurance or paid for by the research study.*

This research study is funded by the National Institutes for Aging (NIA). All study devices will be provided to participants at no cost. Participant insurance will not be billed.

This study uses text messaging to deliver notifications, reminders, and study questionnaires. Standard message and data rates from the participant's wireless carrier may apply to the study participant. Study participants will not be compensated for any costs related to data usage or sending or receiving text messages by the study or by members of the study team.

22. PAYMENT TO SUBJECTS

- *Describe the amount of payment to subjects, in what form payment will be received and the timing of the payments.*

Study participants who successfully complete baseline will be able to keep their Fitbit device (value $150). Participants who complete all study activities will receive a $50 ClinCard as compensation.

23. CONSENT PROCESS

If obtaining consent for this study, describe:

- *Who will be obtaining consent*
- *Where consent will be obtained*
- *Any waiting period available between informing the prospective participant and obtaining consent*
- *Steps that will be taken to assure the participants' understanding*
- *Any tools that will be utilized during the consent process*
- *Information about how the consent will be documented in writing. If using a standard consent form, indicate such.*
- *Procedures for maintaining informed consent.*

Consent and written authorization will be obtained electronically via REDCap with a copy of the electronically signed form sent to the participants with their study instructions and devices. Before being sent a copy of the consent form, potential participants will view a brief summary of the study, complete a written authorization form, and complete initial screening forms. If a prospective participant is deemed ineligible, or if the potential participant is eligible but needs to be waitlisted due to demand, the consenting coordinator will notify the potential participant via text within 2 business days of the initial completion date of the pre-screen. If the potential participant is deemed eligible, potential participants will opt in or out of having a 30-minute virtual call to go over study details with a consenting coordinator and have the opportunity to have any of their questions answered. After the phone call takes place, the consenting coordinator will send the potential participant a link to read and electronically sign the consent form. If the participant opts out of having the call, they will be sent a link to read and electronically sign the consent form. Included at the link sent to participants who opted in and out of the call will be a short, animated video that explains key aspects of the protocol and consent process. Included in these materials will

be contact information to reach a consenting coordinator to answer any additional questions they have before signing the consent form. In order for the consent form to be signed and submitted successfully, potential participants will need to correctly answer 4 questions about the protocol to demonstrate their understanding. PDF versions of signed consent forms will be maintained electronically on a HIPAA-compliant, Northwell Health-approved share drive, accessible only to members of the research team listed on the IRB protocol. A copy of the consent form and signed signature page will be sent to the potential participant along with their baseline study material.

In the state of NY, any participants under the age of 18 are considered children. If your study involves children, additional information should be provided to describe:

- *How parental permission will be obtained*
- *From how many parents will parental permission be obtained*
- *Whether permission will be obtained from individuals other than parents, and if so, who will be allowed to provide permission. The process used to determine these individual's authority to consent for the child should be provided*
- *Whether or not assent will be obtained from the child*
- *How will assent be documented*
- *Whether child subjects may be expected to attain legal age to consent to the procedures for research prior to the completion of their participation in the research. If so, describe the process that will be used to obtain their legal consent to continue participation in the study. Indicate what will occur if consent is not obtained from the now-adult subjects.*

N/A

If the study involves cognitively impaired adults, additional information should be provided to describe:

- *The process to determine whether an individual is capable of consent*
- *Indicate who will make this assessment*
- *The plan should indicate that documentation of the determination and assessment will be placed in the medical record, when applicable, in addition to the research record.*
- *If permission of a legally authorized representative will be obtained,*
  - *list the individuals from who permission will be obtained in order of priority*
  - *Describe the process for assent of subjects; indicate whether assent will be required of all, some or none of the subjects. If some, which subjects will be required to assent and which will not.*
  - *If assent will not be obtained from some or all subjects, provide an explanation as to why not*
  - *Describe whether assent will be documented and the process to document assent*

- *Indicate if the subject could regain capacity and at what point you would obtain their consent for continued participation in the study*

N/A

If the study will enroll non-English speaking subjects:

- *Indicate what language(s) other than English are understood by prospective subjects or representatives*
- *Indicate whether or not consent forms will be translated into a language other than English*
- *Describe the process to ensure that the oral and written information provided to those subjects will be in that language*
- *If non-English speaking subjects will be excluded, provide a justification for doing so*

Presently we hope to collect enough information to justify that this methodology offers a scalable, and efficacious means of supporting sleep health in women who are health care workers, and that this pilot will provide data to support larger clinical trials designed to assess efficacy of the given interventions. Injustice has no place in research with human subjects and undermines public trust in science, thus we are committed to enrolling a racially and ethnically diverse population in this protocol and for all research conducted by the Institute for Health System Science. Towards that commitment, we anticipate that many participants interested in this current research project will represent racial and ethnic minority groups, and we intend to advertise the research without restriction. Race and ethnicity (not just English proficiency) are strongly correlated with access to care, environmental exposures, income, employment, and other social determinants of health, which, by definition, affect health outcomes. We will collect information on all of these factors to help inform virtual research delivery and do not believe that focusing on native English speaking participants in this pilot study - those that may be from ethnically and racially diverse populations - will confirm pre-existing bias or will later negatively impact equitable access, participant comprehensibility or research design applicability to the diverse populations that may be solicited for participation in future clinical trials run under an N-of-1 design.

24. WAIVER OR ALTERATION OF THE CONSENT PROCESS ☒

Complete this section if you are seeking an alteration or complete waiver of the consent process.

- *Describe the possible risks of harm to the subjects involved in this study and explain why the study involves no more than minimal risk to the subject:*
- *Explain why the waiver/ alteration will not adversely affect the rights and welfare of subjects*
- *Explain why it is impracticable to conduct this research if informed consent is required*
- *Explain why it is not possible to conduct this research without using the information or biospecimens in an identifiable form*
- *If appropriate, explain how the subjects will be provided with additional pertinent information after participation. If not appropriate to do so, explain why.*

Since the consent process will be remote and self-directed, it is not practical or feasible for the investigator to sign the consent form in RedCap. As such, we request a **waiver of the investigator's signature** for this research which is no greater than minimal risk. Individuals are encouraged to reach out to the study team via email and/or a direct phone line if they have any questions and prior to signing the consent form.

Complete this section if you are obtaining informed consent but you are requesting a waiver of the documentation of consent (i.e., verbal consent will be obtained). *To proceed with a waiver based on these criteria, each subject must be asked whether they wish to have documentation linking them to this study.* ***Only complete subsection 1 OR subsection 2.***

SUBSECTION 1

- *Explain how the only record linking the subject to the research would be the consent document.*
- *Explain how the principal risk of this study would be the potential harm resulting from a breach in the confidentiality*
- *Indicate whether or not subjects will be provided with a written statement regarding the research.*

SUBSECTION 2

- *Describe the possible risks of harm to the subjects involved in this study and explain why the study involves no more than minimal risk.*
- *Confirm that the research only involves procedure for which consent is not normally required outside the research context.*
- *Indicate whether or not subjects will be provided with a written statement regarding the research.*

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25. WAIVER OF HIPAA AUTHORIZATION ☒ N/A

Complete this section if you seek to obtain a full waiver of HIPAA authorization to use and/or disclose protected health information.

- *Describe the risks to privacy involved in this study and explain why the study involves no more than minimal risk to privacy:*
- *Describe your plan to protect identifiers from improper use or disclosure and to destroy them at the earliest time.*
- *Indicate why it is not possible to seek subjects' authorization for use or disclosure of PHI.*
- *Indicate why it is not possible to conduct this research without use or disclosure of the PHI.*
- *Indicate if PHI will be disclosed outside NSLIJ Health System, and if so, to whom. Note: PHI disclosed outside NSLIJ Health System, without HIPAA authorization needs to be tracked. Please see guidance at www.nslij.com/irb for information about tracking disclosures.*

☐

Complete this section if you seek to obtain a partial waiver of the patient's authorization for screening/recruitment purposes *(i.e., the researcher does not have access to patient records as s/he is not part of the covered entity)*

Note: Information collected through a partial waiver for recruitment cannot be shared or disclosed to any other person or entity.

- *Describe how data will be collected and used:*
- *Indicate why you need the PHI (e.g.PHI is required to determine eligibility, identifiers are necessary to contact the individual to discuss participation, other)*
- *Indicate why the research cannot practicably be conducted without the partial waiver (e.g. no access to medical records or contact information of the targeted population, no treating clinician to assist in recruitment of the study population, other)*

☐

26. VULNERABLE POPULATIONS:

Indicate whether you will include any of these vulnerable populations. If indicated, submit the appropriate appendix to the IRB for review:

☐ *Children or viable neonate*
☐ *Cognitively impaired*
☐ *Pregnant Women, Fetuses or neonates of uncertain viability or nonviable*
☐ *Prisoners*
☒ *NSLIJ Employees, residents, fellows, etc*

☐ *poor/uninsured*
☐ *Students*
☒ *Minorities*
☐ *Elderly*
☐ *Healthy Controls*

If any of these populations are included in the study, describe additional safeguards that will be used to protect their rights and welfare.

This study is enrolling health care workers. Individuals with a supervisory relationship over an employee will not enroll any individual who reports to them in this study. Employee participation or non-participation in this study will have no bearing on an individual's position at Northwell Health.

We do not intend to prevent study personnel or other employees of the Institute of Health System Science who express an interest in the research from participating. However, no supervisory personnel will be able to enroll participants who report to them in this research. We are not intentionally targeting minorities but expect minorities to be part of those eligible for participation.

27. MULTI-SITE HUMAN RESEARCH (COORDINATING CENTER)

If this is a multi-site study where you are the lead investigator, describe the management of information (e.g. results, new information, unanticipated problems involving risks to subjects or others, or protocol modifications) among sites to protect subjects.

N/A

28. REFERENCES/BIBIOGRAPHY

Provide a reasonable list of references directly related to the study. Any diagrams for new medical devices or brief reprints from journals might also prove useful.

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