Study title: We-PAP: A Couples-based Intervention for Sleep Apnea

NCT 04759157

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1. **Study Purposes and Objectives:**

The objectives should be stated in such a way that the reader can determine the appropriateness of the study design. If appropriate, state the specific hypotheses being tested and/or study aims. Use lay language.

The purpose of this study is to develop, refine and evaluate the feasibility of a novel couples-based intervention to improve adherence for patients with OSA.

Aims and Hypotheses Aim 1: To develop and refine the treatment and training materials for the We-PAP intervention, and pilot test treatment modules. The development phase includes adaptation of the existing transdiagnostic sleep and circadian program materials for our target population (patients with OSA and partners), development of study manuals, session and training materials, and patient handouts. The refinement phase will consist of focus groups with key stakeholders and a field test in 4 couples in order to make adjustments prior to the randomized pilot trial.

Aim 2: To evaluate the feasibility, treatment satisfaction and preliminary efficacy of We-PAP versus IC in a sample of 40 OSA patients and their partners (i.e., 20 couples per treatment arm). Feasibility measures include completion and ratings of treatment satisfaction. Outcomes including PAP adherence (primary, patient only), and patient and partners' sleep (actigraphy and diary-assessed), relationship quality, quality of life (QOL), and cognitive function measured at baseline (prior to initiation of PAP treatment) and at 3 months follow-up. Hypothesis: We predict that patients in the WePAP intervention will demonstrate higher PAP adherence compared to the IC at 3 months. We also hypothesize that patients and partners will demonstrate better self-reported and objective sleep quality and greater improvement in other patient reported outcomes such as quality of life.

1. **Background and Introduction:**

Identify the research area being studied and provide a review of the literature that provides the basis for understanding the objectives of the study. This review should be written such that scientists outside the investigator's area of expertise can understand the issues involved. Any information about previous research related to this study involving animals and/or humans should be summarized. Include studies on pregnant animals if the research is conducted on pregnant women, fetuses, or neonates.

Background: OSA poses a major public health burden that disproportionately affects older adults. OSA is associated with significant morbidity, poor quality of life (QOL), as well as increased all-cause mortality. The first-line treatment for OSA, positive airway pressure (PAP) but up to 50% of OSA patients discontinue PAP treatment within the first week of treatment and up to 80% are non-adherent, (defined as >= 4 hr use per night)9. Efforts to improve PAP adherence are critical as there is a dose-response relationship between PAP adherence and improvements in health outcomes, including daytime sleepiness, memory and cognition, and hypertension10. Despite the recognition of the importance of social support, PAP adherence treatments remain focused on the individual patient alone. However, sleep is a “shared” behavior for most adults, with 61% of U.S. adults regularly sharing a bed with a bedpartner. Bedpartners of patients with OSA, show reductions in sleep quality, QOL, and poorer relationship satisfaction. There is increasing recognition of the integral role of the bedpartner in every aspect of clinical management of OSA, from identification to treatment and best practice recommendations suggest incorporating the bedpartner into OSA treatment. Despite the strong data linking bedpartners to PAP adherence, only two studies have involved partners in PAP treatment, and none have specifically focused on improving the bedpartner’s sleep quality as well as PAP adherence. We focus our intervention on older adults because OSA and sleep problems are more common in this population and poor sleep is a threat to healthy aging. In this study, we propose to use a transdiagnostic sleep and circadian framework developed by consultant, Dr. Harvey, adapted with a dyadic (i.e., couples) perspective to develop a novel, couples-focused PAP adherence and sleep health intervention called “We-PAP”. A transdiagnostic process is defined as a clinical feature common across more than one disorder. In this case, transdiagnostic processes target PAP education, sleep quality and regularity, circadian issues common to older adults, and the “shared” sleep experience of couples (including negotiating whether to sleep together or apart, as well as managing differing sleep schedules/ routines). As the name implies, “We-PAP” conceptualizes PAP adherence and sleep health of both partners as a shared, couple-level problem that is best treated in the context of the couple and that targets mutually interacting symptoms and behaviors of both partners.

Describe the project objectives and all the procedures that will be conducted for the proposed project (e.g. participant identification, data collection, data analysis, etc.):HELP?

Visit schedule: Baseline (pre-treatment), 1 month (questionnaires only), 3 months post PAP initiation. Participants will receive the 3 intervention sessions between baseline and 1 month.

Study design

Overall design: The overarching hypothesis of this study is that patients and partners who complete the couples based sleep health intervention (We-PAP) will have greater PAP adherence, improvements in sleep and quality of life compared to patients and partners with standard care plus information (IC). In this phase 2 trial, we will be adapting and testing the intervention modules then will conduct a 2-arm randomized controlled trial of the novel We-PAP intervention in comparison to IC.

Couples will be randomized in a 1:1 ratio using a randomization table created by the study statistician (Dr. Baucom). Allocation will be concealed through using the online randomizer module in the RedCap data management system.

The study will be conducted over 20 months. The duration of participation for participants will be 3.5 months. Participants will complete a baseline assessment (pre-treatment), then 3 intervention sessions via telehealth. They will complete questionnaires at 1 month, then complete a final 3 months post treatment initiation assessment. This is a single site trial with multiple recruitment locations at the University of Utah Sleep Center and community clinics in the Salt Lake City area.

Study intervention description: As the name implies, “We-PAP” conceptualizes PAP adherence and sleep health of both partners as a shared, couple-level problem that is best treated in the context of the couple and that targets mutually interacting symptoms and behaviors of both partners. We will use a transdiagnostic sleep and circadian framework, adapted with a dyadic (i.e., couples) perspective to develop a novel, couples-focused PAP adherence and sleep health intervention. A transdiagnostic process is defined as a clinical feature in common across more than one disorder. In this case, transdiagnostic processes target PAP education, sleep quality and regularity, circadian issues common to older adults, and the “shared” sleep experience of couples (including negotiating whether to sleep together or apart, as well as managing differing sleep schedules/ routines) and utilizes Brief Behavioral Treatment for Insomnia (BBTI) to address multi-dimensional sleep health issues in both partners. Patients and partners assigned to the We-PAP intervention will complete 3 video-based therapy sessions together. Session content will be comprised of cross-cutting themes (content present in every session), required modules (presented to all participants in the We-PAP group in sessions 1 and 2) and optional modules. The optional module(s) will be chosen by the interventionist based on the case formulation. If no specific optional modules are needed, the session will focus on anticipating future obstacles and a plan to maintain their gains. During each session, the interventionist will review homework (if applicable), present session content, engage the couple in discussion and planning, assign homework for the next session and provide an overarching summary of the session.

Session content:

Session 1: Shared experience of sleep, introduction to OSA/CPAP, setting shared goals for couples sleep (75 min).

Session 2: Cognitive behavioral techniques for improving poor sleep in the couple (50 min).

Session 3: Managing anxiety (50 min).

Control group description: We will compare our novel We-PAP intervention to a standard information control group (IC), which includes standardized educational materials published by the American Academy of Sleep Medicine. The materials are standardized educational pamphlets that are available at the sleep wake center and provided to patients. In this study we will be mailing out the materials (right now they are usually just available in the waiting room and handed out by some but possibly not all of the doctors)

Session administration: Participants in the We-PAP will receive 3, sessions conducted weekly via Zoom (depending on the couple's comfort with each platform). Given the challenges to recruiting couples, use of telehealth will increase the flexibility for scheduling with couples. For example, they will not need to find child care to attend the session together. The use of telehealth will allow patients and partners to complete the intervention at home or even if the couple is in separate locations. Session content will be presented via a slide presentation and will include videos and testimonials. Patients will also be provided with handouts from the sessions. Patients in the IC group will be mailed a packet of informational materials.

Study assessment and procedure

Screening assessments: Potential patients and partners will complete screening measures over the phone or via a web link to verify inclusion/exclusion criteria including demographics, a medical history and medication use questionnaire and various measures for inclusion/exclusion criteria. Couples where one or both report moderate to severe symptoms of restless legs syndrome on the International Restless Legs Working Group Questionnaire will be excluded. The PROMIS sleep disturbance questionnaire will be used to select participants with poor sleep quality (must be elevated in patient and/or partner for inclusion). Baseline (pretreatment) will be scheduled prior to initiation of PAP at home. Research staff will schedule to conduct this assessment at home or in the behavioral sleep medicine laboratory. The session will include consent, questionnaires, cognitive testing and training on actigraphy.

The 1-month follow-up will include questionnaires only and will be completed online or via phone. Actigraphy will be mailed to the participants and they will complete another 7-10 days wearing the actigraph prior to this visit. The 3-month assessment will be conducted in person and the same procedures from the baseline visit will be repeated. Participants will complete questionnaires, cognitive testing and a post-intervention exit interview. Objective sleep data will be estimated using the Actiwatch Spectrum Plus (Philips Respironics, Murrysville, PA) collected at 1 week prior to PAP initiation, 1-week post PAP initiation and 3-month follow-up. Research staff will set up the watches and instruct participants in their use. Actiwatches will be configured using 30s epochs and

medium sensitivity. The rest period will be calculated by blinded research staff using standardized procedures. The training protocol will ensure that scorers are within an acceptable agreement range before scoring study records. A random sample of 10% of records will be checked for quality control and retraining will be assigned if scoring is not within 90% of the values determined by the co-PI. Participants will be provided with verbal and written instructions as well as links to youtube.com videos with demonstrations. Participants will wear the Actiwatches for 7-10 days in order to maximize the possibility of collecting 7 nights. Data will be considered valid if there are at least 5 nights. After the watches are retrieved, research staff will use the Actiware software program to calculate the following variables: total sleep time, sleep onset time, sleep offset time, sleep duration, sleep efficiency, sleep latency, wake after sleep onset, and sleep fragmentation index. The Actiwatch will be administered with a sleep diary to assist in scoring the rest interval. Cognitive measures administered at baseline and 3-month follow-up include the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS). We will also administer the cognitive difficulties scale to assess for selfreported cognitive problems. Other self-report questionnaires administered at baseline, 1-month and 3-months include: Self-efficacy for sleep apnea, functional outcomes of sleep questionnaire, the Couple Satisfaction Index, PAP tactics questionnaire, PROMIS sleep related impairment, Epworth Sleepiness Scale. Feasibility and acceptability measures: We will use a combination of quantitative and qualitative measures. Outcomes include percentage of participants completing intervention sessions, ratings of ease of participation in the telehealth, questions about the number and duration of sessions, perceived benefits of the intervention and enjoyment of the sessions. We will also ask open ended questions about the format, feedback on the content, materials and general feedback and suggestions for improving the interventions.

Measures

Screening: Potential patients and partners will complete screening measures over the phone or via a web link to verify inclusion/exclusion criteria including demographics, a medical history and medication use questionnaire and various measures for inclusion/exclusion criteria (e.g., sleep disturbance).

Sleep: Objective sleep duration and sleep efficiency (as an indicator of sleep fragmentation) will be measured via wrist actigraphy (Actiwatch Spectrum, Phillips Respironics, Murrysville, PA). Self-reported sleep will be measured using a standardized sleep diary and the PROMIS sleep disturbance questionnaire.

PAP adherence will be recorded by the patient's PAP machine and remotely downloaded via the web. We will measure PAP adherence continuously. The main time point for adherence is at 3 months. We will record the average duration of use per night, % of nights with use >4 hours, and nights skipped.

Cognitive measures include the Repeatable Battery for Assessment of Neuropsychological Status (RBANS). This validated clinical tool assesses 5 domains

and has two versions (A and B) and will be used to assess cognitive function at baseline and 3-month follow-up94. We will also administer the cognitive difficulties scale.

Other important self-report measures: Couples satisfaction index (4 item), quality of relationships inventory, items from the conflict subscale and the PAP tactics questionnaire (7 most common items will be administered), self-efficacy for sleep apnea, functional outcomes of sleep, PROMIS sleep related impairment, Epworth Sleepiness Scale, patient health questionnaire 8-item, cognitive failures questionnaire, 14-item .

Feasibility and acceptability measures: We will use a combination of quantitative and qualitative measures including intervention completion, patient satisfaction ratings and open-ended responses (attached in the documents section).

5. Characteristics of Participants/Inclusion Criteria: HELP?

Participant-entry criteria should be as detailed as necessary to define the participant population under study and, for clinical studies, to reduce confounding treatments or diseases. Precise criteria for age, gender, or another other factors (e.g. diagnoses, extremes in signs or symptoms, etc.) should be included.

Focus group inclusion:

Two focus groups will be patients and partners: Men and women who are partnered or married and share a bed >=3 nights per week in which one of the couple has OSA. One focus group will be comprised of providers at the University of Utah Sleep Wake Center, able to read and write in English.

Field trial and RCT inclusion:

Patient and partner inclusion criteria: 1) Age >=50; 2) Access to cellular (active data plan) or Wi-Fi, in order to complete the telehealth intervention.

Patients inclusion criteria: 1) Diagnosed with OSA (AHI>10 or AHI>5 with impairment) and intend to start PAP treatment; 2) PAP naïve, re-starting PAP after failed compliance or low adherence (<4 hours per night) 3) Married or cohabiting with a romantic partner for >1 year; 4) Able to read/write English.

Partner inclusion criteria: 1) Able to read/write English. 2) Interested in improving their sleep,

Provider group criteria: Provider or staff at the University of Utah Sleep Center or affiliated clinics.

Mild Cognitive Impairment inclusion:

Referred from existing studies in Dr. Duff's lab. Diagnosed with mild cognitive impairment, able to read and write in English, diagnosed with obstructive sleep apnea and tried positive pressure therapy for at least 1 week. Participants with mild cognitive impairment are experiencing the early stages of memory loss. They are independent in most or all of their daily activities and able to provide consent for this study.

6. Participant Exclusion Criteria: HELP?

Specific exclusion criteria should be listed which could interfere with the study design or place a participant at risk during the study. If no exclusion criteria, please state "None."

Focus groups exclusion criteria: none

Field trial and RCT exclusion criteria:

Patient only exclusion criteria: Concomitant OSA treatments (bariatric surgery planned in the next 3 months or bariatric surgery in the past year, ear nose and throat surgery for sleep apnea occurring in the 3 months before or planning for within the study period).

Exclusion criteria for both patient and partner include the following: 1) High risk or presence of severe comorbid sleep disorders (i.e., restless legs syndrome); 2) History of cognitive or neurological disorders (e.g., dementia, Parkinson's, Multiple Sclerosis); 3) Presence of major psychiatric disorders (e.g., schizophrenia, bipolar disorder), alcohol abuse reported on the Audit-C (score >4 for men, >3 for women), drug use (NIDA-Modified ASSIST score >3); 4) Unstable or serious medical illness that would interfere with participation (cancer, renal disease on dialysis, moderate to severe COPD);5) Use of ASV, VPAP or supplemental oxygen, 6) Overnight work > 1x per month; 7) Pregnancy/ desire to become pregnant in the study period; 8) Current participation in behavioral sleep treatment (e.g., CBT-I) or completion of CBT-I in the past 3 years; 9) Concurrent participation in another clinical trial; 10) Caregiving for an infant < 2 years old or adult who requires overnight assistance. To enhance generalizability, we will not exclude patients or partners on stable doses (>8 weeks) of sleep or psychiatric medications but we will assess medication change at follow-up. Exclusion criteria for both patient and partner include the following: 1) High risk or presence of moderate to severe comorbid sleep disorders (i.e., restless legs syndrome); 2)

History of cognitive or neurological disorders (e.g., dementia, Parkinson's, Multiple Sclerosis); 3) Presence of major psychiatric disorders (e.g., schizophrenia, bipolar disorder), alcohol abuse on the Audit-C (score >4 for men, >3 for women), drug use on the NIDA-Modified ASSIST (score >3); severe depressive symptoms (Patient Health Questionnaire, PHQ-8 >20); 4) Unstable or serious medical illness that would interfere with participation (cancer, renal disease on dialysis, moderate to severe COPD); 5) Overnight work > 1x per month; 6) Pregnancy/desire to become pregnant in the study period; 7) Current participation in behavioral sleep treatment (e.g. CBT-I); 8) Caregiving for an infant < 2 years old or adult who requires overnight assistance. To enhance generalizability, we will not exclude patients or partners on stable doses (>8 weeks) of sleep or psychiatric medications but we will assess medication change at follow-up.

Mild cognitive impairment exclusion:

Unstable or serious medical or psychiatric conditions that would interfere with ability to participate in the study.