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Beliefs and Attitudes Toward Obstructive Sleep Apnea Evaluation and Treatment Among Blacks

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Abstract

Objective—Although blacks are at higher risk for obstructive sleep apnea (OSA), they are not as likely as their white counterparts to receive OSA evaluation and treatment. This study assessed knowledge, beliefs, and attitudes towards OSA evaluation and treatment among blacks residing in Brooklyn, New York.

Methods—Five focus groups involving 39 black men and women (aged 18 years) were conducted at the State University of New York (SUNY) Downstate Medical Center in Brooklyn to ascertain barriers preventing or delaying OSA evaluation and treatment.

Results—Misconceptions about sleep apnea were a common theme that emerged from participants' responses. Obstructive sleep apnea was often viewed as a type of insomnia, an age-related phenomenon, and as being caused by certain bedtime activities. The major theme that emerged about barriers to OSA evaluation was unfamiliarity with the study environment. Barriers were categorized as: problems sleeping in a strange and unfamiliar environment, unfamiliarity with the study protocol, and fear of being watched while sleeping. Barriers to continuous positive airway pressure (CPAP) treatment adoption were related to the confining nature of the device, discomfort wearing a mask while they slept, and concerns about their partner's perceptions of treatment.

Conclusion—Results of this study suggest potential avenues for interventions to increase adherence to recommended evaluation and treatment of OSA. Potential strategies include reducing misconceptions about OSA, increasing awareness of OSA in vulnerable communities, familiarizing patients and their partners with laboratory procedures used to diagnose and treat OSA. We propose that these strategies should be used to inform the development of culturally and linguistically tailored sleep apnea interventions to increase awareness of OSA among blacks who are at risk for OSA and associated comorbidities.

Keywords

focus group; sleep apnea; African Americans; knowledge, attitudes, and beliefs

INTRODUCTION

Obstructive sleep apnea (OSA) is a condition characterized by various episodes of decreased airflow during sleep due to repetitive complete or partial obstruction of the upper airway lasting at least 10 seconds.¹ In the United States, the prevalence of OSA is estimated at approximately 3% to 4% in men and 2% in women.¹ This is a public health concern given the associated health risks and the impact on the health care system.

Blacks are at higher risk for OSA. In a case-control family study, Redline et al showed an increased risk of sleep apnea among young blacks (<25 years).² In another study, conducted among community-dwelling elderly people-, blacks had a 2-fold greater relative risk, compared with their white counterparts, of experiencing moderate to severe sleep apnea.³ OSA has been associated with increased risk of hypertension,^{4,5} type 2 diabetes,⁴ stroke,⁶ coronary artery disease,⁷ and overall increased cardiovascular mortality⁸ Additionally, several studies have shown that patients with OSA utilize health care resources almost twice as much as control patients do; participants were matched for age, gender, and area of residency¹ In view of the public health impact of OSA, it is now recommended that routine medical screening include OSA, especially among patients with comorbid conditions.⁹

Available evidence suggests that prompt recognition of patients at risk for OSA and referral for evaluation and treatment is of public health importance. Timely detection and treatment of OSA are supported by several clinical trials that have demonstrated that, in people with moderate to severe sleep apnea, continuous positive airway pressure (CPAP) can improve measures of sleepiness, affect, quality of life, and associated daytime sleepiness. CPAP has also been found to lower blood pressure, decrease stroke risk and decrease glucose levels type 2 diabetes patients.⁹⁻¹¹

Despite having a greater risk for OSA and having a greater burden of comorbid conditions, blacks are less likely to undergo sleep apnea assessment and to adhere to CPAP therapy, compared to their white counterparts.¹² Previous research has shown that only 38% of blacks adhered to physician-recommended OSA evaluation.¹² Regarding treatment adherence, blacks were 5.5 half times more likely to be nonadherent than whites, after controlling for sex and body mass index.¹³ The rate of adherence to CPAP ranges from 38% to 47% when *adherence* is defined by at least 4 hours of CPAP nightly over a 7-day recording period.¹⁴ On average, blacks have lower mean hours of usage of CPAP¹⁵ Reasons for poor adherence in general include lower outcome expectancy, perceived risks, and early negative experience with the treatment.¹⁵ In addition to lower rates of adherence to OSA treatment, studies also suggest that blacks have more severe OSA and tend to be younger at the age of diagnosis, which makes them particularly vulnerable to poor health outcomes.¹⁶

Disparities in evaluation and treatment of OSA may mirror what is known about blacks regarding underutilization of health care services. In general, blacks have lower screening rates for medical conditions, even after controlling for known predictors such as insurance status.¹² These disparities may be mediated, in part, by patients' beliefs and attitudes towards disease and treatment.¹⁷ This has been established for other health conditions—notably, high blood pressure treatment adherence,^{18,19} HIV therapy adherence,^{20,21} utilization of health services,²² and colorectal cancer screening.²³ Few studies have investigated patients' perception about sleep apnea evaluation and treatment specifically in blacks, a population at great risk for OSA and related medical and psychosocial conditions.

The objectives of this study were 2-fold: (1) to assess knowledge, beliefs, and attitudes regarding *obstructive sleep apnea* and (2) to identify barriers toward OSA evaluation and treatment among blacks. The results presented in this paper are from the formative phase of a larger NIH-funded project to develop and implement a culturally tailored, telephone-

delivered behavioral intervention to improve adherence to recommended OSA treatment among at-risk blacks. By identifying the specific beliefs and barriers that prevent black patients from pursuing sleep apnea assessment and treatments, researchers may be able to develop effective interventions, capable of reducing the sleep health disparities observed in this population.

METHODS

Study Area

The study was performed in Brooklyn, New York, where more than 50% of the 2.2 million inhabitants are minorities. Data collection was conducted at the State University of New York Downstate Medical Center (SUNY-DMC), located in the Flatbush neighborhood, a largely low-income, minority community in which 1 in 4 adults is obese, 1 in 3 has been diagnosed with hypertension, and fewer than half participate in physical activity.²⁴

Study Design

A qualitative research design using focus groups was used to elicit an in-depth understanding of the participants' perceptions about OSA and to identify barriers preventing evaluation of OSA and utilization of CPAP. This methodological approach builds on group interaction and is especially valuable for capturing how views are constructed and negotiated.^{25,26}

Sampling of Informants

Participants were recruited from a community-based primary care center located at DMC. (The study was advertised via local postings near the medical center, referral by primary care physicians, and by word of mouth from previous study participants. A convenience sampling approach²⁷ was used to seek out and identify 39 black adults who: (a) were between 18 and 80 years of age, (b) self-identified as having experienced some type of sleep disorder, (c) received primary care services from the family medicine clinic at SUNY-DMC and were willing to share their views about sleep in a confidential group setting. Patients who had previously been treated or screened for sleep apnea were excluded. Follow-up telephone calls were made and participants were offered a \$50 incentive to participate in the study.

Data Collection

The first author (R.S.) performed the data collection over a period of 3 months. Prior to conducting the focus groups, pilot sessions were conducted to develop and test the interview guide and supporting study materials. The questions used in this study were based on Arthur Kleinman's explanatory model of illness and served as a framework to better understand participants' conceptualization of OSA. This framework has been used in previous studies to elicit patients' perspectives of illness.^{28–30} An initial interview guide was developed to elicit participants' perceptions of the etiology, consequences and course of illness, and perceived barriers to evaluation and treatment for OSA. Data collection also included age, gender, education, marital status, employment, and comorbid medical conditions.

A total of 39 participants were enrolled in the study and participated in 5 focus groups, with an average of 8 participants per session. Focus groups were conducted at SUNY-DMC during working hours and were held in a private room with only the participants and interviewers present. All sessions were audio recorded and varied in length between 30 to 40 minutes. Initially, 3 focus groups were conducted following a peer-debriefing session to determine whether additions and/or revisions in data collection strategies were necessary.

A facilitator experienced in qualitative research and conducting focus groups led semistructured discussions to explore participants' knowledge, attitudes, and beliefs about sleep, OSA assessment, and treatment. The interview guide explored the participants' general knowledge of sleep and sleep apnea. Then, it gradually explored the perceptions towards sleep apnea treatment using CPAP and sleep apnea evaluation at the participating sleep center (Appendix). For this latter phase, participants were shown pictures and videos of patients using the CPAP device and undergoing polysomnographic recordings.

This methodological approach was based on the diffusion of innovations theory, which describes the adoption of new practices or products and the factors that mediate their diffusion throughout a community.³¹ According to this theory, perceptions of an innovation's characteristics affect how quickly and widely the innovation is adopted. One of such characteristics is compatibility, which represents the beliefs about whether the innovation is consistent with personal values.³³ Application of this theory during intervention planning can help sleep apnea researchers tailor interventions, especially within a sample of patients who are not familiar with the CPAP device and evaluation methods.

Data Analysis

All focus group discussions were recorded and transcribed verbatim. Field notes were also taken for examination of contextual information and general impressions during the sessions. Initial a priori codes were developed to guide the initial coding phase of the analysis. Emerging themes were identified through the peer review process and led to the development of a coding book. The final phase of the analysis was guided by grounded theory.³⁵ The final data were uploaded into NVivo software (version 8, QSR International, Australia) for coding and qualitative analysis. An example of the analysis process is given in Table 1 and 2, showing a priori and emerging themes with corresponding codes and subcategories. Members of the research team were involved in the coding and analytical phase and contributed to the interpretation of the data based on their differing professional expertise. Peer debriefing sessions were also conducted to minimize bias in the data analysis.

RESULTS

Sample Characteristics

As shown in Table 3, the mean age of the sample was 49 ± 16 years. Fifty-five percent of the sample was female, only 31% had completed high school, 43% were married and, 71% were unemployed. All of the participants had at least 1 comorbidity, with hypertension, high cholesterol, and vision problems having the highest frequency (65% and 38%, respectively) (Table 3).

Perceptions Regarding Definition, Etiology, and Consequences of *Obstructive Sleep Apnea*

Participants' responses about their perceptions of *obstructive sleep apnea* fell into 3 categories: a type of insomnia, an age-related phenomenon, and caused by certain bedtime activities (dietary). Most participants conveyed a general familiarity with the term *obstructive sleep apnea* and understood, based on their description, that it involved some aspect of a sleep disorder. A major concept that emerged was that OSA was synonymous with *insomnia*. The responses were focused on difficulty falling asleep or staying asleep. Some examples of patient responses included, "You keep waking up. You fall off to sleep. And in an hour or 2 hours you're back up again. You try to fall back to sleep." Another participant said "People don't sleep at all, I think." Another example includes: "People [with sleep apnea] don't sleep at all I think ... [it's] something like that [ie, insomnia]."

A few participants commented on altered breathing in their description of sleep apnea; however, these descriptions may be more reflective of other conditions that impact sleep such as primary cardiac or pulmonary conditions. “I’m coughing every hour, every half hour and I wake myself up ... then I ... have to get up ... so I can breathe better because my chest feels like something’s squashing it.” As an example, one participant stated, “With my sleep apnea ... when I do sleep, I wake right up from lack of breathing. There’s no way I can sleep with a closed window.”

Some participants also associated sleep apnea with an age-related phenomenon that was a natural part of aging. Some examples of responses include: “You get old like them and don’t want to sleep no more”; “I don’t think old people sleep too much at night”; or simply, “Them old people don’t sleep.”

Sleep apnea was also associated with having certain bedtime habits such as patterns of eating or activities. For example,

It’s a lot of different foods that trigger it off [making sleep harder]. I wasn’t sleeping for a while, and I kept complaining about it. So what my doctor did, she asked me to stop drinking coffee for a while. I did, but not for long. And then I started drinking tea, which has the same amount of caffeine as brown coffee.

Another example is

I would believe that the people who have sleep apnea are most likely to have acid reflux because when you gain weight, you increase the likelihood of gaining acid reflux ... and when you sleep, and when you drink and gain weight, you increase the likelihood of sleep apnea.

When asked about how sleep apnea can be treated, participants’ descriptions focused on modifying eating habits or activities around bedtime. For example, “I get up, I go down, and I get a cup of tea, piece of cake or something.” Another respondent said “I’m not tired enough to sleep because when I don’t do enough work in the day ... when you work, you clean, you wash, you do that and then you get tired” while another one said:

I feel tired, achy, and then when you go out, you sit someplace and you fall asleep. But when the night comes, you don’t sleep ... You sit there. You finish eating in the evening, television, and then you fall asleep. But, then when you go up now and get ready to go to bed.

Based on these responses, a major theme that emerged was misconception regarding participants’ perception of sleep apnea. Interestingly, despite this misconception, the responses about consequences or impact of sleep apnea were more accurate. Examples include: “tiredness during the day; headache, migraines; heavy migraines that affect your work or the quality of your life, anxiety”; “You get a lower metabolism, higher cholesterol, and higher blood pressure if you don’t get to sleep”; “It’s hard to concentrate [when you do not get enough sleep]. You won’t focus well”; and “You’re nervous [and] jumpy-like.” Despite awareness of the importance of sleep on health, we found low levels of knowledge on good sleep hygiene or common behaviors prior to sleep that may hinder quality sleep, such as excessive daytime napping or consumption of food or caffeinated beverages before sleep.

Environmental Barriers to Evaluation for Obstructive Sleep Apnea

When asked about barriers to having an overnight assessment for sleep apnea, participants’ responses focused on environmental factors such as sleeping in a strange environment, being watched while they sleep, and not having a clear understanding of what the sleep assessment entails. Examples of responses that fell into these categories include: “[It’s a problem] not

being in your regular sleep setting”; “I’m afraid that someone is watching you”; “You’re there all night, and you never fall asleep. That would be me”; “[There is a] fear ... of not knowing what the study entails for sleeping. Like I had to stay in a hospital....I was very apprehensive. I really couldn’t sleep then.”

Physical and Social Barriers to Treatment Adoption of Continuous Positive Airway Pressure

Across all groups, awareness and knowledge of CPAP treatment were very low, as only one of the study participants had ever come into contact with the device, through a relative.

Barriers to adoption of CPAP treatment fell into the following categories; the confining nature of the CPAP machine, duration of treatment, and the impact it would have on sleeping partners. Some participants felt that CPAP was too confining: “It doesn’t look comfortable [wearing a CPAP mask]. Like you sleep with your mouth open”; “Too confining.” Other examples included: “All these things are on you, so you really can’t sleep. You feel uncomfortable with the suction. Like me, for example, I like to toss, turn, and move on my side”; “I don’t like anything on my body. I don’t even like putting my feet under the covers at night. I couldn’t sleep having that mask over my face. I’d be irritated. I don’t like nothing on my body when I sleep”; “I didn’t know it was a device that gets wrapped around. I’d have, like, a panic attack”; “Some people don’t like machines. You feel like you’re in a hospital setting dying. So, you know, people just look at it that way.”

Another concern was the perception that the CPAP device would have to be worn indefinitely: “So that means that there’s no cure for apnea. You have to use that all the time! That machine! For the rest of your life!” Another respondent said: “I have to see one [CPAP machine] every day? Come on now.” There was also a concern about the impact on sleeping partners. One participant stated: “I’m afraid of divorce!”

Despite these barriers to sleep apnea assessment and treatment, a number of participants suggested practical ways to disseminate information about sleep apnea and its treatment within the community. “Organize a group. If you could go in and find out who’s not sleeping and focus on them. “Talking to them [the community], maybe show them somebody who uses it. If I could use it and explain how it feels.”

DISCUSSION

The public health impact of untreated obstructive sleep apnea is well documented. The consequences for blacks are even greater, given their greater underlying comorbidity. In order to develop optimal approaches for increasing the evaluation of sleep apnea and the subsequent adherence to treatment, a greater understanding of factors that influence patients’ medical decision regarding sleep apnea is needed. A major theme that emerged from this study was misconceptions about the meaning of *obstructive sleep apnea*. Participants’ responses reflected the misconception that OSA was synonymous with *insomnia*. This has important implications for treatments. Associating OSA with insomnia may imply to some that the only problem is “staying asleep,” and a more definitive diagnosis or treatment may not be sought or may be delayed. The misconception that OSA is synonymous with *insomnia* may prompt some to seek complementary or herbal remedies rather than consult a physician. One study found that blacks were less likely than whites to obtain a prescription for insomnia; rather, they were more likely to use herbal remedies.³²

Despite the apparent confusion in participants’ definition of the disease, it is important to assert that there has been a documented association between sleep apnea and insomnia. Patients with insomnia often have concomitant OSA. Indeed, in one study, up to 42% of

patients with a diagnosis of OSA also had symptoms of insomnia. In other studies, 29% to 60% of patients presenting with complaints of insomnia were found on subsequent evaluation to have apnea-hypopnea index^{33,34} greater than 5. The high prevalence of comorbid insomnia and OSA has led some authors to suggest that these disorders exacerbate one another and, when left untreated, could present a barrier to effective clinical and therapeutic management of the combined sleep disturbance.³⁵

A closer examination of the manner in which insomnia symptoms were described suggests that these may represent actual symptoms of OSA. Indeed, OSA-associated arousals among people who actually have sleep apnea can appear as symptoms of insomnia.³⁶ Thus, there needs to be greater awareness among physicians of this misconception since they are often the first to whom insomnia complaints are reported. Finally, approximately one-third of adults complain of some type of insomnia, and about 10% to 15% complain of chronic or severe insomnia.^{37,38} The high prevalence of insomnia in the general population and its coexistence with sleep apnea calls for vigilance among all physicians and for public health awareness campaigns. As Punjabi stated it, “primary care physicians and specialists across various medical disciplines should be sufficiently knowledgeable to identify those affected with this disease.”³⁹ Similarly, there has been a documented association between OSA and gastroesophageal reflux disease (GERD), as nighttime reflux can lead to sleep disturbance and sleep disturbance may further aggravate GERD.⁴⁰ Here again, one needs to be cautious when interpreting patients’ “misconceptions,” as reflux symptoms may in fact reflect actual signs of OSA.

Another misconception was that OSA was a natural process of aging. This may also have implications on treatment outcomes by delaying or preventing help-seeking behaviors. The clinical relevance of these beliefs is reinforced by the fact that older adults are more likely to have sleep disturbances, more likely to have sleep apnea, and have higher levels comorbid conditions that could exacerbate OSA.

Another theme that emerged about participant’s beliefs about OSA is that it was caused by eating certain foods, eating too late or immediately before bedtime, or not doing enough activities during the day and therefore not being tired enough at the end of the day. The implications are that participants also reported attempts to improve this by eating more (unhealthy snacks such as cake) or doing more during the day in order to be more tired at night. These efforts may be counterproductive and may exacerbate weight gain, which may worsen insomnia symptom and/or OSA.⁴¹ Participants also felt that they had to increase their activities before bedtime in an effort to make themselves tired. This finding may help explain the 2010 Sleep in America poll released by the National Sleep Foundation finding that blacks report greater activity the hour before bedtime than other racial and ethnic groups. Thus, these findings suggest the need for greater public health awareness about sleep hygiene in general as well as sleep apnea in particular.⁴² Despite the misconceptions about the definition and etiology of *obstructive sleep apnea*, participants in general had more adequate perceptions of consequences of OSA such as fatigue, irritability, and difficulty concentrating. However, they did not describe the more serious long-term cardiovascular impacts of OSA such as stroke, hypertension, coronary artery disease, and heart failure.^{43,44} This represents an opportunity for increasing awareness about the long-term consequences of sleep apnea.

With regard to barriers to evaluation for sleep apnea, a major theme was a general unfamiliarity with the study environment or setting. When the laboratory setting was described to patients, some felt the environment in which the diagnostic procedures were conducted posed a barrier to pursuing a sleep evaluation. Participants described undergoing the study in the unfamiliar environment that represents the hospital, as being nonconductive

to falling asleep. Participants also described concerns about being “watched” as they sleep. Most felt uncomfortable about sleeping in a strange bed at the hospital and expressed the concern that abuses might occur while they are asleep. This might reflect the issue of medical mistrust.

One aftermath of the Tuskegee Syphilis study is that African Americans have expressed a distrust toward medical research and the medical community in general.⁴⁵ In the field of sleep and mental health services, researchers have shown that African Americans’ mistrust of the medical community could explain the discrepancies in health services utilization.⁴⁶ Sleep specialists should try to use sleep assessment tools that will be perceived as less foreign, such as home and ambulatory portable monitors. In this instance, devices such as the ApneaLINK Home Test have been shown to be an accurate and cost-effective alternative to the standard polysomnography.⁴⁷

The barriers to the adoption and potential adherence to sleep apnea treatment appear to be a combination of functional and interpersonal concerns. Many stated their apprehension to sleeping all night with “wires” and a mask, while others were concerned about the effect that wearing the apparatus might have on their sleep partners. These results mirror the findings of Broström et al, who conducted a qualitative study on CPAP adherence consisting of in-depth interviews with 23 purposively selected patients. This study identified negative psychological effects of the equipment and negative attitudes to CPAP treatment as putative barriers to treatment adherence.⁴⁸ Furthermore, studies have shown that decisions to use CPAP are individualized and are at least in part dependent on the patient’s support environment and early experiences with and beliefs about CPAP.⁴⁹ Increasing familiarity with CPAP during a test trial period may increase adherence. The involvement of patient’s sleeping partner is also important, as participants also described the impact on relationship as a potential barrier.

One key limitation of the study was related to the convenience sampling method used to recruit the participants. Although this technique has the advantage of being fast and easy to implement, it presents high risks of systematic bias and lack of generalizability of the results.²⁷ However, the main goal of a focus group is to generate insights on human behavior. This does not necessarily lead to the possibility of generalizations as in a survey research, for example.⁵⁰ In order for focus groups to yield insightful results, one of the most important factors in selecting the sample resides in its homogeneity. The respondents must have some common interest they can establish, be it in background, product use, and attitudes to help them form themselves into a group.⁵¹ By filtering patients based on ethnicity, prior attendance of our primary care clinic, and previous incidence of a sleep disorder, the authors intended to create small groups that mirrored the community they wanted to study.

Finally, another limitation of this study related to the lack of representation of other racial and ethnic groups. This limits the ability to explore variations in themes, as they may not be unique to black patients and may reflect larger social or cultural phenomena. Notwithstanding these limitations, this study has implications for improving the rates of follow-up for sleep studies as well as for improving adherence to CPAP treatment. Increasing awareness and knowledge can help patients understand the health implications of OSA. This can be done at the community level through public health awareness campaigns or during individual doctor-patient encounters.

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Appendix. Interview Guide

Sleep Practices and Attitudes Questionnaire	
TOPICS OUTLINE	
I. Knowledge of sleep	
<i>Moderator acknowledges, greets participants and presents the study:</i>	
	<ul style="list-style-type: none"> • Distributes name tags • Explains to the participants why they have been selected. • Confidentiality: reiterates the fact that all personal information and views shared in the course of this study will stay confidential.
Q1:	<i>Intro, icebreaker:</i> Hi everybody! Today we are going to talk about sleep wellness. How many hours of sleep do you need to feel well during the day? <i>Ask each participant to give their name and a number of hours.</i>
Q2:	How many hours of sleep should someone get in a night?
Q3:	What can happen when people do not get enough sleep? <i>Probe if necessary for specific medical conditions.</i>
Q4:	How about people's ability to work? How can it be affected by the lack of sleep? <i>Follow up:</i> What type of activities would be the most affected by a lack of sleep
Q5:	Research has shown that the lack of sleep can affect men sexual function and lead to conditions such as ... erectile dysfunction. <i>Follow up:</i> Does anyone know people who have experienced that?
Q6:	What do you think can make sleeping easier or harder? <i>Probe:</i> What could people do to improve their sleep?
Q7:	Where do you think people get that information from? Source? <i>Probe using name tags doctor's office, TV, news, programs, or commercials, friends, radio</i>
Q8:	How could we best share this information about sleep with people in the community? How could we raise awareness about sleep wellness in the community?
II. Sleep apnea and treatment	

Sleep Practices and Attitudes Questionnaire

Q9: Who has heard the expression sleep apnea before this meeting?

Follow up: What is sleep apnea and what are the consequences?

LISTEN for

- Large belly
- Diabetes
- High blood pressure
- Choking or gasping during sleep
- Snoring

PROBE IF NECESSARY

Moderator explains sleep apnea.

Q10: Why is it important to treat sleep apnea?

Q11 Doctors have developed these tests (sleep studies) that take place in a sleep lab at night and record what happens during your sleep.

Moderator will show a picture of the sleep disorder center and ask for the participants comments.

How comfortable would you be participating a study?

Q12: What could make it easier for you to participate in this study?

Probe (specific barriers to sleep studies): Remember your last doctor appointment, what made you want to go and/or to cancel your appointment?

Q13 The researchers have also developed this machine (CPAP), which is mask that the patients wear at night in order to treat sleep apnea.

Moderator will show a sample of CPAP

- What does this machine make you think of?
Moderator will gather the “associations” evoked by the participants related to the CPAP.
- Would you be will willing to use this mask? Why or why not?
- What would make you more likely to use this mask?

CONCLUSION

Q14: Is there anything else that you would like to add?

Figure.
Percentage of Comorbid Conditions in Study Sample

Table 1

Code Book, a priori Codes

No.	Code Name	Notes/Description	Subcode
Q2	No. of hours I sleep	Actual number will be quantified later	
Q3	No. of hours of sleep that I <i>need</i>	Perception of how much sleep they need to function. This is what they would consider the minimum amount of sleep needed.	
Q4	No. of hours of sleep that most people get	Perception of what is considered a “normal” amount of sleep	
Q5	Importance of sleep	Effects of good sleep	
Q6	Effects of lack of sleep		<ul style="list-style-type: none"> Physical (eg, sluggishness) Emotional/Psychological Interpersonal (relationships) function
Q7	Effects of lack of sleep on work		<ul style="list-style-type: none"> Lack of concentration Decreased productivity Lateness/tardiness Daytime sleepiness
Q8	Activities affected by lack of sleep		<ul style="list-style-type: none"> Cognitive/thinking activities Repetitive tasks Detailed work
Q9	Impact of lack of sleep on men’s sexual function		
Q10	What makes sleeping easier?	Strategies to improve sleep	Activity, TV (makes me sleep), meditation
Q11	What makes sleeping harder or more difficult to attain?		<ul style="list-style-type: none"> Pain Bladder problem Personal explanations
Q12	Source of information about sleep or how to improve sleep		Doctor , television, radio, family, friends
Q13	How to share information with community	How to raise awareness	
Q14	Knowledge of apnea	Which includes: what is sleep apnea? What are the symptoms?	
Q15	What are the consequences of sleep apnea?		<ul style="list-style-type: none"> Physical Emotional/Psychological function
Q16	Thoughts about sleep labs		
Q17	Barriers to participation in sleep labs		<ul style="list-style-type: none"> Lack of privacy Can’t sleep in strange environment Fear of being watched
Q18	How to make participation in sleep labs easier	Facilitators to participation in sleep studies	

No.	Code Name	Notes/Description	Subcode
Q19	Thoughts about CPAP machine	<ul style="list-style-type: none">• Willingness to use CPAP machine• Lack of willingness to use CPAP machine	
Q20	Factors that could improve willingness to use CPAP machine		

Table 2

Code Book, Emerging Themes

No.	Themes or Free Codes		
Q21	Sleep environment	<ul style="list-style-type: none"> Places I am able to sleep Conducive sleep environments 	
Q22	Excessive daytime sleepiness		
Q23	Takes frequent naps during day that affects sleep in the evening		
Q24	Description of sleep problem	<ul style="list-style-type: none"> Describe history of sleep problems Duration of sleep problem New sleep patterns 	
Q25	Aging and sleep		
Q26	Snoring		
Q27	Activity	Activity improves sleep	
Q28	Doctor does not give help or advice about sleeping or sleep problems		
Q29	Lack of information or knowledge about apnea/sleep problems		
Q30	Lack of information or knowledge about treatment for apnea/sleep problems		
Q31	Frustration with sleep problems	Quality-of-life issues	Giving up
Q32	Recognition that I have a sleep problem		
Q33	Denial		
Q34	Effect of heavy meals/food on sleep/sleepiness		
Q35	Mistrust of medical procedures and new medical products		

Table 3

Demographic Characteristics and Comorbidities

Mean age, y	49 ± 16
Gender	
Female	45%
Education	
No high school	31%
High school degree	61%
Higher than high school	38%
Marital status	
Married/living with partner	43%
Widowed	13%
Never married	33%
Separated/divorced	6%
Unemployed	71%
Comorbidity	
Hypertension	65%
Diabetes	31%
Elevated cholesterol	39%
Depression	28%
Anxiety	31%
Heart problems	31%
Arthritis	31%
Vision problems	38%
Respiratory problems	15%
Cancer	15%