Published in final edited form as:

Patient Educ Couns. 2011 October ; 85(1): 85–91. doi:10.1016/j.pec.2010.10.014.

Do Cognitive Perceptions Influence CPAP Use?

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Abstract

Objective—Nonadherence to CPAP increases health and functional risks of obstructive sleep apnea. The study purpose was to examine if disease and treatment cognitive perceptions influence short-term CPAP use.

Methods—A prospective longitudinal study included 66, middle-aged (56.7 yr ± 10.7) subjects (34 [51.5%] Caucasians; 30 [45.4%] African Americans) with severe OSA (AHI 43.5 events/hr ± 24.6). Following full-night diagnostic/CPAP polysomnograms, home CPAP use was objectively measured at 1 week and 1 month. The Self Efficacy Measure for Sleep Apnea questionnaire (SEMSA), measuring risk perception, outcome expectancies, and self-efficacy, was collected at baseline, post-CPAP education, and after 1 week CPAP treatment. Regression models were used.

Results—CPAP use at one week was 3.99 hr/night ± 2.48 and 3.06 hr/night ± 2.43 at one month. No baseline SEMSA domains influenced CPAP use. Post-education self-efficacy influenced one week CPAP use (1.52±0.53, p=0.007). Self-efficacy measured post-education and after one week CPAP use also influenced one month CPAP (1.40±0.52, p=0.009; 1.20±0.50, p=0.02, respectively).

Conclusion—Cognitive perceptions influence CPAP use, but only within the context of knowledge of CPAP treatment and treatment use.

Practice Implications—Patient education is important to OSA patients' formulation of accurate and realistic disease and treatment perceptions which influence CPAP adherence.

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Keywords

Patient compliance; Continuous positive airway pressure; Obstructive sleep apnea; Self efficacy

Untreated moderate to severe obstructive sleep apnea (OSA) contributes to daytime symptoms and functional impairments such as excessive sleepiness, impaired cognition and memory, mood alterations, and decreased functional capacity (1) and is associated with increased cardiovascular and metabolic risks. (2-5) Continuous positive airway pressure (CPAP) is an effective treatment for OSA, significantly reducing airway closures during sleep and thereby reversing many of the daytime effects of OSA. (6,7) Yet, patients' use of CPAP is often less than optimal and is widely recognized as a factor contributing to poor health and functional outcomes as a result of untreated or under-treated OSA. (8-13) Many patients decide whether or not to use CPAP early in the treatment period, at least during the first week of treatment. (11,12) Furthermore, early CPAP use predicts long-term CPAP use. (11,12,14,15) Taking into account these two important and relatively consistent empiric findings, it is critical to identify newly-diagnosed OSA patients who are at risk for sub-optimal CPAP use early in the treatment period. By doing so, interventions to prevent low CPAP use (i.e., nonadherence) can be delivered prior to and at the outset of treatment, resulting in improved health and functional outcomes. Recommendations from the American Academy of Sleep Medicine Adult Obstructive Sleep Apnea Task Force addresses the importance of patient education in the evaluation and management of OSA. (16) Yet, empiric studies have not clearly defined the relative importance of how patient education may influence important outcomes such as CPAP use in this population.

Previous studies have examined patient characteristics and disease factors that may reliably identify OSA patients likely to abandon or not adhere to CPAP treatment. Severity of disease (apnea-hypopnea index [AHI]) (10,17,18), subjective sleepiness (9,19), and nocturnal oxyhemoglobin saturation nadir (9,10,14,17) are the only patient characteristic predictors, although weak, of CPAP adherence that have been identified to date. Other patient, disease, and systems characteristics, including age, race, mood, CPAP side effects, and diagnostic procedure, have not been shown to influence subsequent CPAP use. In an effort to identify OSA patients who may be at risk for underuse of CPAP, several published studies have examined theoretically-derived cognitive factors that may influence CPAP use, including outcome expectations, self-efficacy, social support, disease-specific knowledge, decisional balance, and readiness for change. (20-22)

From Social Cognitive Theory (23) the cognitive perception domains of (1) knowledge of health risks and benefits of health behaviors, (2) outcome expectations about costs and benefits of health behaviors, (3) self-efficacy as the belief that an individual can control his/her own health habits, and (4) social structures as barriers and/or facilitators to health behavior have been examined in relationship to CPAP use. (20,21) Similarly, from the Health Belief Model (24), readiness to act (i.e., health behaviors), as influenced by perceived susceptibility to health impairment and disease severity (i.e., threat), external cues to action, and subjective cost-benefit analysis (i.e., perceived benefits of health behavior and barriers) have been studied. (21,22) Decisional balance, which incorporates the process of weighing pros and cons for engaging in particular health behaviors, and readiness for change as a continuum of health behavior change, both derived from the Transtheoretical Model (24), have also been identified as influential on CPAP use. When considered collectively, these theory-derived cognitive factors have been shown to significantly influence subsequent CPAP use, with self-efficacy (20,21) and outcome expectations (20-22) identified as significant independent predictors of CPAP use.

Studies that have examined cognitive factors as influential on CPAP use have measured these variables at baseline and after treatment exposure. (20-22) When measured at baseline, these cognitive factors have not been consistently identified as influential on subsequent CPAP use. After 1 week of treatment exposure though, there is evidence to suggest that cognitive perceptions of disease and treatment are influential on both short- (i.e., 1 month) (20) and long-term CPAP use (i.e., 6 months).(21) The primary objective of our study was to determine if disease-specific cognitive perceptions influence CPAP use, specifically examining these factors not only at baseline and after 1 week of CPAP exposure, but also after the delivery of a standardized, disease- and treatment-specific patient education program provided prior to any treatment exposure. We addressed this objective by measuring cognitive perceptions with the Self-efficacy Measure in Sleep Apnea (SEMSA) (25) at baseline, immediately following patient education but prior to any treatment exposure, and after one week CPAP treatment in a prospective study. We also sought to determine if measuring disease- and treatment-specific cognitive perceptions post-education but prior to CPAP use (i.e., the timing of measuring these perceptions) was influential on subsequent CPAP use.

1. Methods

1.1 Participants

After initial clinical evaluation at a Veterans Affairs hospital-based sleep center by a board-certified sleep physician, consecutively screened patients who were considered clinically likely to have OSA were referred to the study for participation. Ninety-eight subjects were enrolled and consented in the study prior to diagnostic polysomnogram (PSG). The inclusion criteria were: (1) newly-diagnosed OSA (apnea hypopnea index [AHI] ≥ 15 events/hr) on an overnight in-laboratory PSG; (2) absence of medical contraindications for CPAP; and (3) ability to speak and understand English. To ensure study-referred patients would be prescribed CPAP treatment, patients with mild OSA (AHI 5-15 events/hour) were not included. Exclusion criteria were: (1) any current or historical medical/surgical treatment for OSA; (2) refusal of CPAP therapy for home treatment; (3) requirement of supplemental oxygen in addition to CPAP; and (4) requirement of bilevel positive airway pressure therapy. Twenty-five subjects were not included in the cohort after diagnostic PSG (i.e. AHI < 15 events/hr), three subjects withdrew, and four subjects refused CPAP treatment, with 66 subjects in the final cohort (Figure 1).

1.2. Measures

1.2.1. Self-efficacy Measure for Sleep Apnea (SEMSA)—The SEMSA was employed to measure cognitive factors that may influence subsequent CPAP use, including perception of OSA risk, treatment outcome expectancies, and perceived treatment self-efficacy.(25) Risk perception was defined as the individual's perception of health risks associated with OSA. Treatment outcome expectancies included the individual's expectations of certain changes or improvements with CPAP treatment. Treatment self-efficacy was defined as the individual's confidence in their ability to use CPAP, even if faced with specific difficulties (i.e. mask discomfort; noise of device; spouse disturbed by CPAP). The SEMSA is a 26-item Likert type scale with strong evidence of content validity, construct validity, internal consistency (Cronbach's $\alpha = 0.92$), and adequate test-retest reliability for each subscale ($r > 0.68$).(25) SEMSA scores were calculated for each subscale (Perception of Risk, Outcome Expectancies, and Treatment Self-Efficacy) by taking the average of all answered items.

1.2.2. CPAP adherence—All participants received the same type of CPAP apparatus (RemStar Pro®, Philips Respironics). This system contains software (Respironics Encore®

SmartCard™) that measures and records CPAP mask-on time onto a microchip contained on the SmartCard™. CPAP use was defined as time periods in which the device was applied for more than 20 minutes at effective pressure. Average hours of CPAP use during first 7 days of treatment and during first month of treatment were used as outcome measures.

1.2.3. Epworth Sleepiness Scale (ESS)—Subjective sleepiness was assessed with the valid and reliable ESS.(26,27) The ESS is an 8-item, self-administered questionnaire that measures subjective daytime sleepiness by assessing the self-reported likelihood of falling asleep in various settings.

1.2.4. Profile of Mood States (POMS)—Self-reported mood states during the daytime were measured using the POMS.(28) The POMS has established reliability and validity and is sensitive to sleep deprivation (29) and to treatment of obstructive sleep apnea with CPAP. (9)

1.3. Protocol

After study enrollment and informed consent, all participants completed a demographic form, Epworth Sleepiness Scale (ESS), Profile of Mood States (POMS), and Self-efficacy Measure in Sleep Apnea (SEMSA). Participants were individually given a standardized education program that included information about OSA, diagnostic procedures, treatment options, and CPAP. The purpose of the disease- and treatment-specific education was to provide accurate information to recently-diagnosed OSA patients with a particular emphasis on delivering this content from the perspective of other OSA patients (Table 1). The education program included a 15-minute video in which OSA patients described their diagnostic and treatment experiences and a printed brochure about OSA and CPAP. Immediately after completion of the education program, participants completed the SEMSA. Thereafter, participants completed two in-laboratory polysomnograms, the first for diagnosis and the second for establishing effective CPAP pressure (Mean [M] number of days between studies = 21; Standard Deviation [SD] 37.9). Setup and instruction of the home CPAP unit (Respironics; standard of care equipment from VA) was provided by one medical equipment company on average 26 days (SD 18.0) after the second polysomnogram. Following CPAP treatment for 1 week, objectively recorded CPAP use was downloaded from the device and participants completed the ESS, POMS, and SEMSA. After 1 month of CPAP use, participants returned to the sleep center for clinical follow-up visits, at which time CPAP use data was downloaded from the device for the final study outcome measure (Figure 2).

1.4. Analysis

Descriptive statistics were generated for all variables. Subjects with incomplete data were not included in all models. A separate stepwise linear regression model was used for each SEMSA measurement period (baseline, post-education, and after 1 week CPAP use). Three SEMSA domains including risk perception, outcome expectancies, and self-efficacy, and five covariates including age, race, mood, AHI, and ESS, were included in the first step for each model. A forward loading, stepwise selection identified significant covariates ($p \leq 0.15$). These covariates were included in the final linear regression model. Because error variances were unequal in the 1 month models, negative binomial models were also examined for each measurement period. Analyses were performed using SAS 9.1 (SAS Institute, Cary, NC). Statistical significance was identified at $p \leq 0.05$.

2. Results

The participants ($n = 66$) were predominantly middle-aged (56.7 ± 10.7 yr) men (97%) with severe OSA (AHI 43.5 ± 24.6 events/hr). At least half of the cohort was married, had high

school or higher education, and were employed or retired (Table 2). There were no differences between race groups for disease or patient characteristics variable or socioeconomic indicators, including education and employment (X^2 0.71; $p=0.40$; X^2 2.32; $p=0.13$, respectively). Average CPAP use at 1 week was 3.99 ± 2.48 hr/night. Average CPAP use at 1 month was 3.06 ± 2.43 hr/night. No significant bivariate correlations were identified between disease or patient characteristics and the primary outcome, CPAP use at 1 week or 1 month (Table 3).

2.1. 1 week CPAP use

At baseline, the only influential variable on 1 week CPAP use was African American race ($p=0.007$), though the model accounted for only 6.2% of explained variance ($p=0.051$). Variables that were excluded from the final model based on the statistical criteria for inclusion ($p \leq 0.15$) were age, baseline mood and ESS score, AHI, and all SEMSA domains.

After the standardized disease and treatment education program, the only variables included in the final model were from the SEMSA post-education measure, including risk perception ($p=0.14$) and self-efficacy ($p=0.006$). Variables excluded from the final model were age, race, baseline mood and ESS score, AHI, and the SEMSA domain outcome expectancies. The final model accounted for 15% explained variance for 1 week CPAP use ($p=0.012$) with self-efficacy emerging as most influential on 1 week CPAP use ($p=0.006$; Table 4).

2.2. 1 month CPAP use

The selection of variables for 1 month CPAP use final linear models was consistent with the procedure used for 1 week CPAP use models. Variables excluded from all models included: age, baseline mood and ESS score, AHI, and SEMSA risk perception and outcome expectancies ($p>0.15$). At baseline, the model included both African American race ($p=0.02$) and baseline self-efficacy ($p=0.06$) for the final 1 month CPAP use model, with both variables influencing 1 month CPAP use ($R^2=0.15$; $p=0.009$). Post-education, self-efficacy ($p=0.009$) and African American race ($p=0.07$) were included in the 1 month model and accounted for 19% of explained variance in one month CPAP use ($p=0.004$; Table 5).

Finally, the association between 1-week SEMSA variables and 1 month CPAP use was examined. Similar to the baseline and post-education models, African American race ($p=0.01$) and post-1 week CPAP use self-efficacy ($p=0.03$) were retained for the final model. After 1 week of CPAP treatment at home, self-efficacy ($p=0.02$) and African American race ($p=0.02$) influenced 1 month CPAP use, with an explained variance of 21% ($p=0.003$). Because of unequal error variances, negative binomial models for 1 month CPAP use were examined in addition to the linear regression models. Consistently, SEMSA self-efficacy and African American race were significant in the final 1 month models, consistent with the linear regression results.

3. Discussion and Conclusion

3.1. Discussion

Patients' use of CPAP, or adherence, has become a critically important clinical issue in the effective treatment of OSA. Early recognition of OSA patients who are at risk to fail on CPAP treatment due to low use is an imperative disease management strategy that will permit earlier intervention to promote adherence and potentially deter the development of intermittent patterns of CPAP use that frequently lead to treatment failures(1). Previous studies have identified cognitive factors, including risk perception, outcome expectancies, and self-efficacy, as influential on OSA patients' decisions to use CPAP.(20-22) In two of

the three studies, cognitive factors measured at baseline, or prior to any treatment exposure, were not suggestive of subsequent CPAP use behaviors.(20,21) Our study, employing the SEMSA as a measure of the same cognitive factors, uniquely identified self-efficacy as an important determinant of subsequent CPAP use. This finding is novel in that self-efficacy was measured after patient education but prior to any CPAP exposure. The findings from our study extend previous findings, suggesting that OSA patients' formulation of accurate, personalized perceptions of their own ability to use CPAP in commonly-recognized challenging scenarios (i.e., self-efficacy) are responsive to simple, standardized patient education. Further, when patients' cognitive perceptions are derived from patient education content that is specific to the health behavior and health condition, these perceptions are indicators of patients' decisions to invest in or reject the health behavior (i.e., short- and longer-term CPAP use).

From previous studies, cognitive perceptions are influential on concurrent CPAP use.(20-22) Yet, measures of these perceptions prior to any CPAP exposure have not been consistently identified as predictive of future CPAP use. Studies that reported no relationship between baseline, pre-treatment cognitive perceptions variables and CPAP use outcomes did not specifically report on the delivery of any disease- and treatment-specific education.(20,21) Therefore, it is possible that patients were not able to formulate accurate, cognitive perceptions of OSA and CPAP treatment prior to any treatment experience in the absence of patient education from health providers or study investigators. In our study, consistent with previous studies, we identified that baseline, pre-treatment measures of cognitive perceptions did not influence subsequent treatment use; yet, after a standardized, simple patient education program that focused on OSA and CPAP, the same cognitive perceptions measures were insightful factors that identified low-use CPAP patients. These findings are consistent with Olsen and colleagues' results (22), where "baseline" measures of cognitive factors using the SEMSA were employed after detailed OSA and CPAP information was provided to participants by their sleep provider but prior to any CPAP exposure in the sleep laboratory.

In contrast to our own study findings, Olsen and colleagues (22) identified that post-education outcome expectancies and risk perceptions were predictive of subsequent CPAP use at four months, while self-efficacy was not an independent predictor of subsequent CPAP use. In their study, the full model including all SEMSA domains combined with functional outcomes measured by the Functional Outcomes of Sleep Questionnaire was significant ($R=0.467$; $p < 0.01$). However, multicollinearity within the model (SEMSA domains with significant bivariate correlations) may contribute to differing results when the same or similar models are applied in different samples. We similarly identified multicollinearity within our model, with significant bivariate correlations between SEMSA variables (Table 6). In order to more precisely identify individual cognitive perception domains from the SEMSA that influence CPAP use, future replication studies are needed in larger, heterogeneous samples.

Limitations of our study include a relatively homogenous sample, consisting of veterans, predominantly men, with severe OSA. In a general clinical population inclusive of more women and greater variation in disease severity, our findings may not be replicated. We also acknowledge that the study was a prospective, longitudinal study that included a standardized educational program as part of the protocol. The objective of the study was not to test the effect of the education program, but rather to examine influential pre-treatment factors on CPAP use. We enrolled consecutive patients in the study who agreed to participate in the research possibly creating a selection bias, enrolling only those persons who were highly motivated to pursue diagnosis and treatment and participate in research. Yet, in terms of CPAP use outcomes (i.e., adherence or mean hours of CPAP use), the

sample did not demonstrate a higher level of CPAP use than has been previously published reducing our overall concerns for selection bias. Because the study was not designed as an intervention study, suggestions for future intervention research based on our findings are conceptual and exploratory, not hypothesis-driven. Finally, although we identified African American race as influential on CPAP adherence, this finding has not been consistently identified in other studies specifically examining race as a predictor of CPAP adherence. (30-32) In the only study that explored other salient factors that may better explain race-based differences in adherence to CPAP, socioeconomic status (i.e., neighborhood of residence) was found to more importantly contribute to differences in CPAP adherence than race. (30) We were unable to further explore this relationship due to the absence of robust socioeconomic variables included in our study measures and the relatively small sample size in our study.

3.2. Conclusion

The results of our study suggest that disease- and treatment-specific cognitive perceptions may be influenced by patient education that specifically address the learning needs of newly-diagnosed OSA patients. We hypothesize that disease- and treatment-specific patient education helps OSA patients to develop accurate perceptions of OSA and CPAP. Furthermore, measuring cognitive perceptions of disease and treatment after patient education rather than at baseline is a critically important consideration in future studies of influential factors on CPAP use. Moreover, our findings provide preliminary evidence to suggest that particular subgroups of persons with newly-diagnosed OSA may be identified as high risk for treatment failure due to low use (i.e., nonadherence) by measuring disease- and treatment-specific cognitive perceptions. This identification strategy affords us the opportunity to deliver targeted interventions to high risk non-users, testing the overall effectiveness of adherence promotion strategies and potentially improving health and functional outcomes for these high risk CPAP users. Patient education is an essential component of patients' ability to formulate accurate and realistic disease and treatment perceptions. As Bandura suggests, specific knowledge of health risks and benefits is essential to establishing change conditions. (23) Yet, knowledge alone is not sufficient to successfully motivate and implement a new behavior or change old behaviors, such as initiating and maintaining CPAP treatment of OSA. Future intervention studies aimed at promoting CPAP use will possibly be most effective with the inclusion of OSA- and CPAP-specific patient education and careful attention to self-efficacy promotion among OSA patient who are at high risk for CPAP nonadherence.

3.3. Practice Implications

Approximately 50% of OSA patients initiated on CPAP treatment fail to use CPAP at optimal levels (i.e., average hours use per night) to effectively improve health and functional outcomes of the disease (33). Providing interventions to all patients, regardless of their prospective risk for nonadherence to CPAP, is not an efficient use of resources. Strategies to prospectively identify OSA patients at risk for nonadherence are important and will substantially contribute to the identification of effective adherence promotion interventions. Although our study findings are preliminary in nature, and we recognize the need for further risk screening testing in more heterogeneous, larger samples, the SEMSA may provide clinical guidance for risk stratification for nonadherence to CPAP among persons newly diagnosed with OSA. Disease- and treatment-specific patient education is recognized by the American Academy of Sleep Medicine as a standard of care in the diagnosis and management of OSA to support treatment utilization. (16) The findings from our study highlight the importance of patient education for newly diagnosed OSA patients and suggest that disease- and treatment-specific patient education may influence cognitive perceptions of OSA and CPAP treatment and subsequent adherence to CPAP.

Acknowledgments

Research support by VA Stars & Stripes Healthcare Network Competitive Pilot Project Fund (Sawyer) and NIH K99NR011173 (Sawyer). The authors would like to acknowledge the VISN 4 Eastern Regional Sleep Center staff and polysomnography technologists at the Philadelphia VA Medical Center for their diligence in caring for our research patients. We also would like to acknowledge the support of the Nursing/Patient Care Services Department at the Philadelphia VA Medical Center. The study was conducted at the Philadelphia Veterans Affairs Medical Center, Philadelphia, Pennsylvania. The University of Pennsylvania IRB and the Philadelphia Veterans Affairs Medical Center IRB approved the study. Drs. Sawyer, Kuna, Moriarty and Richards and Ms Canamucio disclose the absence of financial conflicts of interest. Dr. Weaver has received research support from Philips Respironics Sleep, Respironics Foundation, and Cephalon; consults for Apnex Medical, Inc. and Cephalon, Inc.; receives royalties from Sanofi-Aventis Pharmaceutical, Merck & Co., Inc., Sleep Solutions, N.V. Organon, Apnex Medical, Inc, Ventus Medical, GlaxoSmithKline, Philips Respironics, Cephalon, Inc.

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Figure 1. Study Protocol and Participant Recruitment/Retention

†ESS – Epworth Sleepiness Scale; POMS – Profile of Mood State; SEMSA – Self Efficacy Measure in Sleep Apnea; PSG – polysomnogram; AHI – Apnea/hypopnea index from diagnostic polysomnogram

Table 1
Theory-derived Factors Guiding Disease- and Treatment-specific Patient Education

Social Cognitive Theory Domains	Education Program Content
Risk Perception	<ul style="list-style-type: none"> • Symptoms of OSA • Functional risks of OSA (e.g., accidents, memory impairment, intimacy/sexual impairment) • Health risks of OSA (e.g., cardiovascular)
Treatment Outcome Expectancies	<ul style="list-style-type: none"> • Improvement of specific symptoms with CPAP • Commonly described unanticipated improvements in daily functioning and quality of life with CPAP
Treatment Self-efficacy	<ul style="list-style-type: none"> • Challenges of using CPAP during first several nights of use • Described successes in overcoming challenges with CPAP • Anticipatory guidance for resolving difficulties with CPAP • Resources for support and additional clinical assistance with CPAP

Table 2
Sample Characteristics (n=66)

Characteristic	Freq (%)
Race	
Caucasian	34 (51.5)
African American	30 (45.4)
Male	64 (97.0)
Married	44 (66.7)
Referred from Primary Care	47 (71.2)
Some Post-high school Education	29 (43.9)
Employment	
Employed	27 (40.9)
Retired	24 (36.4)
Characteristic	Mean (SD)
Age	56.7 (10.7)
AHI [†] (events/hr)	43.5 (24.6)
ESS [†] Score	12.4 (5.3)
Mood Score (POMS) [†]	12.6 (15.4)
BMI [†] (kg/m ²)	33.5 (7.4)
CPAP Use 1 week (hr)	3.99 (2.48)
CPAP Use 1 month (hr)	3.06 (2.43)

[†]AHI = Apnea Hypopnea Index; ESS = Epworth Sleepiness Scale; POMS = Profile of Mood States; BMI = Body Mass Index

Table 3
Bivariate Correlations of Demographic and Disease Variables and CPAP Adherence

Variable	1 Wk CPAP Adherence [†]	1 Mo CPAP Adherence [†]
Age	-0.03	-0.003
AHI [‡] (events/hr)	0.07	0.07
Baseline ESS [‡]	-0.02	-0.01
Mood [‡]	-0.06	-0.19

[†] Pearson correlation coefficient; no significant bivariate correlations between any demographic or disease variables and primary outcomes, CPAP adherence

[‡] AHI – Apnea Hypopnea Index; ESS – Epworth Sleepiness Scale at study entry; Mood – Total Mood Disturbance score from Profile of Mood States

Table 4
Linear Regression Models for One Week CPAP Use

Variable	Model 1 Baseline Measures ¹ : One Week CPAP Use [†] (n=62)		Model 2 Post Education Measures ² : One Week CPAP Use [‡] (n=59)	
	B est ± SE	p value	B est ± SE	p value
Race – African American	- 1.26 ± 0.63	0.05		
Risk Perception			- 0.61 ± 0.44	0.17
Self Efficacy			1.52 ± 0.53	0.006

¹ Variables excluded from final model (p>0.15): age, mood, ESS, AHI, Risk Perception, Outcome Expectancies, and Self Efficacy

² Variables excluded from final model (p>0.15): race, age, mood, ESS, AHI, and Outcome Expectancies

[†] R² = 6.2 (p=0.05)

[‡] R² = 15.0 (p=0.012)

Table 5

Linear Regression Models for One Month CPAP Use

Variable	Model 1 Baseline Measures ^I : One Month CPAP Use [†] (n=62)		Model 2 Post Education Measures ^I : One Month CPAP Use [‡] (n=56)		Model 3 After First Week CPAP Use ^I : One Month CPAP Use [§] (n=53)	
	B est ± SE	p value	B est ± SE	p value	B est ± SE	p value
Race – African American	- 1.41 ± 0.60	0.02	- 1.15 ± 0.62	0.07	- 1.54 ± 0.63	0.02
Self Efficacy	0.88 ± 0.46	0.06	1.40 ± 0.52	0.009	1.20 ± 0.50	0.02

^I Variables excluded from final model (p>0.15): age, mood, ESS, AHI, Risk Perception, Outcome Expectancies;

[†] R² = 14.9; p=0.009;

[‡] R² = 19.0; p=0.004;

[§] R² = 20.8; p=0.003

Table 6
Bivariate Correlations of SEMSA Variables and CPAP Adherence

Variables	Risk Perception [†] Baseline Post Ed After 1wk CPAP	Outcome Expectancies [†] Baseline Post Ed After 1wk CPAP	Self-efficacy [†] Baseline Post Ed After 1wk CPAP	1 Wk CPAP Adherence [†]	1 Mo CPAP Adherence [†]
Risk Perception					
Baseline	-	0.25*	0.23	0.08	0.01
Post Ed	-	0.20	0.09	-0.11	-0.05
After 1wk CPAP	-	0.27*	0.06	-0.06	-0.01
Outcome Expectancies					
Baseline			0.27*	-0.12	-0.14
Post Ed			0.26*	0.10	0.09
After 1wk CPAP			-0.02	0.23	0.08
Self-efficacy					
Baseline				0.20	0.25*
Post Ed				0.26	0.14
After 1wk CPAP				0.21	0.27*

[†] Pearson correlation coefficient

*
p < 0.05