Decreasing Obstructive Sleep Apnea by increasing Continuous Positive Airway Pressure

compliance and eating a Diabetic Diet

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Dedication

I dedicate my capstone project to my family and friends. A special feeling of gratitude goes to

my loving parents, Connie Watson and Robert Reid whose words of encouragement and push for

tenacity ring in my ears. My daughter, Kiera who has been very supportive through this time

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Key Terms

American Academy of Sleep Medicine (AASM)

Apnea Hypopnea Index (ahi)

Body Mass Index (BMI)

Continuous Positive Airway Pressure (CPAP)

Obstructive Sleep Apnea (osa)

Polysomnogram (PSG)

Self-Efficacy Measure for Sleep Apnea (SEMSA)

Social Cognitive Theory (SCT)

Abstract

Obstructive sleep apnea (OSA) is one of the most common sleep disorders, affecting an estimated 20 to 30 million Americans. Seventy percent of all patients with OSA are obese and eighty six percent of all obese patients with type 2 diabetes have OSA. The prevalence of OSA increases with age, with a higher prevalence in persons 65 years and older. However, few educational materials have targeted on the Aged Obese Diabetic OSA patient. The purpose of this project is to develop the theory based educational video for patients newly diagnosed with OSA at the University of Michigan Center for Sleep Disorders. The inclusion criteria encompasses patients aged 65 and older, with a BMI >30, insulin dependent diabetic, and an apnea hypopnea index >15.The patients also have completed a baseline polysomnogram and are scheduled to return to the lab for a continuous positive airway pressure (CPAP) titration. Social Cognitive Theory was utilized for this project. The video will address not only the knowledge of OSA and diabetic nutrition but also the benefits and the strategies used to increase CPAP compliance and to increase healthy diabetic dieting in patients with OSA. The proposed research design is a pre-posttest, accessing the impact of watching the developed video at home, on wearing CPAP every night and eating 3 healthy diabetic meals per day. Self-efficacy, outcome expectations, social support, knowledge of OSA, how to use CPAP, and the contents of diabetic diet will be measured.

Chapter I Introduction

The two most prescribed methods of treating obstructive sleep apnea (OSA) are CPAP and weight loss. Two health education videos were created to decrease obstructive sleep apnea by increasing CPAP compliance and by teaching the patient how to eat 3 diabetic meals each day. The videos focus on increasing self-efficacy, outcome expectations, knowledge, and social support in patients that are newly diagnosed with OSA.

Purpose

The purpose of this project is to develop an educational video that explains how to diet, OSA, and CPAP in patients newly diagnosed with OSA. The video will address the benefits and some of the strategies used to increase CPAP compliance and to increase healthy dieting in patients with OSA. (See table 1, 2,and 3)

Specifically, the study is designed to achieve the following outcome objectives:

Intermediate Outcomes

1. Increase knowledge of a healthy diabetic diet, OSA and CPAP.

2. Increase self-efficacy in wearing CPAP and eating a diabetic diet.

3. Increase outcome expectancies from wearing CPAP and eating a diabetic diet.

4. Increase social support from bed partner/care giver for patients wearing CPAP and/or trying to eat a diabetic diet.

Performance Outcomes

1. Wear CPAP

2. Eat diabetic diet

Rationale

The previous video that was used for patient education at the University of Michigan Center for Sleep Disorders is now out dated and unavailable. The video focused on patient education and did not address any CPAP compliance issues. Patients not only need to be educated on what OSA and CPAP are, but also need to be aware of the severity, benefits, and how to address compliance issues. Patients with OSA also need to know how important it is to maintain a healthy BMI. When a patient maintains a healthy diet it can lead to weight loss, which can also lower CPAP pressure and improves compliance.

Health Education Rationale

Research suggests that patients that receive education prior to wearing CPAP are more likely to be compliant for the first 3 months. (Wiese, Boethel, Phillips, Wilson, Peters, & Viggiano, 2005) . A review of the literature also states that there is a need for increased research on the role of psychosocial variables like anxiety, claustrophobia, and vanity, in helping understand CPAP adherence behavior (Jean Wiese et al., 2005). Using a cognitive based philosophy, increasing the knowledge of the patient can lead to the patient being better equipped to make decisions and to intervene in their own health status. There is initial evidence that social-cognitive variables are associated with CPAP adherence in first-time CPAP users during the first month of treatment. (Stepnowsky, Marler, Palau, & Annette Brooks, 2006). The social cognitive theory (SCT) suggests that patients with an increased perception that they can perform the action, higher outcome expectancy for CPAP, better support at home, and greater education will have better adherence to CPAP"(Jean Wiese et al., 2005). When patients go to a sleep lab, the patient is typically diagnosed and brought back for a CPAP titration if found to have OSA.

This period between diagnosis and CPAP titration can be used for patient education to prepare them for CPAP and therefore improve compliance.

University of Michigan Center for Sleep Disorders

The University of Michigan Center for Sleep Disorders treats patients of all ages with OSA. Over the past 5 years the University of Michigan Center for sleep disorders has ran 15,523 adult diagnostic studies (Ummcnexus, 2013). 11,041 of those patients were diagnosed with OSA. Of these diagnosed patients 32.8% were mild, 24.8% moderate, and 42.4% were severe (Ummcnexus, 2013).This program is specifically designed to be used with patients that are 18 years of age and older. The main objectives of the program are to increase knowledge about OSA and give strategies to reduce OSA by increasing CPAP compliance and encouraging dieting amongst newly diagnosed patients. Research shows that CPAP compliance in the first few weeks is a predictor for long-term CPAP adherence (Wiese et al., 2005). It is imperative that patients understand the importance of CPAP, eating a healthy diet, maintaining a health BMI, and the severity of OSA, in order to decrease the prevalence of OSA.

Chapter II Literature Review

Obstructive sleep apnea (OSA) is a condition in which the airway is either partially or fully blocked, impeding airflow. In sleep, apnea refers to a cessation of breathing that lasts at least ten seconds (National Sleep Foundation, 2012). Obstructive sleep apnea (OSA) is one of the most common sleep disorders, affecting an estimated 20 to 30 million Americans (Robins, Molgard, & Savage, 2008). The American Academy of Sleep Medicine (AASM) defines the severity of sleep apnea as normal, mild, moderate and severe. Having an apnea hypopnea index (AHI) < 5 as normal or no apnea. Mild apnea is considered an AHI ranging from 5 to 15. Moderate apnea is considered to be an AHI ranging from 15 to 30 and severe is an AHI greater than 30 (Lee, Johan, Wong, Edwards, & Sullivan, 2009). Sleep apnea can cause increased sleep arousals which leads to fragmented sleep. Apnea can also cause blood oxygen saturations to be lowered (Robins, Molgard, & Savage, 2008).

Cost

OSA is a substantial financial burden on the US (Kapur, 2010). The cost of diagnosis, treatment, and the potential lifetime burden of a lifetime of restless sleep is slowly rising. For example, the financial cost associated with sleep apnea is estimated to be billions of dollars. OSA-related motor vehicle collisions in the year 2000 were estimated to have cost $15.9 billion (Kapur, 2010). The chronic, life threatening medical conditions that stem from OSA such as cardiovascular disease, hypertension, motor vehicle accidents, and loss of jobs may be avoided by bringing awareness to this condition and educating populations at risk (Kapur, 2010).

Causes

There are various causes of sleep apnea. It has been linked to genetic abnormalities, certain age groups, and ethnicities (Robins, Molgard, & Savage, 2008). OSA is more prevalent in

some families, which suggests a possible genetic connection (National Sleep Foundation,

2012).OSA is closely associated with people that have anatomically large tonsils, adenoids,

tongues and palates. As these structure's size increases, the likeliness of airway obstruction

increases. Others that are likely to have sleep apnea are people with hypertension or some type of

physical abnormality in their nose, throat, or parts of the upper airway (Robins, Molgard, &

Savage, 2008). OSA occurs in all age groups and both sexes, though it appears to be more

prevalent in men (Sean, Apoor, & Virend, 2005). The prevalence of OSA increases with age,

with a higher prevalence in persons 65 years and older (Young, T. 2004). Apnea is most

commonly found in the obese population people with a small jaw or a large overbite, a large

neck size, smoking and alcohol use, and African-Americans (Robins, Molgard, & Savage, 2008).

Obesity

Obesity is also one of the most important risk factor for obstructive sleep apnea.

Tuomilehto (2013) states that one third of all United States citizens are obese. Seventy percent of

all patients with sleep apnea are obese (Tuomilehto, Seppä, & Uusitupa, 2013). Research

supports a strong correlation between obesity and obstructive sleep apnea (Lee, Johan, Wong,

Edwards, & Sullivan, 2009). Tuomilehto (2008) states that patients with a BMI larger than 29,

increase their risk of developing sleep apnea by 10 times the normal rate. OSA and obesity have

a bi-directional link; obesity increases the risk for OSA, while having OSA can predispose an

individual to gain weight (Tuomilehto, Seppä, & Uusitupa, 2013). The increased fat tissue in the

neck of obese patients, particularly visceral fat mass has been linked to an increase in risk of

developing or worsening of OSA (Lee, Johan, Wong, Edwards, & Sullivan, 2009). Obesity can

lead to narrowing of the upper airway, enlarged which impedes the natural flow of air causing

desaturations or arousals (Tuomilehto, Seppä, & Uusitupa, 2013). This fragmented sleep can lead

to daytime sleepiness which can cause a patient to be too tired to engage in physical activity

which further increases the risk of obesity and OSA (Lee, Johan, Wong, Edwards, & Sullivan,

2009). A research study performed on 176 morbidly obese patients resulted in 72% of the

participants having testing positive to OSA, with 48% of them having severe OSA (Lee, Johan,

Wong, Edwards, & Sullivan, 2009). A similar study performed on a morbidly obese population

resulted in 98% of the patients testing positive for OSA and 32.7% were severe (Valencia-Flores

et al., 2000). Valencia-Flores et al. (2000) found that 26% of the patients with a BMI>30 resulted

in an AHI greater than 15, and 60% resulted in indexes greater than 5. 33% of the patients with a

BMI>40 had an AHI greater than 15 and 98% had an AHI greater than 5. The combination of

obesity and sleep apnea has a much more severe impact on the cardiovascular system than either

of these conditions on their own. Research has directly linked OSA to cardiovascular diseases,

type 2 diabetes, metabolic syndrome, decrease in quality of life and working capabilities, and

increased mortality (Tuomilehto, Seppä, & Uusitupa, 2013).

Diabetes

Research has shown a direct correlation between OSA, insulin resistance, glucose

intolerance and type II diabetes (Pamidi & Tasali, 2012). OSA is thought to be a highly prevalent

comorbidity of type 2 diabetes(Aronsohn, Whitmore, Van Cauter, & Tasali, 2010). The

prevalence of OSA in obese patients with type 2 diabetes is estimated to be 86%(Aronsohn et al.,

2010). Pamidi & Tasali (2012) concluded that approximately 19 million diabetics have gone

undiagnosed and have yet to be treated for OSA. Aronsohn et al., (2010) found that the

prevalence in their research study was consistent with those of the most recent and largest study,

the Sleep AHEAD study, which involved 306 obese patients with diabetes, and resulted in a

prevalence of 86% having OSA. The high prevalence of OSA in patients with diabetes implies

that the available therapies to improve obstructive disease, such as CPAP, could have a great

effect on glucose control in patients with type 2 diabetes and OSA(Aronsohn et al., 2010).

Diabetic Diet Strategy

One strategy to decrease the prevalence of OSA is implementing a healthy diabetic diet.

The importance and success of treating OSA with weight loss have been documented for more

than twenty years (Tuomilehto, Seppä, & Uusitupa, 2013). Previous studies examining the effect

of diet as a treatment of OSA have concluded that dieting may reduce the severity of OSA, but

that it will not cure OSA in most patients (Tuomilehto, Seppä, & Uusitupa, 2013). The majority

of the research done in the past has explored the effects of weight loss in OSA patients that were

put on either a low calorie diet programs in moderately overweight patients having a BMI

ranging from 35 to 40 or the effects of bariatric surgery on severely obese patients (BMI>40)

with OSA. (Tuomilehto, Seppä, & Uusitupa, 2013). Research suggests that weight loss along

with increased physical activity and a healthy diet may correct or improve the symptoms of OSA

(Tuomilehto, Seppä, & Uusitupa, 2013). Research studies involving weight loss interventions

that used dieting resulted in AHI improvements of 3–62%, and weight loss of 3 to18%

(Tuomilehto, Seppä, & Uusitupa, 2013). After bariatric surgery, the weight reduction of 12–37%

has shown improvements in AHI ranging from 48–90% from the baseline values (Tuomilehto,

Seppä, & Uusitupa, 2013). The American Diabetes Association (2013) recommends that patients

with diabetes regulate their carbohydrate and calorie intake. This is the best way to control blood

sugar levels and help with weight loss. They suggest 45 g to 60 g of carbohydrates per meal, or

135 to 180 g per day, which is considerably lower than what is typically consumed by Americans

(American Diabetes Association, 2013).

CPAP

Continuous positive airway pressure (CPAP) is currently the most effective therapy for mild to severe sleep apnea. The CPAP machine forces room air through a filter and hose to the patient's mask. The air acts as a mechanical splint to prohibit the air way from closing during sleep (Robins, Molgard, & Savage, 2008). This is typically a lifelong therapy for most patients with any degree of severity. (Sawyer, Canamucio, Moriarty, Weaver, Richards, & Kuna, 2011). Using CPAP on a daily basis reduces daytime sleepiness, while making the user more alert. It increases sexual performance, increases the efficiency of blood flow and lowers blood pressure (Shapiro & Shapiro, 2010). CPAP improves the lives of users and their bed partners by decreasing arousals and decreasing fragmented sleep. Mortality rates of CPAP users' decreases from 20% in untreated patients to 3% (Shapiro & Shapiro, 2010). CPAP use increases overall health, therefore decreasing the need to use health care. Data has correlated CPAP treatment with a reduction in traffic incident rates, reducing auto accidents, costs and related casualties (Shapiro & Shapiro, 2010).Though its effectiveness is well documented, 25 to 35 percent of all patients are not compliant (Robins, Molgard, & Savage, 2008). Patients have reported many reasons for discontinuing CPAP therapy. Some complained that the head and the mask were uncomfortable. Others complained of feeling claustrophobic while wearing the mask. Breu (2008) implicated that the machine was not easy to use. Additional complaints were that the machine was not easy to travel with and that users were unable to watch TV while wearing the mask. Also complaints about physical bruising, congestion, nose bleeding (Breu, Guggenbichler, & Wollmann, 2008).

CPAP Strategy

Hence, another strategy used to decrease OSA is improving CPAP compliance. CPAP compliance research suggests that patient education is directly related to adherence (Jean Wiese

et al., 2005). By improving patient education, patients will have a better understanding of the severity of their condition, and may be more motivated to comply with the CPAP therapy. The American Academy of Sleep Medicine (AASM) recommends that sleep professionals stress the importance of patient education (Sawyer et al., 2011) Past research has focused on patient education before the initial CPAP use, resulting in little to no change in compliance (Sawyer et al., 2011) One research study gave patient education at baseline and checked for compliance at 1 week after initial use and again at 1 month. The study found that patient education was effective at 1 week and 1 month after initial CPAP use (Sawyer et al., 2011). Sawyer et al. (2011) concluded that disease-specific patient education helped OSA patients to accurately understand the severity and importance of OSA and CPAP. Research suggests that future studies may increase effectiveness by including specific OSA and CPAP patient education, paying close attention to self-efficacy amongst patients at high risk for OSA

Wiese et al (2005) found that both patients and staff prefer using a video to convey the information. Videos offer the patient the convenience of being able to watch at their own pace, in privacy, with family, and review the knowledge, insurance options, who to contact, and strategies to improve self-efficacy as frequently as possible. Past research on CPAP patient education suggests several characteristics essential to making a successful educational tool (Wiese et al., 2005). Research has shown that answering the questions and concerns of patients can lead to increased adherence to CPAP (Wiese et al., 2005).

Chapter III Methods

Target Population

The target population includes patients who have completed a baseline polysomnogram

at the University of Michigan Center for Sleep Disorders. The inclusion criteria includes patients

that are ages 65 and up, with a BMI >30, and insulin dependent diabetic. These patients have

been diagnosed with OSA, having an AHI>15 and scheduled to return to the lab for a CPAP

titration. Patients that have tried CPAP in the past or diagnosed with Insomnia will be excluded

from this program because they may have compliance issues that need to be resolved with

alternative methods (see figure 1).

Figure 1 Inclusion/Exclusion Process

Participant

Inclusion

Age ≥ 65
BMI ≥ 30
Diagnosed based on baseline
Polysomnogram
AHI ≥ 15

NO

YES

Yes

Exclusion

Insomnia
CPAP used previously

Excluded

NO

Pre-Test

Watch video at home

Return for CPAP
titration
Post -Test
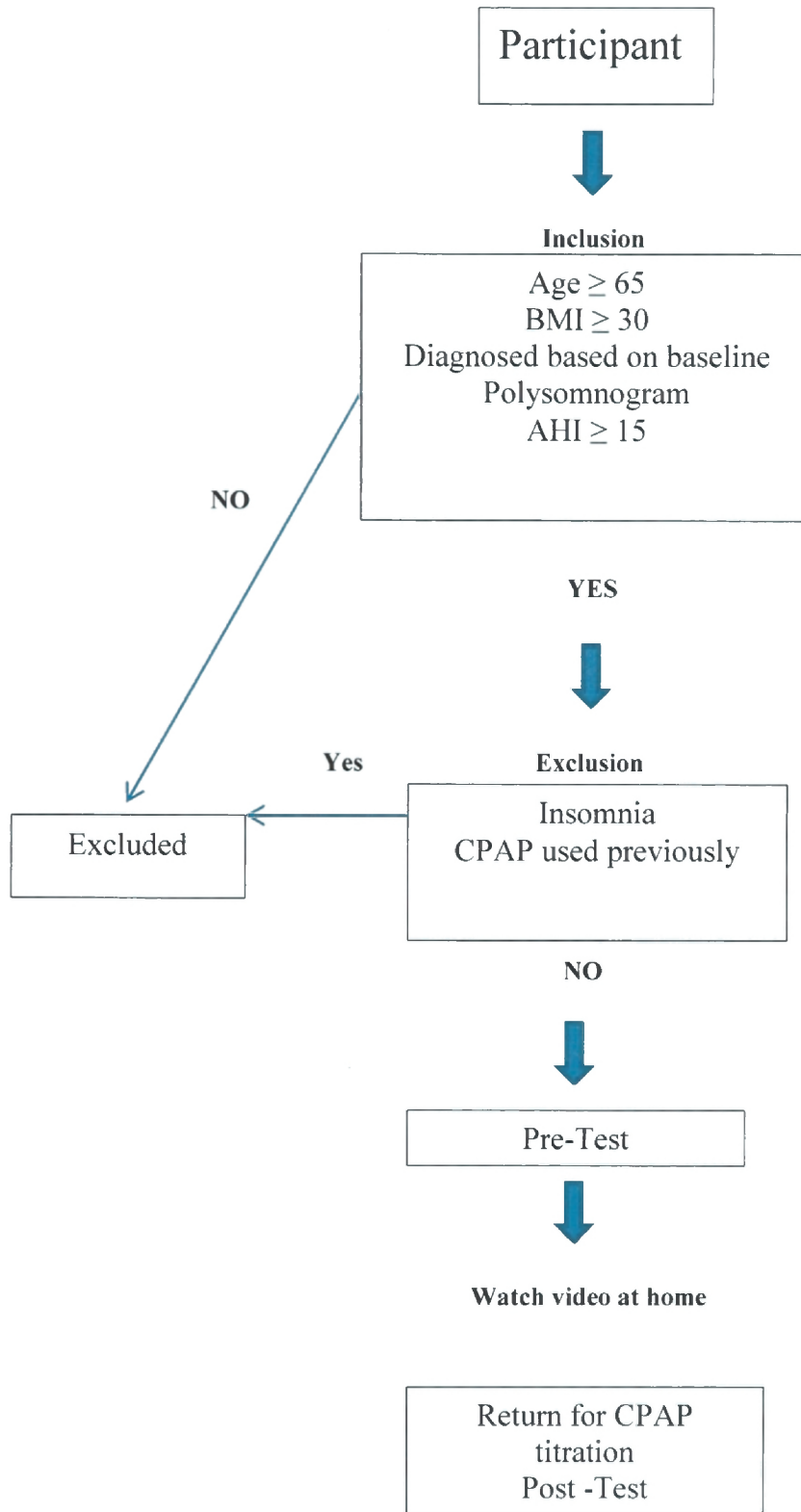
Procedure Design

The patient will come to the sleep center to have a baseline polysomnograph study

performed to determine the diagnosis for sleep apnea. Once diagnosed, the patient will be given

a pre-test to measure their knowledge, self-efficacy, outcome expectations, and social support.

The patient will be given a video to take home to watch in the privacy of their homes before they

come back within 2 weeks to have their CPAP titration study performed. A post-test will be

given to measure their knowledge, self-efficacy, outcome expectations, and social support

strategies they learned and retained from the video. In six weeks a follow-up post- test will be

given to again test measure their knowledge, self-efficacy, outcome expectations, social support

strategies they learned and retained from the video, and their CPAP compliance status.

Theory

The Social Cognitive Theory is comprised of four constructs: self-observation, self-

evaluation, self-reflection and self-efficacy (Bandura, 2004). SCT suggest that people learn from

watching others. Self – efficacy may be increased by making sure that the patient is confident

they can wear CPAP and have the skills to make it comfortable to wear. Outcome expectancies

that the patient can expect from wearing CPAP each night may include feeling more rested, less

snoring, and having more energy throughout the day. SCT research suggests that patients with a

higher perceived self-efficacy, higher outcome expectancy, better social support, and greater

knowledge will be more likely to adhere to CPAP (Stepnowsky, Marler, & Ancoli-Israel, 2002).

Richards et al. (2007) found a strong correlation in treatment adherence in a randomized study of

50 patients that were given a cognitive based therapy and compared them to 50 patients who did

not receive an intervention. The intervention consisted of videos using the modeling technique to

explain CPAP usage. They were also given relaxation strategies to reduce the anxiety before

trying on their masks. Participants who completed the interventions used CPAP 2.9 hours more per night after starting CPAP. In addition, the group reported higher self-efficacy and social support than the group that did not receive any intervention (Olsen, Smith, & Oei, 2008). Increasing self-efficacy of the patients will make them confident that they can prepare a healthy diabetic meal. When the construct self-efficacy is applied to nutrition, it has been a predictor of which nutritional guidelines will be applied, amount of effort applied to changing their food choices and how they prepare their meals, and the length of time they will stick with the healthy plan when faced with obstacles (Sheeshka, Woolcott, & Mackinnon, 1993) . In a recent research study performed they found that there was a strong relationship between self-efficacy and outcome expectancies as both being predictors of the participants intentions to adhere to a healthy diet (Sheeshka et al., 1993). McKinley (2009) found that fruit and vegetable self-efficacy had the strongest effect on healthy eating behaviors suggesting that healthy eating behavior may be directly affected by fruit and vegetable self-efficacy, while social support had a much less effect.

Social support is an important element of human behavior; it can be classified into four different categories: appraisal, instrumental, informal, and emotional (Edberg, 2010). Social support is an important component for CPAP compliance. Patients that are 65 and older typically suffer from memory loss and need to be reminded to wear there CPAP each night. Some may also take their mask off during sleep and need someone to check on them throughout the night to make sure that they are wearing their mask. This age group is especially at risk because they may be without a bed partner. Many patients that are diagnosed with OSA are either married or have been in relationships for an extended time (Olsen, Smith, & Oei, 2008). Spousal support has been identified in research as a predicting variable in CPAP adherence (Olsen, Smith, & Oei,

2008). Olsen et al., (2008) states that living alone has been directly linked to poor CPAP adherence. This population may also require social support to prepare diabetic meals and to help maintain the general health of the patient. With regards to physical activity, research showed that eating having increased social support was a predictor of healthy eating behavior (McKinley, 2009). McKinley's (2009) research showed that young children with lower levels of social support directly correlated with higher BMI scores and higher calories eaten.

Knowledge rarely causes change in behavior on its own; typically it is paired with other constructs like social support or self-efficacy (Claire & Stephen, 2001)The social cognitive theory suggests that improving a patient's self-efficacy and knowledge of OSA and CPAP together are essential in improving CPAP adherence (Stepnowsky et al., 2006). Using the modeling technique, the study aims to improve the patient's knowledge by allowing them to observe the use of CPAP and then emulate the behavior. Knowledge will also be paired with self-efficacy and outcome expectations as the patient learns how to prepare a healthy diabetic meal. Once the patient is confident that he/she can measure and consume the appropriate types of food they can expect to see an improvement in their glucose levels and ultimately may lose weight.

Each table shows the relationship between the constructs of the social cognitive theory and social support and the performance objective. For example, the performance objective of wearing CPAP at least 5 out of 7 days may be reached by increasing self-efficacy in wearing and using CPAP and increasing the patient's knowledge of CPAP and OSA. Once compliance is reached the patient may see some of the outcome objectives gradually over a time period, like improving concentration. Social support might include a family member encouraging CPAP use.

This social support may increase the likeliness of the patient reaching compliance and sustaining

compliance for a lifetime (see tables 1, 2, and 3).

Table 1 Wear CPAP every night for at least 4 hours

SCT, CPAP, and Sleep Apnea

| Performance Objective | Internal Determinants | | External Determinants |
	Skills and Self-Efficacy	Knowledge	Outcome Expectations	Social Support
Wear CPAP every night for at least 4 hours	A. State confidence that they can wear CPAP regularly B. Know how to use CPAP and comfort settings	A. Understand CPAP and OSA B. Understand severity and risk of OSA C. Know importance of wearing CPAP	**Possible benefits of wearing CPAP** A. Reduce daytime Sleepiness B. Stop snoring C. Be more alert	**Daughter** A. Encourages CPAP use B. Checks on patient every 2 hours

Table 2 Wear CPAP at least 5 out of 7 days

Performance Objective	SCT, CPAP, and Sleep Apnea			
	Internal Determinants		Outcome Expectations	External Determinants
	Skills and Self-Efficacy	Knowledge		Social Support
Wear CPAP at least 5 out of 7 days	Demonstrate they have the ability to wear CPAP at least 5 out of 7 days	A. Prioritize CPAP use B. Know to wear CPAP at least 5 out of 7 days	Possible benefits of wearing CPAP A. Improve concentration B. Decrease Stress C. Increase Physical activity D. Lose weight	Daughter A. Encourages CPAP use B. Sets a daily reminder to use CPAP

Table 3 _Eat 3 diabetic meals each day_

<table>
<tr><th colspan="5">SCT, Dieting, and Sleep Apnea</th></tr>
<tr><th></th><th colspan="3">Internal Determinants</th><th>External Determinants</th></tr>
<tr><th>Performance Objective Diabetic Diet</th><th>Skills and Self-Efficacy</th><th>Knowledge</th><th>Outcome Expectations</th><th>Social Support</th></tr>
<tr>
<td>Eat 3 diabetic meals each day</td>
<td>A. I am confident I can prepare healthy diabetic meals

B. I am confident I can eat 3 servings of carbohydrates per meal

C. I am confident I can measure 3 servings of carbohydrates I

D. I am confident I can eat 1-2 servings of fat per meal

E. I am confident I can measure 1-2 servings of fat

F. I am confident I can eat 1 to 3 servings of protein per meal

G. I am confident I can measure 1 to 3 servings of protein</td>
<td>A. Understand importance of eating 3 diabetic meals each day

B. Know how to prepare a healthy diabetic meal

C. Know how to eat 3 carbohydrate servings per meal

D. Know how to measure 3 carbohydrate servings

E. Know how to eat 1-2 fat servings per meal

F. Know how to measure 1-2 fat servings

G. Know how to eat 1-3 protein servings per meal
Know how to measure 1-3 protein servings per meal</td>
<td>**Possible benefits of eating 3 diabetic meals each day**
A. Feel better
B. Lose weight
C. Reduce CPAP pressure
D. Manage diabetes</td>
<td>**Daughter**
A. Provides diabetic meals</td>
</tr>
</table>

Video Contents

The videos uses power point, pictures, and narration to educate the patient on the causes

and risks associated with OSA to meet the performance objectives, wear CPAP at least 5 of 7

days per week and at least 4 hours per night. Through modeling the video shows how to use the

CPAP machine and how to properly wear the CPAP mask. It shows step by step how to turn on

the machine, put the mask on, and also goes through the comfort features. It shows some

strategies to address common problems, like mask leak, pressure tolerance, and facial

discomfort. Instructions to check compliance data including the average usage, used hours, days

used, run hours and pressure will be shown through modeling. This helps to ensure that the

patient knows how to check to make sure they are compliant by Medicare standards, wearing

CPAP 70% of 30 days for at least 4 hours per night (Medicare Learning Network, 2010). The

character in the video displays an increase in self-efficacy as she reaches each of her outcome

expectancies. The daughter/character in the video shows social support by checking on the

patient every 2 hours and by setting a daily reminder to help encourage CPAP usage.

The performance objective of eating a diabetic diet was met through the use of power

points, pictures, and narration. The diabetic diet video educates the patient on how to properly

prepare, measure and eat a diabetic diet. The video focuses on teaching the patient the proper

serving sizes and how to measure the proper food for the diabetic. It also shows several options

and stresses the importance of eating 3 diabetic meals each day. The video uses characters to

show how eating a healthy diabetic meal using the plate method is easy and also shows the

outcome expectancies, like managing glucose levels and losing weight being achieved. A

character portrays the caregiver/daughter preparing the meals and encouraging the patient to eat

the proper foods. In the end the patient shows increased self-efficacy when she sees that she has

reached the outcome expectancy of losing weight and lowering their CPAP pressure (See table

6).

The transcript, handout, and PowerPoint were each modified three times to ensure the

comprehension of the material. A 17 year old female, with no knowledge of obstructive sleep

apnea or diabetic dieting was used to ensure that the literacy rate was at an accurate level. It was

found that the material used too much medical jargon. For example, the word sugar was

substituted for the word glucose. The transcript was then amended to get rid of most of the terms

that were unfamiliar, without losing the message being relayed. The transcript was also read by a

40 year old male, to ensure that the material could be put to use. After having the transcript

reviewed by a medical doctor/surgeon, the transcript was altered one last time. It was changed to

ensure that we only suggest a possible association instead of implying causation. For instance,

CPAP may decrease risk, instead of CPAP will decrease risk. The original handout for the

diabetic diet material was found to contain excess information. The final handout was narrowed

down to only include only pertinent information that related to the knowledge objectives

described in Table 3. For example, the handout had information on how to count calories for a

specific meal plan for 1300 calories per day. The new handout gives the participant a reference

sheet that will help them when they are putting their skills into action and also flows well with

the video content.

Table 4. Wear CPAP every night for at least 4 hours performance method

Transcripts	Method	Who
Knowledge		
A. What is OSA and CPAP	PowerPoint	Narrator
B. Risk associated with OSA	PowerPoint	Narrator
C. Importance of wearing CPAP	PowerPoint	Narrator
D. How to use CPAP	Modeling	Patient
E. How to make It comfortable	Modeling	Patient
Outcome Expectations		
A. May reduce daytime sleepiness	Verbal Persuasion	Patient
B. May stop or reduce snoring	Verbal Persuasion	Patient
C. May be more alert	Verbal Persuasion	Patient
Self-Efficacy		
A. State confidence that they can wear CPAP	Verbal Persuasion	Patient
B. Show they can use CPAP and comfort settings	Modeling	Patient
Social Support		
A. Encourage CPAP use	Verbal Persuasion	Daughter
B. Check on patient every 2 hours	Modeling	Daughter

Table 5. Wear CPAP at least 5 out of 7 days performance method

Transcripts	Method	Who
Knowledge		
A. Prioritize CPAP use	PowerPoint	Narrator
B. Know to wear CPAP at least 5 of 7 days	PowerPoint	Narrator
Outcome Expectations		
A. May improve concentration	Verbal Persuasion	Patient
B. May decrease stress	Verbal Persuasion	Patient
C. May increase physical activity	Verbal Persuasion	Patient
D. May lose weight	Verbal Persuasion	Patient
Self-Efficacy		
A. Demonstrate ability to wear CPAP at least 5 of 7 days	Verbal Persuasion	Patient
Social Support		
A. Encourage CPAP use	Verbal Persuasion	Daughter
B. Set daily reminder to wear CPAP	Modeling	Daughter

Table 6. Eating 3 diabetic meals each day performance method

Transcripts	Method	Who
Knowledge		
A. What is in a healthy diabetic diet	PowerPoint	Narrator
B. Importance of eating 3 healthy diabetic meals each day	PowerPoint	Narrator
C. Know how to prepare a healthy diabetic diet	PowerPoint	Narrator
D. How to measure and eat 1-2 fat servings per meal	Modeling/handout	Patient
E. How to measure and eat 3 carbohydrate servings per meal	Modeling/handout	Patient
F. How to measure and eat 1-3 protein servings per meal	Modeling/handout	Patient
Outcome Expectations		
A. May feel better	Verbal Persuasion	Patient
B. May lose weight	Verbal Persuasion	Patient
C. May reduce CPAP pressure		Patient
D. Manage diabetes		Patient
Self-Efficacy		
A. State confidence that they can eat 3 servings of carbohydrates per meal	Verbal Persuasion	Patient
B. State confidence that they can eat 1 to 3 servings of protein per meal	Verbal Persuasion	Patient
C. State confidence that they can eat 1 to 2 servings of fat per meal	Verbal Persuasion	Patient
D. State confidence they can prepare a healthy diabetic meal	Verbal Persuasion	Patient
E. State confidence that they can measure 3 servings of carbohydrates 1	Verbal Persuasion	Patient
F. State confidence that they can measure 1 to 3 servings of protein	Verbal Persuasion	Patient
G. State confidence that they can measure 1 to 2 servings of fat	Verbal Persuasion	Patient
Social Support		
A. Provides diabetic meals	Modeling	Daughter

Measures

  Social cognitive theory incorporates four measures: self-efficacy, outcome expectations, social support, and knowledge. The Self -Efficacy Measure for Sleep Apnea (SEMSA) accessed these 4 constructs. SEMSA is based on Bandura's social cognitive model and specifically tailored for OSA (Weaver, 2003). The SEMSA is a 26 item questionnaire, intended to be self-administered, typically taking approximately 15 minutes to be completed (Weaver et al., 2003). The questionnaire has been previously tested for health literacy and was determined to be at a 5th grade reading level (Weaver et al., 2003). Weaver et al. (2003) reported alpha as 0.90 for the entire SEMSA scale and retested with reliabilities ranging from 0.68 to 0.77. The questionnaire was shortened and social support along with Medicare compliance standards were added for the purpose of this study. Each construct was measured using a Likert scales ranging from strongly disagree to strongly agree, for CPAP compliance. Two self-efficacy measures were used to determine the participant's confidence level in wearing CPAP regularly. Knowledge of OSA was measured using five items and knowledge of CPAP was measured using four items. Outcome expectations asked participants to gage how effective they believe CPAP is, in helping to improve their everyday lives. Social support measured the likeliness of the patient having someone to help encourage their CPAP use (see appendix A).

  The same Likert Scale was used to measure the self-efficacy, outcome expectations, social support and knowledge of the participant eating a healthy diabetic diet. Five items were used to measure the self-efficacy, asking the participant to gage their confidence level of eating, preparing, and measuring components of a healthy diabetic diet. Eight items were used to gage the participant's knowledge of eating, preparing and measuring three diabetic meals each day. Outcome expectancies were measured using four items that gaged if the patient believed that

they could expect results from eating a diabetic diet. Lastly, social support was measured using

one item to see if the participant believed they had someone for support in maintaining a healthy

diabetic diet (see appendix B).

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Appendix A   Self-Efficacy Measure for Sleep Apnea
(SEMSA) Questionnaire

Self- Efficacy	Strongly Disagree	Disagree	Neutral/ Unsure	Agree	Strongly Agree
I am confident I can wear CPAP at least 4 hours per night					
I can wear CPAP at least 5 nights per week					
OSA knowledge **Having OSA increases my risk of ....**					
Falling asleep during the day					
Having a heart attack					
Difficulty concentrating					
Having an accident					
Having high blood pressure					
CPAP knowledge					
I know how to wear CPAP					
I know how to adjust CPAP to make it comfortable					
I know that CPAP is more effective if I wear it every night					
I know the importance of wearing CPAP					
CPAP Outcome Expectancies **If I wear CPAP I may ....**					
have more energy throughout the day					
Stop snoring					
Improve concentration					
Be more alert					
Social Support					
I have people in my life to encourage me to wear CPAP					

(Weaver et al, 2003)

Appendix B   **Self-Efficacy Measure for Diabetic Dieting**

Self- Efficacy	Strongly Disagree	Disagree	Neutral/ Unsure	Agree	Strongly Agree
I am confident I can prepare a low carb diet					
I am confident I can eat 3 servings of carbohydrates per meal					
I am confident I can eat 1 to 3 servings of protein per meal					
I am confident I can eat 1-2 servings of fat per meal					
I am confident I can prepare healthy diabetic meals					
Diabetic Diet Knowledge					
I know how to prepare a healthy diabetic meal					
I know the importance of eating 3 diabetic meals per day					
I know how many carbs to eat each meal					
I know how much protein to eat each meal					
I know how much fat to eat each meal					
I know how to measure protein servings					
I know how to measure carbohydrate servings					
I know how to measure fat servings					
Diabetic Diet Outcome Expectancies **Eating a diabetic diet may…**					
Help manage my diabetes					
Lower my CPAP pressure					
Help me feel better					
Help me lose weight					
Social Support					
I have people in my life to support me in eating a healthy diabetic diet					

(Weaver et al, 2003)

Appendix C

CPAP Video

PowerPoint

Slide 1: Introduction – (Title and author) "Obstructive sleep apnea and CPAP"

Slide 2: "Obstructive sleep apnea (OSA) is a condition in which the airway is periodically either

partially or fully blocked which impedes airflow during sleep. During normal breathing, the

airway is open which allows air to flow freely. When apnea occurs, the airway is blocked, which

prevents air from flowing freely. Apnea can cause oxygen levels in the blood to decrease and it

can also cause brief arousals from sleep. These arousals can lead to fragmented sleep which can

lead to daytime fatigue and also many other serious health problems."

Slide 3: "Sleep apnea has been associated with gender, aging, race, endocrine disorders, alcohol,

smoking, medications, post-menopause, abnormalities of the head and neck, BMI, large neck

size and genetics."

Slide 4: "Sleep apnea increases the risk of high blood pressure, impotence, weight gain, memory

loss, diabetes, depression, heart disease, driving accidents, stroke, and headaches. "

Slide 5: "Sleep apnea is commonly treated by weight loss, positional therapy, surgery, oral

appliances, and Positive Airway Pressure Devices."

Slide 6: "A CPAP machine is an electrical device, small enough and quiet enough to sit on a

nightstand. It takes in air from the room, lightly pressurizes it and delivers it through a flexible

tube to a special mask. CPAP uses ordinary air to keep your airway open while you sleep. It is

not the same as oxygen therapy, although oxygen can be added for people who need both. A

complete CPAP system has several essential components: CPAP machine (cpap machine picture

appears), flexible air tube (air tube appears), and face mask and straps or headgear to hold the mask in place."

Slide 7: "CPAP is the most widely used treatment for moderate and severe sleep apnea. The mask is worn snugly over the nose, or sometimes nose and mouth, during sleep. It supplies pressurized air that flows continuously into the sleeper's throat preventing their airway from collapsing. (picture of nasal pillows shows) The first type is a nasal pillow that sits under your nose and blows direct pressure into the nose and airway.(picture of nasal mask shows) The next style of mask is the nasal mask. The air blows into the mask and is inhaled through the nose. For both the nasal pillow and nasal mask you must breathe in and out against the pressure using your nose only. (picture of Full face mask shows) For those that are unable to breathe without using their mouth, there are full face masks, which cover both the mouth and nose.(Picture of the total face mask shows) Finally, total face masks also cover the entire face, allowing the patient to breathe through their mouth or nose."

Slide 8: "Why should you wear CPAP? There are many benefits to wearing CPAP including: reducing snoring, being more alert, improving concentration, decreasing stress, increasing physical activity, weight loss, and improving cardiovascular function."

Slide 9: "Here are a few ways to prioritize CPAP: make CPAP part of your daily routine, have your CPAP ready before bedtime, put your CPAP on before you sit down to watch TV or read near bedtime, and set reminders

        a. Set an alarm on your phone, clock, or TV, to make sure you wear your mask

        b. Use posted notes in your bed room as reminders to put your mask on."

Slide 10: "How often should you wear CPAP? Cpap is most effective if worn every day for the entire length of sleep. Insurances like Medicare do require you to wear it for at least 4 hours 70% of nights, which is about 5 out of 7 day per week. Some people with weight related sleep apnea are able to lose enough weight to discontinue the CPAP therapy, but for most people this will be a lifelong therapy."

Transcript

Persons Present:

Mrs. Watson -mother

Tracy - Daughter

Dr. Montoya- Sleep Doctor

Dana- DME staff

(Mother and daughter walk in to office of sleep doctor)

Doctor: "Hello Mrs. Watson, what brings you to my office today?"

Mrs. Watson: "To tell you the truth I have been very tired lately. I sleep about 8 hours per night but still wake up feeling tired. I use to like doing the crossword in the newspaper, but lately it has been hard to concentrate. I'm starting to feel stressed out. I don't even have the energy to take my dog for a walk anymore and it's caused me to gain a few pounds."

Tracy: "I've also noticed that she is snoring louder than usual! I can hear her through the walls!"

Doctor: "What you are describing sounds like you could be suffering from sleep apnea. It sounds like we should get you scheduled for a sleep study."

(Fades out)

(Patient and daughter arrive at DME to pick up CPAP)

Tracy: "Hi, my mother has an appointment to pick up her CPAP equipment."

Receptionist: "Sign in here, have a seat and we will be right with you."

Dana: (calls out) "Mrs. Watson" (Mrs. Watson raises her hand) "Hi, I'm Dana and I will be

helping you today. Just follow me back this way."

(Mrs. Watson and Tracy follow Dana back to a room)

Dana: "When you had your sleep study they determined that you have obstructive sleep apnea

and would benefit from sleeping with a full face mask on CPAP. I'm going to show you how to

put the mask on and how to operate the machine at home." (Dana connects the CPAP hose to the

machine and mask, then pushes a button that turns the machine on and then holds down the same

button to turn it off).

Dana: "This machine is called a CPAP and it stands for continuous positive airway pressure. It

blows room air through this hose into the mask that acts as a splint to keep your airway open

while you sleep. This is the button to turn the machine on. Your machine is set at a pressure of

7cm H2O. The same button is used to turn the machine off by holding it down until the machine

powers off. Now you try."

Mrs. Watson: (pushing the button to turn on the machine) (the machine starts blowing air)

Dana: "Ok, now turn it off."

Mrs. Watson: (holds down the same button and the air stops blowing) "Wow, that was easy. I

can do that!"

Dana: (while removing the hose from the mask and machine) "this hose slides right off and back

on the machine and mask by pulling with minimum force. Here, you try!" (She hands the hose to

Mrs. Watson)

Mrs. Watson: (Takes the hose and attaches it to the mask and CPAP machine)

Dana: "Ok, now let's see you turn the machine on and off again, and then detach the hose from the machine and mask."

Mrs. Watson: "I'm pretty confident I can do that! (She turns the machine on and then off, then pulls the hose off the mask and machine."

Tracy:" You're doing great mom!"

Dana: "Ok, Mrs. Watson, now it's time to learn to put the mask on. First pull the straps over your head and then these clips are connected right here to fasten the mask." (Dana reconnects the hose and turns the machine on. She then takes the mask and pulls the straps over Mrs. Watson's head and secures the clips to the mask.)

(Next, she pulls the Velcro loose and tightens the straps so that air is not leaking out)

Dana: "Do you feel any air leaking in your eyes or around your chin?"

Mrs. Watson: (nods her head no)

Dana: (Squeezing the clips to release the mask on each side) "You can take the mask off by squeezing these two clips on the side of the mask". (Pulling the mask off Mrs. Watson's face)

Dana: "Ok, now let's see you try to put the mask on."

Mrs. Watson: (takes the mask and pulls the straps over her head and secures the straps)

Dana: "Do you feel air leaking out?"

Mrs. Watson: (nods her head yes)

Dana: "Whenever you feel air leaking out you should pull the straps a little tighter to get a better seal. Just try not to make it too uncomfortable."

Mrs. Watson: (pulls straps tighter)

Dana: "Did you fix the leak?"

Mrs. Watson: (nodding her head yes)

Dana: "Ok, now let's see if you can remove the mask and turn off the machine."

Mrs. Watson: (takes off mask and turns machine off)

Dana: "Do you have any questions?"

Mrs. Watson: "How am I supposed to fall asleep with so much air blowing out?"

Dana: "The machine also has a comfort feature called a ramp. The ramp can be set by pushing

this knob and turning it until the ramp is highlighted. Once you have selected the ramp you can

turn the knob to choose how much time you want the machine to take to ramp from the lowest

pressure up to your set pressure. You can choose 5 minutes up to 45 minutes. How much time do

you think it takes you to fall asleep?"

Mrs. Watson: "About 30 minutes."

Dana:" Ok let's set your ramp at 30 minutes. This means that each time you turn your machine

you will have up to 30 minutes before your machine gets up to your set pressure. I'll walk you

through the steps. Push the knob."

Mrs. Watson: (pushes the knob)

Dana: "Ok, now turn it until the ramp is highlighted and push it in to select ramp."

Mrs. Watson: (turns knob and pushes the knob in) "Ok, I have it"

Dana: "Next, turn the knob until you see 30 minutes, and press the knob in to select it."

Mrs. Watson: (turns the knob and presses it in to select it)

Dana: "You did it! Now let's look at another comfort feature." Sometimes people get dry mouth

from opening their mouth while their sleeping. To help with dry mouth you can add a feature

called heated humidity. This is the humidification chamber." (pointing at the chamber) "This

attaches to the CPAP by simply pushing both ends together until you feel it lock" (pushing

machine and humidifier together). "Lift this flap and pull out the chamber and fill it with distilled

water to the fill line." (lifting flap and pointing to the line on the chamber). "Then slide the

chamber back in to its place and pull the flap back down." (sliding chamber back into place and

pulls flap down.) "Now I want you to try. First, let me show you how to disconnect the

humidifier by pushing this button and pulling the humidifier apart from the cpap. (Pushes button

and pulls cpap and humidifier apart."

Mrs. Watson: (pushes cpap and humidifier together) "that was easy. I can do that." (then pulls up

the flap and pulls out the chamber) "I fill the chamber to this line, right?" (pointing at fill line)

Dana: Yes

Mrs. Watson: (fills chamber to the fill line, slides it back into place, and then pulls the flap

down.)

Dana: "You're doing great! Now let's look at how to turn the humidifier on. This is similar to

turning the ramp feature on. You have to push the knob once and turn the knob until you see the

humidity setting." (pushing knob and turning knob) "now push the knob again to select the

humidity setting and then twist the knob to turn the desired amount of humidity. I recommend

that you start off at level 1 and then raise it until you reach the level that feels best to you. You

might need to use different levels in the winter and summer."

Mrs. Watson: "Will this also help with nasal congestion?"

Dana: "Yes, this will also help to keep the nasal passages clear." (turning off the humidity) "Now

it's your turn."

Mrs. Watson: (pushes knob and twist it to humidity setting) "Now I press this knob to select the

humidity."

Dana: (nods her head, yes)

Mrs. Watson: (Presses the knob and twists it to the 1 setting, and presses the knob again) How

high does this go?

Dana: "this particular unit goes up to 6. Just be careful not to have your humidity too hot in a

cool room, this could cause moisture to build up in your hose and you might wake up to water on

your face."

Mrs. Watson: "ok I can do that."

Dana: "Medicare requires you to wear your CPAP at least 70% of the days for at least 4 hours

per night each month. If you are not compliant they may take your machine from you and you

will have to go through another sleep study to get it back. This equals to about 5 or 6 days per

week. Keep in mind that you want to wear your CPAP as much as possible for it to be effective."

Mrs. Watson: What do I do if I forget how to do everything you taught me?

Dana: "We have a 24 hour help line that you can call if you are having any issues. Your machine

also comes with an instruction booklet that it comes with, and your daughter can also help."

Tracy: "I watched everything mom, I will make sure you wear your CPAP properly, I will check

on you every 2 hours."

Dana: "You can check your compliance on the CPAP too. It tells you how many hours you wore

your CPAP and it tells if your mask was leaking. You can do this by pressing the Information

button. The screen will tell you how many hours you wore the mask the previous night and will

show a green smiley face if you had a good leak. Then you can turn the knob to see how many

days in the last month you have worn the mask for more than 4 hours and how many days you

wore it."

Mrs. Watson: (presses the knob and turns it to the compliance setting, then presses it again) Ok, I

see it here.

Dana: "Make sure that you wash your equipment regularly. Your humidity chamber, hose and mask can all be washed in antibacterial dish soap. You can even put it in your dishwasher, if you have one. (Puts equipment in carrying case) Are there any other questions?"

Mrs. Watson: "Can I take this CPAP on a plane?"

Dana: Good question! "Yes, but they are required to check your machine when you go through the security check. Do you feel confident that you will be able to go home and wear your cpap."

Mrs. Watson: "Yes, I am pretty confident that I can do this at home."

Dana: "Well you ladies are all set" (handing bag to Mrs. Watson), "here is my card, call if you have any problems."

Mrs. Watson and Tracy: "Thank you" (taking the bag and walking out)

(fades out)

(fades in) (Mrs. Watson is home getting ready for bed) (There is a not on her bed reminding her to put on her CPAP)

Mrs.Watson: (puts on her mask, turns on her machine, and goes to sleep)

(2 hours later)

Narration: (Tracy, peeking in her mother's room to make sure she is wearing her CPAP) "Tracy peeks in her mother's room to make sure she is wearing her CPAP"

(fades out)

(fades in) (6 weeks later, Mrs. Watson and Tracy arrive at Dr. Montoya's office)

Dr. Montoya: "Hello Mrs. Watson. We downloaded the data from your CPAP card and I can see that you have been wearing your machine every night. How are you feeling?"

Mrs. Watson: "I feel much better now that I have been wearing CPAP. My concentration has gotten better and I have the energy to walk my dog again. I have lost a few of the pounds that I had gained too."

Dr. Montoya: "Your blood pressure has also improved drastically. How is your stress level?"

Mrs. Watson: "My stress level has gone down, I don't seem to get frustrated like before."

Dr. Montoya: "Keep up the good work and I will see you in a year to re-evaluate your status. Call me if you have any problems."

(fades out)

Appendix D

Transcript

Diabetic Diet Video

Persons Present:

Mr. Watson -father

Tracy - Daughter

Patricia- Dietician

(At doctor's office speaking with dietician)

Patricia: "Hello Mr. Watson, my name is Patricia and I am a registered dietician. Do you know why you are here today?"

Mr. Watson: "The doctor says I have diabetes and I need to get my sugar under control."

Patricia: "Well the best way we can control your sugar is to get you started eating a healthy diabetic diet for 3 meals each day."

Mr. Watson: "That doesn't sound like it tastes good."

Patricia: "You will find that you can still eat many of the foods that you already eat. The key is portion sizes and keeping track of what you eat each day and at what time. I'm going to play a short video that will help you out." (Turns on video)

Video of Power Point

Slide 1: Title and author- "The Diabetic Diet"

Slide 2: "Diabetes is a problem with your body that causes blood glucose (sugar) levels to rise higher than normal. This is also called hyperglycemia. Type 2 diabetes is the most common form of diabetes. To keep your glucose (sugar) at a healthy level and promote weight loss, you should eat a healthy diabetic diet by controlling your intake of: carbohydrates, fat, and proteins."

Slide 3: "A small amount of weight loss can: improve insulin resistance, lower blood glucose (sugar), improve blood cholesterol, reduce blood pressure, and reduce CPAP pressure."

Slide 4: "Carbohydrates- Many meal plans include 3 to 4 carbohydrate servings at each meal. Each carbohydrate serving equals 15 grams of carbohydrate. Use carbohydrate tables and food labels to learn more about serving sizes."

Slide 5: "Carbs are found in the following foods: fruit, fruit juices (or any food that contains fruit or fruit juices), milk, ice cream, yogurt (or any food that contains milk), breads, cereals, crackers, grains, pasta, rice, starchy vegetables (such as corn, potatoes, peas or beans), sweets (such as cake, candy, cookies, pie), sugary foods (such as regular soda, fruit drinks, sherbet) beer, wine and some mixed drinks."

Slide 6: "One serving of starchy vegetables:1/2 cup or 1 small ear of corn, 1/2 cup cooked lentils or dried beans, 1/2 cup green peas, 3-inch potato, or 10 French fries."

Slide 7: "One serving of bread, rice, or cereal would be 1/2 cup cooked oatmeal, 1 slice of bread, 1/2 small bagel, 1/3 cup cooked pasta or rice, 3 cups popped popcorn, 3/4 cup unsweetened cereal, or 6 Saltine crackers.

Slide 8: "One serving of fruit:15 small grapes, 4-inch banana, 2 tablespoon raisins, 3/4 cup berries, 1 cup cantaloupe or other melon, 1/2 cup fruit juice (fresh squeezed or store bought), or 1 small apple"

Slide 9: "Choose the kinds of fats that can help lower your cholesterol levels: monounsaturated fats, polyunsaturated fats, and Omega-3 fatty acids."

Slide 10: "Eat less total fat, especially less saturated fat and trans-fat. Both raise LDL (bad) cholesterol. Many are "hard" or solid at room temperature"

Slide 11: "Fats should be limited to about 1-2 servings per meal. Here are a few examples what one serving of fat looks like equals: 1 tsp-Oil (vegetable, corn, canola, olive, etc.), 1 tsp-butter, 1 Tbsp - reduced-fat margarine or mayonnaise, 1 Tbsp - salad dressing, 2 Tbsp. - Lite cream cheese, 8 large -black olives, or 1 slice of bacon."

Slide 12: "Protein is found in foods such as beef, poultry, pork, fish, cheese and eggs. Protein does not significantly affect the blood sugar unless large portions are consumed. It is best to limit meat to 0-1 servings per meal (2-3 per day). One serving should be 1 ounce (7 grams) or less. Three ounces of meat is about the size of a deck of cards or the palm of a hand. The US Department of Agriculture recommends that all men and women over the age of 19 should get at least 0.8 grams of protein per kilogram of body weight per day (or 0.37 grams per pound). That means a woman who is 130 pounds should get at least 48 grams of protein, which could look like 7 ounces of salmon or 7 eggs. However, that's the bare minimum requirement. Depending on your daily activities, you still may not be getting enough."

Slide 13: "Protein is found in the following foods: meats, poultry, and fish, legumes (dry beans and peas), tofu, eggs, nuts and seeds, milk and milk products, grains, some vegetables, and some fruits (provide only small amounts of protein relative to other sources)."

Slide 14: "1 serving is about 7 grams of protein. Here are a few samples of 1 serving of protein: one 8 ounce glass of milk, 1 large egg, 1 ounce of chicken, 1 8 ounce cup of low fat yogurt, or a one ounce hamburger."

Slide 15: "The key is to change your eating habits. Eat regular meals. Ask your health care team to help you choose a meal plan. Your dietitian may suggest you eat three meals and a snack or two every day at about the same times. Eating every 4 to 5 hours can help control blood sugar.

Eat a variety of foods. Choose a variety of foods to eat so that your body gets the nutrition it needs .Eat less fat. Avoid fried foods. Foods that are baked, broiled, grilled, boiled, or steamed are healthier to eat. Eat meats that have little fat. When you eat dairy products like cheese, milk, yogurt, choose those that have little or no fat or cream. Eat less sugar. You may find that eating less sugar helps you control your blood glucose level. Eat less salt. Eating less salt may help control your blood pressure."

Slide 16: "When you have diabetes, eating well takes practice and planning. A good balance of the right foods, along with regular exercise and your prescribed medications, can help you feel better and stay healthier. Work with your doctor and dietitian to create a meal plan that: works with your schedule, keeps your weight on track, and improves your blood glucose, blood pressure, and cholesterol numbers."

Slide 17: "For additional information call 1-888-DIABETES or visit online :

American Diabetes Association http://www.diabetes.org/

Center for Disease Control http://www.cdc.gov/diabetes/"

(video ends)

Patricia: "Now that you have watched the video, can you tell me the importance of eating a diabetic diet?"

Mr. Watson: "It will help me control my sugar, have more energy, and maybe help to lose a few pounds."

Patricia: "I also see that you have sleep apnea. This may also lower your CPAP pressure or decrease you apnea. Overall you should start to feel better."

Mr. Watson: "As long as I don't have to give up all my favorite foods."

Patricia: "Don't worry. You will just have to cut back on them. I'm going to give you a small booklet that you can take home that will help with this diet.

Mr. Watson: "I will give this a try."

Patricia: "The booklet I gave you will show you a few different ways of how to measure things. You probably already know how to use measuring cups, measuring spoons, and food scales. But I'm going to show you how to measure serving sizes using labels and your hand.

Mr. Watson: "That sounds like it may be hard."

Patricia: "Once you get the hang of it you will do fine. I want you to focus on the 3 things the video discussed, carbohydrates, protein, and fats. On the food label you will see each of the items listed and an amount next to it. (She points to the sample in the booklet) This first line gives you the serving size for a bowl of oatmeal. That means every time you eat a bowl of oatmeal you have eaten another serving. Do you remember from the video which category oatmeal falls into?"

Mr. Watson: "Carbohydrates?"

Patricia: "Exactly! So can you read this label and tell me how many carbohydrates are in one serving of oatmeal?"

Mr. Watson: "26 grams?"

Patricia: "Right again! Now write it on your journal. This will help you to keep track of what you eat each day. You can do this when measuring protein and fats too. Another way of measuring is using your hands. (Pointing at the palm of her hand) The palm of my hand is equal to about 1 serving of protein. Your meats should be lean and no bigger or thicker than the palm of your hand."

Mr. Watson: "Hey that, I can remember!"

Patricia: (making a fist) "Your fist is about the size of 1 cup" (Mrs. Watson makes a fist and nods)

Mr. Watson: "Ok, that's easy to remember."

Patricia: (pointing to her thumb) "Your thumb is about the size of a tablespoon and the tip of your thumb is close to the size of a teaspoon. These are ways you can measure your food if you don't have measuring tools handy while you're out."

Mr. Watson: "That will make things a lot easier for me!"

Patricia: "Any questions?"

Mr. Watson: "No, I think I understand."

Patricia: "Take that booklet home and call me if you have any questions. Make sure you fill in your food journal each day and bring it back in with you when you come back in 6 weeks. You should document how many carbohydrates, protein, and fat you eat each day. It gives you a place to enter 3 meals and 3 snacks. Try to eat at the same time each day."

Patricia: "It was nice seeing you, bye-bye!" (waves)

(Mr. Watson and Tracy gather their things and leave)

(next day)

Tracy: "Dad, the doctor says that we have to watch how much sugar you eat so we can get your diabetes under control. Let's cook a healthy diabetic meal for breakfast."

Mr. Watson: "I don't have the energy to get up from this chair. I'm too tired to do anything."

Tracy: "Well the doctor said that if you start to control your sugar better you will start to feel better and have more energy to do things that you use to do."

Mr. Watson: "Ok I will try it out!"

Tracy: "Ok, let's get the handout the dietician gave us."

Mr. Watson: (taking paper out of folder on counter) "Here it is!"

Tracy: "That handout will help us prepare 3 healthy diabetic meals each day for you."

Mr. Watson: (Looking through the pages of the handout) "It has a chart in here so I can write down what I eat."

Tracy: "That's how you will keep count of your protein, carbohydrate, and fat intake."

(dad hands the paper to Tracy)

Tracy: (Reading the handout) "It says here that we should use a 9" plate to put your food on for lunch and dinner, and use half the plate for breakfast."

Mr. Watson: (grabbing a plate) "This plate is smaller than what I am use to."

Tracy: "Well dad, we have to watch your portion sizes to make sure you aren't eating too much food. Now what are you in the mood to eat for breakfast today?"

Mr. Watson: "Can I have a bowl of oatmeal?"

Tracy: (Grabbing the container of oatmeal) "Look at the label and tell me, how much one serving of oatmeal equal to is?"

Mr. Watson: (reading the label) "Where do I find it?"

Tracy: "Look on the back where it says serving size."

Mr. Watson: "It says here that ½ cup is equal to 1 serving."

Tracy: "Ok so let's get the measuring cup out and measure ½ cup of oatmeal."

Mr. Watson: (getting the measuring cups out of the drawer) (He pours fills the measuring cup that reads ½)

Tracy: "Great job dad, now let's put this in the pot to boil. (takes a pot and puts water and oatmeal in…. stirs the pot) Ok dad, what type of food is oatmeal considered."

Mr. Watson: (Writing on the handout) "It's a carbohydrate and I can have 3 to 4 servings each meal."

Tracy: "Ok, so what other carbohydrate do you want for breakfast?"

Mr. Watson: "How about adding some strawberries to my oatmeal along with a slice of toast."

Tracy: "That would give you 3 servings of carbohydrates, How about I make you an egg for protein."

Mr. Watson:" It says here that I should have 1 to 3 servings of protein per meal. So that means I can have 1 egg and 3 slices of turkey bacon." (She writes it on her food journal)

Tracy: "Correct" (she takes out an egg and turkey bacon and begins to prepare them)

Mr. Watson: "What about fats? It says I should have 1 to 2 servings of fat per meal."

Tracy: "Well mom, you can have a teaspoon of margarine in your oatmeal. That would be one serving of fat."

Mr. Watson: "Ok, this diabetic diet might not be too bad after all."

Tracy: "Do you think that this is something you can do for each meal every day?"

Mr. Watson: "Yes! I'm pretty sure I can measure the carbohydrates, protein, and fats in the foods that I eat."

(6 weeks later)

(Tracy and Mr. Watson go back to the doctor's office)

(Tracy and Mr. Watson sitting in Patricia's office)

Patricia: "Hello!"

Tracy and Mr. Watson: "Hi!"

Patricia: "So how has the diabetic diet been working for you?"

Mr. Watson: "Well, at first it was hard to remember to read the labels before I eat something and to log it in the journal, but now I am confident that I can eat 3 diabetic meals each day."

Tracy: "Yeah, she did resist in the beginning, but I have been making sure that she eats the right foods."

Patricia: (reading a paper in front of her) "I see that your blood work was much better this time. Your sugar was in normal range and you have lost 5lbs since the last time you were here."

Mr. Watson: "I've had more energy. I started back walking outside with my neighbor each day."

Patricia: "Well good for you! I'm glad to see that you have been able to adjust to this new lifestyle change. Do you have any more questions for me?"
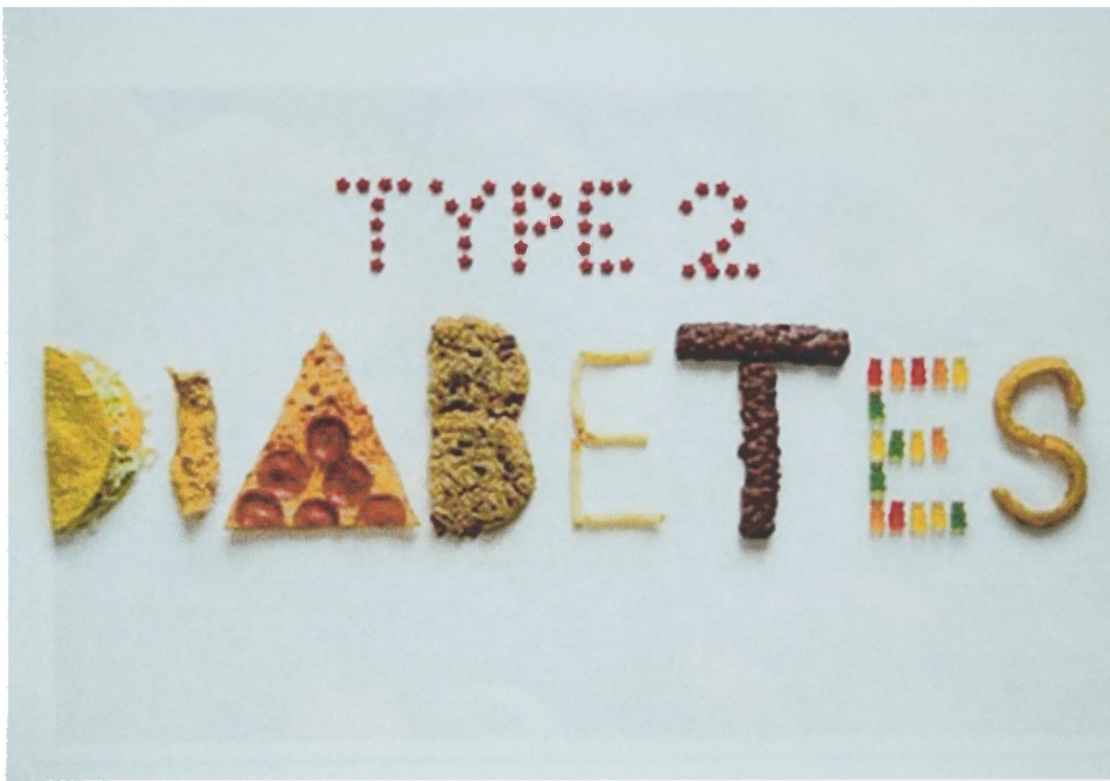
Mr. Watson: "No, I think I have the hang of it."

(fades out)

Appendix E

The Diabetic Diet
Handout

The Importance of Carbohydrates, Protein, and Fat
By Kirahn Watson

Cunningham (2012)

WHY DO WE NEED CARBOHYDRATES TO SURVIVE?

1. Carbohydrates are the body's main source of fuel.

2. Carbohydrates are easily used by the body for energy.

3. All of the tissues and cells in our body can use glucose (sugar) for energy.

Perry (2012)

Carbohydrates are mainly found in starchy foods (like grain and potatoes), fruits, milk, bread, and yogurt. Other foods like vegetables, beans, nuts, seeds and cottage cheese contain carbohydrates, but in lesser amounts. You should eat 3 to 4 servings per meal.

WHY DO WE NEED PROTEIN TO SURVIVE?

1. Tissue repair

2. Immune function

3. Energy when carbohydrate is not available

4. Preserving lean muscle mass

Nikkola (2013)

Protein is found in meats, poultry, fish, meat substitutes, cheese, milk, nuts, legumes, and in smaller quantities in starchy foods and vegetables. You should eat 0 to 1 servings per meal.

WHY DO WE NEED FAT TO SURVIVE?

1. Normal growth and development

2. Energy (fat is the most concentrated source of energy)

3. Absorbing vitamins

Adams (2013)

Fat is found in meat, poultry, nuts, milk products, butters and margarines, oils, lard, fish, grain products and salad dressings. There are three main types of fat, saturated fat, unsaturated fat, and trans fat. You should eat no more than 1 to 2 servings per meal.

Diabetic Plate
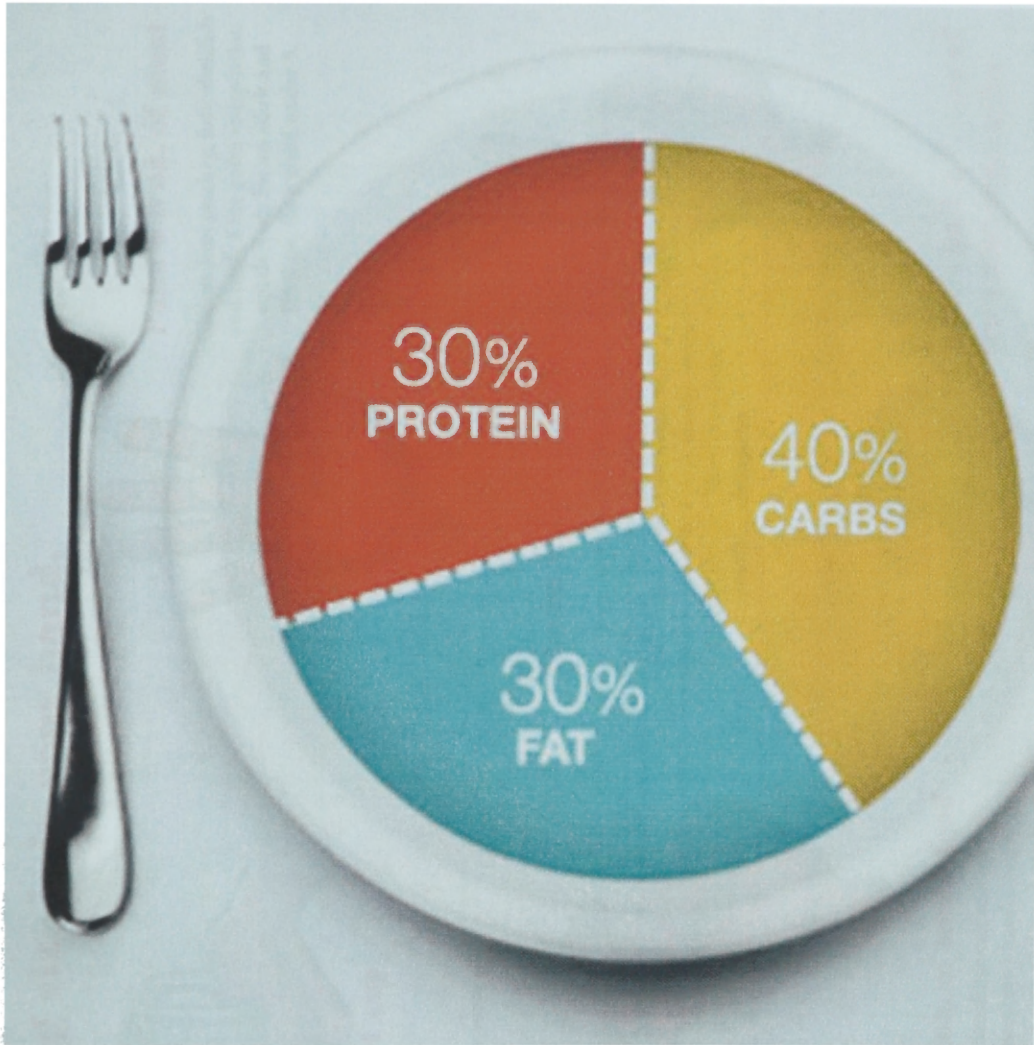
The science of eating (2014)

Using a 9" plate you can help to make sure that you are eating the correct

proportions of foods. Carbohydrates should fill approximately 40% of your plate.

The rest of the plate should be divided in half with 30% fat and 30% protein.

The secret to serving size is in your hand.

A fist or cupped hand = 1 cup

1 cup =   1½-2 servings of fruit juice
1 oz. of cold cereal
2 oz. of cooked cereal, rice or pasta
8 oz. of milk or yogurt

Palm = 3 oz. of meat

Choose lean poultry, fish, shellfish and beef. One palm size portion equals 3 oz. for an adult and 1½-2 oz. for a child under 5.

A thumb = 1 oz. of cheese

Consuming low-fat cheese helps you meet the required servings from the milk, yogurt and cheese group. 1½ oz. of low-fat cheese counts as 8 oz. of milk or yogurt.

Thumb tip = 1 teaspoon

Keep high-fat foods, such as peanut butter and mayonnaise, at a minimum. One teaspoon is equal to the end of your thumb, from the knuckle up.   Three teaspoons equals 1 tablespoon.

Handful = 1-2 oz. of snack food

Snacking can add up. Remember, 1 handful equals 1 oz. of nuts and small candies. For chips and pretzels, 2 handfuls equal 1 oz.

1 tennis ball = ½ cup of fruit and vegetables

Healthy diets include a variety of colorful fruits and vegetables every day.

Because hand sizes vary, compare your fist size to an actual measuring cup.

Sample Oatmeal Label

Nutrition Facts

Serving Size 38 g
Servings Per Container 6

Amount Per Serving

Calories   140   Calories from Fat 20

% **Daily Value***

Total Fat 2.5g	**4**%
Saturated Fat 0g	**0**%
Trans Fat 0g	
Cholesterol 0mg	**0**%
Sodium 0mg	**0**%
Total Carbohydrate 26g	**9**%
Dietary Fiber 4g	**17**%
Sugars 0g	
Protein 5g	

Vitamin A 0%	Vitamin C 0%
Calcium 4%	Iron 10%

* Percent Daily Values are based on a 2,000 calorie diet.

Check Fat

Check Carbs

Check Protein

Diabetic Meal Plan Journal

Name:_____

# of Servings				
Date	Breakfast Time:____	Lunch Time:____	Dinner Time:____	Total Servings
Carbohydrates				
Starchy				
Fruits				
Non-Starchy				
Sweets, Desserts, & other Carbs.				
Fats				
Proteins				
Menu				

Try to plan meals ahead of time to avoid eating the wrong types of foods.

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