

Obstructive Sleep Apnea (OSA) Diagnosis: A life-altering experience for women

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Objectives

- Identify at least two unusual aspects of OSA symptomatology in women
- Identify at least two ways in which women respond to diagnosis and initiation of treatment of OSA
- Identify how this research study can impact perianesthesia nurses

Dissertation

- *Dissertation Defense:*
 - *Obstructive Sleep Apnea Diagnosis: A life-altering experience*
- *Dissertation defended on April 21, 2015*
- *Dissertation Committee*
 - *Dr. Jean Boucher (Chair)*
 - *Dr. Carol Bova (Committee member)*
 - *Dr. Lichuan Ye (Committee member/Sleep Expert)*

Background and Significance

- SDB/OSA affects 22 million Americans
- About 80% of Americans with moderate to severe OSA are undiagnosed
- Overall prevalence for OSA is 26% for all individuals aged 30-70
 - Largest increase in younger men & women
- Incidence will rise with population aging and obesity epidemic

Finucane, et al., 2011

Lam, Mak, & Ip, 2012

American Sleep Apnea Association (ASAA), 2012

Peppard, et al., 2013

Significance to women

- Viewed as male disorder
- OSA undiagnosed/underreported
- Delays in diagnosis and treatment
 - Selection bias among health care providers
 - Women's presenting symptoms
 - Sociocultural factors
- Lower ability to function with effects of OSA
- Equally at risk for side effects, including death
- Respond well to treatment, including adherence to treatment

Young, 1993

Young, Hutton, Finn, Badr, Palta, 1996

Resta, et al., 2003

Sheperdycky, Banno & Kryger, 2005

Yeobah, et al., 2007

Ye, Pien, Weaver, 2009

Kapsimalis & Kryger, 2009

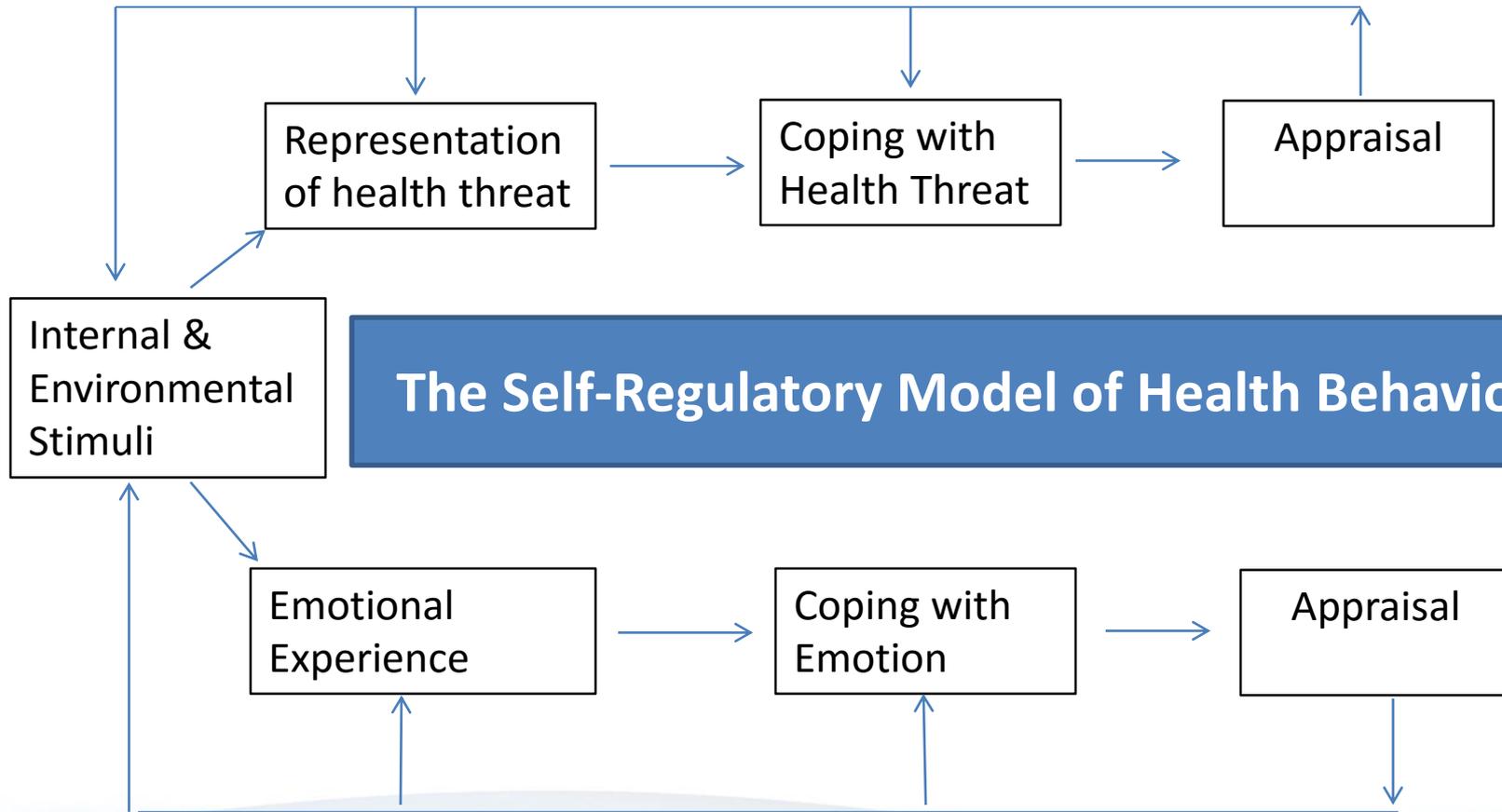
The Gap

- To date, little is known about the diagnosis of OSA from the perspective of women
- Exploration of women's experience of diagnosis & treatment
 - Illness representation
 - Threat appraisal
 - Use of self-regulation in coping strategies
- Assist in earlier diagnosis & successful treatment

Purpose & Specific Aims

- **Purpose** is to explore women's experiences with the diagnosis of OSA using Leventhal's Self-Regulatory Theory
- **The specific aims:**
- Explore the illness representation of women with a recent diagnosis (within one year) of OSA
- Explore the cognitive perceptions and emotional response to diagnosis and treatment of OSA in this sample of women
- Explore the meaning of OSA and the coping strategies used by this sample of women

Conceptual Processing of Health Threat Information



Concrete Processing of Health Threat Information

Cameron & Leventhal, 1995

Methods

- Design
 - Qualitative descriptive design
- Sample
 - Purposive recruitment of adult female subjects newly diagnosed (within one year) with OSA
 - Recruitment

Sandelowski, 2010

Methods

- Sample
 - Inclusion:
 - Newly diagnosed with OSA (within one year)
 - Prescribed treatment
 - Able to provide informed consent
 - Able to understand, read, write English
 - Physically and mentally able to answer questions and verbally interact during the interview process
 - Exclusion:
 - Male gender
 - Not able to communicate well in English
 - OSA diagnosis > one year
 - Severe psychiatric disorders

Methods

Measures

- Semi-structured, digitally recorded interviews (30-60 minutes) using a self-regulatory theory based interview guide
- Field notes
- Permission for follow-up contact
- Collection of demographic data to collect descriptive information on:
 - Age, gender, ethnicity, education level, income, marital status, occupation, etc.
 - Information regarding diagnosis of OSA (time, method, etc), associated health issues

Methods

- Data Management & Analysis
 - Audio digitally recorded interviews
 - Field notes
 - Professional transcription
 - NVivo 9 & hand-coding
 - Demographic data double-entered using IBM PASW 21[®]
 - Content analysis techniques
 - Themes derived
- Trustworthiness – Lincoln & Guba
- Reflexivity

Lincoln & Guba, 1985

The Study

- IRB approval from UMMS 12/13
 - (IRB ID: H00002995)
- Study Timeline 12/2013 – 7/2014
- 36 women expressed interest in study
 - 15 excluded for lack of participant response to requests for interviews
 - 21 women interviewed
 - Final sample: 20 women

The Sample Demographics

Category	Mean (SD)	Median (Range)
Age	53.20 years (12.992)	57 years (19-71)
Menopause age	46.86 years (6.538)	49 years (29-54)
Category	Number	Percentage
BMI:		
Normal (18.5-24.9)	3	15%
Overweight (25-29.9)	5	25%
Obese (30-40)	9	45%
Morbidly obese (>40)	3	15%
Married/Living w/partner	13	65%
Postmenopausal	14	70%

Sample Co-morbidities

Category	Number	Percentage
Depression	13	65%
Hypertension	12	60%
Insomnia	6	30%
Diabetes	1	5%
Borderline/under obs.	5	25%
Asthma	5	25%
Thyroid disease	4	20%
Cancer	2	10%

Sample OSA Characteristics

Category	Number	Percentage
Degree of OSA		
Mild	2	10%
Moderate	6	30%
Severe	8	40%
Don't Know/Not Told	4	20%
Snoring		
Aware of loud snoring	10	50%
Aware of mild snoring	6	30%
Unaware of mild snoring	2	10%
No snoring	2	10%
Sleep characteristics		
Good sleeper	9	45%
Poor sleep, frequent arousals	11	55%

Sample ~ Other Symptoms

Category	Number	Percentage
Cognitive		
Difficulty concentrating	15	75%
Short-term memory loss	14	70%
Forgetful/absent-minded	5	25%
Lack of focus	3	15%
Depression	13	65%
Morning headaches	10	50%
Teeth grinding/Sleep Bruxism	9	45%
Restless legs	8	40%
Anxiety	8	40%
Irritability	6	30%
Libido/sexual dysfunction	6	30%

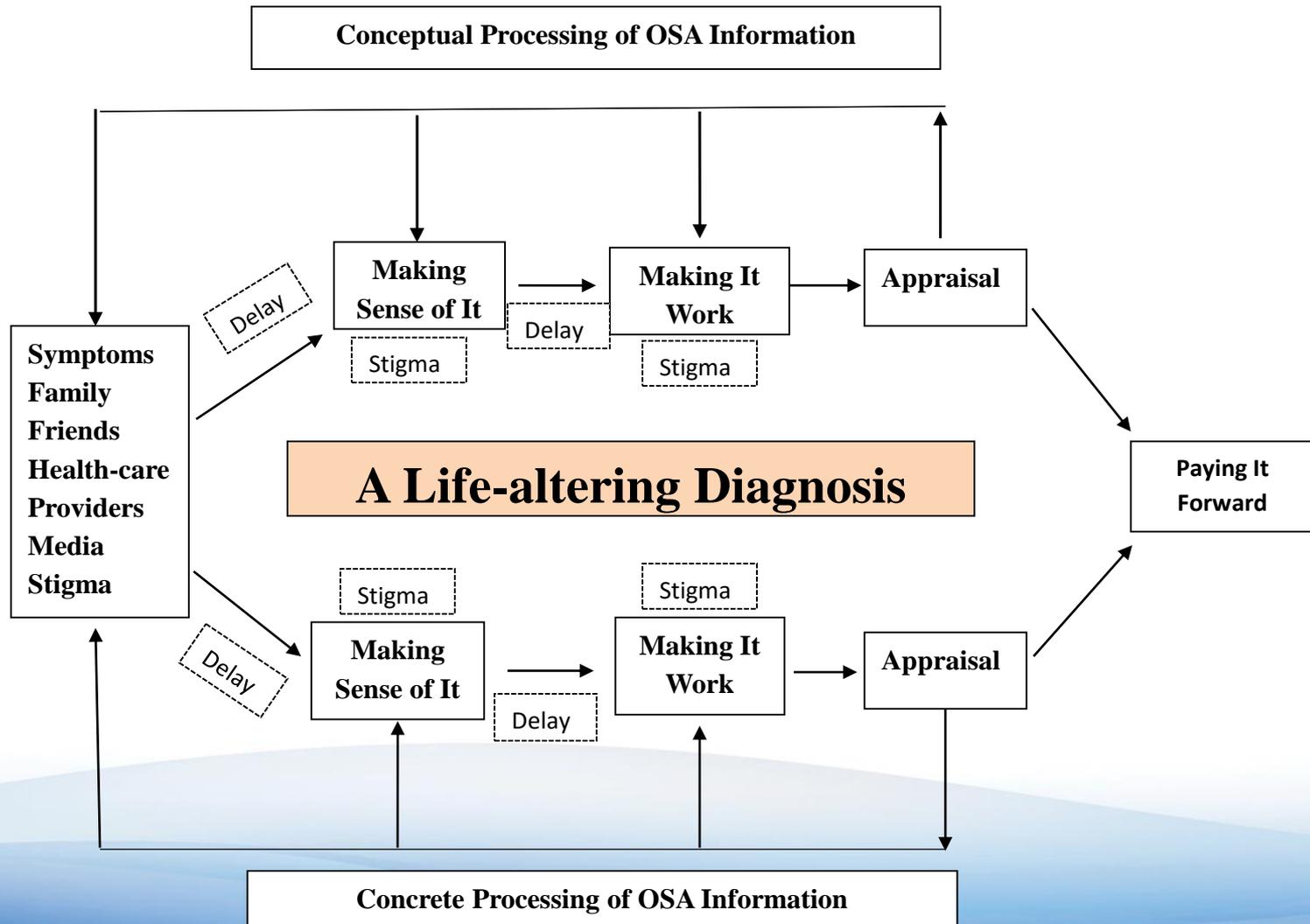
Sample Treatment

Category	Number	Percentage
All were prescribed CPAP	20	100%
Used every night	13	65%
Hours/night usage(6-8.5)	16	80%

Themes

- ***A life-altering diagnosis***
 - Both positive and negative outcomes
- Subthemes:
 - ***Making sense of it***
 - Coming to terms with symptoms (illness representation) and seeking diagnosis
 - ***Making it work***
 - Coming to terms with treatment
 - ***Paying it forward***
 - Advocating for others with OSA
 - Improving lifestyle, advocating for herself & family

Figure 2. A Life-altering Diagnosis



A Life-altering Diagnosis

- Positives
 - *Many of them reported initial thoughts of being “happy to have a diagnosis”, “OK” with the diagnosis, “hoping to have a magic pill to feel better, like I did before.”*
- Negatives
 - *“A bunch of hogwash. . . That it wasn’t a real problem, that something else must be going on, and how could so many millions of people be suffering from sleep apnea. I kind of looked it at as the new medical trend.”*
 - *“I was somewhat depressed and sad because I felt very old — I was in denial and I didn't want to believe I had it and I — it makes you feel old.”*

Making Sense of It

- Delay in diagnosis

“I actually pushed for this. . . my brother-in-law is a big guy and he has none of these symptoms either and he has the worst form, and I drive a school bus. That was it. She put me in for the test.”

“I didn’t know it until I was seventy years old. Excuse me, seventy years old. So I don’t know how you, I think you have to have doctors to ask questions, ‘how are your sleep habits?’ I just never knew it. Again, I don’t think doctors pick up on this.”

Making Sense of It

- Family influence/Sleep partner awareness:

“Sometimes you go so quiet that I have to actually look to see whether you’re still breathing or not, you get too quiet.”

“I’m very concerned about your breathing in the middle of the night. I’m really scared. It worries me. I lay awake listening to you.”

Making Sense of It

- Symptoms – identifying & recognition of association to OSA

“I just didn’t put that much stock into it. And then when they told me, I was scared at first because all of the new information. Like knowing that it is dangerous, it was very like, it was very shocking, I guess, to just hear that this is happening inside my own body and it took me thirty-three years to figure it out.”

Making Sense of It

- Stigma of OSA

“I actually, I chased a date out of the house, he says, ‘I can’t do this. I need sleep’” she was “embarrassed and horrified.” She was looking to the future and concerned about “how is a relationship ever going to work?”

“It's embarrassing just because it's a girl. Guys snore. That's a typical thing. Girls to be like that—no.”

Making Sense of It

- Conceptual and concrete processing of OSA information (Leventhal's Theory)

"I mean it was, you know, it was surprising to me I guess because I just felt, you know, atypical, you know. I would say ninety-nine, maybe not that high, we'll go with eighty-five percent of the people that had sleep apnea that I've worked with were men with fat necks, you know. So I'm thinking, you know, well obviously I'm not a man and, secondly, I don't have a fat neck. . . . but I just didn't feel like I fit that stereotype, you know?"

Making It Work

- Adjusting to using CPAP was often difficult:
“So the CPAP machine was the automatic choice. So a machine if you’re a guy that just crawls into bed, closes his eyes, falls asleep and the machine just takes you through the night, it’s great. But when you’re a woman that does not sleep well to start with, to just throw a machine that makes noise and is more inconvenient may not be the right first step in the process.”
“It was so noticeable that it was like, oh my God, like I don’t care how hard this is, I have to stick with it.”

Making It Work

- Delay in treatment

One woman then experienced significant delays (months) in obtaining her CPAP, resolving issues with CPAP problems including taking away her CPAP and leaving her without treatment because of miscommunication between her providers

- Lifestyle changes

Considered leaving her CPAP behind on a trip to Europe because she didn't "want to have to deal with it."

Concern about a woodland camping trip where she could not take her CPAP

Business woman was annoyed with the added burden of transporting her CPAP

Making It Work

- Family influences:

Women with partners often referred to working as a team with their spouses, “We set our team up and we help each other”, and their biggest source of support, “Mostly is like my husband.”

“You know—I’m raising my daughters. My husband left when my daughters were two and seven. My job was—I’m going to raise my children My kids are still young. They’re still little. I want to be around here for them. That’s why I would never not use my machine. Ever.”

Making It Work

- Stigma of OSA treatment (CPAP)
 - “Look at this stupid machine I’ve got to use. So I can use this so I don't snore and keep you awake or something.”
 - “I’d be more embarrassed you hearing me snore than seeing me wear a machine.”
 - “I dated a gentleman, and he had one too. So we both looked like idiots.”

Making It Work

- Conceptual and concrete processing of OSA treatment (Leventhal's Theory)

“And then once I got the machine, the first night I used it, I remember waking up and feeling like a completely different person. Oh, yeah, in a good way.”

“I wish I didn't have to use it, I wish there was an easier way to help with it, but it's just, you know, a little bit of an aggravation, you know, so oh I've got to clean this today and I have to you know. But, I mean, I know I need it to help me, so I do use it. Yeah, just decided why fight it, you know? That's my attitude is why fight it. Yeah. I think it helped definitely.”

Paying It Forward

- Offering information & support to others

“I’m just one of those people who like wants to tell the world about the wonderfulness that I have found.”

“I have my ex-husband, my daughter’s father, I have been on him all the time. Go and ask for a sleep test, go fast and push for a sleep test. Because I know he has it, because I have heard him stop breathing. And my little brother went through this when we were little, and so I keep pushing him to like, and that’s why my sister got it done. And one of my best friends pushed to get it done, and what do you know, they all have it.”

Paying It Forward

- Advocating for OSA education for women

“I also kind of wish that more PCPs talked about it with their patients . . . I wish that it had been suggested to me earlier in my life. . . there was more awareness about it.”

- Concern over others

One younger participant had to fight her children’s PCP as well as insurance companies for coverage for sleep studies and treatment for her teenage sons.

Another woman was concerned about her husband and her son, “No, he should be, and my son (tested for OSA).

Definitely. Maybe after I get a good handle on it (CPAP), I’ll stick it on his nose. He does stop breathing.”

Paying It Forward

- Health Promotion

“I go walking. When I walk every day I felt great. We were doing two to four miles a day. . . Great blood oxygen flowing, a lot of feeling good, and I think that’s also a very big part, is exercise.”

“I absolutely plan on walking. Now I have the energy to walk.”

Treatment Success

- Successful treatment was achieved by 55% ($n = 11$) women in the study
 - Improved QOL
 - Improved health
 - More rested, less fatigued
 - Improved sleep
 - Fewer apneic episodes
- *“I mean it’s my sleep apnea, so I own it.”*
- *“Okay yeah, it’s a pain, but deal with it.”*

Discussion

- Delay in diagnosis and treatment
- Women in this study did not present with the classic symptoms of OSA
- Sleep partners were very aware of breathing difficulties
- 55% of women in this study were unaware they might have OSA

Discussion

- Women were often unaware of OSA's co-morbidities or association with depression, cardiovascular disease, cognitive dysfunction, sexual dysfunction, diabetes, etc
- These women often had difficulty adjusting to OSA treatment with CPAP

Implications for Practice

- Increased knowledge by HCPs and insurance companies of women's OSA presentation
- More accessibility to testing for women
- Use of professional standards and guidelines to assist with diagnosis & treatment
- Inclusion of sleep partners in the evaluation of sleep disorders in women
- Awareness of other treatment options more suitable for women

Implications for Research

- Women-specific research on OSA screening tools, risk factors & treatments
- Interventional studies that test gender-based strategies to manage OSA treatment
- Inclusion of sleep partners in future studies for valuable input on women's symptomatology for earlier diagnosis

Implications for Health Policy

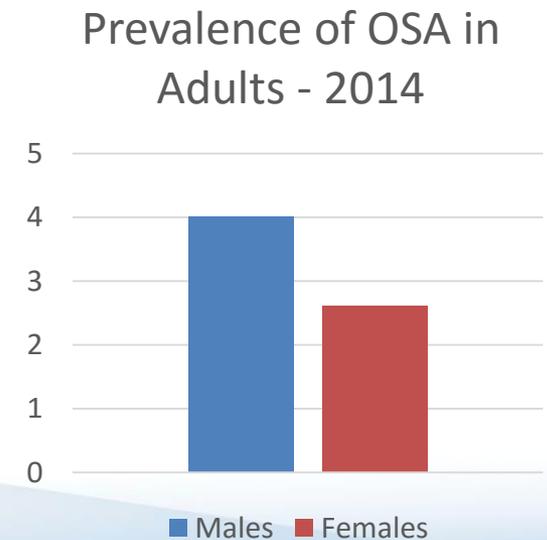
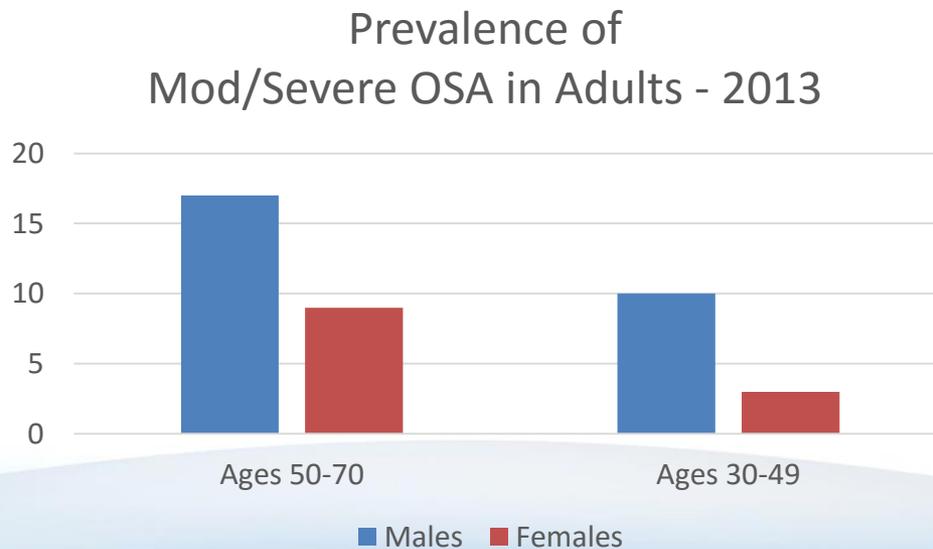
- Universal coverage for diagnosis and treatment by insurance companies
- More public awareness of the consequences of OSA, especially for women
 - Public service announcements (PSA) during prime time programs of interest to women
 - Use of other social media to disseminate OSA information

Limitations

- Lack of racial/ethnic diversity
 - One Hispanic, all others were Caucasian
- Majority of phone interviews versus in-person interviews

Impact on Perianesthesia Nursing

- 80% of Americans with moderate to severe OSA undiagnosed
- Americans with diagnosed OSA ~ 26%



American Sleep Apnea Association (ASAA), 2012

Peppard et al., 2013

Pan, Wang, & Wang, 2014

Impact on Perianesthesia Nursing

- More awareness
 - 80/93
- Undiagnosed OSA
 - Difficult intubation
 - Anesthetic management challenges
 - Postoperative complications
 - Increased LOS
 - Increased rate of ICU admissions (or overnight stays after minor surgery)

ASPAN Perianesthesia Nursing Standards, Practice Recommendations & Interpretive Statements, 2014

Impact on Perianesthesia Nursing

- What do you need to be aware of?
 - Anyone with known or suspected OSA
 - Receiving opioids
 - Undergoing procedural sedation
 - General anesthesia
 - Regional anesthesia with sedation
 - Treat them like they have OSA!

ASPAN Perianesthesia Nursing Standards, Practice Recommendations & Interpretive Statements, 2014

ASPAN Screening Recommendations

- BMI > 30
- Increased abdominal fat
- Cardiovascular disease
 - Hypertension (resistant)
 - Ischemic Heart Disease
 - Heart Failure
 - Arrhythmias
 - Stroke
- Age
- Male gender

ASPAN Perianesthesia Nursing Standards, Practice Recommendations & Interpretive Statements, 2014

ASPAN Screening Recommendations

- Barrett's esophagus
- Endocrine dysfunction
 - Type II diabetes
 - Metabolic syndrome
- Hypercapnia
 - Increased BMI
 - Restrictive chest wall
 - Decreased overnight saturation
- Upper airway enlargement

ASPAN Perianesthesia Nursing Standards, Practice Recommendations & Interpretive Statements, 2014

Pre-operative Screening Tools

- Preoperative screening imperative
- Most are based on the male model
 - Classic symptoms:
 - Loud snoring
 - Frequent awakening, choking, snorting
 - Witnessed apneas
 - EDS
 - Male gender is usually a scoring criteria

ASA OSA Checklist

- Snoring
- Tired
- Witnessed apnea
- BMI > 25
- Age > 50
- Neck circumference >40 cm
- Male gender

American Society of Anesthesiologists (ASA), 2014

STOP-BANG

1. Do you SNORE loudly (louder than talking or loud enough to be heard through closed doors)?
2. Do you often feel TIRED, fatigued, or sleepy during daytime?
3. Has anyone OBERVED you stop breathing during your sleep?
4. Do you have or are you being treated for high blood PRESSURE?
5. BMI more than 35?
6. AGE over 50 years old?
7. NECK circumference > 40 cms (15.75 inches)?
8. Male GENDER?

≥3 yes answers: High-risk for OSA

<3 yes answers: Low-risk for OSA

Chung, Subramanyam, Liao, Sasaki, Shapiro & Sun, 2012

Signs & Symptoms to be Aware

- EDS
- Observed snoring
- Snoring under sedation
- Dry mouth or sore throat
- Morning headache
- Fatigue or malaise
- Witnessed apneas
- Restlessness
- Drowsy driving
- Awakening unrefreshed after sleep
- Nocturia

What I would Add

- Cognitive dysfunction
- Depression
- Sleep bruxism
- Restless leg syndrome (RLS)
- Insomnia
- Anxiety
- Irritability
- Sexual dysfunction
- Cancer diagnosis

Quintana-Gallego et al., 2004

Shepertycky et al., 2005

Ye et al., 2008

Ye et al., 2009

Resta et al., 2003

Valipour et al., 2007

Wheaton et al., 2012

Petersen et al., 2011

Petersen et al., 2013

Stavaras et al., 2012

Steinke, 2013

Castillo et al., 2014

Cronlein et al., 2011

Kapsimalis & Kryger, 2009

M. H. Lee et al., 2014

Phillips et al., 2008

Subramanian et al., 2011

A Cautionary Tale

- 66 year old with OSA, non-adherent with CPAP use
- Remote history of breast cancer in the early 90s
- Co-morbidities included HTN, depression, atrial fibrillation
- Admitted with recurrent breast cancer
- Bronchoscopy for evaluation of lesions consistent with lung metastasis

References

- American Sleep Apnea Association. (2012). Apnea Support Forum. Retrieved from <http://www.apneasupport.org/>
- American Sleep Apnea Association (ASAA). (2012). A very short course on sleep apnea. Retrieved from: <http://www.sleepapnea.org/i-am-a-health-care-professional.html>
- American Society of Anesthesiologists (ASA). (2014). Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea: An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea. *Anesthesiology*, 120, 1-19.
- American Society of PeriAnesthesia Nurses (ASPAN). (2014). Obstructive Sleep Apnea in the Adult Patient. *2015-2017 Perianesthesia Nursing Standards, Practice Recommendations and Interpretative Statements*. Cherry Hill, New Jersey: ASPAN.
- Cameron, L. D., & Leventhal, H. (1995). Vulnerability Beliefs, Symptom Experiences, and the Processing of Health Threat Information: A Self-Regulatory Perspective. *Journal of Applied Social Psychology*, 25, 1859-1883.

- Castillo, J., Goparaju, B., & Bianchi, M. T. (2014). Sleep-wake misperception in sleep apnea patients undergoing diagnostic versus titration polysomnography. *Journal of Psychosomatic Research*, 76, 361-367. doi: 10.1016/j.jpsychores.2014.03.001
- Chung, F., Yegneswaran B., Liao, P., Chung, S., Vairavanathan, S., Islam, S., . . Shapiro, C.M. (2008). STOP questionnaire: A tool to screen patients for obstructive sleep apnea. *Anesthesiology*, 108, 812-821.
- Cronlein, T., Geisler, P., Langguth, B., Eichhammer, P., Jara, C., Pieh, C., . . . Hajak, G. (2011). Polysomnography reveals unexpectedly high rates of organic sleep disorders in patients with prediagnosed primary insomnia. *Sleep and Breathing*. doi: 10.1007/s11325-011-0608-8
- Finucane, M. M., Stevens, G. A., Cowan, M. J., Danaei, G., Lin, J. K., Paciorek, C. J., . . . Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating, G. (2011). National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants. *Lancet*, 377, 557-567. doi: 10.1016/S0140-6736(10)62037-5

- Kapsimalis, F., & Kryger, M. (2009). Sleep breathing disorders in the U.S. female population. *Journal of women's health, 18*, 1211-1219. doi: 10.1089/jwh.2008.1054
- Lam, J. C., Mak, J. C., & Ip, M. S. (2012). Obesity, obstructive sleep apnoea and metabolic syndrome. *Respirology, 17*, 223-236. doi: 10.1111/j.1440-1843.2011.02081.x
- Lee, M. H., Lee, S. A., Lee, G. H., Ryu, H. S., Chung, S., Chung, Y. S., & Kim, W. S. (2014). Gender differences in the effect of comorbid insomnia symptom on depression, anxiety, fatigue, and daytime sleepiness in patients with obstructive sleep apnea. *Sleep and Breathing, 18*, 111-117. doi: 10.1007/s11325-013-0856-x
- Leventhal, H., Benyamini, Y., Brownlee, S., Diefenbach, M., Leventhal, E. A., Patrick-Miller, L., & Robitaille, C. (1997). Illness Representations: Theoretical Foundations. In K. J. Petrie & J. A. Weinman (Eds.), *Perceptions of health and illness : Current research and applications*. Amsterdam: Harwood Academic.

- Leventhal, H., & Johnson, J. J. (1983). Laboratory and field experimentation: Development of a theory of self-regulation. In P. J. Wooldridge, M. H. Schmitt, J. K. Skipper & R. C. Leonard (Eds.), *Behavioral science & nursing theory* (pp. 189- 266). St. Louis: Mosby
- Leventhal, H., Safer, M. A., & Panagis, D. M. (1983). The impact of communications on the self-regulation of health beliefs, decisions, and behavior. *Health Education Quarterly*, 10, 3-29. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/6629788>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, Calif.: Sage Publications.
- Pan, Y., Wang, W., & Wang, K. S. (2014). Associations of Alcohol Consumption and Chronic Diseases With Sleep Apnea Among US Adults. *International Journal of High Risk Behaviors and Addiction*, 3, e19088. doi: 10.5812/ijhrba.19088
- Peppard, P. E., Young, T., Barnet, J. H., Palta, M., Hagen, E. W., & Hla, K. M. (2013). Increased Prevalence of Sleep-Disordered Breathing in Adults. *American Journal of Epidemiology*. doi: 10.1093/aje/kws342
- Petersen, M., Kristensen, E., Berg, S., Giraldi, A., & Midgren, B. (2011). Sexual function in female patients with obstructive sleep apnea. *Journal of Sexual Medicine*, 8, 2560-2568. doi: 10.1111/j.1743-6109.2011.02358.x

- Petersen, M., Kristensen, E., Berg, S., & Midgren, B. (2013). Long-term effects of continuous positive airway pressure treatment on sexuality in female patients with obstructive sleep apnea. *Journal of Sexual Medicine*, 1, 62-68. doi: 10.1002/sm2.18
- Phillips, B. A., Collop, N. A., Drake, C., Consens, F., Vgontzas, A. N., & Weaver, T. E. (2008). Sleep disorders and medical conditions in women. Proceedings of the Women & Sleep Workshop, National Sleep Foundation, Washington, DC, March 5-6, 2007. *Journal of Women's Health (Larchmt)*, 17, 1191-1199. doi: 10.1089/jwh.2007.0561
- Quintana-Gallego, E., Carmona-Bernal, C., Capote, F., Sanchez-Armengol, A., Botebol-Benhamou, G., Polo-Padillo, J., & Castillo-Gomez, J. (2004). Gender differences in obstructive sleep apnea syndrome: a clinical study of 1166 patients. *Respiratory Medicine*, 98, 984-989.
- Resta, O., Caratozzolo, G., Pannacciulli, N., Stefano, A., Giliberti, T., Carpagnano, G. E., & De Pergola, G. (2003). Gender, age and menopause effects on the prevalence and the characteristics of obstructive sleep apnea in obesity. *European Journal of Clinical Investigation*, 33, 1084-1089. doi: 10.1111/j.1365-2362.2003.01278.x
- Sandelowski, M. (2010). What's in a name? Qualitative description revisited. *Research in Nursing & Health*, 33(1), 77-84. doi: 10.1002/nur.20362

- Shepertycky, M. R., Banno, K., & Kryger, M. H. (2005). Differences between men and women in the clinical presentation of patients diagnosed with obstructive sleep apnea syndrome. *Sleep, 28*, 309-314.
- Stavaras, C., Pastaka, C., Papala, M., Gravas, S., Tzortzis, V., Melekos, M., . . . Gourgoulianis, K. I. (2012). Sexual function in pre- and post-menopausal women with obstructive sleep apnea syndrome. *International Journal of Impotence Research*. doi: 10.1038/ijir.2012.20
- Steinke, E. E. (2013). Sexuality and chronic illness. *Journal of Gerontological Nursing, 39*, 18-27; quiz 28-19. doi: 10.3928/00989134-20130916-01
- Subramanian, S., Guntupalli, B., Murugan, T., Bopparaju, S., Chanamolu, S., Casturi, L., & Surani, S. (2011). Gender and ethnic differences in prevalence of self-reported insomnia among patients with obstructive sleep apnea. *Sleep and Breathing, 15*, 711-715. doi: 10.1007/s11325-010-0426-4
- Valipour, A., Lothaller, H., Rauscher, H., Zwick, H., Burghuber, O. C., & Lavie, P. (2007). Gender-related differences in symptoms of patients with suspected breathing disorders in sleep: a clinical population study using the sleep disorders questionnaire. *Sleep, 30*, 312-319. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/17425227>

- Wheaton, A. G., Perry, G. S., Chapman, D. P., & Croft, J. B. (2012). Sleep disordered breathing and depression among U.S. adults: National Health and Nutrition Examination Survey, 2005-2008. *Sleep*, 35, 461-467. doi: 10.5665/sleep.1724
- Ye, L., Liang, Z. A., & Weaver, T. E. (2008). Predictors of health-related quality of life in patients with obstructive sleep apnoea. *Journal of Advanced Nursing*, 63, 54-63. doi: 10.1111/j.1365-2648.2008.04652.x
- Ye, L., Pien, G. W., & Weaver, T. E. (2009). Gender differences in the clinical manifestation of obstructive sleep apnea. *Sleep medicine*, 10, 1075-1084. doi: 10.1016/j.sleep.2009.02.006
- Yeboah, J., Redline, S., Johnson, C., Tracy, R., Ouyang, P., Blumenthal, R. S., . . . Herrington, D. M. (2011). Association between sleep apnea, snoring, incident cardiovascular events and all-cause mortality in an adult population: MESA. *Atherosclerosis*, 219, 963-968. doi: 10.1016/j.atherosclerosis.2011.08.021
- Young, T. (1993). Analytic epidemiology studies of sleep disordered breathing--what explains the gender difference in sleep disordered breathing? *Sleep*, 16(8 Suppl), S1-2.

- Young, T., Evans, L., Finn, L., & Palta, M. (1997). Estimation of the clinically diagnosed proportion of sleep apnea syndrome in middle-aged men and women. *Sleep*, 20, 705-706.
- Young, T., Finn, L., Austin, D., & Peterson, A. (2003). Menopausal status and sleep-disordered breathing in the Wisconsin Sleep Cohort Study. *American Journal of Respiratory and Critical Care Medicine*, 167, 1181-1185. doi: 10.1164/rccm.200209-1055OC
- Young, T., Hutton, R., Finn, L., Badr, S., & Palta, M. (1996). The gender bias in sleep apnea diagnosis. Are women missed because they have different symptoms? *Archives of Internal Medicine*, 156, 2445-2451. Retrieved from http://archinte.jamanetwork.com.ezproxy.umassmed.edu/data/Journals/INT/EMED/17508/archinte_156_21_007.pdf
- Young, T., Palta, M., Dempsey, J., Skatrud, J., Weber, S., & Badr, S. (1993). The occurrence of sleep-disordered breathing among middle-aged adults. *The New England Journal of Medicine*, 328, 1230-1235. doi: 10.1056/NEJM199304293281704

Questions???

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Thank You!