

Sleep in women Veterans

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- Dr. Martin is President of the American Academy of Sleep Medicine. The content of this presentation does not reflect positions or opinions of the organization.

HISTORY LESSON

1901

U.S. Army Nurse Corps established

- First time women were formally allowed to serve



WWI & WWII:

Women served in non-commissioned officer and non-combat roles.

- Nearly 350,000 American Women Served in WWII

Korean War

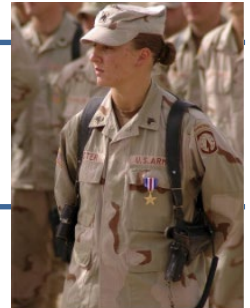
Number of women restricted to 2% of each branch

- Automatic discharge for pregnancy

Viet Nam War

Women served in Vietnam, primarily as nurses.

- 1972, women permitted to command units that included men



Army Sgt. Leigh Ann Hester after receiving her Silver Star medal

2015

Ban on women serving in combat roles lifted

- Over 300,000 women served in Iraq and Afghanistan
- Over 9,000 have earned Combat Action Badges
- Women make up 16% of Armed Forces

CURRENT STATISTICS

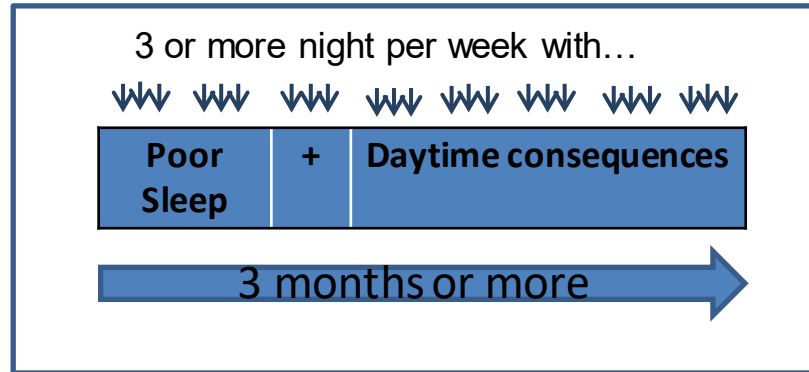
- Women make up >10% of the US Veteran population
- 1 in 5 women receiving care VA experienced sexual trauma during their service
- Women Veterans have higher rates of unemployment and homelessness than Veterans who are men
- Women Veterans are more likely to have mental health conditions
- What about sleep and circadian disorders?

Insomnia
treatment
program within
VA Sleep
Disorders
Center (2007)

VA Sepulveda Ambulatory Care Center



DSM-5 AND ICSD CRITERIA FOR INSOMNIA DISORDERS



- Poor sleep at least 3x/week for at least 3 months
- With daytime consequences
- Not fully accounted for by another comorbid condition or medication
 - One does not have to “rule out” other factors, instead, insomnia is diagnosed comorbid with other health/mental health conditions
- Not the result of insufficient opportunity for sleep
 - Insomnia is not the same as sleep deprivation or inadequate housing

Cognitive-behavioral model and CBT-I components (brief psychotherapy)

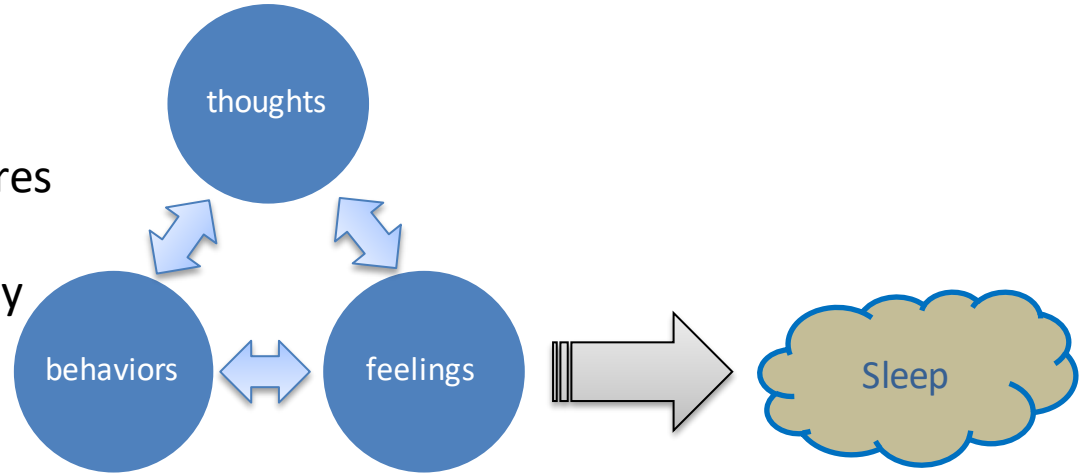
Cognitive therapy

Counter arousal measures

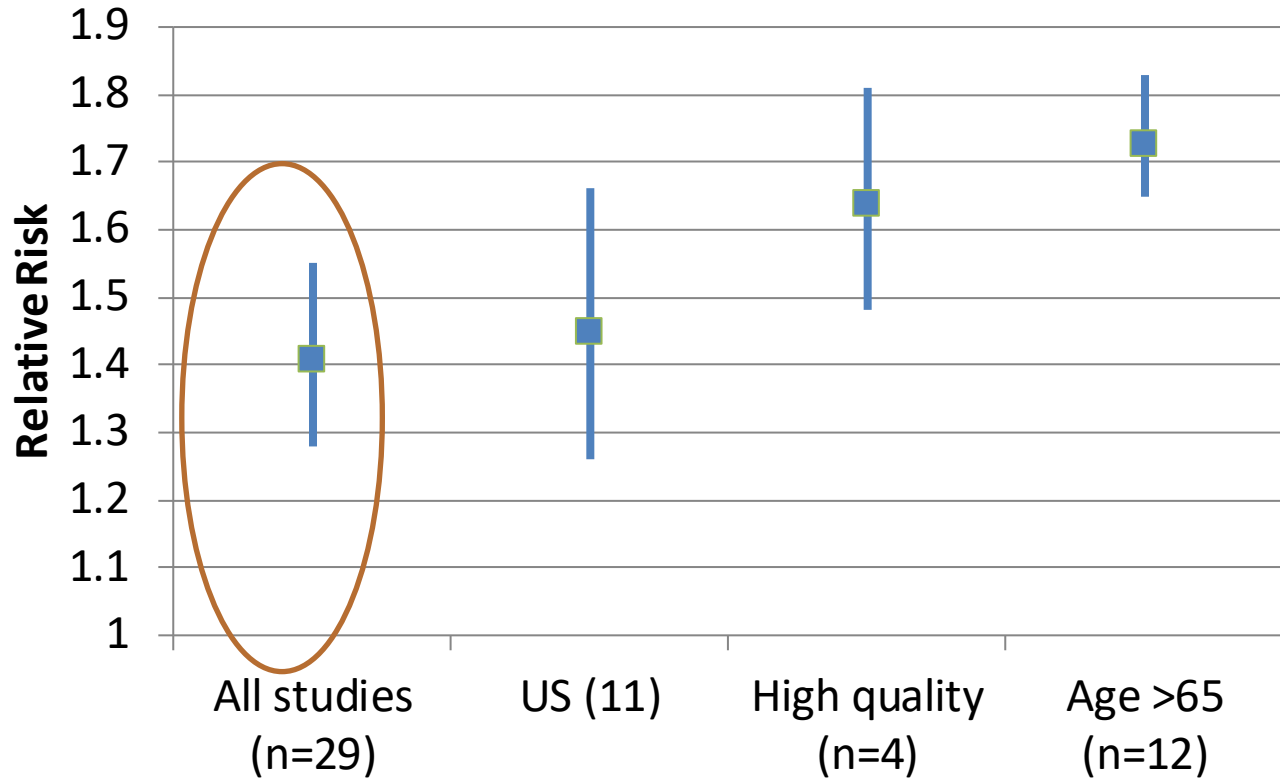
Sleep restriction therapy

Stimulus control

Sleep hygiene



RISK FOR INSOMNIA IS HIGHER AMONG WOMEN THAN MEN



Number of women receiving care, FY08	6,000
Expected number with insomnia	1,380 (23%)
Number referred (for any sleep care)	112 (1.9%)

- Only 8% of the expected number of women veterans with insomnia disorder were referred to the sleep center.
- Question: Why are fewer women veterans than expected referred?

QI project: Referral of women Veterans for insomnia treatment FY08

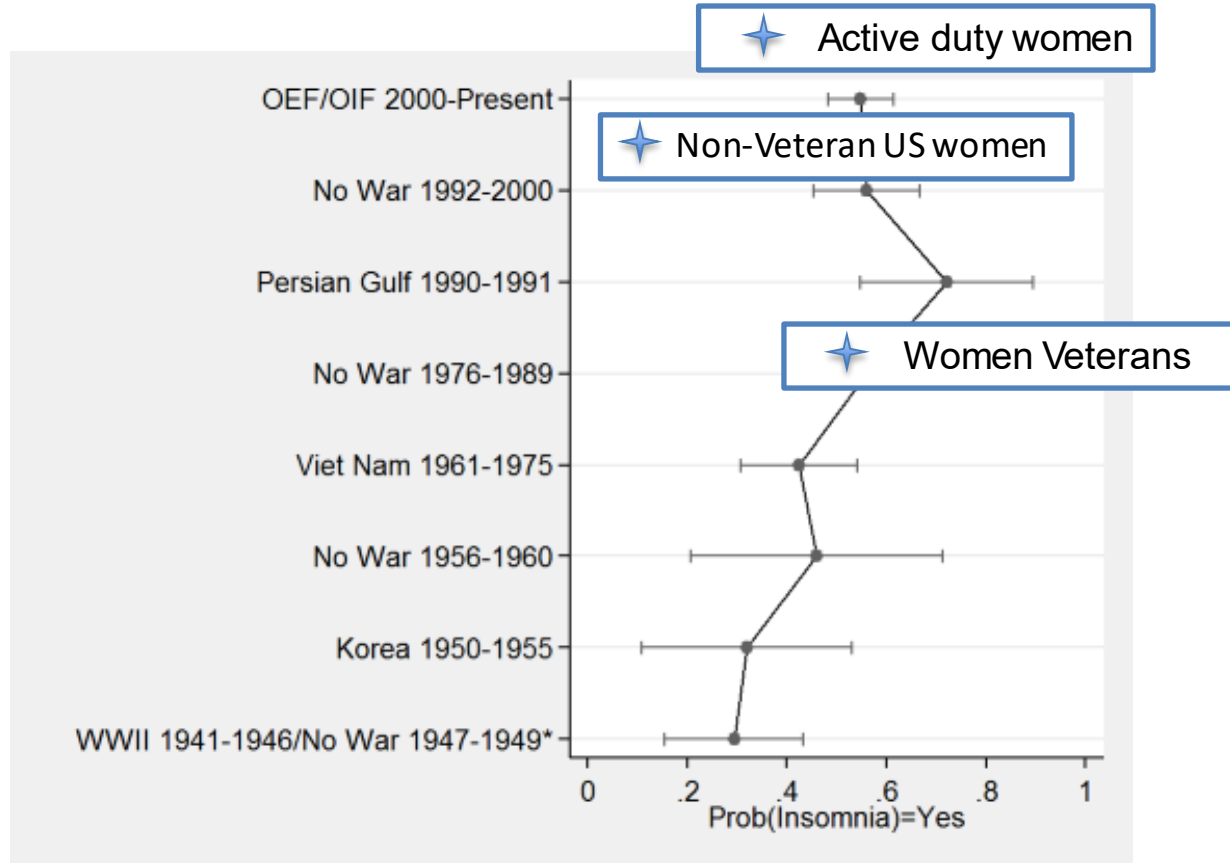
Studies of insomnia in women Veterans, 2008

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Survey to identify rates of insomnia in women Veterans

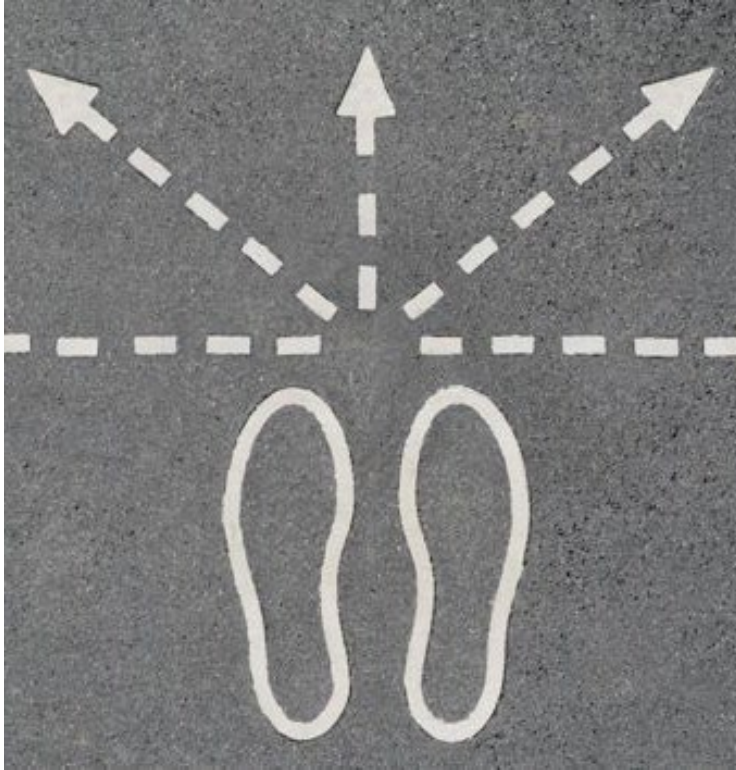
- Developed and distributed a survey including items to address diagnostic criteria for insomnia disorder
- Sample: all women who received VA care in prior 12 months, residing within 25 miles
- 1,530 potential responders
 - 671 returned survey; 69 completed by phone
- 660 (43.1%) with complete data for analysis

**PROBABILITY OF INSOMNIA DISORDER BY PERIOD OF SERVICE COHORT (N=660;
AGE=50.9±17.7YRS)**



AMONG WOMEN VETERANS WITH INSOMNIA, WOMEN WITH PTSD HAVE MORE SEVERE SYMPTOMS

N=107	PTSD (n=55)	No PTSD (n=52)	P-value
Duration of sleep problems (years)	15.8 (13.0)	13.5 (14.2)	.438
Sleep quality (PSQI total score)	13.2 (3.5)	10.4 (3.0)	<.001
Frequency of bad dreams (PSQI)	1.9 (1.5)	0.6 (.91)	<.001
Insomnia severity index total score	19.2 (4.8)	14.3 (5.5)	<.001
Dysfunctional beliefs and attitudes about sleep-10 item scale mean score	6.4 (1.9)	5.0 (2.0)	<.001



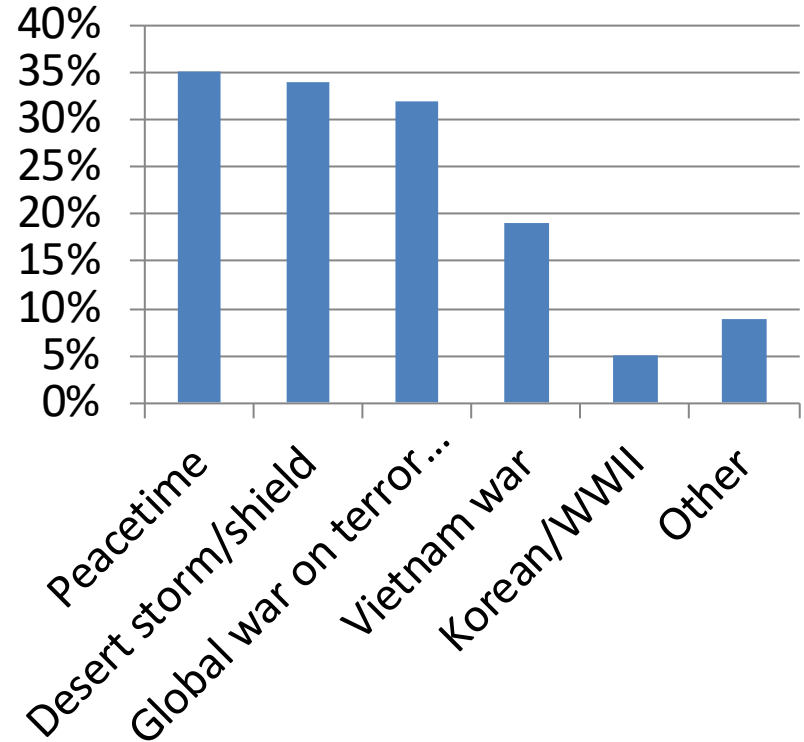
Treatment
preferences and
what matters most

Insomnia is common. What treatments do women Veterans want?

- National random sample (n=4,000)
- Expanded postal survey (Martin et al., 2017)
 - Sleep (insomnia, sleep apnea, restless legs, sleepiness)
 - Comorbidities (medical, psychiatric)
 - Treatment preferences (type, location, provider)
- 1,560 completed surveys (39% response rate)
 - 1,371 by mail; 198 by phone

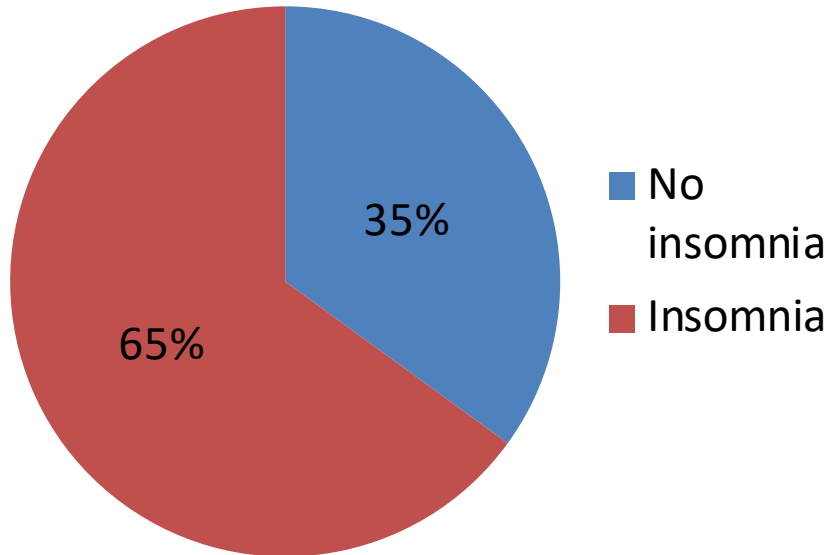
Demographics (n=1560)

	Mean or %
Mean (SD) Age, years	52 (15)
% Non-Hispanic White only	72%
% Married	41%
% Employed for wages	41%
% With children at home	30%

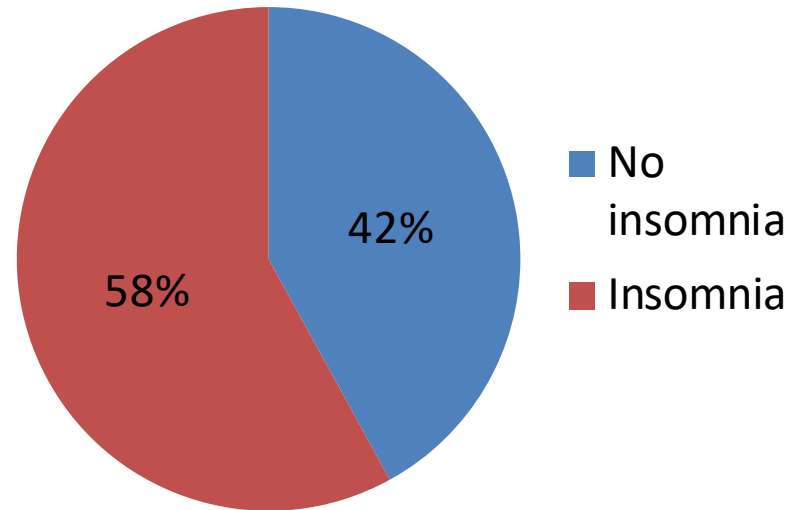


Rates of insomnia disorder in a national sample of women Veterans

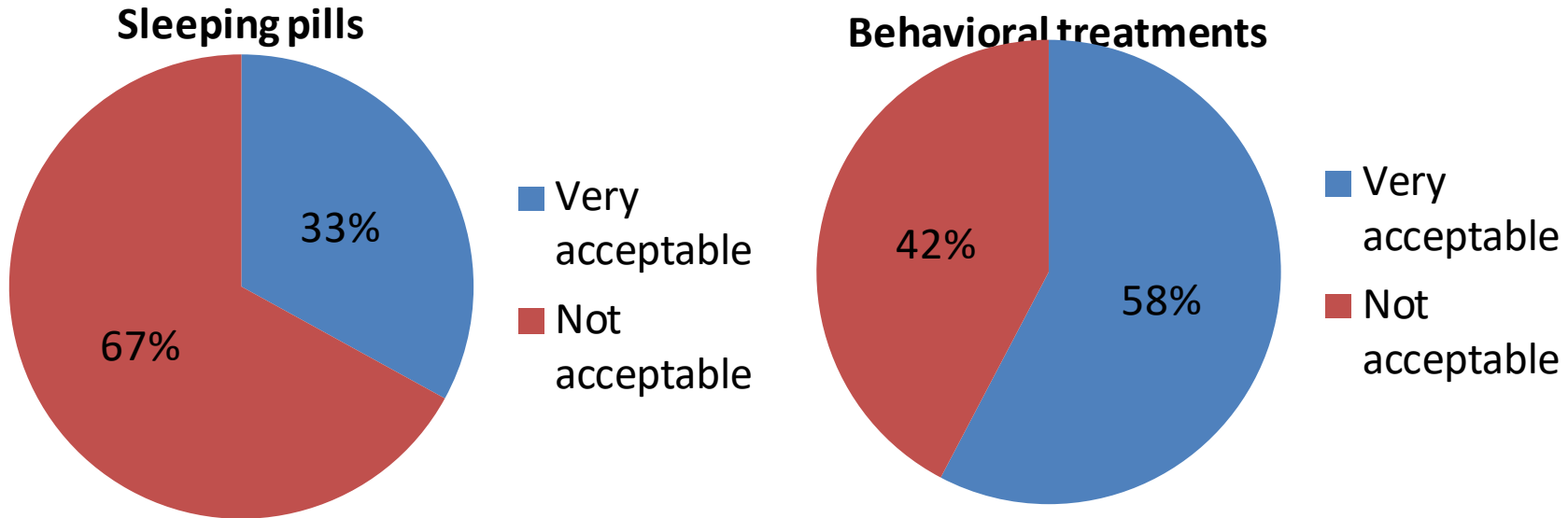
Diagnostic criteria (ICSD-2)



Insomnia severity index (moderate or higher)



Acceptability of treatment for insomnia



Patient were significantly more likely to prefer behavioral treatments over medications ($Z=13.3$; $p<.001$)

QI project: Treatment completion rates for men and women Veterans (CBT-I)

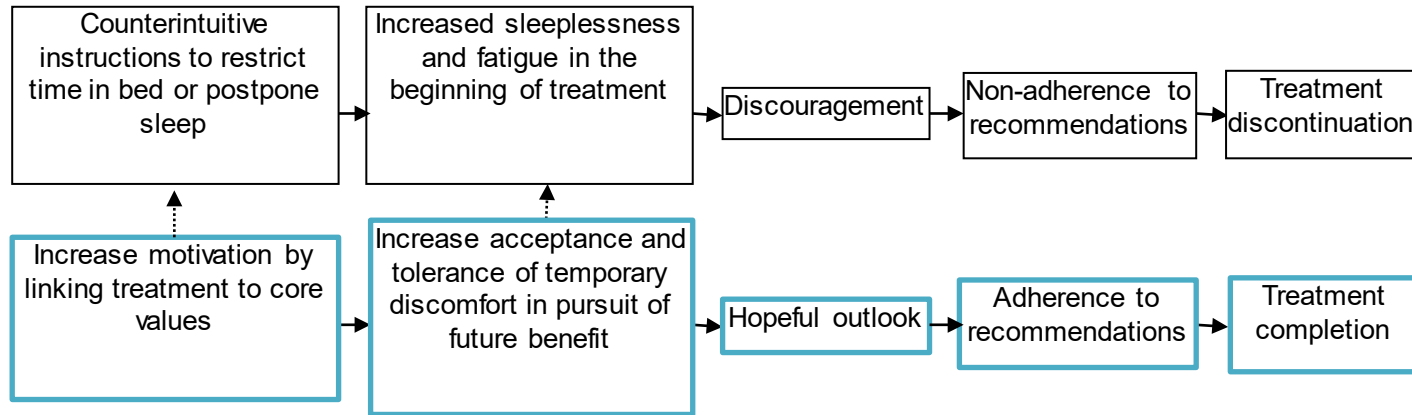
Women were equally likely to initiate treatment (attend an intake sessions) ...but were **more likely to discontinue treatment** (typically by “no show” to scheduled follow up visit) compared to men (Q3, FY13)

	Men (n=25)	Women (n=10)
Treatment completion	71%	50%
Treatment discontinuation	29%	50%

Cognitive Behavioral Therapy for Insomnia (CBT-I)

Sleep education	2-process model of sleep regulation, 3-factor model of insomnia
Sleep restriction	Reduce time spent awake in bed and regularize schedule
Stimulus control	Eliminate association between bed and arousal
Sleep hygiene	Correct/improve environmental factors and behaviors that impact sleep quality
Cognitive therapy	Identify and change maladaptive/inaccurate thoughts about sleep to adaptive/helpful thoughts

Theoretical model of CBT-I treatment non-adherence and strategies to improve adherence



Core Values

What Is Most Important In Your Life? What Do You Care About?

List 3 of the things you most care about in your life

1. My family

2. Spending time with my dog

3. Taking care of my health

Insomnia And What You Care About...

Write down the ways insomnia impacts what you care about most

1. _____

2. _____

3. _____

ABC-I Pilot study (pre-post)

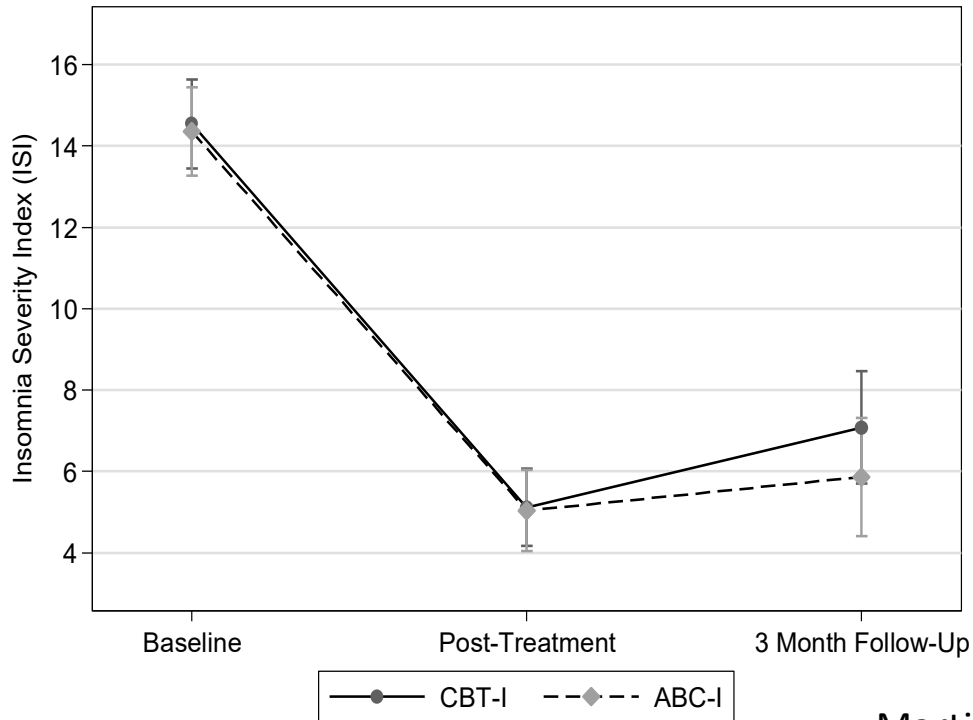
	BEFORE ABC-I	AFTER ABC-I	<i>t</i> (<i>p</i> -value)	Effect size (<i>d</i>)
Sleep Quality (PSQI)	14.8 (3.4)	10.5 (4.9)	2.33 (0.10)	1.26
Insomnia Severity (ISI)	18.5 (5.3)	7.2 (7.2)	2.22 (0.11)	2.13
Sleep Efficiency (Sleep Diary)	81.9 (10.7)	94.2 (1.3)	-5.14 (.01)	1.09

- 11 women Veterans with insomnia participated ($M[SD]$ age = 56.4 [13.3] years). 5 began treatment. 4 completed pre- and post- treatment evaluations.

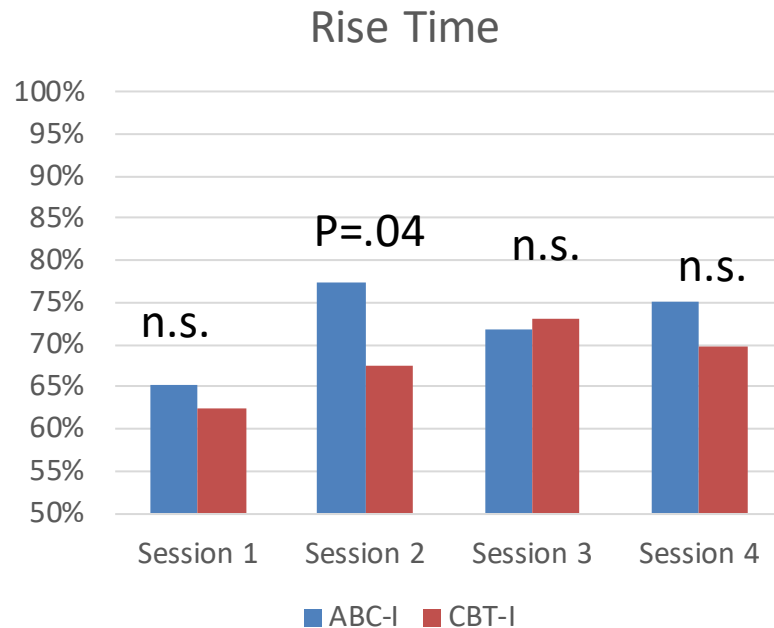
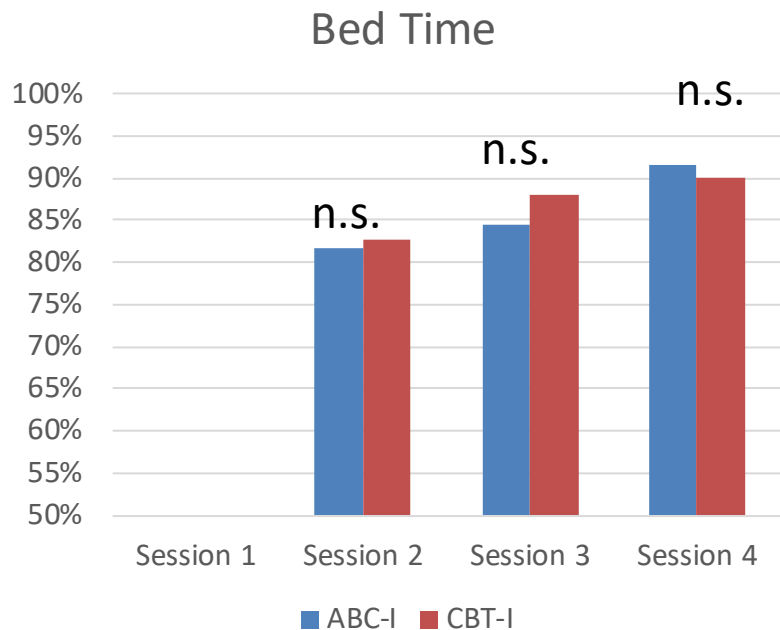
Comparative effectiveness: ABC-I vs. cbt-i

- Randomized trial (N-148) women with insomnia disorder
- Aim 1: compare the effectiveness of ABC-I in improving sleep to CBT-I from baseline to post-treatment and 3-month follow-up.
 - ABC-I will be non-inferior to CBT-I
- Aim 2: compare dropout rates and adherence to behavioral recommendations between ABC-I and CBT-I.
 - Hypothesis: ABC-I will be superior to CBT-I

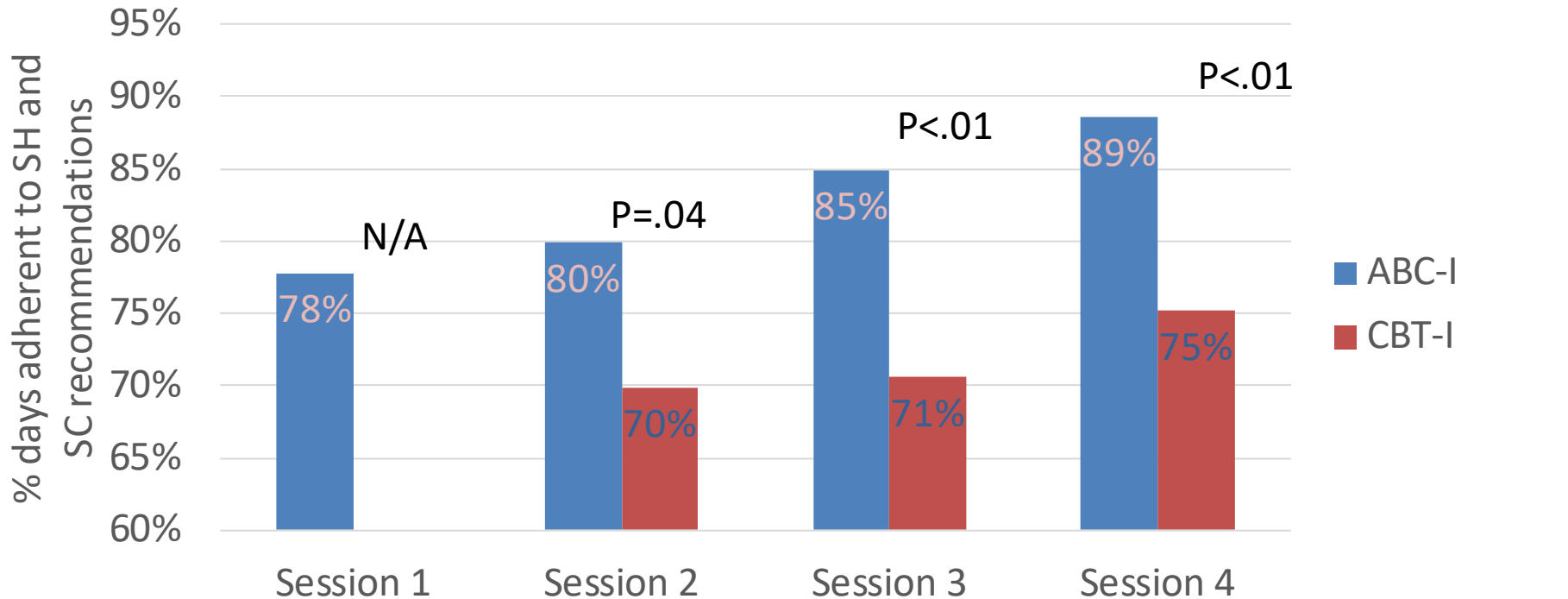
ISI scores at each time point by treatment group: ABC-I is non-inferior to cbt-i



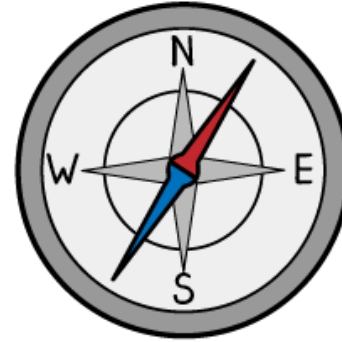
Adherence to treatment recommendations: Sleep Schedule, % days adherent to recommendations



Superior adherence to sleep hygiene and stimulus control recommendations with ABC-I



PERSONAL VALUES



YOUR CORE VALUES ARE LIKE A COMPASS.
A USEFUL TOOL TO HELP YOU MAKE DECISIONS.
UNSURE WHICH DIRECTION TO GO?
CONSULT THE COMPASS TO INFORM YOUR CHOICE.

ABC-I Values Worksheet Example

What Is Most Important In Your Life? What Do You Care About?

List 3 of the things you most care about in your life

1. My children and grandchildren
2. My relationship with God
3. My health, long-term health; trying to eat well, watch my weight, and take care of myself

Insomnia And What You Care About...

Write down the ways insomnia impacts what you care about most

1. Relationships with my family because I am tired and feel like I miss out on things with them
2. Sometimes I don't go to church because I'm too tired
3. Sometimes I'm too tired to eat healthy and it impacts my food choices

Keep In Mind What Is Important To YOU...

Religion



Spirituality

Family



Work



Health



Advocacy



Hobbies

Relationships



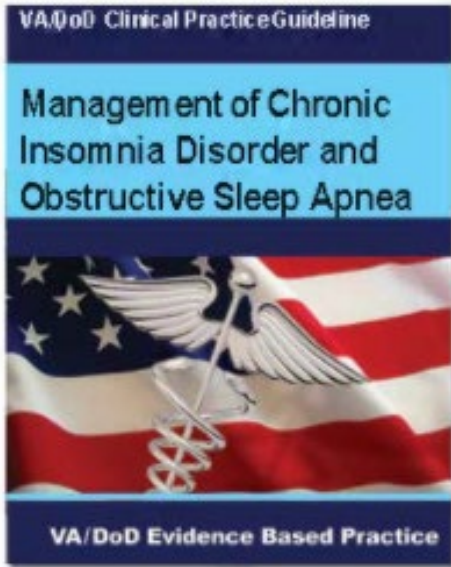
Value categories were coded based on the Values Bull's Eye (Lundgren, Luoma, Dahl, Strosahl, & Melin 2012) and Valued Living Questionnaire (Wilson & Groom, 2002).

Surprise! Sleep Apnea in Women Veterans

- Over 1/3 of women with insomnia also had sleep disordered breathing, which is higher than the population base rate
- SDB: Interruptions in breathing that lead to drop in oxygen levels or arousals from sleep
- The recommended first-line treatment is positive airway pressure therapy (PAP)



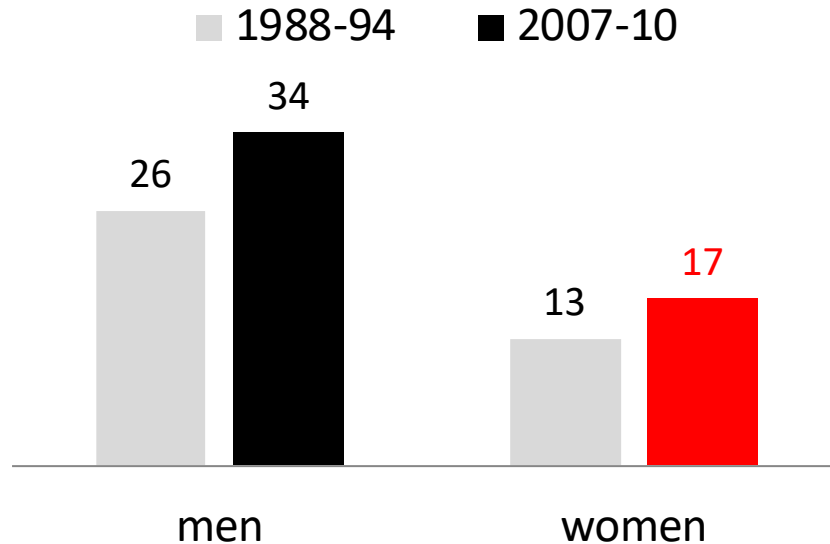
VA/DOD CLINICAL PRACTICE GUIDELINES



<https://www.healthquality.va.gov/>

- Diagnosis of Obstructive Sleep Apnea and Insomnia Disorder
 - 6 recommendations
- Treatment/Management of Obstructive Sleep Apnea
 - 12-recommendations
- **Treatment/Management of Chronic Insomnia Disorder**
 - 8 Behavioral/Psychological Treatments
 - 4 Complementary/Integrative Treatments
 - 4 Over the counter Treatments
 - 7 Pharmacotherapy

Rates of SDB in men and women Wisconsin Sleep Cohort Study



National survey of women veterans (Martin et al., 2022)	% respondents
Diagnosed with sleep apnea	13.3%
STOP high risk (- 2 or more of snoring, tiredness, observed apneas, high BP)	50.1%
% undiagnosed	36.8%

Women with sleep apnea under-represented in VA research

- Positive Airway Pressure Adherence in Veterans with Posttraumatic Stress Disorder (El-Solh et al., 2010)
 - 148 Veterans with PTSD and 148 matched controls without PTSD
 - PAP adherence lower at 30-day follow-up for those with PTSD ($p < .001$)
- The Impact of Posttraumatic Stress Disorder on CPAP Adherence in Patients with Obstructive Sleep Apnea (Collen et al. 2012)
 - 45 Veterans with PTSD, 45 control
 - PAP use lower in Veterans with PTSD ($p = .01$)

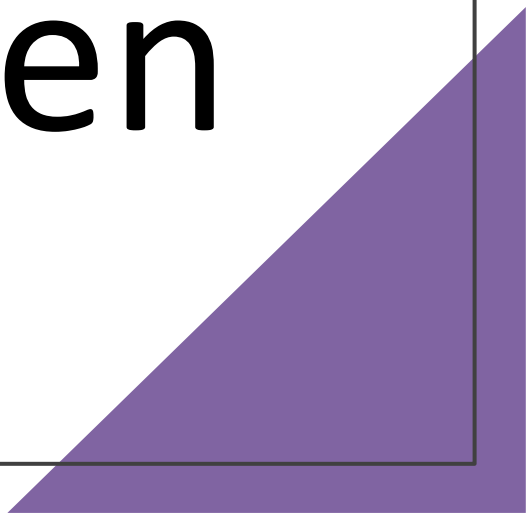
	PTSD Men/women	Control Men/women
El-Solh 2010	148/0	148/0
Collen 2012	38/7	38/7



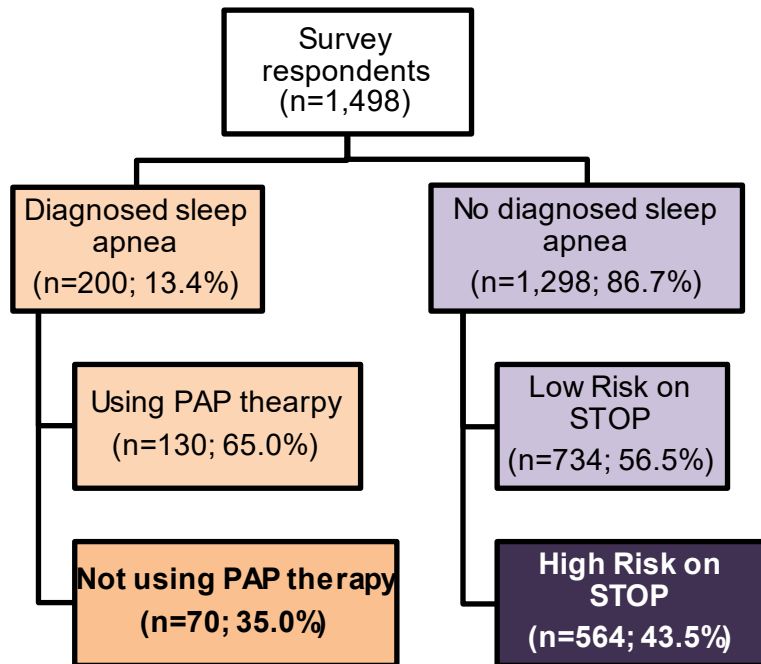
SDB in women

Results of a National Survey

Martin et al. *JCSM*. 2021



Risk for SDB in a National Sample of Women Veterans (n=1,498)



Non-users had
lower BMI
than PAP users

Undiagnosed women with high risk on STOP had:

- **Higher BMI**
- **More comorbid sleep disorders**
- **More mental health symptoms**
- **More likely to be non-white race**

Than women who were low risk on STOP.

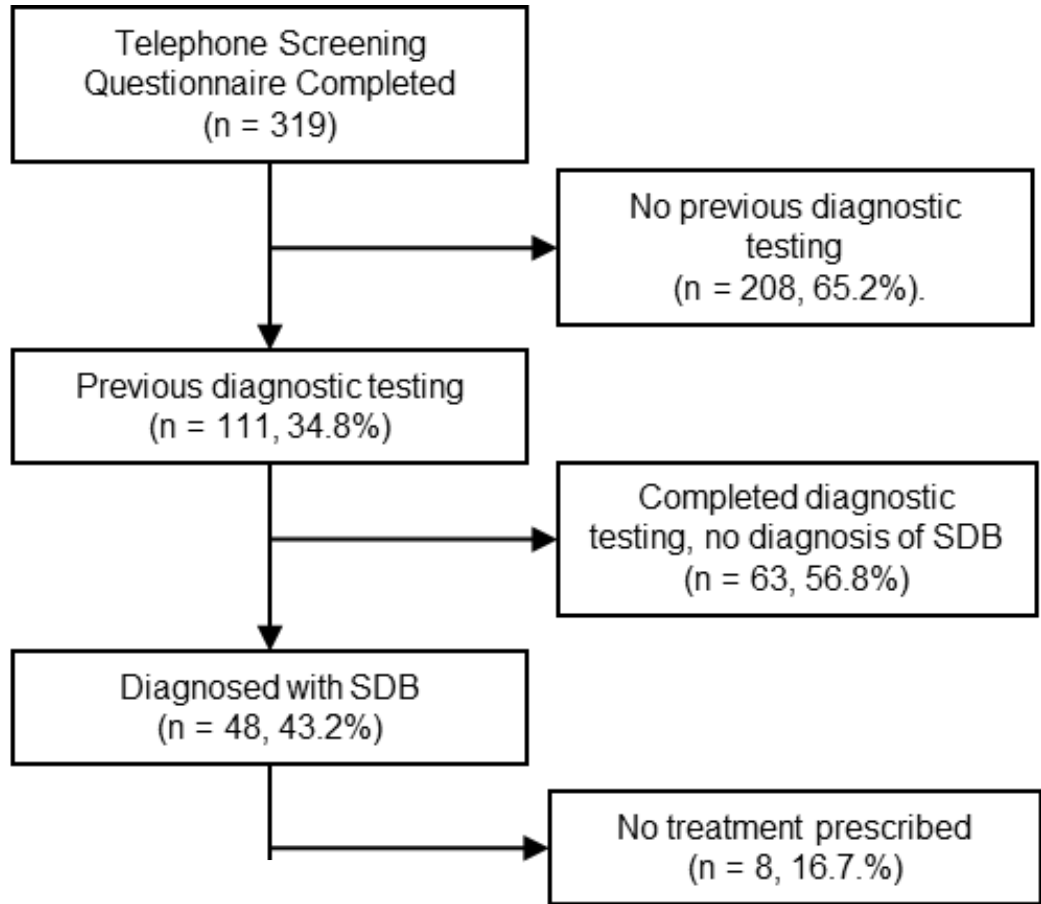
Diagnosis and treatment of women veterans with SDB risk

Screening for a PAP adherence study for women

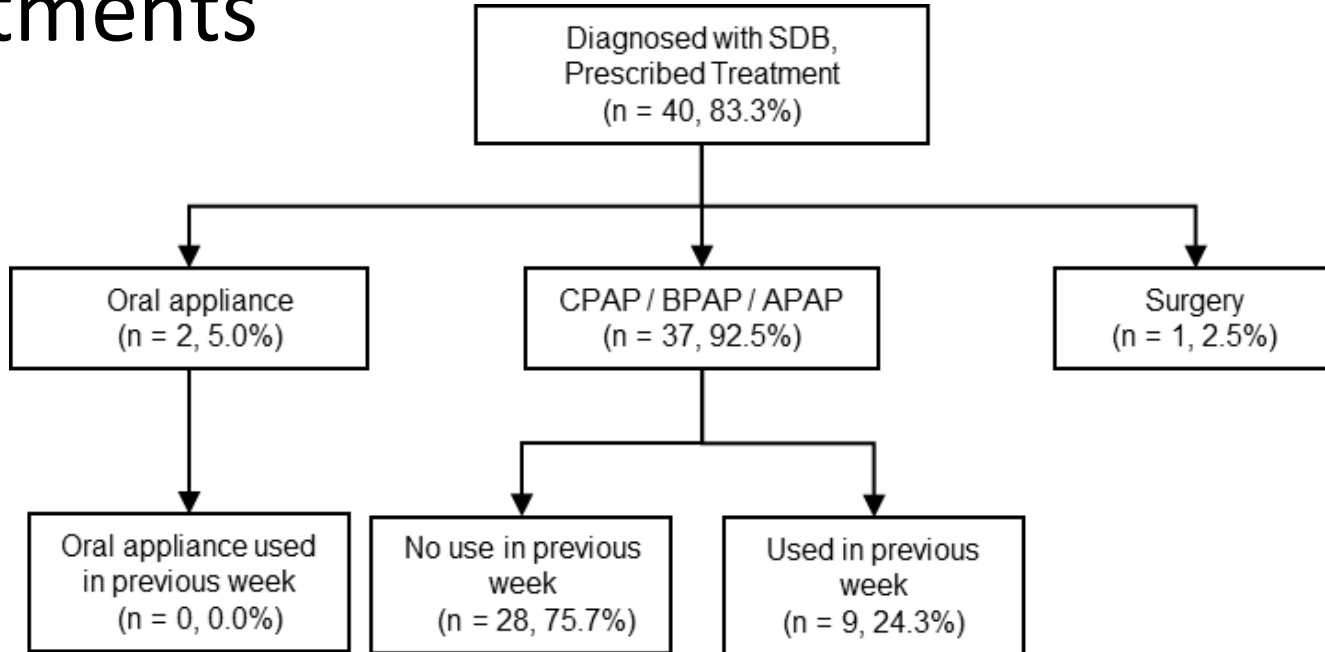
All had at least 1 risk indicator for SDB

- Age >50 (46%)
- Obesity (74%)
- Hypertension (22%)
- Type 2 Diabetes (15%)

Diagnosis of women with risk factors:

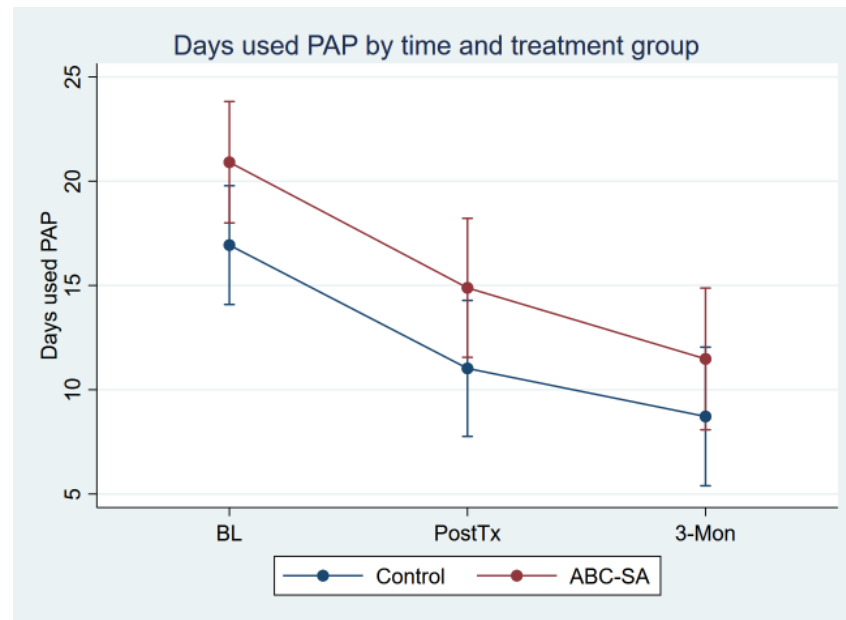


Treatments



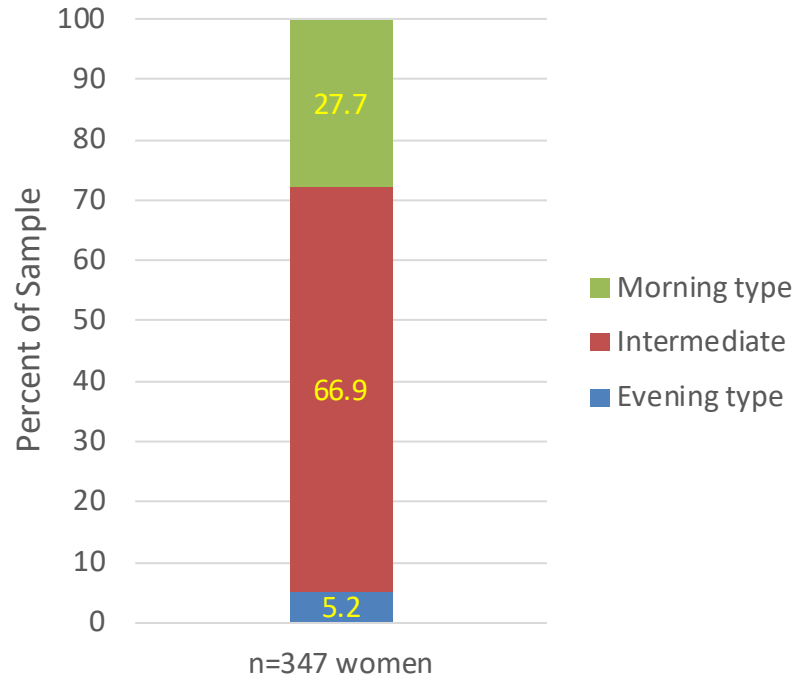
How can we increase PAP use among women with SDB?

- 6-session ACT-based treatment (n=45) versus SDB/PAP education control (n=45)
- Monitored for first 3 months of use
- No significant differences between groups on any PAP measures
- Significant differences in other outcomes favored ABC-SA (sleep quality, objective sleep duration and quality)



Bonus Material: Circadian tendency

Morningness Eveningness Questionnaire in women Veterans with Poor Sleep



- Morningness tendencies more common than eveningness tendencies
- More “eveningness” (lower MEQ scores) were associated with
 - Less depression, anxiety and PTSD symptoms (PHQ-9, GAD-7, PCL)
 - Better sleep quality (PSQI, ISI)
 - Better quality of life (SF-12)
 - $P's < .01$

Where are we now?

- Insomnia disorder treatments (CBTI) can be enhanced by focusing on patient-centered outcomes within the treatment itself.
- Diagnosis and treatment of sleep apnea in women Veterans needs further study. Adherence to PAP therapy remains an unsolved challenge
- Other sleep/circadian disorders have yet to be studied in this population.



Women's Health Collaborators and Team Members



Collaborators

- Donna Washington, MD, MPH
- Elizabeth Yano, PhD
- Cathy Alessi, MD
- Safwan Badr, MD MBA
- Connie Fung, MD, MSHS
- Sarah Kate McGowan, PhD
- Michael, Mitchell, PhD
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- Kathryn Saldana, PsyD
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- VAGLAHS HSR&D CSHIIP

Questions?