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THE RELATIONSHIP BETWEEN PRESLEEP COGNITIONS AND  
DELAYED SLEEP-ONSET IN A SAMPLE OF WOMEN  
SEEKING TREATMENT FOR SEXUAL ASSAULT

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## CHAPTER 1

### INTRODUCTION

Women who have been sexually assaulted have a high probability of experiencing sleep disturbances and, for many, these disturbances last for months (Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992; McCahil, Meyer, & Fischman, 1979), and possibly years. Although there is an extensive research literature on the causal factors for sleep disturbances (e.g., see Morin, 1993 for a review), specific factors that mediate the relationship between sexual assault and sleep disturbance have not been identified. Research from several areas suggests that pre-sleep thoughts may be a significant causal factor in sleep-onset difficulties. The goal of this study is to describe sleep disturbances and to examine the degree to which the content and valence of pre-sleep thoughts are associated with delayed sleep-onset in a sample of female victims of sexual assault.

According to the National Crime Victimization Survey<sup>1</sup> (NCVS), there were 261,000 rapes, attempted rapes, or sexual assault in the U.S.A. during the year 2000. The rate of rape, attempted rape, or sexual assault victimizations for 2000 is 1.2 per 1000 persons (US Dept. of Justice, Bureau of Justice Statistics, 2001). Prevalence estimates of sexual assault for adult women range from approximately 14% to 25% (Koss, 1993). Estimates vary, depending on the research methodology (e.g., telephone survey, police statistics), sample

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<sup>1</sup> The NCVS defines rape as “forced sexual intercourse”, including vaginal, anal, or oral penetration by the offender(s), and sexual assault as “unwanted sexual contact.” The NCVS also includes attempts and threats to commit rape or sexual assault and excludes victims under the age of 12. In this proposal, the term “sexual assault” refers to both rape and sexual assault as defined by the NCVS (Greenfeld, 1997).

population used (e.g., sample differences such as college women or community samples), and timeframe (e.g., lifetime or past year estimates).

### Sequelae of Sexual Assault

Within the first two weeks following sexual assault, victims report significantly more anxiety than non-victims of sexual assault on the State Trait Anxiety Inventory (STAI) (e.g., mean scores for State-STAI = 44 (SD = 11) vs. 36 (SD = 10), and Trait-STAI = 50 (SD = 12) vs. 40 (SD) (Kilpatrick, Veronen, & Resick, 1979). Sixty-nine % of the victims of sexual assault in an Atlanta Study reported being more fearful (Ellis, 1983). In addition, Atkeson, Calhoun, Resick, & Ellis (1982) compared Beck Depression Inventory scores and found that mean scores for victims of sexual assault were significantly higher than non-victims of sexual assault at 2 weeks post-assault (mean = 18 vs. 11), 1 month post-assault (mean = 13 vs. 8) and 2 months post-assault (mean = 10 vs. 6)(standard deviations not reported). Other commonly reported sequelae within the first few weeks are, disruptions in social adjustment (e.g. problems at work or with family) (Resick, Calhoun, Atkeson, & Ellis, 1981), decreased self esteem (Murphy et al., 1988), and sexual problems (e.g. decreased interest or satisfaction in sex) (Siegel, Golding, Stein, Burnam, & Sorenson, 1990). These sequelae peak at about 1 to 3 weeks, may remain high for the next month, and then often subside (Koss & Harvey, 1991; Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992). For the women who continue to experience problems, the symptoms most likely to remain longer than 1 year are fear, anxiety, low self esteem, and sexual dysfunction (Koss & Harvey, 1991). Rothbaum, et al., (1992) studied posttraumatic symptoms in victims of sexual assault, using criteria for Posttraumatic Stress Disorder (PTSD) as defined by the Diagnostic and

Statistical Manual<sup>2</sup> (DSM III-R) (American Psychiatric Association, 1985). They found 94% of the participants met diagnostic criteria for PTSD within 2 weeks post-assault (except for duration), 65% met criteria at 1 month post-assault, and 47% still met criteria at 3 months post-assault.

A significant relationship has been found between poorer psychological functioning (i.e., PTSD) and specific types of thoughts after sexual assault (Dunmore, Clark, & Ehlers, 1997; Dunmore, Clark, & Ehlers, 1999; Ehlers & Steil, 1995; Shiperd & Beck, 1999). Shiperd & Beck (1999) found that sex assault victims with chronic PTSD reported significantly lower perceived thought control<sup>3</sup> when asked to suppress thoughts of their assault (mean = 44, SD = 29) than did sex assault victims without PTSD (mean = 76, SD = 27). In a pilot study examining cognitions after physical or sexual assault, Dunmore, et al., (1997) reported that participants with persistent PTSD were significantly more likely than

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<sup>2</sup> The diagnosis of PTSD is given when a person has been exposed to a traumatic event that resulted in symptoms of persistent reexperiencing of the event (e.g. recurrent distressing dreams of the event), persistent avoidance of stimuli associated with the event and numbing of general responsiveness, and persistent symptoms of increased arousal (e.g. hypervigilance, difficulty falling or staying asleep). Symptoms must cause clinically significant distress or impairment of social, occupational or other areas of functioning. Diagnosis is given when symptoms persist more than one month, and the disorder is classified as acute if duration is less than 3 months, or chronic if more than 3 months (American Psychiatric Association, 1985).

<sup>3</sup> Control of thoughts was rated on a 0 to 100 Likert scale, with 0 equal to “no difficulty controlling thoughts at all”, and 100 equal to “extreme difficulty controlling these thoughts or constant rape-related thoughts” (Shiperd & Beck, 1999).



participants without PTSD<sup>4</sup> to report negative appraisals of: (a) their actions during the assault (60% vs. 11%), (b) other's reactions to hearing about the assault (82% vs. 33%), and (c) their own initial PTSD symptoms after the assault (82% vs. 11%). A follow-up study reported significant differences between women with PTSD after sexual assault (N = 41) compared to women who had recovered<sup>5</sup> after sexual assault (N = 20) for their reported negative appraisal of their initial post-trauma symptoms (mean = 1.5, SD = 0.6 vs. 2.4, SD = 1.0), the extent to which they believed they were permanently changed by the assault (mean = 1.8, SD = 1.0 vs. 2.8, SD = 1.2), and avoidance (e.g., places or thoughts associated with the sexual assault) or safety seeking behavior (e.g. sleep with lights on, carry weapon) (mean = 1.1, SD = 0.6 vs. 1.5, SD = 0.4)(Dunmore et al., 1999). Ehlers & Steil (1995) argue that the underlying theme running through the negative beliefs and appraisals associated with persistent PTSD is *one of ongoing threat* (e.g., loss of control or predictability of events, loss of safety, loss of assumptions of the world being a fair or just place) (Ehlers & Steil, 1995; Dunmore et al., 1999).

There are also physical and health consequences to sexual assault. An estimated one third to one half of victims of sexual assault suffer physical trauma during the attack (Koss, 1993). Pregnancy results in approximately 5% of victims and sexually transmitted diseases result in 4% to 30% (Koss, Heise, & Russo, 1994). As a group, victims of sexual assault have significantly poorer perceived health status, visit doctors more often, and are diagnosed with some disorders (e.g. gynecological and gastrointestinal disorders, headaches) more often than

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<sup>4</sup> Participants met criteria for PTSD within first month post assault, but did not meet criteria at the time of the research assessment (mean = 2.2 years, SD = 1.8 years post-assault) (Dunmore, et al., 1997).

<sup>5</sup> Did not meet criteria for PTSD according to the DSM IV (American Psychiatric Association, 1994).

non-victims (Golding, 1999; Kimerling & Calhoun, 1994; Koss, 1993; Waigandt, Wallace, Phelps, & Miller, 1990). In addition, a 2 year matched control study comparing victims of sexual assault with non victims of sexual assault reported that victims of sexual assault engaged in approximately 50% more negative health behaviors. These behaviors include lack of exercise, excessive alcohol and caffeine consumption, and increased cigarette smoking (Waigandt et al., 1990). At least two other studies have reported an increased likelihood of alcohol abuse after sexual assault (Burnam et al., 1988; Frank, Turner, Stewart, Jacob, & West, 1981).

Almost all victims of sexual assault report sleep disturbances immediately after sexual assault, with a substantial proportion experiencing long term difficulties (e.g., Calhoun, Atkeson, & Resick, 1982; Krakow, Tandberg, Barey, & Scriggins, 1995; Rothbaum et al., 1992). In the Philadelphia Sexual Assault Victim Study, 49.9% of participants (N=1,401) reported changes in sleeping habits during 11 months post sexual assault (McCahill, Meyer, & Fischman, 1979). Rothbaum et al., (1992) found that sleep disturbances occur in approximately 90% of victims during the first week after a sexual assault. At 12 weeks, about 40% of their participants still experienced nightmares and 50% reported other sleep disturbances.

A recent study assessed sleep difficulties in female victims of sexual assault with PTSD (N = 74), using the Pittsburgh Sleep Quality Index (PSQI) component (subscale) scores (Nishith, Resick, & Mueser, 2001). PSQI component scores<sup>6</sup> range from 1 to 3, with higher

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<sup>6</sup> Sleep onset latency = a calculation based on how long it takes to fall asleep at night, sleep disturbances = a calculation based a number of factors that may disturb sleep (e.g., getting up to use the bathroom, coughing or snoring, bad dreams), sleep efficiency = Total sleep time/ Total time in bed x 100, daytime dysfunction = a calculation based on how much of a

numbers indicating more sleep difficulty. Victims of sexual assault with PTSD had higher mean PSQI component scores, compared to a normal sleeper control group (from a separate validation study for the PSQI; N = 52) on the following sleep variables: (a) sleep-onset latency score (1.9, SD =1.0 vs. 0.6, SD =0.7), (b) subjective sleep quality score (1.8, SD = 0.8 vs. 0.4, SD =0.5), (c) sleep duration (1.6, SD = 1.0 vs. 0.3, SD= 0.5), (d) sleep disturbances (1.7, SD = 0.6 vs. 1.0, SD = 0.4), (e) sleep efficiency (1.1, SD = 1.2 vs. 0.10, SD = 0.3), and (f) daytime dysfunction (1.8, SD = 0.7 vs. 0.4, SD = 0.5)(Nishith et al., 2001; Buysee, Reynolds, Monk, Berman, & Kupfer, 1989).

#### Consequences of Sleep Disturbance

While there is little published research that delineate the specific effects of sleep disturbances for victims of sexual assault, the probable consequences of sleep disturbances can be inferred from the insomnia literature. Studies of partial and total sleep deprivation have demonstrated that loss of sleep increases daytime sleepiness (Carskadon & Dement, 1981; Carskadon & Dement, 1979; Roth, Roehrs, Carskadon, & Dement, 1994), and may result in the emergence of microsleeps (periods of a few seconds of sleep) during the day (Hauri, 1982). For example, Carskadon & Dement (1981) found that Multiple Sleep Latency Scores<sup>7</sup> changed from an average of 17 minutes (SD = 3) during baseline measurement to 7 minutes (SD = 4) after 7 sleep restriction nights. Sleep loss also impairs performance on highly creative or monotonous tasks (Balkin & Badia, 1988; Gillberg, Kecklund, & Torbjorn, 1994; Hauri, 1982), decreases motivation (Horne, 1988), cognitive functions (i.e.

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problem it is to stay awake and get things done during the day (Buysee, Reynolds, Monk, Berman, & Kupfer, 1989; Morin, 1993).

<sup>7</sup> Individuals are offered several naps at 2 hour intervals during the day, and the speed at which they fall asleep is measured (Morin, 1993)

concentration, memory, creativity, perception, judgment, and reaction times) (Morin, 1993), and mood (e.g. irritability) (Morin, 1993; Totterdell, Reynolds, Parkinson, & Briner, 1994). Finally, sleep loss can result in more somatic complaints, sick leave, and greater utilization of health care resources (Morin, Culbert, & Schwartz, 1994).

One study has specifically looked at the relationship between sleep disturbance and health in victims of sexual assault. Clum, Nishith, & Resick (2001) evaluated the relationship between trauma-related sleep disturbances and health in 167 victims of sexual assault (at least 3 months post-assault) and found that sleep disturbance accounted for a small, but significant (2%) portion of the variance in self-reported physical health symptoms above and beyond that accounted for by PTSD (particularly hyperarousal symptoms) and depressive symptoms.

#### Causal factors for Extrinsic Sleep Disorders<sup>8</sup>

Theories regarding possible causal factors for extrinsic sleep disorders often involve cognitive factors, physiological hyperarousal, and sleep hygiene. Most theories suggest that insomnia is not caused by any single factor, but an interaction between physiological, behavioral, and cognitive factors (Lacks & Morin, 1992). Of these factors, presleep

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<sup>8</sup> Extrinsic Sleep Disorders are classified by the International Classification of Sleep Disorders (1997) as part of the larger category of dyssomnias. Extrinsic sleep disorders include: inadequate sleep hygiene, environmental sleep disorder, altitude insomnia, insufficient sleep syndrome, limit-setting sleep disorder, sleep-onset association disorder, food allergy insomnia, nocturnal eating (drinking ) syndrome, hypnotic-dependent sleep disorder, stimulant-dependent sleep disorder, alcohol-dependent sleep disorder, toxin-induced sleep disorder, extrinsic sleep disorder not otherwise specified (American Sleep Disorders Association, 1997)

thoughts may play an important role in sleep-onset difficulties after trauma. A model of the relationship between symptoms experienced after sexual assault, delayed sleep-onset latency, and the consequences of sleep disturbance is shown in Figure 1.

### Physiological Hyperarousal

Results of studies comparing insomniacs with good sleepers and treatment outcome studies provide evidence that physiological hyperarousal may have a causal role in sleep disturbance. When compared to normal control groups, groups of insomniacs or poor sleepers often demonstrate higher average pre-sleep physiological arousal. Studies have found significantly higher presleep heart rates (Freedman & Sattler, 1982; Haynes, Adams, & Franzen, 1981; Stepanski, Glinn, Zorick, Roehrs, & Roth, 1994), electromyogram [EMG] readings (Freedman & Sattler, 1982), and sleeping temperatures (Monroe, 1967) in insomniac groups vs. normal sleeper groups. In addition, several treatment outcome studies have found that decreasing physiological arousal with relaxation methods can significantly reduce some sleep disturbances (Haynes, Sides, & Lockwood, 1977; Murtagh & Greenwood, 1995; Woolfolk & McNulty, 1983).

### Sleep Hygiene

Sleep hygiene refers to behavioral and environmental factors that can affect sleep (Morin, 1993). These factors usually include sleep scheduling (i.e. bedtime, wake-time, naptime), the sleeping environment (e.g. amount of noise, light), and use of substances that affect sleep, such as hypnotics, alcohol, caffeine (Spielman, Caruso, & Glovinsky, 1987), or tobacco (Morin, 1993).

Insomnia treatments that target elements of sleep hygiene have been found to reduce sleep disturbances (Morin et al., 1994; Murtagh & Greenwood, 1995). For example, stimulus control treatment is a treatment paradigm based on elements of sleep hygiene. The assumption of stimulus control is that insomnia is the result of maladaptive conditioning. Stimuli that are normally associated with sleep and sleepiness (e.g. bedroom environment,

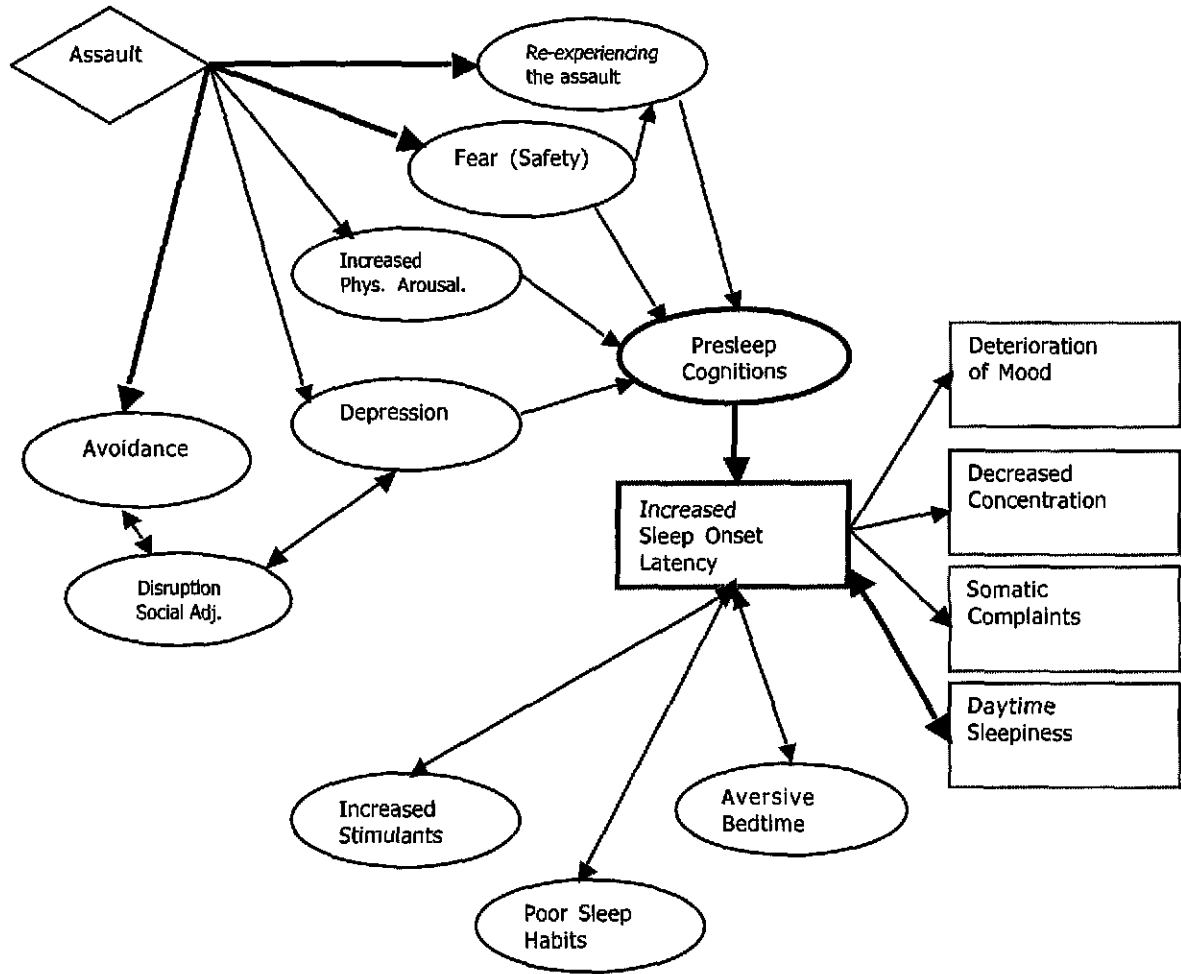


Figure 1. A model of the relationship between symptoms experienced after sexual assault, delayed sleep-onset latency, and consequences of sleep disturbance

Figure 1 Note: The width and direction of the arrows indicates the hypothesized strength and direction of the relationship. Thicker lines represent stronger relationships. The original causal variable is represented by a diamond. Hypothesized independent (causal) variables are represented by ovals. Hypothesized dependent variables (effects) are represented by squares. The width of the ovals indicate the hypothesized modifiability of the relationship. The width of the squares indicate the hypothesized importance of the variable. Thicker lines represent more modifiable/important variables.

Narrative of model: Victims of sexual assault commonly report symptoms (e.g., feeling fearful, avoiding stimuli associated with the assault) that are hypothesized to have a negative effect on presleep cognitions, leading to increased SOL time. Some variables (e.g., increased physical arousal, increased use of stimulants) are also hypothesized to have a direct and bi-directional effect on SOL. Increased SOL is hypothesized to lead to disruptions in daytime functioning (e.g., daytime sleepiness).

**Definitions:**

SOL - Sleep Onset Latency. The amount of time between going to bed with the intent of sleeping and falling asleep.

Presleep Cognitions - Thoughts that occur during SOL.

bedtime) become associated with sleep incompatible behaviors (e.g. worrying, reading, watching TV) (Bootzin & Nicassio, 1978). Treatment is based on a set of instructions designed to curtail sleep incompatible behaviors and re-associate the bedroom and bedtime environment with sleep (Bootzin, Epstein, & Wood, 1991).

Alcohol, caffeine, and tobacco use have all been shown to have deleterious effects on sleep. Alcohol has an initial sedative effect, followed by increased arousal (rebound) once the alcohol is metabolized (Stradling, 1993). While small amounts of alcohol (e.g. one or two glasses of wine) may not disrupt sleep, ingestion of more than one or two drinks before bedtime can produce increased arousals later in the night. Caffeine may cause sleep-onset or maintenance difficulties (Edelstein, Keaton-Brasted, & Burg, 1984; Smith, Maben, & Brockman, 1993), 300 mg (approx. 2- 8oz. cups of coffee) or more can adversely affect sleep (Stradling, 1993). In addition, caffeine has a half-life of approximately 5 hours, therefore caffeine ingested well before bedtime (e.g. in the evening) can disrupt sleep. High concentrations of nicotine (i.e. more than 1 cigarette 1 hour before bedtime) cause feelings of arousal and agitation, and may result in sleep-onset disturbances (Stradling, 1993).

#### Cognitive factors

The presumption that presleep thoughts may be causally related to sleep disturbance (particularly sleep-onset) in victims of sexual assault is supported by several lines of research (see Table 1). First, the role of presleep thoughts as a causal factor for sleep disturbances is indirectly supported by the research on anxiety, which has both cognitive and physiologic components (Lichstein & Rosenthal, 1980). Lichstein & Rosenthal (1980) hypothesized that anxiety can lead to worry and racing thoughts at bedtime, interfering with sleep. Several studies have demonstrated a significant relationship between measures of anxiety (e.g. state and trait anxiety questionnaires such as the STAI) and sleep disturbances (Bourdet & Goldenberg, 1994; Chambers & Alexander, 1992; Freedman & Sattler, 1982; Haynes, Follingstad, & McGowan, 1974; Waters, Adams, Binks, & Varnado, 1993).



Table 1. Summary of Studies that Investigate the Relationship Between Pre-sleep Cognitions and Sleep Indices

Reference	Participants		Pre-sleep Cognitive Measures	Variables	Results
	N	Gender (M/F)			
Lichstein & Rosenthal, 1980	296 Insomniac	(87/209)	Survey- asked participants to decide primacy of cognitive, somatic arousal - or both- as responsible for sleep disturbance.	Sleep onset insomnia predicted by cognitive and/or somatic arousal	Respondants blamed insomnia on: 1) cognitive arousal (54.7%) 2) somatic arousal (5.4%) 3) both factors (34.8%) 4) neither factor (5.1%).
Nicassio, Mendlowitz, Fussel, & Petras, 1985	147 College Students 30 Insomniac 30 Control	(85/62) (16/14) (13/17)	Pre-sleep Arousal Scale (PSAS)	General Sleep Indices predicted by presleep arousal, anxiety, and depression.	Relationship between PSAS Cognitive arousal score and: 1) Sleep Onset Latency 0.59* 2) Total Sleep Time -0.34* 3) Awakenings from sleep 0.35* 4) Self-report of Insomnia 0.45*

Table 1. (Continued) Summary of Studies that Investigate the Relationship Between Pre-sleep Cognitions and Sleep Indices

(Smith, Perlis, Giles, & Carmody, 2000)	51 Chronic pain patients	(16/35)	Pre-sleep Arousal Scale (PSAS)	Poor sleep quality secondary to chronic pain as predicted by presleep arousal, pain, activity, and depression.	Presleep cognitive arousal accounted for 11% of the variance in sleep quality.
Harvey, 2000	30 Insomniac 30 Control	(12/18) (11/19)	Semi-structured interview – presleep cognitive activity	Sleep onset insomnia predicted by presleep cognitive activity.	Insomniacs spent more time during the presleep period thinking/worrying than the control group (mean = 52 min, SD = 42 vs. mean = 12 min, SD = 2) $t(58) = -5.4, p < .001$
Kuisk, Bertelson, & Walsh, 1989	16 Insomniac 8 Control	(6/10) (3/5)	Interview – presleep content	Objective and Subjective insomnia predicted by presleep cognitive hyperarousal.	1) Insomniacs rated presleep mental experience as less pleasant than the control group ( $t_{21} = 1.72, p < .05$ , one-tailed test).

Table 1. (Continued) Summary of Studies that Investigate the Relationship Between Pre-sleep Cognitions and Sleep Indices

Wicklow & Espie, 2000	21 Insomniac	(7/14)	1) Presleep Arousal Scale (Cognitive subscale) 2) voice- activated audiocassette recorder	Sleep onset insomnia predicted by presleep cognitions.	1) Actigraph sleep latency and thoughts about planning and/or consequences of poor sleep (adjusted $R^2 = 0.161$ ) 2) Subjective sleep onset and cognitive arousal measured by PSAS (adjusted $R^2 = 0.17$ )	
14	Van Egeren, Haynes, Franzen, & Hamilton, 1983	34 College students	(14/20)	Presleep cognitive thought sampling, Attribution ratings, Perceived control of presleep cognitions, Presleep cognitive content.	Sleep onset insomnia predicted by presleep cognitions and attributions about the causes of sleep onset difficulties.	1) Subjective sleep onset latency and presleep cognitions ( $R^2 = 0.36, P < 0.0004$ ). 2) Sleep onset latency and attribution ratings of sleep onset difficulties ( $R^2 = 0.29, P < 0.02$ ). 3) Cognitive variables were not

Table 1. (Continued) Summary of Studies that Investigate the Relationship Between Pre-sleep Cognitions and Sleep Indices

					significantly related to objective measures of sleep onset latency.
Freedman & Sattler, 1982	12 Insomniac 12 Control	(1/11) (4/8)	Mental content reports-samples of "mental activity" throughout the night (e.g., control over mental activity.)	Sleep onset insomnia predicted by pre-sleep mental activity, physiologic measures, and personality traits.	No group differences in pre-sleep cognitions.

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15 \*  $p < 0.001$

Second, studies that compare physiologic and cognitive arousal as competing causal theories support a greater perceived role (by study participants) for cognitions in sleep disturbance. Researchers have found that insomniacs tend to attribute their sleep disturbances to cognitive arousal more often than physiologic arousal (Lichstein & Rosenthal, 1980), and endorse more presleep cognitive symptoms than physiologic symptoms (Nicassio, Mendlowitz, Fussell, & Petras, 1985). In a study examining sleep quality in chronic pain patients, Smith, Perlis, Giles, & Carmody (2000) found that presleep cognitive arousal, rather than pain severity, was the primary predictor of sleep quality (11% of the variance in sleep quality was predicted by presleep cognitive arousal alone).

Third, several studies have compared presleep thoughts of insomniacs or poor sleepers with those of good sleepers. Insomniacs report anxiety or worry related thoughts more often than good sleepers (Borkovec, Lane, & VanOot, 1981; Harvey, 2000). Several studies have evaluated specific presleep thought content, and found that insomniacs reported less pleasant presleep thoughts than normal sleepers (Kuisk, Bertelson, & Walsh, 1989), and were focused more on worries, problems and noises in the environment than good sleepers (Harvey, 2000). In addition, thinking about sleep and the anticipated consequences of poor sleep, and general planning/problem solving (e.g., thinking about the past day or next day, planning things) were the strongest predictors of increased sleep-onset latency (SOL)(Wicklow & Espie, 2000), presleep cognitions regarding negative sleep related concerns, physical sensations, and environmental cues were significantly related to longer SOL (Van Egeren, Haynes, Franzen, & Hamilton, 1983). Freedman & Sattler (1982) found no significant differences in presleep control or repetition of mental activity between good and poor sleepers, however, 23 of 24 participants reported “excessive rumination” when having trouble getting to sleep.

Finally, two studies used an experimental design to manipulate presleep thoughts. Gross & Borkovec (1982) found that the introduction of a task likely to cause cognitive

intrusions resulted in increased SOL. A similar study found that the introduction of a brief presleep cognitive stressor resulted in increased SOL for the non-insomniac (control) group and decreased SOL for the insomniac group (Haynes et al., 1981). The authors suggested that the insomniacs may have experienced sleep related cognitions that contributed to sleep difficulties, and the introduction of a non-sleep related stressor may have worked to offset the effects of those cognitions.

*In summary, a large proportion of victims of sexual assault report sleep disturbance immediately following the assault. For many, these disturbances continue for months or years. Currently, little is known about what type of sleep problems victims of sexual assault experience, and what factors may maintain them over time. Trauma research suggests that victims of sexual assault are likely to experience post assault negative thoughts relating to fear, anxiety, and re-experiencing the trauma. Insomnia research suggests that pre-sleep cognitions are an important factor in sleep-onset insomnia, and that the content of presleep thoughts may differ between normal sleepers and those with chronic sleep disturbances.*

#### Goals of the study

The goal of this study was to investigate sleep disturbances in victims of sexual assault. The specific goals were; (1) To describe the sleep patterns and content of presleep thoughts of victims of sexual assault at multiple time frames, (2) To describe the content of pre-sleep thoughts in victims of sexual assault with and without sleep-onset disturbances, (3) To examine the relationship between pre-sleep thoughts and sleep-onset latency in victims of sexual assault, and (4) To examine the relationship between variables hypothesized to be related to sleep onset difficulties and presleep thoughts (i.e., depression, post trauma symptomatology) in victims of sexual assault for the purpose of exploring directions for future research.

## CHAPTER 2

### STUDY 1

#### Method

##### Overview of Method

Data from Study 1 were gathered between 1995 and 1997, as part of a larger study involving multiple samples, to develop and validate the Trauma Related Guilt Inventory (TRGI) and other trauma related questionnaires (Kubany et al., 1996; Kubany et al., 2000a; Kubany, Leisen, Kaplan, & Kelly, 2000b). For the purposes of the current study, data on demographics, trauma symptomatology, response to trauma, and depression were collected from a subsample of women who were sexually assaulted.

##### Goals

The specific goals of study 1 were; (1) To describe the sleep patterns for a group of victims of sexual assault, (2) To examine the relationship between variables hypothesized to be related to sleep onset difficulties and presleep thoughts (e.g., depression, post trauma symptomatology) in victims of sexual assault for the purpose of exploring directions for future research.

##### Participants

Participants were 79 women who were sexually assaulted after the age of 12, recruited via flyers, newspaper advertisements, and referrals from treatment agencies. During the year previous to this assessment, all participants received services from an agency that served victims of sexual assault (Kubany et al., 2000b). Demographic and sexual assault characteristic data were available for 72 participants. Participants' ages ranged from 18 to 65 years (mean age = 35.2; SD = 9.9 years)(Kubany et al., 2000b), and years of education ranged from 8 to 17 years (mean education = 13.7 years, SD = 2.2 years). Table 2 includes a detailed description of both demographic and sexual assault variables.

Table 2. Demographic and Sexual Assault Characteristics for Study 1 & Study 2 Participants.

Characteristics	Study 1 (N = 72)*		Study 2 (N = 12)*	
	<i>n</i> <sup>a</sup>	%	<i>n</i> <sup>a</sup>	%
<b>Age Group<sup>b</sup></b>				
Under 20	3	4	0	n/a
20 – 29	17	25	1	8
30 – 39	28	41	2	17
40 – 49	13	19	3	25
Over 50	7	10	6	50
<b>Education Group</b>				
Non-high School graduate	4	6	0	n/a
High School graduate	24	33	1	8
College – up to Bachelor’s Degree	34	47	10	83
Post Graduate	10	14	1	8
<b>Marital Status</b>				
Married	14	19	4	33
Divorced or Separated	30	42	5	42
Never married	25	35	2	17
Other/ not specified	3	4	1	8
<b>Ethnic Background</b>				
Caucasian	30	42	6	50
Mixed ethnicity	30	42	4	33



Table 2. (Continued) Demographic and Sexual Assault Characteristics for Study 1 & Study 2 Participants.

Japanese	3	4	1	8
African American	2	3	0	n/a
Samoan	2	3	0	n/a
American Indian/Alaskan		3	0	n/a
Chinese	2	1	1	8
Filipino	1	1	0	n/a
Puerto Rican	1	1	0	n/a
	1			
<b>Time between last assault and Study 1<sup>c</sup></b>				
Less than 6 months	14	23	0	n/a
6 months to 1 year	12	20	0	n/a
2 years to 5 years	9	15	2	18
More than 5 years	26	43	9	82
<b>Sexual Assault before 13</b>				
Yes	40	61	9	82
No	26	39	2	18
<b>Number of Sexual Assaults from age 13 or older</b>				
One	13	21	1	8
2	10	16	3	25
More than 2	38	62	8	67
<b>Stranger/ Acquaintance<sup>d</sup></b>				
Stranger	15	23	1	8
Acquaintance	50	77	11	92

Table 2. (Continued) Demographic and Sexual Assault Characteristics for Study 1 & Study 2 Participants.

<b>Number of Assailants<sup>d</sup></b>				
One	57	92	11	92
More than one	5	8	1	8
<b>Weapon<sup>d</sup></b>				
Weapon used	19	29	4	33
No weapon used	46	71	8	67
<b>Drugs/Alcohol<sup>d</sup></b>				
Drugs and/or alcohol were involved	42	66	5	42
Drugs and/or alcohol were not involved	11	17	5	42
Victim did not know	11	17	2	17
<b>Reported to Police<sup>d</sup></b>				
Yes	31	48	6	55
No	33	52	5	45
<b>Physical Injury<sup>d</sup></b>				
Yes	46	26	7	64
No	16	74	4	36
<b>Pregnancy resulted from assault<sup>d</sup></b>				
Yes	3	5	0	n/a
No	58	91	11	100
Uncertain at time of interview	3	5	0	n/a
<b>Sexually Transmitted Disease from Assault<sup>d</sup></b>				
Yes	5	8	2	18
No	44	70	7	64
Uncertain at time of interview	14	22	2	18

Table 2. (Continued) Demographic and Sexual Assault Characteristics for Study 1 & Study 2 Participants.

Assailant threatened to hurt or kill <sup>d</sup>

Yes	52	18	9	75
No	11	83	3	25

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\* Study 2 participant sex assault characteristics data was taken from sex assault history form collected during Study 1. No information regarding sex assault characteristics was gathered during Study 2.

a) The N for each individual category may be lower than the N given, as some participants did not respond to all the questions; b) Age = age given at the time of the assessment; c) In cases where the participant has reported the year of the sexual assault, but no month, the month of June was used; d) Participants were asked to report details of the assault that prompted them to seek treatment.

## Measures

The Beck Depression Inventory. The Beck Depression Inventory (BDI; see Appendix A) is a widely used 21 item self-report scale that measures depressive symptoms (Beck, Rush, Shaw, & Emery, 1979; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI has demonstrated high reliability and validity. In a meta-analytic study of the BDI, Beck, Steer, & Garbin (1988), reported a mean coefficient alpha of 0.86 in psychiatric populations, and high correlations with other measures of depression. For example, when compared to the Hamilton Psychiatric Rating Scale for Depression (HRSD), correlations with the BDI ranged from 0.61 to 0.86, with a mean correlation coefficient of 0.73 (Beck, Steer & Garbin, 1988).

The Modified PTSD Symptom Scale. The Modified PTSD Symptom Scale (see Appendix B) is a 17 item scale developed to assess severity of PTSD symptoms over the previous two weeks (MPSS; Falsetti, Resnick, Resick, & Kilpatrick, 1993). The scale was originally developed to assess the frequency of PTSD symptoms in victims of sexual assault (PSS; Foa, Riggs, Dancu, & Rothbaum, 1993), and was modified to include both frequency and severity ratings for each symptom (Falsetti et al., 1993). According to Falsetti et al., (1993), the MPSS has been shown to have high internal consistency (alpha coefficients = .96 to .97), and “demonstrated good concurrent validity”.

The Trauma Related Guilt Inventory. The Trauma Related Guilt Inventory (see Appendix C) is a 32 item self-report inventory that assesses multiple dimensions of trauma-related guilt (TRGI; Kubany et al., 1996). The inventory consists of three scales, a four-item Global Guilt scale, a six-item Distress scale, and a 22-item Guilt Cognitions scale. The subscales consist of items in the Cognitions scale, and include the Hindsight-Bias/Responsibility subscale, the Wrongdoing subscale, and the Lack of Justification subscale. The three scales demonstrated high internal consistency (alpha coefficients of .90, .86, and

.86 respectively) and test-retest correlations (.86, .84, and .73) respectively for the Global Guilt, Guilt Cognitions and Distress scales. In samples of Vietnam veterans (N = 74) and battered women (N = 68), the TRGI scale scores were significantly correlated with measures of trait guilt (.61 to .77), PTSD symptomatology (.35 to .72), Depression (.53 to .69), trait shame (.43 to .61), and social anxiety/avoidance (.53 to .56).

The Distressing Events Questionnaire. The Distressing Events Questionnaire (see Appendix D) is a 21 item self-report measure designed to assess PTSD symptoms according to diagnostic criteria provided by the Diagnostic and Statistical Manual of Mental Disorders IV (DEQ; Kubany, et al., 2000a; American Psychiatric Association, 1994). The DEQ had high internal consistency in 255 treatment-seeking women (.94 to .95)(women were recruited in four groups, consisting of survivors of incest, sexual assault, partner abuse, or women with histories of prostitution/substance and sexual abuse)(Kubany et al., 2000b). The DEQ demonstrated good discriminative validity with Vietnam veterans (86% correctly classified as having PTSD) and treatment seeking women (90% correctly classified as having PTSD) when compared to a diagnosis of PTSD using the CAPS.

Sleep Questions. The Sleep Questions (see Appendix E) is a short questionnaire developed to provide quantitative indices of sleep onset, maintenance and functional impairment due to sleep loss during the past month. Questions were based on the foci of sleep questionnaires/diaries and created from items used by Haynes and colleagues in previous research (e.g., Haynes et al., 1981; Haynes, Fitzgerald, Shute, & O'Meara, 1985; Haynes et al., 1974). The questionnaire reports sleep onset latency, the average number of awakenings during the night, the average amount of time sleeping, nightmares, perceived difficulty falling asleep, and the degree to which sleep difficulties interfere with daily life. This questionnaire was designed specifically for use in Study 1.

## Procedures

Participants were recruited from the Sex Abuse Treatment Center (SATC). If a client of the SATC expressed an interest in participating in the study, they were given the phone number for the research group at the National Center for PTSD and asked to leave a message. The project director<sup>9</sup> would call the potential participant and conduct a short screen to determine eligibility to participate in the study and gather a brief sexual assault history. Participants were eligible if they were 18 or older, female, and answered affirmatively to the question, “after your 13<sup>th</sup> birthday: has anyone forced sexual intercourse, or unwanted sexual contact with you, against your will or without your consent?” Participants would be referred to other groups of the trauma study if they were victims of incest alone or were assaulted by an abusive spouse.

The project director would make individual appointments for eligible participants to be interviewed. Upon arrival, a participant would initially be consented, then complete a series of questionnaires including measures of depression, post trauma symptoms, and sex assault history. Research assistants would then conduct a Clinician-Administered PTSD Scale (CAPS) interview. After the interview, the participant would be debriefed, given a referral list for community resources, and reimbursed \$30.00. Questionnaires took approximately 1 to 1 1/2 hours to complete, and the interview/debriefing was an additional 30 to 45 minutes. For each participant, a research assistant would check the Beck Depression Inventory and screening form for current suicide ideation and suicide history. Participants with current thoughts of suicide were asked to sign a “no suicide contract.” In addition, the PI of the study was always available for consult. An estimated 10% of the women that initially called

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<sup>9</sup> Except where otherwise indicated, information regarding the procedures for this study was provided by Julie Owens, project director, via personal communication, May 11, 2002.

to participate did not follow through with the appointment (Edward S. Kubany, personal communication, March 1, 2002).

### Results

On the Sleep Questions survey, 61 % of 79 participants reported that they had trouble either getting to sleep or staying asleep at least three nights per week. In addition, 64 % of the participants reported that it typically took 30 minutes or longer to fall asleep, 68 % reported that they were typically awake 30 minutes or longer during the night (after they fall asleep and before they arise in the morning), and 53 % reported they typically sleep less than 6 hours per night. Finally, 29 % reported that their sleep problems interfered with daily life “a little”, and 31% believed that their sleep problems interfered with daily life “somewhat”, “much”, or “very much.”

Using the BDI, 4 % of the participants obtained scores consistent with none or minimal depression, 23 % obtained scores consistent with mild to moderate depression, and 64 % obtained scores consistent with moderate to severe depression (using < 10 for no depression, 10 – 18 for mild to moderate depression, and > 19 for moderate to severe depression (Beck, Steer, & Garbin, 1988)).

Estimates of PTSD vary, depending on the measure used. For the Distressing Events Questionnaire, 90 % of the participants reported symptoms consistent with PTSD (using a cutoff score of 18 or greater)(Kubany et al., 2000b). For the MPSS, 52 % of the participants reported symptoms consistent with PTSD (using a cutoff score of 71 or greater)(Falsetti, Resnick, Resick, & Kilpatrick, 1993). Women that reported symptoms consistent with PTSD were more likely to also report sleep disturbances. This is particularly evident when using the MPSS to measure symptoms of PTSD. Of the women that reported having trouble falling sleep or staying asleep 3 nights or more per week, 96 % had Distressing Events Questionnaire scores of 18 or greater, and 70 % had MPSS scores of 71 or greater. In contrast, of the women that reported having trouble falling or staying asleep less than 3

nights per week, 79 % had Distressing Events Questionnaire scores of 18 or greater, and 13 % had MPSS scores of 71 or greater.

The mean and standard deviation scores for Study 1 questionnaires (Sleep Questions, BDI, Distressing Events Questionnaire, MPSS, Trauma Related Guilt Inventory) are reported in Table 3 under Group 1. The BDI and measures of post-trauma symptoms were significantly correlated with all sleep indices, with the exception of the Trauma Related Guilt Inventory with Sleep Onset Latency (see Table 4).

#### Study 1 Discussion

The women in Study 1 reported higher rates of sleep disturbances than is typical of community samples. For example, 61 % of the participants reported having trouble sleeping at least 3 nights a week during the previous month. In the National Institute of Mental Health Epidemiologic Catchment Area Study, 10.2 % of the participants (N = 7954) described having a problem falling or staying asleep for at least 2 weeks during the past 6 months<sup>10</sup> (Ford & Kamerow, 1989). When comparing specific sleep indices, another community study reported an SOL > 30 minutes in 28 % of female participants<sup>11</sup>, and nightly sleep duration of < 6 hours in 12 % of the same population (N = 2917)(Ohayon, 1996), in contrast to a SOL > 30 minutes in 64 %, and nightly sleep duration of < 6 hours in 53 % of the women in Study 1.

The rates of depression observed in Study 1 were also higher than previously reported in the literature for sexual assault victims. Sixty-four % of the participants were moderately

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<sup>10</sup> Sleep disturbances were not a result of physical illness, medication, or drug or alcohol use, and the respondent stated that it interfered with his/her life, took medication for it, and told a professional about it (Ford & Kamerow, 1989).

<sup>11</sup> Participants in this group also reported being dissatisfied with their sleep (Ohayon, 1996).



Table 3. Means and Standard Deviations for Questionnaires Completed by Participants in Both Study 1 and Study 2.

Questionnaires/Sleep Question Items	Study 1		Study 2 (N = 12)
	Group 1 <sup>a</sup> (N = 79)	Group 2 <sup>a</sup> (N = 12)	Mean (S.D.)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
1. How many nights per week did you have a problem with falling asleep or staying asleep?	3.8 (2.5)	3.7 (2.5)	4.0 (3.0)
2. On a typical night, how long did it take you to fall asleep after you went to bed and turned off the lights? (reported in minutes)	66.2 (58.2)	28.5* (36.9)	30.0 (42.7)
3. On a typical night, how many times did you wake up during the middle of the night?	2.3 (1.3)	2.6 (0.7)	2.7 (1.4)
4. On a typical night, how long did you spend awake, in total, in the middle of the night? (reported in minutes)	89.8 (102.5)	64.0 (51.1)	79.1(78.0)
5. How many hours of sleep per night did you usually get?	5.7 (2.0)	5.7 (0.98)	5.5 (1.3)
6. On a typical night, how many times did you wake up?	2.3 (1.3)	2.7 (0.8)	2.8 (1.6)

Table 3. (Continued) Means and Standard Deviations for Questionnaires Completed by Participants in Both Study 1 and Study 2.

7. On a typical night, how many times did you get out of bed (between going to bed and getting up in the morning)?	2.0 (1.7)	1.8 (1.0)	2.2 (1.2)
8. How many times per week did you have nightmares?	2.1 (1.8)	2.0 (2.1)	1.6 (2.2)
9. To what extent do your sleep problems interfere with your daily life ( e.g. memory, ability to do chores, concentration)? (0= no problem to 5= very much)	1.9 (1.4)	1.8 (1.5)	2.6 (2.1)
10. Beck Depression Inventory <sup>b</sup> (BDI)	23.6 (12.6)	23.1 (12.1)	14.2** (9.6)
11. Distressing Events Questionnaire <sup>c</sup> (DEQ)	44.2 (20.1)	37.5 (22.1)	25.6** (21.9)
12. Modified PTSD Symptom Scale <sup>d</sup> (MPSS)	66.4 (30.5)	57.2 (30.8)	37.4** (33.3)
12. Trauma Related Guilt Inventory <sup>e</sup> (TRGI)	67.8 (24.9)	67.7 (26.4)	42.3** (24.7)

Note. Participants are asked to report sleep patterns during the past month. a) Group 1 consists of the complete group victims of sexual assault participating in Study 1. Group 2 consists of data gathered during Study 1 for the participants that agreed to participate in both Study 1 and Study 2. b) None or minimal depression < 10; mild to moderate 10-18; moderate to severe 19-29; severe depression 30-63. c) Cut-off or higher scores indicate probable PTSD: for Vietnam vets = 26, for Treatment-seeking Women = 18. d) Cut-off or higher scores indicate probable PTSD: for Treatment sample = 71, for Community sample = 46. e) Normal values or cut-off scores not available.

Table 3. (Continued) Means and Standard Deviations for Questionnaires Completed by Participants in Both Study 1 and Study 2.

\* Indicates a significant t-test difference between Group 1 and Group 2 (without Bonferroni correction for multiple tests). \*\* Indicates a significant t-test difference between Study 1 (Group 2) and Study 2 (without Bonferroni correction for multiple tests). Using Bonferroni correction for multiple t-tests, no t values are significant.

Table 4. Intercorrelations Between Questionnaires and Sleep Indices for Study 1.

Questionnaire	N	1	2	3	4	5	6	7	8	9	10
1) Beck Depression Inventory	79	--	.70**	.73**	.61**	.43**	.44**	.59**	.49**	-.50**	.59**
2) Distressing Events Questionnaire	77		--	.88**	.70**	.42**	-.34**	.51**	.55**	-.42**	.62**
3) Modified PTSD Symptom Scale	77			--	.57**	.38**	.35**	.61**	.52**	-.42**	.63**
4) Trauma Related Guilt Inventory	79				--	.22	-.29*	.27*	.39**	-.33**	.34*
5) Sleep Onset Latency (Minutes)	76					--	-.37**	.23*	.40**	-.32**	.48**
6) Time awake after sleep onset (Minutes)	76						--	.25*	.25*	-.44**	.42**
7) Number of nights per week reported difficulty falling asleep or staying asleep	79							--	.45**	-.39**	.47**
8) Nightmares per week	79								--	-.20	.48**
9) Hours of sleep per night	78									--	-.45**
10) Degree that sleep problems interfere with day (0 = none to 5 = very much)	77										--

\*\* Correlation is significant at the 0.01 level (2-tailed); \* Correlation is significant at the 0.05 level (2-tailed).

to severely depressed as measured by the BDI (using cutoff scores reported in the Study 1 results section). While some longitudinal studies of women post-rape have found that the rate of depression is no different than normal control groups after several months (e.g., Atkeson et al., 1982), other studies have found higher rates of depression. For example, one study assessing women from 1 to 16 years post-rape, found that 45% of the participants met criteria for moderate or severe depression as measured by the BDI (Ellis et al., 1981). One factor that may explain the high rate of depression found in Study 1 is the fact that the women participating were all seeking treatment for post sexual assault symptoms.

High rates of PTSD symptoms were also described by the women in Study 1. Either 52 % or 90 % of participants met criteria for PTSD as measured by the MPSS or Distressing Events Questionnaire respectively (using cutoff scores described in the Study 1 results section). In comparison, Kilpatrick et al. (1987) reported the 16.5 % of the participants in their study met criteria for PTSD (using a modified version of the Diagnostic Interview Schedule) after experiencing a completed rape (N = 391; mean = 15 years post assault) (Kilpatrick et al., 1987; cited in Foa & Rothbaum, 1998). One factor that may account for the difference in rates of PTSD symptoms between these studies is the nature of the sample, the Kilpatrick et al., (1987) study was a community sample rather than exclusively treatment seeking sample.

Women reporting sleep disturbances<sup>12</sup> were found to have higher rates of symptoms consistent with PTSD (96 % with Distressing Events Questionnaire, 70 % with MPSS) than women without sleep disturbances (79 % with Distressing Events Questionnaire, 13 % with MPSS). The proportion of sleep disturbances in women with and without symptoms that meet criteria for PTSD (when using the MPSS only) are similar to rates reported in a

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<sup>12</sup> Sleep disturbances are defined for the purpose of this calculation as the proportion of women reporting difficulty either falling asleep or staying asleep 3 nights or more per week.

prospective study. Rothbaum and colleagues (1992) measured sleep disturbances<sup>13</sup> over time in women after sexual assault and found that 73 % of the women that met criteria for PTSD (as defined by the DSM-III-R) reported sleep disturbances, compared to 18 % of the women that did not meet criteria for PTSD, at 12 weeks post assault.

## CHAPTER 3

### STUDY 2

#### Method

##### Overview of Method

Study 2 was conducted from February, 2000 to September, 2000. A person affiliated with Study 1 attempted to contact participants from the original project<sup>14</sup> to ascertain their willingness to participate in Study 2. Women who agreed to participate gave verbal permission to allow a member of the current research team to contact them. Participants took part in a one-time assessment that included several questionnaires about demographics (see Appendix F), response to trauma and current sleep patterns, and a brief structured interview about presleep cognitions.

##### Goals

The goals of this study were: (1) To describe the sleep patterns of victims of sexual assault several years after the previous assessment (i.e, Study 1), (2) To describe the content of presleep thoughts in victims of sexual assault, and (3) To examine the relationship between sleep-onset latency and pre-sleep thoughts in victims of sexual assault.

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<sup>13</sup> Sleep disturbances are defined as difficulty falling or staying asleep, with no criteria regarding number of nights (Rothbaum et al., 1992).

<sup>14</sup> The author gratefully acknowledges the help of Susan Watson, member of the research team for Study 1, who contacted participants.

## Participants

Twelve of the women who participated in Study 1 consented to participate in Study 2. Participants' ages ranged from 29 to 68 years (mean age = 46.8; SD = 10.8 years), and years of education ranged from 12 to 17 years (mean education = 14.6 years, SD = 1.4 years). Table 2 includes a detailed description of both demographic and sexual assault variables for Study 2 participants.

## Measures

In addition to the measures described in Study 1, the following measures were used in Study 2:

Anxious Thoughts Inventory (AnTI): Meta-Worry Subscale. The Anxious Thoughts Inventory (AnTI) is a 22 item self-report scale developed to measure individual vulnerability to multiple dimensions of anxious worry (see Appendix G) (Wells, 1994). The 7 item meta-worry subscale contains 1 item to assess thought content (i.e. negative vs. positive thoughts) and 6 items that assess worries about the controllability of thought processes. The term meta-worry was used as the items "reflect a pre-occupation with meta-cognition in the form of thinking negatively about one's own worry". The AnTI was rationally derived and revised using a factor analytic approach. The meta-worry subscale demonstrated an acceptable alpha coefficient (0.75) with 239 undergraduate students between the ages of 18 and 35 (141 female and 98 males)(Wells, 1994). Test-retest reliability was assessed with 64 undergraduate students, tested 6 weeks apart. The Pearson test-retest correlation for the meta-worry subscale was 0.77 ( $p < .0001$ ). Wells (1994) also found that the meta-worry subscale was significantly correlated with the Spielberger Trait Anxiety subscale (STAI) [ $r = 0.68, p < .0001$ ]. Finally, the meta-worry subscale demonstrated an ability to discriminate between a normal control group (mean = 11, SD = 4) and outpatients with panic disorder (mean = 18, SD = 5), social phobia (mean = 16, SD = 6), or major depression (mean = 15, SD = 4).

The Pittsburgh Sleep Quality Index (PSQI). The PSQI is a rationally derived, self-report scale developed to measure sleep quality in clinical populations (see Appendix H) (Buysee, Reynolds, Monk, Berman, & Kupfer, 1989). The 19 item scale evaluates sleep over the past month, and yields a single global sleep score, in addition to generating scores for seven components of sleep; subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction (See Appendix I for scoring instructions).

Evaluation of psychometric properties was carried out with three groups of participants, good sleepers (N = 52), poor sleepers (N = 34) diagnosed with major depressive disorder, and poor sleepers that had been diagnosed<sup>15</sup> with Disorder Initiating and Maintaining Sleep (DIMS; N = 45) or Disorders of Excessive Somnolence (DOES; N = 17) (Buysee et al., 1989). When component scores were compared to the global PSQI score, the mean correlation coefficient was 0.58, with a range of 0.35 (sleep disturbances) to 0.76 (habitual sleep efficiency and subjective sleep quality). Test-retest reliability (N = 91) for the global PSQI score was 0.85 ( $p < 0.001$ ), and for component scores ranged from 0.65 ( $p < 0.001$ ) for medication use to 0.84 ( $p < 0.001$ ) for sleep latency. Buysse, et al., (1989) assessed discriminative validity, and found that mean Global PSQI scores differed significantly between all 3 subject groups, using an ANCOVA with age and sex as covariates. Using a global cut off score of 5 (> 5 constitutes poorer sleep quality), Buysse, et al., (1989) were able to correctly

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<sup>15</sup> Depression was assessed with the Schedule for Affective Disorders and Schizophrenia-Lifetime version (SADS-L; Endicott & Spitzer, 1978), and diagnosed according to Research Diagnostic Criteria (Spitzer et al., 1978; cited in Buysee, et al., 1989). Sleep disorder patients were diagnosed according to Association of Sleep Disorders Center (ASDC) criteria (ASDC, 1979; cited in Buysee, et al., 1989).



identify 88.5% of all control and poor sleeper participants, with a resulting sensitivity of 89.6% and specificity of 86.5%.

Pre-Sleep Arousal Scale (PSAS). The PSAS (Nicassio et al., 1985) is a 16 item self-report scale developed to measure both cognitive and somatic arousal states at bedtime (see appendix J). Cronbach's  $\alpha$  for the cognitive and somatic subscales were (respectively) 0.88 and 0.79 for college students, 0.67 and 0.84 for normal sleepers, and 0.76 and 0.81 for insomniacs<sup>16</sup>(Nicassio et al., 1985). Test-retest correlations (for 30 college students) after 3 weeks were 0.72 for the cognitive subscale and 0.76 for the somatic subscale. Nicassio et al., (1985) also provided evidence of validity for the PSAS, particularly the cognitive subscale. In correlations with measures of sleep indices (e.g., self report of total sleep time, awakenings from sleep), the cognitive scale demonstrated higher correlations than the somatic scale on all indices. The cognitive scale had the highest correlation with self-reported sleep-onset latency (0.59,  $p < 0.0001$ ), while the somatic scale had the highest correlations with self-reported sleep-onset latency (0.29,  $p < 0.0001$ ) and awakenings (frequency not given) from sleep (0.29,  $p < 0.0001$ ). In addition, mean scores for the insomniac group were significantly higher on all individual items than mean scores for the normal sleeper group, with the cognitive scale demonstrating greater differences than the somatic scale. Finally, the PSAS cognitive subscales were significantly correlated with scores on the Taylor Manifest Anxiety Scale (MAS) ( $r = 0.50$ ,  $p < 0.001$ ), and the Center for Epidemiological Studies Depression Scale

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<sup>16</sup> Participants of the study were 147 university undergraduate students, 30 self-reported insomniacs, and 30 self-reported normal sleepers, who filled out questionnaires during a single administration (with the exception of 30 students that participated in the test-retest correlations of the PSAS) (Nicassio et al., 1985).

(CES-D)( $r = 0.40, p < 0.001$ ). Similarly, the somatic subscales correlated with scores on the MAS ( $r = 0.58, p < 0.001$ ), and the CES-D ( $r = 0.41, p < 0.001$ ).

Presleep Thoughts Interview. The content and frequency of a variety of presleep thoughts were evaluated by a semi-structured interview, the Presleep Thoughts Interview (PTI; see Appendix K). This interview was developed specifically for Study 2, and has not been evaluated psychometrically. Interview questions were rationally derived from both sleep and sexual assault research sources. For example, sleep studies cite presleep thoughts regarding negative sleep related concerns, physical sensations, and environmental cues as having a detrimental effect on sleep (e.g., Sanavio, 1988; Van Egeren et al., 1983; Watts, Coyle, & East, 1994). Research on the psychological impact of sexual assault suggests that victims of sexual assault have intrusive thoughts that include, re-experiencing the traumatic event, negative appraisal of their actions/thoughts during the assault, thoughts about other people's negative reactions to the assault, safety related thoughts/fears, fear of disease associated with the assault, and worries about interactions with the justice system as a result of the assault (e.g., Calhoun et al., 1982; Dunmore et al., 1999).

A preliminary version of the Presleep Thoughts Interview was given to 3 researchers in the fields of sleep or sex assault, who were asked to review the interview to determine if all relevant and important thoughts were included. An item regarding thoughts of guilt after sexual assault was added at the recommendation of one of the sex assault researchers. The interview was then pilot tested with 6 non-sexually assaulted participants (members of the research group were asked to give the interview to one or two friends). For the questions pertaining to thoughts about a sexual assault, participants were asked to respond according to how they thought a person might respond after a physical or sexual assault. As a result of the pilot testing, the wording of several questions was altered to make the intent of the question more understandable.

The interview queries the frequency and degree of interference with sleep for 16 specific types of thoughts that might occur during the time a person is trying to fall asleep, during the past month. A single item is used to rate how often presleep thoughts are positive and how often they are negative. Two items are open-ended and query any recurring presleep thoughts that are not mentioned in the interview.

### Procedures

Recruitment. Women who participated in Study 1 were contacted by a person affiliated with the original project to ascertain their willingness to participate in the current study (see Appendix L for initial contact protocol). Women who agreed to participate gave the original project member verbal permission to allow a member of the current research team to contact them.

Attempts were made to contact 74 of the original participants. Of the original participants, 41 were unreachable due to non-working phone numbers and no information available from directory or Internet searches, and seven were otherwise unreachable (e.g. in prison, deceased). Of the remaining 26 women with working contact numbers, 10 did not respond to messages or pages asking them to contact our research group, two were contacted and declined to participate, two agreed to participate and did not answer subsequent messages, and 12 women completed the interview.

Interview. Nine of the participants were contacted and interviewed by the PI, and the remaining three participants were contacted and interviewed by a graduate student member of the research team. Appendix M describes research assistant training protocol, and Appendix N provides a transcript of the recruitment call for the research assistants to follow. Participants were told that they would not have to provide any information about their traumatic experience, but would be interviewed and asked to fill out questionnaires regarding aspects of their current functioning (participants were offered a small reimbursement of \$20.00 or four movie tickets). They were asked to confirm their willingness to participate

before proceeding to set up the appointment. The research assistant called the participant the day before the appointment to re-confirm the time and place of the meeting, unless requested to do otherwise (see Appendix O for a transcript of the confirmation call).

Six participants chose to be interviewed at a coffee shop or other public place, 4 were interviewed at their place of residence, 2 participants lived on Kauai and were interviewed by phone, and 1 participant was interviewed at her place of work. At the onset of the meeting, the interviewer explained the purpose of the study (see Appendix P), then read and asked participants to sign two copies of the Consent to Participate form (see Appendix Q). One copy was given to the participant as a reference for contact information. Participants were given a packet of questionnaires to fill out (see Appendii A, B, C, D, E, F, G, H and J). While the participant was filling out the questionnaires, the research assistant remained nearby to answer any questions.

After the questionnaires were filled out, the research assistant reviewed the participant's response to question 9 (suicidal thoughts or intentions) on the Beck Depression Inventory and assessed suicidal intent. The protocol in Appendix R was followed to decide what action to take for any given response to question 9. Nine participants responded that they had no thoughts of killing themselves and the assessment was resumed, and 3 of the participants responded that they had thoughts, but no intention of killing themselves. These participants agreed to sign a "no suicide" contract and continued with the assessment.

The research assistant conducted a brief semi-structured interview surveying pre-sleep thought content (see Appendix K). Mean time for the interview was 72 minutes, although one interview took 6 \_ hours to complete. Seven participants chose cash reimbursement, and 5 participants chose 4 Group Movie Tickets as a reimbursement. After completion of the interview, the interviewer debriefed the participant as to the purpose of the study, answered any questions the participant had, and give them a copy a sleep hygiene brochure and a list of community resources for women.

## Results

All statistical analyses were conducted using SPSS Base 9.0 (SPSS, 1999).

### Missing Data

Nine participants completed all items on all questionnaires. For 3 participants, one missing item on the BDI questionnaire was replaced with a mean value across completed items for that participant. One participant omitted a single item on the Pittsburgh Sleep Quality Index, needed to calculate one of the seven subscales. In this instance the mean value across Pittsburgh Sleep Quality Index subscales for that participant was used. Three participants were each missing significant portions (19%, 29%, and 78%) of a questionnaire (the Anxious Thoughts Inventory for participant 6, the Trauma Related Guilt Inventory for participants 11 & 12) and these questionnaires were omitted from the analysis. Finally, two items not completed in one Sleep Questions assessment were left as missing values and excluded from analysis.

### Self reported Sleep Patterns

In Study 2, 67 % of the participants reported that they had trouble either getting to sleep or staying asleep at least three nights per week. In addition, 33 % reported that it typically takes 30 minutes or longer to fall asleep, 67 % reported that they were typically awake more than 30 minutes during the night (after they fall asleep and before they arise in the morning), and 58 % reported that they typically sleep less than 6 hours per night. Finally, 17 % reported that their sleep problems interfered with daily life “a little”, and 50 % reported that their sleep problems interfered with daily life “somewhat”, “much”, or “very much.” Pre-sleep Arousal Scale- Cognitive subscale scores ranged from 12 to 40 and Somatic subscale scores ranged from 10 to 34 (range = 0 to 40 for each scale, with higher scores indicating greater arousal). Ten of the 12 participants in this study had global Pittsburgh Sleep Quality Index cutoff scores of greater than 5 (scores greater than 5 indicate poor overall sleep quality).

Presleep Thoughts. Table 5 reports means and standard deviations for the frequency and perceived degree of interference for each presleep thought queried in the Presleep Thoughts Interview. All participants reported having non-sexual assault-related presleep thoughts more frequently than sexual assault-related presleep thoughts. The most frequently reported non-sexual assault-related presleep thoughts (occurring at least once a week) were: (a) planning the next day's activities (N = 12), thinking about family members (N = 12), thinking about friends (N = 10), thinking about environmental distractions (e.g., light, noise) (N = 8), and thinking about the current day's events (N = 8). The most frequently reported sexual assault-related presleep thought (occurring at least once a week) was safety-related thoughts and fears (N = 9). Approximately one half of the women interviewed also reported thinking about health problems related to the assault (N = 7), thinking about or re-experiencing the assault (N = 6), and thinking about friends/family reactions to hearing about the assault (N = 6) at least once during the past month.

Four participants who reported a typical SOL of 30 minutes or more were compared to the 8 participants who reported a typical SOL of under 30 minutes on frequency/interference of sexual assault-related thoughts vs. non-sexual assault related thoughts. Independent t-tests indicated significant between group differences for sexual assault-related thoughts [ $t(10) = -2.352, p = .04$ ], and no significant between group differences for non-sexual assault-related thoughts.

#### Other Measures

Means and standard deviations for measures used in both studies (Sleep Questions, BDI, MPSS, Distressing Events Questionnaire, and Trauma Related Guilt Inventory) are reported in Table 3. Means and standard deviations for measures used only for Study 2 (Pittsburgh Sleep Quality Index, Pre-sleep Arousal Scale, Anxious Thoughts Inventory, and Presleep Thoughts Interview) are reported in Table 6.

Table 5. Means and Standard Deviations for Items on the Presleep Thoughts Interview (N = 12).

<u>Presleep Thought*</u>	<u>Frequency</u>		<u>Interference</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
<b>Part A – Non-sexual Assault Related Thoughts</b>				
Think about family members (not related to the assault)	3.33	.78	1.08	1.16
Plan the next day’s activities	3.25	.75	1.67	1.23
Think about physical sensations (e.g., feeling tense, feeling hot or cold)	2.33	1.50	1.75	1.36
Think about friends (not related to the assault)	2.25	1.14	.92	1.31
42 Think about the current day’s events	2.17	1.40	1.50	1.24
Think about noise, light, or other environmental distractions	2.08	1.38	1.42	1.51
Worry about being tired the next day	2.00	1.59	.92	1.24
Think about work (not related to the assault)	1.92	1.44	1.17	1.40
Worry about not getting to sleep	.83	1.19	1.00	1.35
<b>Part B – Sexual Assault Related Thoughts</b>				
Think about safety related thoughts or fears	2.33	1.61	1.08	1.31

Table 5. (Continued) Means and Standard Deviations for Items on the Presleep Thoughts Interview (N = 12).

Think about health problems related to the assault	1.25	1.42	.58	1.08
Think about or “reexperience” the assault	.83	1.03	.92	1.24
Think about interactions with the justice system	.75	1.36	.83	1.40
Think about your thoughts or actions during the assault	.67	.98	1.00	1.41
Have feelings of guilt related to the assault	.67	1.23	.67	1.23
Think about reactions of friends or family to hearing about the assault	.67	.78	.83	1.53

Note. Each thought is rated on a scale of 0 to 4 for frequency and subjective interference with sleep. Frequency Scores : 0 = Not during the past month, 1 = Less than once a week, 2 = Once or twice a week, 3 = Three to six times a week, 4 = Every night; Interference Scores: 0 = Does not interfere, 1 = Interferes a little, 2 = Interferes to some extent, 3 = Interferes strongly, 4 = Interferes very strongly.



Table 6. Study 2: Means and Standard Deviations for Questionnaires Completed by Study 2 Participants (N = 12).

Questionnaires	Normal Values or Cut-off Scores	Mean	S.D.
Anxious Thoughts Inventory	Mean: for female control group = 11.0 (3.6)*; higher scores indicate greater anxious thoughts.	11.9	4.8
Pittsburgh Sleep Quality Index			
Global Score	Greater than 5 score indicates poor sleep quality <sup>c</sup> (Range 0-21).	11.0	4.6
Reported Sleep onset Latency	Greater than 30 minutes indicates possible sleep disorder <sup>b</sup> .	30.6	41.3
Subjective Sleep Quality	Mean: Control group = 0.4 (0.4); for Disorders of Initiating and Maintaining Sleep (DIMS) = 2.0 (1.9) <sup>c</sup> (Range 0-3; higher scores indicate poorer sleep).	1.9	0.9
Sleep Latency	Mean: Control group = 0.6 (0.7); for DIMS = 1.4 (1.1) <sup>c</sup> (Range 0-3; higher scores indicate poorer sleep).	1.2	1.3
Sleep Duration	Mean: Control group = 0.3 (0.3); for DIMS = 1.5 (1.5) <sup>c</sup> (Range 0-3; higher scores indicate poorer sleep).	1.9	1.0

Table 6. (continued) Study 2: Means and Standard Deviations for Questionnaires Completed by Study 2 Participants (N = 12).

	Habitual Sleep Efficiency	Mean: Control group = 0.1 (0.1); for DIMS = 1.5 (1.4) <sup>e</sup> (Range 0-3; higher scores indicate poorer sleep).	0.5	0.9
	Sleep Disturbances	Mean: Control group = 1.0 (1.0); for DIMS = 1.4 (1.4) <sup>e</sup> (Range 0-3; higher scores indicate poorer sleep).	2.3	0.5
	Use of Sleep Medication	Mean: Control group = 0.04 (0.1); for DIMS = 1.2 (1.1) <sup>e</sup> (Range 0-3; higher scores indicate poorer sleep).	1.4	1.4
	Daytime Dysfunction	Mean: Control group = 0.4 (0.4); for DIMS = 1.4 (1.4) <sup>e</sup> (Range 0-3; higher scores indicate poorer sleep).	1.8	1.0
45	Pre-sleep Arousal Scale			
	Total Score	Total score normal values not available. Range for each subscale = 0-40	34.6	13.8
	Cognitive Subscale	Mean: Normal sleepers = 12.8 (2.8); for Insomniacs = 25.5 (6.6) <sup>d</sup> .	18.9	7.6
	Somatic Subscale	Mean: Normal sleepers = 11.2 (4.0); for Insomniacs = 17.7 (6.5) <sup>d</sup> .	15.7	6.7
	Presleep Thoughts Interview (PTI)			
	Part A	Not available. Score range = 0 to 8.	3.5	1.3
	Part B	Not available. Score range = 0 to 8.	1.9	1.4
	Valence	Not available. Score range = 0 to 4.	2.8	0.9

Table 6. (continued) Study 2: Means and Standard Deviations for Questionnaires Completed by Study 2 Participants (N = 12).

\* Numbers in brackets indicate standard deviations

Note. a. Wells, 1994; b. Morin, 1993; c. Buysee, Reynolds, Monk, Berman, & Kupfer, 1989; d. Nicassio, Mendlowitz, Fussell, & Petras, 1985. PSQI = Pittsburgh Sleep Quality Index; PSAS = Pre-sleep Arousal Scale; PTA = Presleep Thoughts Assessment.

Thirty-three percent of the participants reported BDI scores of less than 10, 42% reported scores between 10 and 18, and 25 % reported scores of 19 or more<sup>17</sup>. Estimates of PTSD vary, depending on the measure used. For the Distressing Events Questionnaire, using a cutoff score of 18 (Kubany et al., 2000b), 58% of the participants reported symptoms consistent with PTSD. For the MPSS, using a cutoff score of 71 (Falsetti et al., 1993), 17 % of the participants reported symptoms consistent with PTSD. Of the women that reported having trouble getting to sleep or staying asleep 3 nights or more per week, 75 % had Distressing Events Questionnaire scores of 18 or greater, and 25 % had MPSS scores of 71 or greater. In contrast, of the women that reported having trouble getting to sleep or staying asleep less than 3 nights per week, 25 % had Distressing Events Questionnaire scores of 18 or greater, and none had MPSS scores of 71 or greater.

Between Group Comparisons of: (1) Study 1 total group and Study 1 women who participated in both studies, and (2) Study 2 group at two time frames (Study 1 and Study 2).

In the first comparison, independent t-tests were done to determine if the means on the Sleep Questions, BDI, Distressing Events Questionnaire, and Trauma Related Guilt Inventory were significantly different in Study 1 between the total group of women and the women who participated in both studies. T-tests using Bonferroni correction for multiple tests showed no significant differences, however, without Bonferroni correction, t-test results indicated that the length of time it took to fall asleep (SOL) was significantly lower for Group 2.

In the second comparison, matched-pair t-tests were done to determine if mean scores on Sleep Questions, BDI, Distressing Events Questionnaire, and Trauma Related Guilt

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<sup>17</sup> According to Beck et al., (1988), a BDI score of less than 10 is consistent with minimal or no depression, 10 – 18 is consistent with mild to moderate depression, and > 19 is consistent with moderate to severe depression.

Inventory were significantly different between the initial (Study 1) and follow-up assessment (Study 2) for women who participated in both studies. T-tests, using Bonferroni correction for multiple tests, showed no significant differences. However, without Bonferroni correction, t-test results indicated that the BDI, MPSS, Distressing Events Questionnaire, and Trauma Related Guilt Inventory were all significantly lower for the Study 2.

#### Internal Consistency of Dependent Variables

Alpha coefficients are reported in Table 7. To examine internal consistency, Cronbach's  $\alpha$  was calculated for questionnaires that provide aggregated scores, such as the Pre-sleep Arousal Scale, Anxious Thoughts Inventory, the Pittsburgh Sleep Quality Index, the Presleep Thoughts Interview, the BDI, MPSS, Distressing Events Questionnaire, and Trauma Related Guilt Inventory. Cronbach's alpha ranged from 0.70 for the Pittsburgh Sleep Quality Index (an overall reliability coefficient of the seven component scores of the PSQI) to 0.98 for the MPSS.

#### Construction of Aggregated Measures

Table 7 presents a zero-order correlation matrix for measures of sleep-onset latency, presleep cognitive variables (Pre-sleep Arousal Scale cognitive subscale, Presleep Thoughts Interview), the Pittsburgh Sleep Quality Interview, Anxious Thoughts Interview, BDI, MPSS, Distressing Events Questionnaire, and Trauma Related Guilt Inventory. Correlations between multiple measures of the same construct were examined to ascertain whether they share sufficient variance to justify their aggregation. Although there is no established criterion for determining the suitability of aggregating two correlated measures, a correlation of 0.5 was used as the criterion for aggregation, indicating that the components have 25% of their variance in common (Peralta, 1999).

Correlations to determine whether or not measures were suitable for forming aggregate scores were examined for both SOL (i.e., the Sleep Questions report of SOL, and the Pittsburgh Sleep Quality Index report of SOL), and a cognitive composite score (i.e.,

Table 7. Alpha Coefficients and Intercorrelations Between Questionnaires Used in Study 2.

Questionnaire	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Alpha
1) PSQI-G	12	–	.55	.46	.52	.34	.04	.57	.73**	.76**	.73	.72**	.74*	.05	.21	.70
2) PSQI- SOL	12		–	.93**	.24	.18	-.17	.05	.58*	.15	.36	.44	-.26	.07	-.52	n/a
3) SQ- SOL	11			–	.80**	.75**	.07	.72*	.73*	.44	.67*	.58	-.30	.11	-.51	n/a
4) PSAS- T	12				–	.97**	.31	.85**	.70*	.72**	.82**	.72**	.71*	.15	.51	.92
5) PSAS- C	12					–	.38	.79**	.61*	.64*	.72**	.63*	.44	.18	.35	.87
6) AnTi	11						–	.39	.39	.33	.36	.26	.54	.07	.44	.89
7) PTA-Pt. A	12							–	.54	.70*	.68*	.54	.52	.01	.14	.82
8) PTA- Pt. B	12								–	.68*	.90**	.86**	.64*	.43	.30	.83
9) BDI	12									–	.85**	.83**	.86**	.48	.37	.90
10) MPSS	12										–	.97**	.84**	.39	.57	.98
11) DEQ	12											–	.76*	.48	.55	.96
10) TRGI- GG	10												–	.21	.61	.94
13) TRGI- D	11													–	-.20	.94
14) TRGI-GC	10														–	.94

Table 7. (Continued) Alpha Coefficients and Intercorrelations Between Questionnaires Used in Study 2.

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**\*\*** Correlation is significant at the 0.01 level (2-tailed); **\*** Correlation is significant at the 0.05 level (2-tailed).

PSQI – G = Pittsburgh Sleep Quality Index – Global Score; PSQI – SOL = Pittsburgh Sleep Quality Index – Sleep Onset Latency Score; SQ = Sleep Questions; SOL = Sleep Onset Latency; PSAS- T = Pre-sleep Arousal Scale- Total; PSAS – C = Pre-sleep Arousal Scale – Cognitive subscale; AnTi = Anxious Thoughts Inventory; PTA = Presleep Thoughts Assessment; BDI = Beck Depression Inventory; MPSS = Modified PTSD Symptom Scale; DEQ = Distressing Events Questionnaire; TRGI = Trauma Related Guilt Inventory; TRGI- GG = Trauma Related Guilt Inventory, Global Guilt Scale; TRGI- GC = Trauma Related Guilt Inventory, Guilt Cognitions scale

Presleep Arousal Scale- cognitive subscale, and the Anxious Thoughts Inventory- meta-worry subscale). The Presleep Thoughts Interview was not included in the aggregated measures, as this interview delineates between assault and non-assault related pre-sleep cognitions and was analyzed separately. The Pre-sleep Arousal Scale and the Anxious Thoughts Inventory make no distinction between assault and non-assault related thoughts.

The Sleep Questions and Pittsburgh Sleep Quality Index reported SOL scores met criteria to form an aggregated score (correlation of .93,  $p < 0.01$ ). An aggregated score for each participant was formed by converting the Sleep Questions SOL and Pittsburgh Sleep Quality Index SOL measures to z-scores and adding the two scores. The Presleep Arousal Scale Cognitive subscale and Anxious Thoughts Inventory did not meet the above criteria to form an aggregated score ( $n = .38$ ) for a Cognitive Composite Score.

#### Relations Between Pre-sleep Cognitions on Sleep-onset Latency

Table 8 presents a correlation matrix of variables used in the following multiple regression analyses.

SOL in Study 2 predicted by variance in presleep cognitive arousal and controllability of thought processes. The purpose of the next set of analyses were to: (1) examine the degree to which variance in SOL can be accounted for by variance in presleep cognitive arousal (as measured by the Pre-sleep Arousal Scale – cognitive subscale) and worry about the controllability of thoughts (as measured by the Anxious Thoughts Inventory- meta-worry subscale) in combination, and (2) examine the degree to which variance in SOL can be accounted for by variance in presleep cognitive arousal above and beyond variance accounted for by variance in worry about the controllability of thoughts. Table 9 reports a summary of these analyses.

The following equations were used:

(a) the variance in SOL accounted for by variance in presleep cognitive arousal and worry about the controllability of thoughts:



Table 8. Intercorrelations Between Measures Used in Multiple Regression Analysis.

Measure	N	1	2	3	4	5
1) Aggregated SOL	10	--	.73**	.06	.71**	.73**
2) Presleep Arousal Scale- Cognitive Subscale	10		--	.38	n/a	n/a
3) Anxious Thoughts Inventory- Meta worry	10			--	n/a	n/a
Subscale						
4) Presleep Thoughts Interview: Non-assault related thoughts	11				--	.67
5) Presleep Thoughts Interview: Assault related thoughts	11					--

Note: Correlations are reported only for the specific relationships examined in the multiple regression analysis. \*\* Correlation is significant at the 0.01 level (2-tailed). \*Correlation is significant at the 0.05 level (2-tailed).

Table 9. Summary of Regression Analysis of SOL in Study 2 Predicted by Presleep Arousal Scale- Cognitive Subscale and Anxious Thoughts Inventory – Meta Worry Subscale.

Variables	<u>B</u>	<u>SEB</u>	<u>_</u>	Adj. R <sup>2</sup>	<u>F</u>	R <sup>2</sup> change	<u>F comp</u>
Model 1 (restricted model)				.004*	.03		
AnTi-M	1.8	.10	.06				
Model 2 (full model)				.47	5.06		
PSAS- Cognitive	.15	.05	.83				
AnTi- M	-7.34	.08	-.25				
Comparison of Model 1 and Model 2						.59	8.91

Note: R<sup>2</sup> change = the difference between the R<sup>2</sup> of Model 1 and Model 2; F comp = the calculated F score when comparing Model 1 and Model 2; SOL = Sleep Onset Latency; PSAS-C = Presleep Arousal Scale- Cognitive Subscale; AnTi-M = Anxious Thoughts Inventory- Meta worry Subscale. \* Number reported is R<sup>2</sup>. Adjusted R<sup>2</sup> is less than 0.

$$Y = b_1X_1 + b_2X_2 + e \quad (1)$$

where  $Y = \text{SOL}$  in Study 2,  $X_1 = \text{presleep cognitive arousal}$ ,  $X_2 = \text{worry about the controllability of thoughts}$ , and  $e = \text{error}$ .

(b) the degree to which variance in SOL is accounted for by variance in presleep cognitive arousal above and beyond variance accounted for by variance in worry about the controllability of thoughts:

$$Y = b_2X_2 + e \quad (2)$$

where  $Y = \text{SOL}$  at ,  $X_2 = \text{worry about the controllability of thoughts}$ , and  $e = \text{error}$ .

Equations (1) and (2) were compared with an F test to test for significant differences between the two models. In the restricted model, worry about the controllability of thoughts accounts for 0.4% of the variance in SOL. In the full model, presleep cognitive arousal and worry about the controllability of thoughts accounted for 47% of variance in SOL. Presleep cognitive arousal, as measured by the Presleep Arousal Scale- Cognitive subscale, accounted for a significant amount of the variance in SOL above and beyond worry about the controllability of thoughts.

SOL in Study 2 as predicted by non-assault related presleep thoughts and assault related presleep thoughts. The purpose of the next set of analyses were to (1) examine the degree to which variance in SOL could be accounted for by variance in non-assault related presleep thoughts (as measured by the Presleep Thoughts Interview, part A) and assault related presleep thoughts (as measured in the Presleep Thoughts Interview, part B) in combination, and (2) examine the degree to which variance in SOL could be accounted for by variance in assault related presleep thoughts above and beyond variance accounted for by variance in non-assault related presleep thoughts. Table 10 reports a summary of the regression analysis.

The following equations were used:

Table 10. Summary of Regression Analysis of SOL in Study 2 Predicted by Non-assault Related Thoughts (PTI- Part A) and Assault Related Thoughts (PTI- Part B).

Variables	<u>B</u>	<u>SEB</u>	<u>_</u>	Adj R <sup>2</sup>	<u>F</u>	R <sup>2</sup> chang e	<u>F comp</u>
Model 1 (full model)				.52	6.45		
PTI- Part A	.42	.31	.39				
PTI- Part B	.46	.30	.46				
Model 2 (restricted model)				.44	8.97		
PTI- Part A	.75	.25	.71				
Comparison of Model 1 and Model 2						.08	1.51

Note: R<sup>2</sup> change = the difference between the R<sup>2</sup> of Model 1 and Model 2; F comp = the calculated F score when comparing Model 1 and Model 2; PTI = Presleep Thoughts Interview.

(c) the degree to which variance in SOL is accounted for by variance in non-assault related presleep thoughts and assault related presleep thoughts was determined:

$$Y = b_3X_3 + b_4X_4 + e \quad (3)$$

where  $Y = \text{SOL}$ ,  $X_3 = \text{non-assault related presleep thoughts}$ ,  $X_4 = \text{assault related presleep thoughts}$ , and  $e = \text{error}$ .

(d) the degree to which variance in SOL is accounted for by variance in assault related presleep thoughts above and beyond variance accounted for by variance in non-assault related presleep thoughts:

$$Y = b_3X_3 + e \quad (4)$$

where  $Y = \text{SOL}$ ,  $X_3 = \text{non-assault related presleep thoughts}$ , and  $e = \text{error}$ . Equations (3) and (4) were compared with an F test to test for significant differences between the two models. In the full model, non-assault related presleep thoughts and assault related presleep thoughts in combination accounted for 52 % of the variance in SOL. In the restricted model, non-assault related presleep thoughts accounted for 44 % of the variance in SOL. According to the F test, there is no significant difference between the full and restricted models. Assault related presleep thoughts do not account for a significant amount of the variance in SOL above and beyond non-assault related presleep thoughts.

### Study 2 Discussion

Approximately 3 to 5 years after Study 1, the group of women that agreed to participate in Study 2 continued to report high rates of sleep disturbances in general. For example, 10 of the 12 participants had global Pittsburgh Sleep Quality Index cutoff scores of greater than 5, indicating poor overall sleep quality (Buysee et al., 1989). In contrast, the average global Pittsburgh Sleep Quality Index score for a normal sleeper control group ( $N = 52$ ) was 2.67 (Buysee et al., 1989). While the number of nights women had trouble sleeping and typical nightly duration of sleep remained higher than described in community studies, the number of women reporting a typical SOL of  $> 30$  minutes was similar to the study

conducted by Ohayon and colleagues (1996; N = 2917). Twenty-eight % of the women in the Ohayon study (1996) described a typical SOL of > 30 minutes vs. 33 % in Study 2.

All participants reported having presleep thoughts related to the sexual assault at least once per month, and as often as every night (for 5 of 12 participants), even years after the assault. The most commonly reported assault related thoughts were safety-related thoughts and fears. This is consistent with sexual assault literature that reports fear is a common long-term symptom following sexual assault (e.g., Calhoun et al., 1982; Ellis, Atkeson, & Calhoun, 1981). When the participants who reported a typical SOL of > 30 minutes were compared to the participants who reported a typical SOL of < 30 minutes, the group with the SOL of > 30 minutes had significantly higher scores on the Presleep Thoughts Interview Part B (sexual assault related thoughts). This is consistent with the hypothesis that presleep thoughts related to sexual assault may affect sleep-onset difficulties for women who have been sexually assaulted. This assumption was not supported by multiple regression analysis, which indicated that, while presleep thoughts account for a significant amount of variance in SOL, assault related presleep thoughts did not account for a significant amount of the variance in SOL above and beyond non-assault related presleep thoughts.

The rates of depression observed in Study 2 were consistent with other studies of sexual assault victims. Twenty-five % of the participants were moderately or severely depressed as measured by the BDI. As previously stated, rates of depression reported after sexual assault vary from no different than normal control groups after several months (e.g., Atkeson et al., 1982) to 45 % one to 16 years post sexual assault (Ellis et al., 1981).

In study 2, 17% or 58% of the participants met criteria for PTSD according to the MPSS and Distressing Events Questionnaire respectively. Kilpatrick et al. (1987) reported rates of PTSD (using a modified version of the Diagnostic Interview Schedule) after sexual assault similar to those seen in this study, when the MPSS was used to estimate PTSD (Foa & Rothbaum, 1998). When using the Distressing Events Questionnaire, rates of symptoms

consistent with PTSD continue to be higher than rates previously reported for women post sexual assault.

## CHAPTER 4

### DISCUSSION

The purpose of this study was to describe sleep patterns and to investigate the relationship between presleep cognitions and sleep onset latency in women who have been sexually assaulted. Previously published descriptions of sleep indices have been restricted to sexually assaulted women with PTSD (Nishith et al., 2001) or women with complaints of insomnia, nightmares, and PTSD symptoms (Krakow et al., 2000). This study expands the description of sleep indices to include women that have been sexually assaulted and have sought treatment. In addition, this is the first study to investigate the relationship between presleep cognitions and sleep onset latency in this population.

The participants in both Study 1 and Study 2 reported higher rates of sleep disturbances than are representative of community samples, with the single exception of the proportion of women reporting a typical SOL of > 30 minutes in Study 2. The rates of sleep disturbances are higher than previously described for women after sexual assault. For example, Rothbaum and colleagues (1992) stated that approximately 50 % of their participants reported sleep disturbances at 12 weeks post sexual assault. In comparison, 61 % of the women in Study 1, and 67 % of the women in Study 2 reported having trouble sleeping at least 3 nights a week during the past month, with length of time between the sexual assault and study participation typically longer (e.g., for Study 1, 23 % of the participants were sexually assaulted less than 6 months previously, and 43 % sexually assaulted more than 5 years previously). It is also interesting to note that there are no statistically significant differences in reported sleep indices for the Study 2 group of participants between their Study 1 and Study 2 interviews (approximately 3 to 5 years later).

While sleep disturbances remained consistent between Study 1 and Study 2, rates of depression and symptoms consistent with PTSD appeared to decrease. The proportion of women that were moderately to severely depressed as measured by the BDI went from 64 % in Study 1 to 25 % in Study 2. Between study 1 and Study 2, the proportion of participants reporting symptoms consistent with PTSD went from 52 % to 12 % as measured by the MPSS, and 90 % to 58 % as measured by the Distressing Events Questionnaire. It is difficult to ascertain whether these differences are significant, due to the small sample size in Study 2. While higher rates of depression and PTSD symptomatology in Study 1 may be due to the fact that all participants were seeking treatment for post sexual assault symptoms, no information was obtained during Study 2 regarding treatment. Lower rates in Study 2 may reflect treatment effects, or may be an artifact of attrition.

In Study 1 and Study 1, rates of reported sleep disturbances were substantially higher for women reporting symptoms consistent with PTSD when measured by both the Distressing Events Questionnaire and the MPSS. This may be an artifact, as sleep disturbances are part of the criteria for diagnosing PTSD (APA, 1994). However, the fact that overall proportions of PTSD symptomatology decrease between Study 1 and Study 2, but overall proportions of sleep disturbances remain similar suggests that sleep disturbances may continue after other symptoms of PTSD have abated.

The proportion of women with PTSD symptomatology was reliably higher when using cutoff scores for the Distressing Events Questionnaire than with the MPSS. In study 2, the proportion of women reporting symptoms consistent with PTSD continued to be higher than other reports of PTSD after sexual assault with the DEQ. In contrast, the MPSS yielded results similar to rates seen in Kilpatrick et al., (1987). It is difficult to ascertain which measure is more accurate with this sample. The Distressing Events Questionnaire demonstrated good discriminative validity with treatment seeking women (90% correctly classified as having PTSD) when compared to a diagnosis of PTSD using the CAPS (Kubany



et al., 2000). There is no published data regarding the discriminative validity of the MPSS. In addition, the MPSS has two cutoff scores, one for treatment seeking samples (71 or higher; used in this study) and a lower cutoff score (46 or higher) for community samples. Using the lower cutoff score for the MPSS would have yielded results more similar to the Distressing Events Questionnaire.

Data from Study 1 and Study 2 have suggested some modifications to the model of the relationship between symptoms experienced after sexual assault, delayed sleep onset latency, and consequences of sleep disturbances (see Figure 1). First, the strong relationship between symptoms consistent with PTSD and sleep disturbances suggests that the relationship between sexual assault and the increased physiological arousal dimension of PTSD (which includes the criteria of sleep disturbances) should be stronger than portrayed in the original model (i.e., equally as strong as the re-experiencing and avoidance dimensions). Information from the Presleep Thoughts Interview further informs the model. For example, presleep thoughts about fear/safety were the most frequently reported presleep thought related to the assault, and re-experiencing the assault or thinking about physical sensations were also reported by at least half of the participants. In addition, participants reported that they perceived these thoughts to interfere with sleep, suggesting that their relationship to presleep cognitions should be stronger than originally depicted in the model (i.e., equally as strong as the relationship between presleep thoughts and sleep onset latency).

There are several limitations to this study, relating to both the sample and the measures used. The most salient limitation is the small sample size associated with Study 2. This restricts the extent to which conclusions can be generalized to all women that have been sexually assaulted. The second limitation with this sample is the variation in time between the sexual assault and participation in both studies. In study 1, participants were assessed two

weeks to 20+ years post assault<sup>18</sup>, while in Study 2, participants were assessed 5 years to 20+ years post assault. The third limitation relating to the sample is the method of recruitment. Participants were all women who were seeking treatment at the time of the assessment, resulting in a biased sample. This group was likely to report more severe psychological symptoms than a random selection of women who had been sexually assaulted.

There are two major limitations associated with the measures used in this study. First, all questionnaires were retrospective in nature and asked participants to recall sleep patterns over periods of time as long as one month. This is difficult, particularly with sleep, which can vary from night to night. Second, the focus of this investigation was the effect of presleep thoughts on sleep onset latency. While the research literature supports the probable importance of presleep thoughts in sleep disturbances, this study did not report information about other factors likely to affect sleep, such as physiologic arousal, or factors associated with sleep hygiene, including substance use (e.g., caffeine, alcohol, nicotine), exercise and eating habits, and other sleep related habits (e.g., napping, consistency of bedtime or getting up time).

Future research could address these limitations. The problem of sample size is currently being addressed by continued data collection with a community sample. This sample may allow a more reliable analysis of the relationship between presleep thoughts and sleep onset latency. Future studies could address other sample limitations by limiting inclusion criteria to a more specific time frame and gathering information about the onset and duration of sleep disturbances. Limitations with measures could be addressed in future research by using prospective measures (such as actigraph readings, thought sampling, or

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<sup>18</sup> Approximately 25% of the women in this sample were assaulted within a year of participating, while the majority of the women had been assaulted more than a year before the assessment.

nightly diaries) over several nights, or over several weeks as in a time series design. Finally future research should collect data relating to other factors that are likely to affect sleep quality, such as physiologic arousal and sleep hygiene.

## APPENDIX A: Beck Depression Inventory (BDI)

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY. Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements before making your choice.

1.     0    I do not feel sad.  
       1    I feel sad.  
       2    I am sad all the time and I can't snap out of it.  
       3    I am so sad or unhappy that I can't stand it.
  
2.     0    I am not particularly discouraged about the future.  
       1    I feel discouraged about the future.  
       2    I feel I have nothing to look forward to.  
       3    I feel the the future is hopeless and that things cannot improve.
  
3.     0    I do not feel like a failure.  
       1    I feel I have failed more than the average person.  
       2    As I look back on my life, all I can see is a lot of failures.  
       3    I feel I am a complete failure as a person.
  
4.     0    I get as much satisfaction out of things as I used to.  
       1    I don't enjoy things the way I used to.  
       2    I don't get real satisfaction out of anything anymore.  
       3    I am dissatisfied or bored with everything.
  
5.     0    I don't feel particularly guilty.  
       1    I feel guilty a good part of the time.  
       2    I feel guilty most of the time.  
       3    I feel guilty all of the time.
  
6.     0    I don't feel I am being punished.  
       1    I feel I may be punished.  
       2    I expect to be punished.  
       3    I feel I am being punished.
  
7.     0    I don't feel disappointed in myself.  
       1    I am disappointed in myself.  
       2    I am disgusted with myself.  
       3    I hate myself.
  
8.     0    I don't feel I am worse than anybody else.  
       1    I am critical of myself all the time for my faults.  
       2    I blame myself all the time for my faults.  
       3    I blame myself for everything bad that happens.

9. 0 I don't have any thoughts of killing myself.  
 1 I have thoughts of killing myself, but would not carry them out.  
 2 I would like to kill myself.  
 3 I would kill myself if I had a chance.
10. 0 I don't cry any more than usual.  
 1 I cry now more than I used to.  
 2 I cry all the time now.  
 3 I used to be able to cry, but now I can't cry even though I want to.
11. 0 I am no more irritated now than I ever am.  
 1 I get annoyed more easily than I used to.  
 2 I feel irritated all the time now.  
 3 I don't get irritated at all by the things that used to irritate me.
12. 0 I have not lost interest in other people.  
 1 I am less interested in other people than I used to be.  
 2 I have lost most of my interest in other people.  
 3 I have lost all of my interest in other people.
13. 0 I make decisions about as well as I ever did.  
 1 I put off making decisions more than I used to.  
 2 I have great difficulty in making decisions than before.  
 3 I can't make decisions at all anymore.
14. 0 I don't feel I look any worse than I used to.  
 1 I am worried that I am looking old or unattractive.  
 2 I feel that there are permanent changes in my appearance that make me look unattractive.  
 3 I believe that I look ugly.
15. 0 I can work about as well as before.  
 1 It takes extra effort to get started at doing something.  
 2 I have to push myself very hard to do anything.  
 3 I can't do any work at all.
16. 0 I can sleep as well as usual.  
 1 I don't sleep as well as I used to.  
 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.  
 4 I wake up several hours earlier than I used to and cannot get back to sleep.
17. 0 I don't get more tired than usual.  
 1 I get tired more easily than I used to.  
 2 I get tired from doing almost anything.  
 3 I am too tired to do anything.
18. 0 My appetite is no worse than usual.  
 1 My appetite is not as good as it used to be.  
 2 My appetite is much worse now.  
 3 I have no appetite anymore.

19. 0 I haven't lost much weight, if any, lately.  
1 I have lost more than 5 pounds.  
2 I have lost more than 10 pounds.  
3 I have lost more than 15 pounds.  
I am purposely trying to lose weight. Yes \_\_\_\_\_ No \_\_\_\_\_
20. 0 I am no more worried about my health than usual.  
1 I am worried about physical problems such as aches and pains, or upset stomach, or constipation.  
2 I am very worried about physical problems and it's hard to think of much else.  
3 I am so worried about my physical problems that I cannot think of anything else.
21. 0 I have not noticed any recent changes in my interest in sex.  
1 I am less interested in sex than I used to be.  
2 I am much less interested in sex now.  
3 I have lost interest in sex completely.
-

APPENDIX B: Modified PTSD Symptom Scale (MPSS)

This scale is about your reactions to your experience of being sexually assaulted after the age of twelve. The purpose of this scale is to measure the frequency and severity of symptoms in the PAST TWO WEEKS.

Indicate the frequency to the left of each item. Indicate the severity to the right of each item.

FREQUENCY

- 0 = Not at all**
- 1 = Once per week or less/  
a little bit/ once in a while**
- 2 = 2 to 4 times per week/  
somewhat/ half the time**
- 3 = 5 or more times per week/  
very much/ almost always**

SEVERITY

- A = Not at all distressing**
- B = A little distressing**
- C = Moderately distressing**
- D = Quite a bit distressing**
- E = Extremely distressing**

INDICATE FREQUENCY:

INDICATE SEVERITY

- |     |  |   |   |   |   |   |
|-----|--|---|---|---|---|---|
| ___ | 1. Have you had recurrent or intrusive distressing thoughts or recollections about the event(s)?   | A | B | C | D | E |
| ___ | 2. Have you been having recurring bad dreams or nightmares about the event(s)?   | A | B | C | D | E |
| ___ | 3. Have you had the experience of suddenly reliving the event(s), having flashbacks of it, acting or feeling as if it were re-occurring? | A | B | C | D | E |
| ___ | 4. Have you been intensely EMOTIONALLY upset when reminded of the event(s) (including anniversary reactions)?                            | A | B | C | D | E |
| ___ | 5. Have you persistently been making efforts to avoid thoughts or feelings associated with the event(s) we've talked about?              | A | B | C | D | E |
| ___ | 6. Have you persistently been making efforts to avoid activities, situations, or places that remind you of the event(s)?                 | A | B | C | D | E |
| ___ | 7. Are there any important aspects about the event(s) that you still cannot recall?  | A | B | C | D | E |
| ___ | 8. Have you markedly lost interest in free time activities since the event(s)?   | A | B | C | D | E |

- |         |   |   |   |   |   |   |
|---------|---|---|---|---|---|---|
| ___ 9.  | Have you felt detached or cut off from others around you since the event(s)?  | A | B | C | D | E |
| ___ 10. | Have you felt that your ability to experience emotions is less (e.g., unable to have loving feelings, do you feel numb, can't cry when sad, etc.)?  | A | B | C | D | E |
| ___ 11. | Have you felt that any future plans or hopes have changed because of the event(s) (e.g., do not expect a career, marriage, children, or long life)? | A | B | C | D | E |
| ___ 12. | Have you been having persistent trouble falling or staying asleep?  | A | B | C | D | E |
| ___ 13. | Have you been continuously irritable or having outbursts of anger?  | A | B | C | D | E |
| ___ 14. | Have you been having persistent difficulty concentrating?   | A | B | C | D | E |
| ___ 15. | Are you overly alert (e.g., check to see who is around you, etc.) since the event(s)?   | A | B | C | D | E |
| ___ 16. | Have you been jumpier, more easily startled, since the event(s)?  | A | B | C | D | E |
| ___ 17. | Have you been having intense <b>PHYSICAL</b> reactions (e.g., sweaty, heart palpitations) when reminded of the event(s)?                            | A | B | C | D | E |



APPENDIX C: Trauma Related Guilt Inventory (TRGI; RESPONSE TO TRAUMA)

Individuals who have experienced traumatic events—such as physical or sexual abuse, combat, sudden loss of loved ones, serious accidents or disasters, etc.—vary considerably in their response to these events. Some people do not have any misgivings about what they did during these events, whereas other people do. They may have misgivings about something they did (or did not do), about beliefs or thoughts they had, or for having had certain feelings (or lack of feelings). **The purpose of these questions is to evaluate your response to being sexually assaulted after the age of 12.**

Please take a few moments to think about your experience(s) of sexual abuse or assault. All the following items refer to events related to this experience. Circle the answer that best describes how you feel about each statement.

- |     |  |                |                 |                |               |                 |
|-----|--|----------------|-----------------|----------------|---------------|-----------------|
| 1.  | I could have prevented what happened.  | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 2.  | I am still distressed about what happened.   | Always true    | Frequently true | Sometimes true | Rarely true   | Never true      |
| 3.  | I had some feelings that I should not have had.  | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 4.  | What I did was completely justified.   | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 5.  | I was responsible for causing what happened.   | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 6.  | What happened causes me emotional pain.  | Always true    | Frequently true | Sometimes true | Rarely true   | Never true      |
| 7.  | I did something that went against my values.   | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 8.  | What I did made sense.   | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 9.  | I knew better than to do what I did.   | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 10. | I feel sorrow or grief about the outcome.  | Always true    | Frequently true | Sometimes true | Rarely true   | Never true      |
| 11. | What I did was inconsistent with my beliefs.   | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |
| 12. | If I knew today- only what I knew when the event(s) occurred- I would do exactly the same thing. | Extremely true | Very true       | Somewhat true  | Slightly true | Not at all true |

13. I experience intense guilt that relates to what happened.  
Always true      Frequently true      Sometimes true      Rarely true      Never true
14. I should have known better.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
15. I experience severe emotional distress when I think about what happened.  
Always true      Frequently true      Sometimes true      Rarely true      Never true
16. I had some thoughts or beliefs that I should not have had.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
17. I had good reasons for doing what I did.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
18. Indicate how frequently you experience guilt that relates to what happened.  
Never      Seldom      Occasionally      Often      Always
19. I blame myself for what happened.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
20. What happened causes a lot of pain and suffering.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
21. I should have certain feelings that I did not have.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
22. Indicate the intensity or severity of guilt that you typically experience about the events.  
None      Slight      Moderate      Considerable      Extreme
23. I blame myself for something I did, thought, or felt.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
24. When I am reminded of the event(s), I have strong physical reactions such as sweating, tense muscles, dry mouth, etc.  
Always true      Frequently true      Sometimes true      Rarely true      Never true
25. Overall, How guilty do you feel about the event(s)?  
Not guilty at all      Slightly guilty      Moderately guilty      Very guilty      Extremely guilty
26. I hold myself responsible for what happened.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
27. What I did was not justified in any way.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
28. I violated personal standards of right and wrong.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
29. I did something I should not have done.  
Extremely true      Very true      Somewhat true      Slightly true      Not at all true
-

30.	I should have done something that I did not do.	Extremely true	Very true	Somewhat true	Slightly true	Not at all true
31.	What I did was unforgivable.	Extremely true	Very true	Somewhat true	Slightly true	Not at all true
32.	I didn't do anything wrong.	Extremely true	Very true	Somewhat true	Slightly true	Not at all true

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APPENDIX D: Distressing Events Questionnaire (DEQ)

The purpose of these questions is to evaluate your reactions to your experience(s) of being sexually assaulted as an adult. The questions ask about the degree to which you experienced 20 symptoms in the PAST MONTH (THE LAST 30 DAYS, COUNTING TODAY).

0 = Absent or Did Not Occur

1 = Present to a Slight Degree

2 = Present to a Moderate Degree

3 = Present to a Considerable Degree

4 = Present to an Extreme or Severe Degree

1. \_\_\_ Unwanted thoughts or mental pictures of the event(s) when nothing was happening to remind you?
2. \_\_\_ Bad dreams or nightmares about the event(s)?
3. \_\_\_ Suddenly reliving the event(s), flashbacks of the event(s), or acting or feeling as if it was actually happening again?
4. \_\_\_ Distress or emotional upset when reminded of the event(s)?
5. \_\_\_ Physical reactions when reminded of the event(s)? (such as sweaty palms, rapid breathing, pounding heart, dry mouth, nervous stomach, tense muscles).
6. \_\_\_ Efforts to avoid thoughts or feelings that would remind you of the event(s)?
7. \_\_\_ Efforts to avoid activities, conversations, people, or places that would remind you of the events?
8. \_\_\_ Inability to recall any important parts of what happened?

**Items 9 to 17 as about how you thought and felt in the last month—compared to before the event(s)?**

9. \_\_\_ Loss of interest in activities that had been important—such as loss of interest in your job, sports, or social activities.
10. \_\_\_ Feeling detached or cut off from others around you?
11. \_\_\_ Feeling emotionally “numb”? (for example, inability to feel tenderness, loving feelings, joyful feelings, or unable to cry).
12. \_\_\_ Thinking your future would be cut short in some way? (for example, no expectation of a career, marriage or children; expecting a shortened life or premature death)
13. \_\_\_ Trouble falling or staying asleep?

14. \_\_\_ Irritability or outbursts of anger?
15. \_\_\_ Difficulty concentrating?
16. \_\_\_ Being alert, watchful, or “on guard?” (for example, looking around you, checking out noises, checking to see if windows and doors were locked)
17. \_\_\_ Jumpy or startled by sudden sounds or movements?
18. \_\_\_ Feeling guilt that was related to the event(s)—in other words, upset because you think you should have thought, felt, or acted differently?
19. \_\_\_ Feeling anger that was related to the event(s)—in other words, upset because you think someone else should thought, felt, or acted differently?
20. \_\_\_ Grief, sorrow, or feelings of loss? (over loss of loved ones, belongings, identity, self-worth, faith in human nature, optimism, or beliefs that something like this would never happen to you)
21. \_\_\_ Did you experience intense fear, helplessness, or horror at any time during the event(s)?
- Yes \_\_\_ No \_\_\_
-

APPENDIX E: Sleep Questions (SQ)

During the **PAST MONTH:**

1. How many nights per week did you have a problem with falling asleep or staying asleep? \_\_\_\_\_ nights per week
2. On a typical night, how long did it take you to fall asleep after you went to bed and turned the lights off? \_\_\_\_\_ hours    minutes \_\_\_\_\_
3. On a typical night, how many times did you wake up during the middle of the night? \_\_\_\_\_ times
4. On a typical night, how long did you spend awake, in total, in the middle of the night? \_\_\_\_\_ hours    minutes \_\_\_\_\_
5. How many hours of sleep per night did you usually get? \_\_\_\_\_ hours    minutes \_\_\_\_\_
6. On a typical night, how many times did you wake up? \_\_\_\_\_ times
7. On a typical night, how many times did you get out of bed (between going to bed and getting up in the morning)? \_\_\_\_\_ times
8. How many times per week did you have nightmares? \_\_\_\_\_ times per week
9. Do you currently have a sleep problem? \_\_\_\_\_ yes    no \_\_\_\_\_
10. To what extent do your sleep problems interfere with your daily life (e.g. memory, ability to do chores, concentration)?  
\_\_\_\_\_ no sleep problem  
\_\_\_\_\_ not at all  
\_\_\_\_\_ a little  
\_\_\_\_\_ somewhat  
\_\_\_\_\_ much  
\_\_\_\_\_ very much

APPENDIX F: Demographic Information

Today's Date: \_\_\_\_\_

Date of Assault(s) (month/year): \_\_\_\_\_

Age: \_\_\_\_\_

Occupation: \_\_\_\_\_

Ages of Children: \_\_\_\_\_

Marital Status: Married \_\_\_\_\_ Remarried \_\_\_\_\_ Divorced \_\_\_\_\_ Separated \_\_\_\_\_  
Widowed \_\_\_\_\_ Never married \_\_\_\_\_ Other (please specify) \_\_\_\_\_

Highest level of education completed (please circle number):

- 8 13 College Freshman
- 9 14 Sophomore
- 10 15 Junior
- 11 16 Senior (College grad)
- 12 (high school or GED) 17 Post-graduate (specify # of years and degree): \_\_\_\_\_

Other (please specify): \_\_\_\_\_

What is your ethnic background (please check all that apply):

- |   |                                    |                                       |
|---|------------------------------------|---------------------------------------|
| <input type="checkbox"/> Aleutian               | <input type="checkbox"/> Filipino  | <input type="checkbox"/> Mexican      |
| <input type="checkbox"/> American Indian/Native | <input type="checkbox"/> Guamanian | <input type="checkbox"/> Portuguese   |
| <input type="checkbox"/> Alaskan                |                                    |                                       |
| <input type="checkbox"/> Black                  | <input type="checkbox"/> Hawaiian  | <input type="checkbox"/> Puerto Rican |
| <input type="checkbox"/> Cambodian              | <input type="checkbox"/> Hmong     | <input type="checkbox"/> Samoan       |
| <input type="checkbox"/> Caucasian              | <input type="checkbox"/> Japanese  | <input type="checkbox"/> Thai         |
| <input type="checkbox"/> Chinese                | <input type="checkbox"/> Korean    | <input type="checkbox"/> Tongan       |
| <input type="checkbox"/> Eskimo                 | <input type="checkbox"/> Laotian   | <input type="checkbox"/> Vietnamese   |

Other ethnic group (please specify): \_\_\_\_\_

If you belong to more than one ethnic group, with which one group do you primarily identify or belong?

How much do you identify or belong to this ethnic group? \_\_\_\_\_ %  
(indicate percent)

Please indicate your blood ancestry (i.e. genetic or racial ancestry) as a percentage or fraction: \_\_\_\_\_  
(e.g. 100% Japanese, 50% Hawaiian & 50% Caucasian, 1/4 Hawaiian & 3/4 Filipino)

APPENDIX G: Anxious Thoughts Inventory (AnTI; Meta-Worry Subscale)

Meta-Worry				
1. When looking to my future I give more thought to the negative things than the positive things that might happen to me.	1 almost never	2	3	4 almost always
2. I take disappointments so keenly that I can't put them out of my mind.	1 almost never	2	3	4 almost always
3. I have repetitive thoughts such as counting or repeating phrases.	1 almost never	2	3	4 almost always
4. Unpleasant thoughts enter my mind against my will.	1 almost never	2	3	4 almost always
5. I have difficulty clearing my mind of repetitive thoughts.	1 almost never	2	3	4 almost always
6. I think that I am missing out on things in life because I worry too much.	1 almost never	2	3	4 almost always
7. I worry that I cannot control my thoughts as well as I would like to.	1 almost never	2	3	4 almost always



APPENDIX H: Pittsburgh Sleep Quality Index (PSQI)

**Instructions:**

The following questions relate to your usual sleep habits during the past month *only*. Your answers should indicate the most accurate reply for the *majority* of days and nights in the past month.

Please answer all questions.

1. During the past month, when have you usually gone to bed at night?

USUAL BED TIME \_\_\_\_\_

2. During the past month, how long (in minutes) does it usually take you to fall asleep each night?

NUMBER OF MINUTES \_\_\_\_\_

3. During the past month, when have you usually gotten up in the morning?

USUAL GETTING UP TIME \_\_\_\_\_

4. During the past month, how many hours of *actual sleep* did you get at night? (This may be different than the number of hours you spend in bed.)

HOURS OF SLEEP PER NIGHT \_\_\_\_\_

For each of the remaining questions, check the one best response. Please answer *all* questions.

5. During the past month, how often have you had trouble sleeping because you...

- (a) Cannot get to sleep within 30 minutes

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- (b) Wake up in the middle of the night or early morning

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- (c) Have to get up to use the bathroom

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- (d) Cannot breathe comfortably

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- (e) Cough or snore loudly

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- (f) Feel too cold

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- (g) Feel too hot
- |                                    |                                |                               |                                     |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
| Not during the<br>past month _____ | Less than once<br>A week _____ | Once or twice<br>a week _____ | Three or more<br>times a week _____ |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
- (h) Had bad dreams
- |                                    |                                |                               |                                     |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
| Not during the<br>past month _____ | Less than once<br>A week _____ | Once or twice<br>a week _____ | Three or more<br>times a week _____ |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
- (i) Have pain
- |                                    |                                |                               |                                     |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
| Not during the<br>past month _____ | Less than once<br>A week _____ | Once or twice<br>a week _____ | Three or more<br>times a week _____ |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
- (j) Other reason(s), please describe \_\_\_\_\_

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How often during the past month have you had trouble sleeping because of this?

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

6. During the past month, how would you rate your sleep quality overall?

- Very good \_\_\_\_\_
- Fairly good \_\_\_\_\_
- Fairly bad \_\_\_\_\_
- Very bad \_\_\_\_\_

7. During the past month, how often have you taken medicine (prescribed or “over the counter”) to help you sleep?

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Not during the past month _____	Less than once A week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all \_\_\_\_\_
- Only a very slight problem \_\_\_\_\_
- Somewhat of a problem \_\_\_\_\_
- A very big problem \_\_\_\_\_

**APPENDIX I: Scoring Instructions for the Pittsburgh Sleep Quality Index**

The Pittsburgh Sleep Quality Index (PSQI) contains 19 self-rated questions and 5 questions rated by the bed partner or roommate (if one is available). Only self-rated questions are included in the scoring. The 19 self-rated items are combined to form seven "component" scores, each of which has a range of 0-3 points. In all cases, a score of "0" indicates no difficulty, while a score of "3" indicates severe difficulty. The seven component scores are then added to yield one "global" score, with a range of 0-21 points, "0" indicating no difficulty and "21" indicating severe difficulties in all areas. Scoring proceeds as follows:

**Component 1: Subjective sleep quality**

Examine question #6, and assign scores as follows:

<u>Response</u>	<u>Component 1 score</u>
"Very good"	0
"Fairly good"	1
"Fairly bad"	2
"Very Bad"	3

Component 1 score: \_\_\_\_\_

**Component 2: Sleep latency**

Examine question #2, and assign scores as follows:

<u>Response</u>	<u>Score</u>
≤ 15 minutes	0
16-30 minutes	1
31-60 minutes	2
> 60 minutes	3

Question #2 score: \_\_\_\_\_

2) Examine question #5a, and assign scores as follows:

<u>Response</u>	<u>Score</u>
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

Question #5a score: \_\_\_\_\_

3) Add #2 score and #5a score

Sum of #2 and #5a: \_\_\_\_\_

4) Assign component 2 score as follows:

<u>Sum of #2 and 5a</u>	<u>Component 2 score</u>
0	0
1-2	1
3-4	2
5-6	3

Component 2 score: \_\_\_\_\_

**Component 3: Sleep Duration**

Examine question #4, and assign scores as follows:

<u>Response</u>	<u>Component 3 score</u>
> 7 hours	0
6-7 hours	1
5-6 hours	2
< 5 hours	3

Component 3 score: \_\_\_\_\_

**Component 4: Habitual sleep efficiency**

(1) Write the number of hours slept (question #4) here: \_\_\_\_\_

(2) Calculate the number of hours spent in bed:

Getting up time (question #3): \_\_\_\_\_

- Bedtime (question #1): \_\_\_\_\_

Number of hours spent in bed: \_\_\_\_\_

(3) Calculate habitual sleep efficiency as follows:

(Number of hours slept/ Number of hours spent in bed) × 100 = Habitual sleep efficiency (%)

( \_\_\_\_\_ / \_\_\_\_\_ ) × 100 = \_\_\_\_\_ %

(4) Assign component 4 score as follows:

<u>Habitual sleep efficiency %</u>	<u>Component 4 score</u>
> 85%	0
75-84 %	1
65-74%	2
< 65%	3

Component 4 score: \_\_\_\_\_

**Component 5: Sleep disturbances**

(1) Examine questions #5b – 5j, and assign scores for *each* question as follows:

<u>Response</u>	<u>Score</u>
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

#5b score \_\_\_\_\_  
 c score \_\_\_\_\_  
 d score \_\_\_\_\_  
 e score \_\_\_\_\_  
 f score \_\_\_\_\_  
 g score \_\_\_\_\_  
 h score \_\_\_\_\_  
 i score \_\_\_\_\_  
 j score \_\_\_\_\_

(2) Add the score for questions # 5b- 5j:

Sum of # 5b- 5j: \_\_\_\_\_

(3) Assign component 5 score as follows:

<u>Sum of #5b- 5j</u>	<u>Component 5 score</u>
0	0
1-9	1
10-18	2
19-27	3

Component 5 score: \_\_\_\_\_

**Component 6: Use of sleeping medication**

(1) Examine question #7 and assign scores as follows:

<u>Response</u>	<u>Component 6 score</u>
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

Component 6 score: \_\_\_\_\_

**Component 7: Daytime dysfunction**

(1) Examine question #8, and assign scores as follows:

<u>Response</u>	<u>Score</u>
Never	0
Once or twice	1
Once or twice each week	2
Three or more times each week	3

Question #8 score: \_\_\_\_\_

(2) Examine question #9, and assign scores as follows:

<u>Response</u>	<u>Score</u>
No problem at all	0
Only a very slight problem	1
Somewhat of a problem	2
A very big problem	3

Question #9 score: \_\_\_\_\_

(3) Add the scores for question #8 and #9:

Sum of #8 and #9: \_\_\_\_\_

(4) Assign component 7 score as follows:

<u>Sum of #8 and #9</u>	<u>Component 7 score</u>
0	0
1-2	1
3-4	2
5-6	3

Component 7 score: \_\_\_\_\_

**Global PSQI Score**

Add the seven component scores together:

**Global PSQI score:**

\_\_\_\_\_

## APPENDIX J: The Pre-Sleep Arousal Scale (PSAS)

In your average pre-sleep period (in bed with the lights out before falling asleep for the first time) during the last week, did you have any of the following experiences? Please indicate (by circling the appropriate number) the degree to which you experienced each of those listed below. Do not include what you experienced during the middle of the night if you awakened after falling asleep.

	Not at all	A little	Moder- ately	A lot	Extreme- ly
1. Heart racing, pounding, or beating irregularly.	1	2	3	4	5
2. A jittery, nervous feeling in your body.	1	2	3	4	5
3. Worry about falling asleep.	1	2	3	4	5
4. Review or ponder events of the day.	1	2	3	4	5
5. Shortness of breath or laboured breathing.	1	2	3	4	5
6. Depressing or anxious thoughts.	1	2	3	4	5
7. A tight, tense feeling in your muscles.	1	2	3	4	5
8. Worry about problems other than sleep.	1	2	3	4	5
9. Being mentally alert, active.	1	2	3	4	5
10. Cold feeling in your hands, feet, or your body in general.	1	2	3	4	5
11. Can't shut off your thoughts.	1	2	3	4	5
12. Have stomach upset (knot or nervous feeling in stomach, heartburn, nausea, gas, etc.)	1	2	3	4	5
13. Perspiration in palms of your hands or other parts of your body.	1	2	3	4	5
14. Thoughts keep running through your head.	1	2	3	4	5
15. Dry feeling in mouth or throat.	1	2	3	4	5
16. Distracted by sounds, noise in the environment (e.g. ticking clock, house noises, traffic).	1	2	3	4	5

APPENDIX K: Presleep Thoughts Interview (PTI)

Research Assistant:

“I am going to read a list of thoughts that people may have between the time they turn out the lights to go to sleep and the time they actually fall asleep. These will be referred to as “presleep thoughts”. During the past MONTH, for each of these thoughts, please describe how often they occur, and how much you think they interfere with you trying to get to sleep. We realize that it is not always easy to remember exactly how often thoughts occur, and how they affect you each time, but please just make your best guess.”

Part A

<b>1) How often do you worry about not getting to sleep?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>2) How often do you worry about being tired tomorrow?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>3) How often do you think about noise, light, or other environmental distractions?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>4) How often do you think about physical sensations (e.g. feeling tense, feeling hot or cold)?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4

<b>5) How often do you think about the current day's events?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>6) How often do you plan the next day's activities?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>7) How often do you think about family members (not related to the assault)?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>8) How often do you think about work (not related to the assault)?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere strongly	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very
0	1	2	3	4
<b>9) How often do you think about friends (not related to the assault)?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>10) During the past month, how often do you have presleep thoughts not related to the assault (i.e. thoughts 1 through 9)?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4



<b>When you have these thoughts, how much do they interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>On a typical night, how long would you think about presleep thoughts such as those we have already talked about?</b>				
Not applicable	less than 15 minutes	15 to 30 minutes	31 to 60 minutes	more than 60 minutes
0	1	2	3	4

Part B (Remind participant that they are answering about thoughts during the past month)

<b>11. How often do you think about or "reexperience" the assault?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>12. How often do you think about your actions or thoughts during the assault?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>13. How often do you have feelings of guilt related the assault?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>14. How often do you think about safety related thoughts and/or fears?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4

<b>15. How often do you think about health problems related to the assault (e.g. infection, pregnancy, changes in health since the assault)?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>16. How often do you think about interactions with the justice system (e.g. testifying in court) as a result of the assault?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>17. How often do you think about reactions of friends/family to hearing about the assault?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have this thought, how much does it interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>18) During the past month, how often do you have presleep thoughts that are related to the assault (i.e. thoughts 11 through 16)?</b>				
Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4
<b>When you have these thoughts, how much do they interfere with sleep?</b>				
Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4
<b>On a typical night, how long would you think about presleep thoughts related to the assault?</b>				
Not applicable	less than 15 minutes	15 to 30 minutes	31 to 60 minutes	more than 60 minutes
0	1	2	3	4

Valence

19. Would you say that your presleep thoughts are usually positive (e.g. happy, pleasant, calming), negative (e.g. anxious, worrisome, or upsetting), or a mixture of both?

Always positive		half positive & half negative		Always negative
1	2	3	4	5

Other

20. Are there any other recurring thoughts that you have when you try to go to sleep that we have not talked about yet? If yes, what is the thought: \_\_\_\_\_

How often do you think about this?

Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4

When you have this thought, how much does it interfere with sleep?

Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4

21. Are there any other recurring thoughts that you have when you try to go to sleep that we have not talked about yet? If yes, what is the thought: \_\_\_\_\_

How often do you think about this?

Not during the past month	Less than once a week	Once or twice a week	Three to six times a week	Everynight
0	1	2	3	4

When you have this thought, how much does it interfere with sleep?

Does not Interfere	Interferes a little	Interferes to some extent	Interferes strongly	Interferes very strongly
0	1	2	3	4

## APPENDIX L: Initial Contact Protocol

All potential participants for this study had participated in an earlier study assessing the symptoms of and effects of traumatic life events, and identified themselves as having been sexually assaulted. To protect confidentiality, potential participants were contacted by a member of the original research group (Susan Watson). During the initial contact, Susan introduced and identified herself as a member of the previous study. She informed the women that:

- (1) A colleague was conducting a similar study, and that the current study would take less than half the time than the previous study (i.e. current study will take approximately 1 and a half to 2 hours to complete).
- (2) The goal of the study was to see how people are currently functioning, several years after the assault. The meeting would include a brief interview, and filling out some questionnaires.
- (3) Participants were informed that they would not be asked to describe the traumatic event or events, but there would be questions about how they currently think and feel about the event. Participants would also be asked some questions about demographic information (for example, your age and occupation), and current sleep patterns. This information could lead to a better understanding of how to help people who have long term sleep difficulties after an assault.
- (4) Any information given by the participant would remain anonymous and confidential. If the woman chose to participate, Susan asked permission to release her name and contact information to the current research team to be contacted for an appointment.
- (5) The participant could choose the place and time to be interviewed (e.g. university campus, participants' home, coffee shop).

- (6) They would be offered their choice of \$20.00 or 4 movie tickets as reimbursement for their participation.
- (7) At the end of the phone call, Susan offered to send an “Information and Referral List” of services on Oahu for women who have been assaulted.

## APPENDIX M: Research Assistant Training Protocol

The following protocol was used to prepare research assistants to interview participants:

- (1) Readings were provided as an introduction to attending and listening skills (Egan, 1994), and tactics of behavioral interviewing (Haynes, 1996).
- (2) Research assistants reviewed the “Transcript of the Participant Interview” and discussed ways to answer questions that participants might ask.
- (3) Research assistants reviewed behavioral signs of distress and the protocol for attending to participants that express distress during the interview, and reviewed the suicide protocol (Appendix R).
- (4) Research assistants interviewed a friend, and taped the interview for the PI to review.

APPENDIX N: Transcript of Recruitment call

**Information:**

Participant Name \_\_\_\_\_  
Date \_\_\_\_\_  
Phone Number \_\_\_\_\_  
Interviewer \_\_\_\_\_  
Call back \_\_\_\_\_

Session Date \_\_\_\_\_  
Session Location \_\_\_\_\_  
Confirmation call? N Y If yes, call date \_\_\_\_\_

**Transcript:**

Introduction

“Hello, this is \_\_\_\_\_ from the UH Psychology department. I am calling because you recently agreed to allow us to meet with you, as a follow up to the study that you participated in with the Sex Abuse Treatment Center several years ago. Do you have about 5 minutes to talk now?”

If no, arrange a convenient time to call and note time above in Call Back section.  
If yes, continue with dialogue below.

“The meeting will include a brief interview, and filling out some questionnaires. You will not be asked to describe the traumatic event or events, but there will be questions about how you currently think and feel about the event. You will also be asked some questions about demographic information (for example, your age and occupation), current sleep patterns, smoking habits, and caffeine and alcohol use. All of the answers you give will be completely confidential. Your name and other identifying information will be removed from your answers so that no one will know how you answered the questions. After the interview, you can choose either \$20 dollars or 4 movie tickets to reimburse you for your time and trouble. Do you have any questions so far?”

“Are you still willing to participate?”

If no, thank the participant for their time and say good bye.  
If yes, continue with dialogue below.

Making an Appointment

“Could we set up a time to meet? You have the choice of meeting at the university, at your residence, or other location if you would rather not meet at either of those places.

Choice \_\_\_\_\_

Attempt to set up an appointment within the next two weeks- please be as accommodating as possible.

Appointment time and place

\_\_\_\_\_

If there are no compatible times for you and the participant:

- 1) Ask the participant to name at least three times when they are usually available.

- 
- 
- 2) Check the schedule of the other research assistants to see if someone is free when the participant is available. If noone is available, use my (Kathrine Fast) name.
  - 3) Tell the participant that \_\_\_\_\_ would likely be able to meet with her. Ask the participant if it would be OK for \_\_\_\_\_ to call and arrange the interview.
  - 4) Ask participant when it would be convenient to call, and write time(s) in the Call Back space at the top of the page.
  - 5) Give the information to the research assistant that would be most likely to be able to meet with the participant.

After the appointment is made

“ Would you like me to call you the night before the appointment to confirm that you will still be able to make it?” Y N

If yes,

“ I will call on (date)\_\_\_\_\_ to confirm. Thank you, I look forward to seeing you on (date/time)\_\_\_\_\_ at (place)\_\_\_\_\_.”

If no,

“Thank you, I look forward to seeing you on (date/time)\_\_\_\_\_ at (place)\_\_\_\_\_.”



APPENDIX O: Transcript of confirmation call

In person:

“Hello, this is \_\_\_\_\_ from the UH psychology department. We spoke on (date)\_\_\_\_\_ about your participation in a study. I am calling to confirm that you will be able to meet with me at (location)\_\_\_\_\_, at (time)\_\_\_\_\_ tomorrow.”

“ Thanks again for agreeing to meet with me, I’ll see you tomorrow.”

Leaving a message:

“Hello, this is \_\_\_\_\_ from the UH psychology department. We spoke on (date)\_\_\_\_\_ about your participation in a study. I am calling to confirm that you will be able to meet with me at (location)\_\_\_\_\_, at (time)\_\_\_\_\_ tomorrow. If you are able to make the appointment, you do not need to call back. If you are unable to attend, please call and leave a message at 291-6030, and I will call you back to re-schedule. Thanks again for participating, I look forward to seeing you tomorrow.”

## APPENDIX P: Transcript of Participant Interview

“Hi, I’m \_\_\_\_\_. Thanks again for agreeing to meet with me today. As we discussed over the phone, this meeting should take about 1 to 1\_ hours. I will be asking you to fill out some questionnaires and then there will be a short interview. Before we get started, I would like to read the consent form to you. If you agree with all the statements, you can sign the form and we can start the interview. If you have any questions at any time during the session, I’ll do my best to answer them.” [Read the consent form to the participant and sign two copies, give one of the copies to the participant to keep].

“Here are the questionnaires. They all ask about how you are doing currently. Please read the instructions for each one before you start, as some will ask you to answer questions based on the past month, past two weeks or past week. Others (like the Anxious Thoughts Inventory) just want to know how you are doing on average and don’t give you a specific time frame. Please answer every item in the packet. I’ll be around to answer any questions you might have.” [Give questionnaire packet to participant.]

“Thanks. How are you doing? Would you like a short break or should we continue?” [Check the BDI, Question 9 to assess suicidal thoughts. Follow the protocol in Appendix R. If participant expresses distress, or if you notice obvious behavioral signs of distress, offer to discontinue the interview. Notify Kathrine ASAP.]

“Now I would like to do a short interview. I’ll be asking you some questions about the things that you usually think about when you are trying to get to sleep at night. Are you ready to start?” [Read the instructions for the PTA and start the interview].

“Great, thanks very much for helping us out. Before I leave, do you have any final questions about the study? If you would like a copy of the study, please make sure that you fill out your address on the consent form. Would you like movie tickets or cash?” [Give participant tickets or cash. Then give the participant the pamphlets of Community Resources and Sleep Hygiene]. “One of these handouts lists resources in the community such

as agencies, therapists, or books to help people deal with certain types of trauma. There is also a pamphlet that describes the types of things that can help or disturb your sleep, and things you can do if you are having trouble sleeping. Even if you don't have much trouble sleeping, this can help you out if you occasionally have insomnia. Also, if you have any questions regarding the study in the future, feel free to call Kathrine Fast." [Point out phone numbers on the participants' consent form, including SATC, crisis line, Kathrine Fast, and Stephen Haynes].

APPENDIX Q: AGREEMENT TO PARTICIPATE IN

Sleep Disturbances After Sexual Assault

Edward S. Kubany, Ph.D., Principal Investigator  
Kathrine Fast, Co-Principal Investigator  
National Center for PTSD, 1132 Bishop St., Suite 307,  
Honolulu, Hi., 96813  
(808) 566-1651

Purpose

I understand that the purpose of this study is to research sleep patterns in women who have been sexually assaulted in the past, and also to look at those factors that might affect sleep (e.g., thoughts or physical sensations when trying to get to sleep). The information I give may help researchers and clinicians gain a better understanding about why some women have long term sleep disturbances after assault and other women do not.

Description

I understand that as a participant in this study, I will spend approximately fifteen to twenty minutes being interviewed about my thoughts at bedtime, and approximately one to one and a half hours answering questionnaires. The questionnaires will ask about demographic information, thoughts, feelings and physical sensations that I have, current sleep patterns, smoking habits, and caffeine and alcohol use. The meeting will be at the time and place of my choice.

Risks

I understand that I will not have to answer any questions about the traumatic event itself, but there will be questions about how I currently think and feel about the event. If I feel discomfort while completing these questions, at my request, the research assistant will refer me to social service and counseling agencies in the community including the Sex Abuse Treatment Center at (808) 973-8337 or the Crisis Line at (808) 521-4555. If I would like to speak with a therapist, I will be referred to Dr. Edward Kubany (office: [808] 566-1651; pager: [808] 680-2932), who will discuss referrals and options for treatment for my distress. At the end of the interview, I will also be provided a list of referral agencies and therapists in the community.

I understand that although results will be kept private, I may experience some loss of privacy through the interview process.

Benefits

I understand that talking about my sleep patterns and those things that can affect sleep may result in gaining a better understanding of my own sleep patterns and the factors that affect my sleep. At the end of the meeting, the research assistant will give me a pamphlet that provides information about things that I can do to improve the chances of getting a good night's sleep. I understand that I will also receive either \$20.00 or 4 Group Movie Tickets to compensate me for my time.

Confidentiality

I understand that to ensure confidentiality, completed questionnaires will be identified by a code number only, and any identifying information (e.g. participant’s name, age) will be detached from the questionnaires and kept in a separate, locked cabinet.

I understand that the information provided in the interview is confidential. However, I understand that the research assistant must inform an agency (e.g. crisis line) or therapist if I state that I intend to cause harm to myself, in order to protect my safety.

Alternative Therapy

I understand that this study does not involve any treatment, and no alternative therapy will be offered.

Financial Risks

I understand that should any injury or illness result from the research, there is no compensation available.

Contact Information

I understand that if I have any further questions about the research and my rights as a participant, or feel that I have been injured by this study, I can contact the principal investigator, Edward S. Kubany, Ph.D. in the National Center for PTSD, at his office (808) 566-1651, or I can page Dr. Kubany at 680-2932. I may also call the co-principal investigator, Kathrine Fast, in the Department of Psychology at (808) 956-8108.

Right to Withdraw

I understand that my participation in this research project is voluntary and that I may withdraw from the study at any time without prejudice.

I have read the material above and any questions I asked have been answered to my satisfaction. I agree to participate in this study. Such consent does not waive my legal rights, nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence.

\_\_\_\_\_  
Participant Date

\_\_\_\_\_  
Investigator Date

(If you cannot obtain satisfactory answers to your questions or have comments or complaints about your treatment in this study contact: Department of Veterans Affairs, Research and Development Office (151), E-wing, Room 4-A101, Spark M. Matusnaga Medical and Regional Office Center, 459 Patterson Road, Honolulu, Hi., 96819-1522. Phone: (808) 433- 0124/0125; Fax: (808) 433-0379)

A summary of the results of this study will be available from Kathrine Fast,  
University of Hawaii Department of Psychology, 2430 Campus Road, Honolulu, Hi., 96822.  
Phone: (808) 956-8108, Results will be sent to you at your request.

\_\_\_\_ check here if you would like a summary of the results sent to you.

Please print your address here ONLY if you would like a summary:

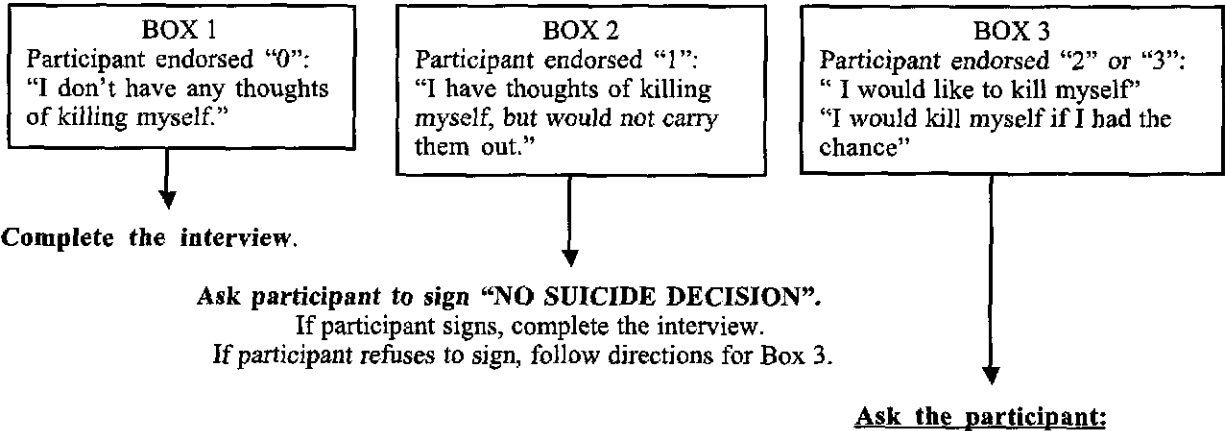
Name \_\_\_\_\_

Street address \_\_\_\_\_

City, State, Zip code \_\_\_\_\_

## APPENDIX R: Suicide Protocol

After the participant finishes answering the questionnaires, AND BEFORE THEY LEAVE, the research assistant will check the BDI, question 9.



- Have you had serious thoughts about suicide in the past two weeks? \_\_\_\_\_
- Do you know how you would kill yourself ? (how?) \_\_\_\_\_
- Do you have the means to carry out your plan? \_\_\_\_\_
- Describe (e.g. pills, gun) \_\_\_\_\_

ASK: "Will you sign a NO SUICIDE DECISION or NO HARM CONTRACT?"

**If participant agrees to sign contract,**

1. Have them sign two copies.
2. Identify a therapist and/or safety contact person with the participant.  
(if signing the "no harm contract")
3. Give one copy to the participant and keep one copy for our files.
4. Complete interview.
5. Notify Dr. Edward Kubany (566-1651) after interview.

**If participant refuses to sign the contract,**

1. Inform the participant that you are very concerned about their safety,  
and you need call the crisis line and have the participant talk to them.
2. **Call the crisis line.**
3. Tell the crisis line worker who you are and ask them to speak with the  
participant.
4. Wait until the participant is speaking with the crisis line worker and has given  
them contact information before you terminate the interview.
5. Inform Dr. Edward Kubany ASAP after the interview is terminated  
(pager 680-2932, ext. 911; cellphone 284-4497).

**If participant refuses to sign the contract or talk to crisis line worker**

1. Inform the participant that you are very concerned about their safety,  
and you need call the crisis line, even if the participant does not want to talk to a  
crisis worker. **Call the crisis line** and speak with the crisis line worker yourself.  
Call the crisis line even if the participant asks you to leave (i.e. call from cell/pay  
phone).
2. Inform the crisis line worker of the situation and follow their instructions.
3. Inform Dr. Kubany ASAP after the crisis line worker has handled the situation.

( ) NO SUICIDE DECISION

“No matter what, I, \_\_\_\_\_ will not kill myself  
accidentally or on purpose.”

---

( ) NO HARM CONTRACT

“ I, \_\_\_\_\_, contract  
with \_\_\_\_\_  
that I will call and talk with the Suicide and Crisis Center’s 24-hour hotline or my personal  
therapist any time I begin to feel suicidal/homicidal AND BEFORE I consider doing harm to  
myself or others.”

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Witness: \_\_\_\_\_

**Suicide and Crisis Phone: 521-4555 or 911 (ask for the Crisis Center)**

**Therapist:** \_\_\_\_\_ **Phone:** \_\_\_\_\_

**Safety Contact Person:** \_\_\_\_\_ **Phone:** \_\_\_\_\_



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