

שינה וחלימה לאחר אירועים טראומטיים

פרופ' אמר' פרץ לביא

הפקולטה לרפואה ע"ש רות וברוך רפפורט

הטכניון-מכון טכנולוגי לישראל

Long-term effects of traumatic war-related events on sleep.

Lavie P, Hefez A, Halperin G, Enoch D.

Am J Psychiatry. 1979 Feb;136(2):175-8.

Eleven patients who had combat neuroses resulting from the 1973 Yom Kippur War and complained of sleep disturbances were studied in a sleep laboratory. **Sleep-onset insomniacs, dream-interruption insomniacs, and pseudoinsomniacs** were differentiated on the basis of electrophysiologic recordings. Compared with normal controls who actively participated in the Yom Kippur War, patients showed significantly **longer sleep latencies, lower sleep efficiency indices, lower percentage of REM sleep, and longer REM latencies.**

Long-term effects of traumatic war-related events on sleep.

Lavie P, Hefez A, Halperin G, Enoch D.

Am J Psychiatry. 1979 Feb;136(2):175-8.

Eleven patients who had combat neuroses resulting from the 1973 Yom Kippur War and complained of sleep disturbances were studied in a sleep laboratory. **Sleep-onset insomniacs, dream-interruption insomniacs, and pseudoinsomniacs** were differentiated on the basis of electrophysiologic recordings. Compared with normal controls who actively participated in the Yom Kippur War, patients showed significantly **longer sleep latencies, lower sleep efficiency indices, lower percentage of REM sleep, and longer REM latencies.**

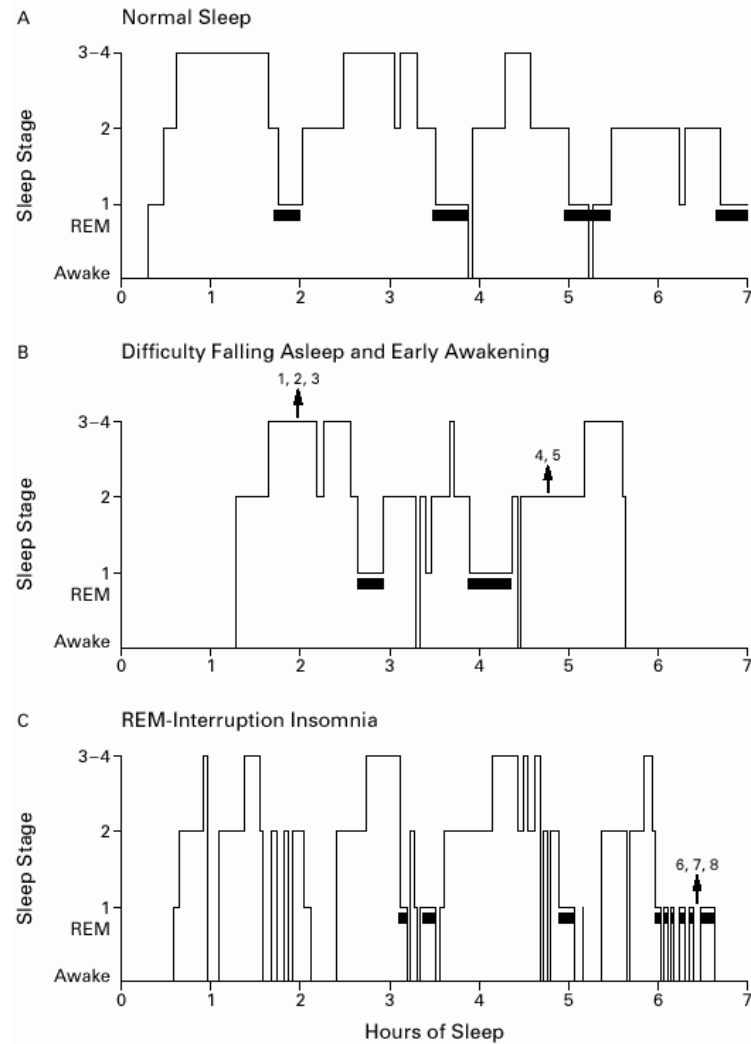


Figure 1. Hypnograms of Normal Sleep (Panel A), Insomnia in the Form of Difficulty Falling Asleep and Early-Morning Awakening (Panel B), and Rapid-Eye-Movement (REM) Interruption Insomnia (Panel C).

REM sleep is shown by the dark bars. In normal sleep, there is a progression from stage 1 to stage 4 sleep and REM. This pattern repeats itself a number of times through the sleep period without any awakening or only brief awakenings. In Panel B, showing difficulty with the onset of sleep and early-morning interruption, there is less time asleep and less time in REM sleep, and the duration of periods spent asleep are shorter. In REM-interruption insomnia, the periods of sleep are very short, with minimal amounts of stage 3-4 sleep and REM sleep. There are frequent awakenings, particularly from REM sleep. Numbers above the graphs indicate typical sleep disturbances in traumatized patients: 1 denotes night terrors, 2 sleep walking, 3 confusional awakenings, 4 periodic leg movements, 5 disordered breathing, 6 nightmares and anxiety dreams (which may also occur during stage 2), 7 REM behavior disorder, and 8 intense phasic activity.

Long-Term Effects of Extreme Situational Stress on Sleep and Dreaming

Albert Hefez, M.D., Lily Metz, M.D., and Peretz Lavie, Ph.D.

Sleep data were obtained on 11 patients who had survived traumatic events and who complained of sleep disturbances. Each was awakened from REM and non-REM sleep for dream recall. The patients had lower sleep efficiency indices (because of prolonged sleep latency and larger amounts of "awake" plus "movement" time within sleep periods), shorter REM time, and longer REM latencies than did control subjects. Four of the 11 patients had REM- and non-REM-related nightmares, which, in two sea disaster patients, were associated with REM-related motor activity. The rest of the patients had unusually low dream recall in spite of high eye movement density.

(Am J Psychiatry 1987; 144:344-347)

**Five Holocaust survivors (age 45 to 68)
~ 45 years after the events**

**Four War related PTSD (age 33 to 44)
14 and 3 years after the event**

**Two sea disasters survivors (age 20, 25)
6 and 12 months after the events**

**two control groups: 12 for Holocaust
survivors and 9 for war related and sea
disaster PTSD**

Post-combat and sea disaster patients were studied during hospitalization

Holocaust survivors were studied as outpatients

2-5 nights

REM awakenings for dream reports

TABLE 2. Sleep Data of Post-Combat and Sea Disaster Patients (N=6) and of a Control Group (N=9)

Measure	Patients		Control Group ^a		Analysis	
	Mean	SD	Mean	SD	t (df=13)	p
Total sleep time (min)	253.8	16.3	377.4	23.6	10.4	<.01
Sleep latency (min)	41.3	2.7	19.6	16.2	3.03	<.02
REM latency (min)	136.3	33.9	68.6	15.2	4.89	<.01
Sleep efficiency (%)	71.1	2.9	91.1	3.2	11.5	<.01
"Awake" plus "movement" time (%)	16.5	6.0	4.5	2.8	4.85	<.01
Stage 1 sleep (%)	4.2	2.9	2.1	1.7	1.64	n.s.
Stage 2 sleep (%)	47.4	7.3	42.2	8.1	1.18	n.s.
Stages 3 and 4 sleep (%)	21.3	9.9	28.4	4.9	1.71	n.s.
REM sleep (%)	10.3	2.9	22.6	4.5	5.52	<.01

^aControl data are from Lavie et al. (12).

TABLE 1. Sleep Data of Patients Who Were Holocaust Survivors (N=5) and of a Control Group (N=12)

Measure	Patients		Control Group ^a		Analysis	
	Mean	SD	Mean	SD	t (df=15)	p
Total sleep time (min)	296.7	32.4	389.8	49.5	3.64	<.01
Sleep latency (min)	16.1	16.2	11.9	10.5	0.59	n.s.
REM latency (min)	102.3	28.3	84.8	19.4	1.38	n.s.
Sleep efficiency (%)	75.5	9.5	92.0	4.0	4.73	<.01
"Awake" plus "movement" time (%)	15.9	7.9	4.3	2.3	4.36	<.01
Stage 1 sleep (%)	5.2	2.3	7.6	3.9	1.21	n.s.
Stage 2 sleep (%)	55.2	7.8	61.7	10.3	1.19	n.s.
Stages 3 and 4 sleep (%)	14.7	3.4	4.9	7.7	2.57	<.05
REM sleep (%)	14.9	4.0	21.5	4.0	2.9	<.02

^aControl data are from Williams et al. (19) for the 50-59-year age group (men).

Dreaming

In 4 out of the 11 patients: REM and non-REM related nightmares

In the 2 sea disaster survivors – REM interruption insomnia (fragmentation, violent body movements, vocalization, falling from bed, vivid nightmares reliving the sea disaster).

A 45-year old concentration camp survivor- same anxiety dream after spontaneous and elicited awakenings – repetition of an actual traumatic experience he had at age 6.

A 33-year old combat related PTSD patient. Same combat related nightmares after awakenings from REM sleep and spontaneous awakenings from non-REM

In 7 patients there was a remarkably low dream recall, in 4 out of 21 REM awakenings (19%) dreams with some content were reported. In the rest of the awakenings, they denied dreaming at all.

Dreams in the Acute Aftermath of Trauma and Their Relationship to PTSD

**Thomas A. Mellman,^{1,2,4} Daniella David,¹ Victoria Bustamante,¹
Joseph Torres,¹ and Ana Fins^{1,3}**

Dreams following trauma have been suggested to aid emotional adaptation, yet trauma-related nightmares are a diagnostic symptom of Posttraumatic Stress Disorder (PTSD). There is little published data relating dreams to PTSD soon after trauma. We assessed dreams and PTSD in 60 injured patients after life-threatening events and obtained follow-up assessments in 39 of these participants 6 weeks later. Ten of 21 dream reports from morning diaries were rated and described as similar to the recent traumatic event. The participants reporting these distressing “trauma dreams” had more severe concurrent PTSD symptoms than those reporting other categories of dreams and had more severe initial and follow-up PTSD than those without dream recall. These findings along with our preliminary longitudinal observations relating changes in dream patterns to outcome, suggest a relationship of dream characteristics and early adaptive versus maladaptive patterns of processing traumatic memory.

Overall, the frequency for morning dream recall was substantially lower than what has been reported for nonclinical populations.

Dream recallers had more severe initial and follow-up PTSD than those without dream recall.

16465

No Evidence of Sleep Disturbance in Post-Traumatic Stress Disorder: A Polysomnographic Study in Injured Victims of Traffic Accidents

Ehud Klein, MD,¹ Danny Koren, PhD,^{1,2} Isaac Arnon, PhD,¹ and Peretz Lavie, PhD³

¹ Department of Psychiatry, Rambam Medical Center, and Rappaport Faculty of Medicine, Technion — Israel Institute of Technology, Haifa, Israel

² Psychology Department, University of Haifa, Haifa, Israel

³ Sleep Laboratory, Rappaport Faculty of Medicine, Technion — Israel Institute of Technology, Haifa, Israel

Abstract: *Background:* Disturbed sleep is a common complaint among patients with PTSD. This complaint can be found in both the reexperiencing and hyperarousal symptom clusters in the DSM-IV. However, laboratory studies of sleep in PTSD have provided inconsistent evidence of objective sleep disturbances. Shortened REM latency, reduced sleep efficiency, restless sleep and increased prevalence of sleep apnea have been reported, but were not confirmed by all. A major shortcoming of most previous studies is the fact that they were done retrospectively in patients with chronic PTSD, often complicated by psychiatric comorbidity and drug abuse. Thus, little is known about the development of sleep disturbances in recently traumatized subjects. *Method:* Eight injured victims of traffic accidents with PTSD and 6 injured victims without PTSD participated in a 3-night polysomnographic study one year after the accident. *Results:* No significant differences between PTSD and non-PTSD patients were noted on any of the PSG measures. In addition, the two groups did not differ significantly from each other with respect to awakening thresholds during REM sleep. *Conclusion:* Considering that the present sample was free of active psychiatric comorbidity at the time of trauma and free of hypnotic medications, these results strengthen previous PSG studies suggesting that altered sleep perception, rather than sleep disturbance per se, may be the key problem in PTSD. More research is needed in order to examine whether this problem is specific to sleep or generalizes to other domains as well.

Table 1. Demographic characteristics of traffic accident victims with and without PTSD

	PTSD (n=8)	Non-PTSD (n=6)	Significance test
Age (years)	22.1 (2.0)	22.0 (2.5)	0.1, n.s.
Sex (M / F)	5 / 3	3 / 3	0.2, n.s.
Marital status (M / S)	0 / 8	0 / 6	0.0, n.s.
Education (years)	12.6 (0.9)	11.7 (0.8)	2.0, n.s.
SES (rooms/person)	1.5 (1.2)	1.4 (0.7)	0.1, n.s.

SES = Socioeconomic status

Table 3. Sleep data of injured traffic accident victims with and without PTSD.

	PTSD (n=8) Mean (SD)	Non-PTSD (n=6) Mean (SD)	Significance test t
Mini-Sleep Questionnaire			
Insomnia	15.0 (5.3)	13.7 (7.2)	0.4, n.s.
Excessive day sleepiness	17.9 (5.4)	16.5 (8.6)	0.3, n.s.
Polysomnography			
Sleep Latency (min)	28.8 (31.2)	34.0 (25.2)	0.3, n.s.
REM Latency (min)	72.6 (32.3)	78.0 (14.6)	0.4, n.s.
Total Sleep Duration (min)	389.6 (36.1)	381.3 (53.6)	-0.3, n.s.
True Sleep Duration (min)	354.0 (41.1)	344.2 (49.2)	-0.4, n.s.
Sleep Efficiency (%)	85.7 (6.2)	84.7 (6.3)	-0.3, n.s.
No. of Awakenings (<1 min)	15.6 (3.8)	14.8 (5.8)	-0.3, n.s.
No. of Awakenings (1-3 min)	2.3 (1.1)	2.4 (1.2)	0.2, n.s.
No. of Awakenings (>3 min)	1.4 (1.2)	1.2 (1.1)	-0.4, n.s.
Sleep stages:			
Stage 0 (min)	17.0 (13.9)	14.8 (9.4)	-0.3, n.s.
Stage 1 (min)	4.3 (3.3)	4.6 (3.5)	0.2, n.s.
Stage 2 (min)	191.0 (26.0)	184.3 (37.6)	-0.4, n.s.
Stage 3 (min)	78.8 (24.4)	90.2 (19.5)	0.9, n.s.
REM (min)	84.1 (11.7)	72.5 (20.6)	-1.3, n.s.

These results suggest that altered perception of sleep rather than sleep disturbances per se may be the key problem in at least some patients with PTSD

**Polysomnographic Sleep Is Not Clinically Impaired in
Vietnam Combat Veterans with Chronic Posttraumatic
Stress Disorder**

Thomas D.Hurwitz, et al.

Polysomnographically recorded sleep was notably better than expected in the presence of clinically significant PTSD with typical histories of disrupted sleep. In these subjects, there is no clinically significant sleep disorder or typical pattern of sleep disturbance detectable by standard polysomnography.

Biol Psychiatry 1998;44:1066±1073

Sleep and Dreaming in Holocaust Survivors

Dramatic Decrease in Dream Recall in Well-Adjusted Survivors

HANNA KAMINER, D.Sc., AND PERETZ LAVIE, Ph.D.¹

Sleep data were obtained on 12 well-adjusted and 11 less-adjusted Holocaust survivors and on 10 control subjects. Each was also awakened from rapid eye movement sleep for dream recall. The less-adjusted survivors had more prolonged sleep latency than the well-adjusted and the control groups and lower sleep efficiency than the control subjects. The well-adjusted group had a significantly lower dream recall rate (33.7%) than the less-adjusted (50.5%) and control groups (80%). There were also significant between-groups differences in dream structure and dream content, in the direction of less complex and less salient dreams in the well-adjusted survivors. It is suggested that the decrease in dream recall is one of the forms of long-term adjustment to severe traumatic events.

—*J Nerv Ment Dis* 179:664–669, 1991

Well-adjusted and less-adjusted

Clinical interviews regarding:

Problems at work

Marital and familial problems

Social relations

Somatic complaints

Mental problems

Dissatisfaction in life (general)

LA: Complaints for 3 out of the 6

No history of psychotic state or hospitalization due to mental illness

Dream recall after REM awakenings

Controls (N=10) Less-adjusted (N=11) Well-adjusted (N=12)

5 M, 5 F

61.1 ± 5.4 yrs

1.1 ± 0.8

5 M, 6 F

57.5 ± 5.7 yrs

3.8 ± 1

5 M, 7 F

62.7 ± 4.4 yrs

0.9 ± 1

TABLE 1
Sleep Data for the Three Groups

	Well Adjusted	Less Adjusted	Control	<i>p</i>
Total sleep (min)	335 ± 62.2	350 ± 46.0	375 ± 46.1	NS
SE (%)	79 ± 8.3	73 ± 18.6	86 ± 6.3	.001
Sleep latency (min) ^a	20 ± 7.6	33 ± 25.4	12.3 ± 6.8	.001
REM latency (min) ^a	71 ± 16.7	81 ± 29.4	78 ± 21.1	NS
% Sleep Stages				
0 + Movement time	9 ± 4.1	9.7 ± 11.6	4.8 ± 2.3	NS
1	4 ± 1.9	5.3 ± 5.9	2.4 ± 2.3	NS
2	44 ± 10.8	42 ± 10	47 ± 10.8	NS
3/4	21 ± 7.7	19 ± 11.5	22 ± 8.8	NS
REM	19 ± 5.2	18 ± 6.3	21 ± 8	NS

^aMeans based on all available nights in the laboratory.

TABLE 2

Means of Eye Movement Density, Pulse Rate, and Respiratory Rate in REM Sleep for the Three Groups

	Well Adjusted	Less Adjusted	Control
Eye Movement Density	4.6 \pm 1.2	5.5 \pm 1.4	4.4 \pm .9
Pulse Rate (bpm)	64.0 \pm 4.2	66.7 \pm 3.3	66.7 \pm 4.6
Respiratory Rate/Min	13.9 \pm 1.2	12.7 \pm 1.9	12.7 \pm 1.7

Dream recall (%) after REM awakenings

Controls (N=10)	Less-adjusted (N=11)	Well-adjusted (N=12)
80%	50.5%	33.7%

A surviving “Mengele twins” from Auschwitz, in the well-adjusted group, was awakened 13 times from REM sleep. He recalled only 2 (15%) brief dreams unrelated to the Holocaust.

Dreams' characteristics

Control group had significantly more **complex** ($p < .004$) and **Saliant** ($p < .01$) dreams than the well-adjusted. Less-adjusted held an intermediate position. Well-adjusted **denied emotions** towards the dreams more than Controls ($p < .002$) and Less-adjusted ($p < .002$).

In the less-adjusted 49% of the dreams were **anxiety dreams**, some related to the holocaust.

Coping style and dream recall

Impact Events Scale (IES): assesses two characteristic post traumatic coping styles
intrusion and avoidance

PTSD questionnaire (word 'War' replaced by 'Holocaust') number of positive symptoms

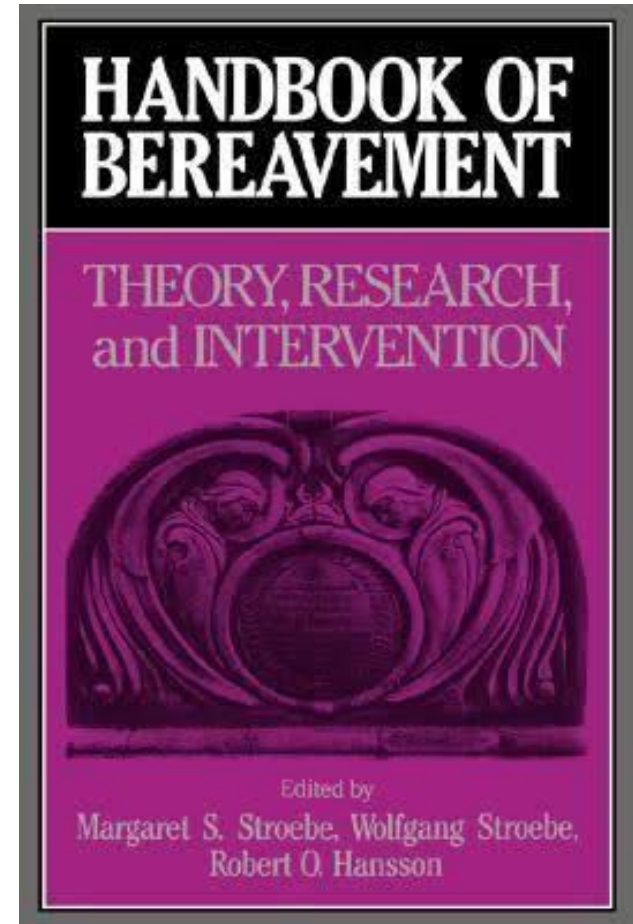
MMPI (three scales) Manifest anxiety, Repression–sensitization, Ego strength

Symptom Checklist Q-90

SSIAM Adjustment Q

Byrne's R-S scale

Barron's ego strength scale



Kaminer and Lavie, 1992, Pp. 331-344

Lack of recall Significantly related to:

Stronger ego,

A repressing coping style

Lower anxiety

Less intrusions of thoughts and memories

Fewer PTSD symptoms

Frequent recallers significantly related to:

Lower ego strength

Higher anxiety

Scored higher as sensitizers

More PTSD symptoms

Mechanism of dreams' suppression?

What differentiate dream recallers from non-recallers?

Increased Evoked Potentials to Arousing Auditory Stimuli during Sleep: Implication for the Understanding of Dream Recall

Raphael Vallat ^{1,2}, Tarek Lajnef^{3,4}, Jean-Baptiste Eichenlaub⁵, Christian Berthomier⁶,
Karim Jerbi^{1,4}, Dominique Morlet^{1,2} and Perrine M. Ruby^{1,2*}

There is a greater brain reactivity
during sleep in dream recallers than
non-recallers

Frontiers in Human Neuroscience, 2017

Resting brain activity varies with dream recall frequency between subjects

Eichenlaub JB, et al.

Neuropsychopharmacology. 2014, 39:1594-602.

High recallers (5.2 ± 1.4 dreams per week) showed **higher cerebral blood flow** in the temporal parietal junction during REM sleep, N3, and wakefulness, and in the medial prefrontal cortex **during REM sleep and wakefulness**, than Low recallers (0.5 ± 0.3 dreams/week).

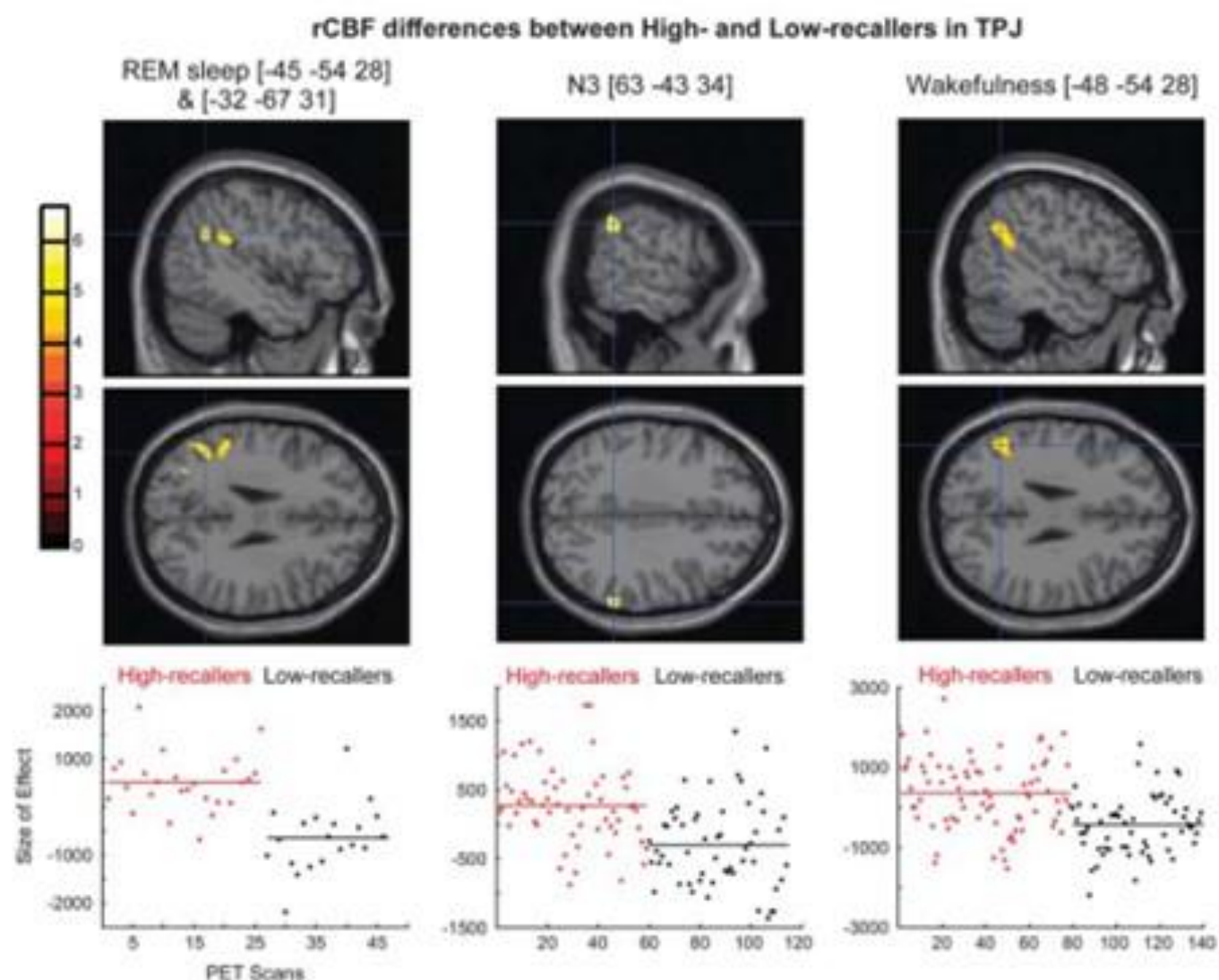


Figure 2 Regional cerebral blood flow (rCBF) differences in temporoparietal junction (TPJ) between High recallers and Low recallers during rapid eye movement (REM) sleep, N3, and wakefulness. Upper panel: Sagittal and axial sections of the brain showing foci with higher activation in High recallers than in Low recallers during REM sleep [-45 -54 28] and [-32 -67 31], N3 [63 -43 34], and wakefulness [-48 -54 28]. Foci of activation have been superimposed onto the normalized single-subject magnetic resonance imaging (MRI) provided with SPM8 at a threshold of $p < 0.001$ uncorrected. Lower panel: Plots of the fitted response in the peak voxel for the contrast High recallers vs Low recallers in each condition. Each circle represents one scan. Red circles, scans acquired in High recallers, and black circles, scans acquired in Low recallers. MNI (Montreal Neurological Institute) coordinates are presented between brackets.

Elevated Awakening Thresholds in Sleep Stage 3-4 in War-Related Post-traumatic Stress Disorder

Y. Dagan, P. Lavie, and A. Bleich

Awakening thresholds from sleep stage 3/4 were investigated in 19 DSM-III-defined, war-related post-traumatic stress disorder (PTSD) patients compared with 6 normal controls. Patients had significantly higher awakening thresholds and significantly longer latencies to an arousal response than controls. These results are interpreted to suggest modifications in the depth of sleep as one of the long-term sequelae of traumatic events.

Table 1. Sleep Data for the PTSD Group

	% Sleep effic.	Sleep latency (min)	REM latency (min)	% Stage 2	% Stage 3/4	% REM
PTSD						
Mean*	87.6	15.4	85.5	48.1	30.4	21.5
SD	6.3	13.9	35.4	8.0	7.8	3.7

*Mean of 2 nights.

Table 2. Awakening Thresholds (in DB) and Latency to Arousal Response (in Sec) during Stage 3/4 for the Two Groups of PTSD Patients and Controls

	PTSD		Controls	
	Mean	SD	Mean	SD
DBdiff	55.6	24.4	32.1	12.9
RT(sec)	6.3	5.6	1.2	0.5

12 DSM-III defined PTSD patients aged 31±4.4

10 PTSD since the Lebanon War in 1982

1 Yom Kippur in 1973

1 Terrorist activities 10 years prior to the study

12 healthy IDF veterans aged 32.8±5.3

Each spent 4 nights in the sleep laboratory

DSM-III subscale for PTSD

Impact Events scale

Spielberger State-Trait anxiety Q

Zung self rating depression Scale

Beck depression inventory

Symptom Checklist (SCL-90)

Patients and controls significantly differed from each other on every one of the psychiatric questionnaires!

Elevated Awakening Thresholds during Sleep: Characteristics of Chronic War-Related Posttraumatic Stress Disorder Patients

Peretz Lavie, Neri Katz, Giora Pillar, and Yaffa Zinger

Background: *Sleep disturbances are one of the hallmarks of posttraumatic stress disorder (PTSD); however, sleep laboratory studies have provided inconsistent evidence of the existence of objective sleep disturbances in PTSD patients. Reports that awakening thresholds from sleep in war-related PTSD patients were significantly elevated compared to normals are discordant with complaints of insomnia. The present study investigated the relationship between awakening threshold from REM sleep in war-related PTSD patients and their dream recall, dream content, and clinical condition.*

Methods: *After informed consent was obtained from 12 PTSD patients and 12 controls, they were investigated by polysomnographic recordings for 4 nights. Awakening thresholds to clicks were determined during 1 night, and dreams were collected during 2 nights. Patients' symptoms were assessed by the Zung and Beck depression scales, Impact of Events Scale, State and Trait Anxiety, and Symptom Check List questionnaires.*

Results: *Although there were no significant differences between sleep data of patients and controls, PTSD patients had significantly higher awakening thresholds. Awakening thresholds were significantly positively related to depression and anxiety scores. Patients' dreams were significantly more aggressive and hostile, and in 6 patients they included explicit war-related contents. The severity of the clinical picture was significantly related to the dreams' scores of aggression-hostility, and to sleep quality variables.*

Conclusions: *Elevated awakening thresholds from sleep are a characteristic finding in chronic war-related PTSD patients, which may help to explain the diverse sleep laboratory findings in this syndrome. Biol Psychiatry 1998;44:1060-1065 © 1998 Society of Biological Psychiatry*

Key Words: Awakening thresholds, posttraumatic stress disorder, REM sleep, dreaming

Introduction

Posttraumatic stress disorder (PTSD) is a syndrome arising from a variety of overwhelming and/or extremely traumatic experiences, such as combat, natural disasters, accidents, assault, and rape (Helzer et al 1987). Since the early description of the syndrome, sleep disorders have stood out as cardinal characteristic symptoms, which has led to their inclusion in the DSM-III diagnostic criteria of the syndrome. In spite of their presumed centrality, the picture emerging from a large number of studies investigating sleep in war-related PTSD patients has been far from uniform (Glaubman et al 1990; Dagan et al 1991; Kramer and Kinney 1988; Fuller et al 1994; Ross et al 1994; Mellman et al 1995). Although subjectively, most patients complained of sleep disturbances in the form of fragmented sleep and repeated nightmares, there were few, if any, significant differences between the polysomnographic sleep quality measures of patients and comparison groups. Sleep efficiency in five of the six studies cited above ranged from 81.1% to 88.5%, and sleep latency from 10 to 32.3 min. Only in one (Glaubman et al 1990) was sleep efficiency significantly different from a comparison group. In none of them was sleep latency significantly different from controls. In two previous studies from our own laboratory on mixed groups of PTSD patients, the most severe sleep disturbances were observed in patients in the acute phase of the syndrome, while in both studies there were subgroups of patients without any evidence of sleep disturbance (Hefez et al 1987; Lavie et al 1979). These sleep laboratory studies were corroborated

PTSD patients had higher awakening thresholds from REM sleep:

25 ± 11 vs. 15 ± 8 dB, p<.02

Awakening thresholds correlated with:

Beck depression score, r = 0.56 p<0.05

Percent dream recall, r = -0.51 p<0.08

No significant difference in percent dream recall:

83% PTSD

81% controls

A marked difference in dreams' content:

In 50% of the PTSD but in none of the controls dreams contained explicit combat-related content.

Table 1. Sleep Data of PTSD Group and Controls (Means ± SD)

	PTSD	Control
TST (min)	358 ± 40.8	345.1 ± 23
TRUST (min)	302 ± 73.9	301.3 ± 51
SE%	80.2 ± 15.9	86.6 ± 8.7
SL (min)	29.9 ± 38.4	19.7 ± 20.0
RL (min)	100.4 ± 48.3	90.4 ± 19.1
% Wake + Movement	11.3 ± 14.9	9.2 ± 8.8
% Stage 2	47.3 ± 12.6	51.0 ± 10.8
% Stage 3-4	21.3 ± 9.3	22.2 ± 8.7
% REM	15.6 ± 6.9	14.6 ± 5.4


TST-total sleep time; TRUST-true sleep time; SE-sleep efficiency; SL-sleep latency; RL-REM latency; *None of the comparisons was statistically significant.*

Vigilance and Avoidance during Sleep in US Vietnam War Veterans with Posttraumatic Stress Disorder

Kramer, Milton MD*; Kinney, Lois PhD†

Journal of Nervous and Mental Disease 191(10):p 685-687, 2003. |

The expectation was that that the PTSD group, who reported being hyper-vigilant, **would have a lower arousal threshold** than the comparison group. **The PTSD group had higher arousal thresholds in both non-REM and REM across the night.**How might the elevated arousal threshold in the PTSD group be explained? [Dagan et al. \(1991\)](#) and [Lavie et al. \(1998\)](#) suggest that to maintain sleep active blocking of internal (dreams) and external (noise) stimuli occurs.

Sleep Medicine Reviews, Vol. 4, No. 2, pp 183–200, 2000
doi:10.1053/smr.1999.0095,
available online at <http://www.idealibrary.com> on 

**SLEEP
MEDICINE**
reviews

REVIEW ARTICLE

Post-traumatic stress disorder and sleep—what a nightmare!

Giora Pillar, Atul Malhotra and Peretz Lavie

*Sleep Laboratory, Bruce Rappaport Faculty of Medicine, Gutwirth Building, Technion–Israel
Institute of Technology, Haifa 32000, Israel*

Table 1 Effect of PTSD on general sleep measures—summary of studies

Group	N	TST (min)	(min) Sleep latency	% stages 3–4	Awakenings (n) % sleep	% sleep efficiency	
Lavie, Israel	64	328	25	23	12	80	
Controls	49	345	16	19	6	89	
Mellman, Miami	34	339	26	15	15	85	
Controls	18	348	26	15	7	88	
Ross, Philadelphia	11	378	21	7	6	89	
Controls	8	410	10	11	6	93	
Woodward, Palo Alto	87	~330	~8	~9		~90	
Controls	14	~320	~8	~14		~91	
Hurwitz, Minneapolis	18	~397	~13	~13	14	18	~82
Controls	10	~403	~10	~13	15	15	~85
Gillin, San Diego	14	~370	~13	~6		~90	
Depressed controls	15	~318	~38	~8		~82	
Normal controls	12	~309	~16	~10		~85	

Review Article

Current Concepts

**SLEEP DISTURBANCES IN THE WAKE
OF TRAUMATIC EVENTS**

PERETZ LAVIE, PH.D.

THE terrorist attacks on the United States of
September 11, 2001, are without precedent

used to describe sleep is defined in Table 1. Hypno-grams (charts of sleep stages) of normal sleep and two types of insomnia that are typically found in traumatized patients are shown in Figure 1.

IMMEDIATE EFFECTS

Subjective Findings

Since it is difficult to conduct research immediately after a disaster, most studies have involved small sam-

Insights and conclusions

- 1. Sleep disorders in at least some PTSD patients appear to be mainly subjective and therefore history should be very carefully taken, attention should be given to comorbidities**
- 2. Low dream recall and possibly deepening of sleep may be specific to PTSD and should be evaluated when dealing with such patients**
- 3. One consequence of sleep deepening may be lower threshold for disorders of arousal to appear such as sleep-walking, night terrors, confusional awakenings, and disordered breathing in sleep. This should be kept in mind when questioning and treating these patients.**
- 4. The question if a PSG should be performed as part of the clinical evaluation should be addressed on an individual basis.**

SLEEPING UNDER THE THREAT OF THE SCUD: WAR-RELATED ENVIRONMENTAL INSOMNIA

PERETZ LAVIE¹, AVRAHAM CARMELI², LILACH MEVORACH² AND NIRA LIBERMAN²

¹Sleep Laboratory, Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, and ²Department of Behavioral Sciences, Israel Defense Forces, Israel

ABSTRACT. The influence of the Scud missile attacks during the Persian Gulf war on the sleep of the Israeli population is described. Our study group comprised a random sample of 200 people (mean age 41.13 ± 15.32) who were contacted by telephone during the third week of the war and interviewed about their sleep. Overall, 28% of the entire sample complained about sleep: 10% complained about mid-sleep awakenings, 4.5% on difficulties falling asleep, and 13.5% about the combination of the two. People living in the Tel Aviv and Haifa areas complained significantly more than those in the rest of the country. Women complained significantly more than men, and people with lower education complained significantly more than people with higher education. Only 3% of the sample reported using sleeping pills. During the war actigraphic sleep recordings in 19 adults living in the Tel Aviv and Haifa areas did not reveal any measurable decrease in sleep quality in comparison with pre-war recordings. Possible explanations for the discrepancy between the subjective and objective assessments are discussed.

Isr J Med Sci 1991;27:681-686

Part 1: Survey of sleep disturbances

Third week of the War

Random sample of 200 people (100 men 100 women, mean age 41 ± 15.3 years)

Telephone interviews

Do you have difficulties falling asleep?

Do you use sleeping pills?

Do you suffer from mid-sleep awakenings?

“every night”, “almost every night”, “sometimes”, “seldom”, “never”

Comparison with similar data obtained from 1501 industrial workers (1981)

Stage 2: Actigraphic monitoring

6 men and 13 women Median age 42

Tel Aviv and Haifa

7-day recordings

Nights following an evening missile attack (n=19)

Nights without preceding missile attacks (n=19)

A night with a missile attack at 01:36 (n=6)

Survey of sleep disturbances

10% mid-sleep awakenings

5% W vs. 4.1% M

4.5% difficulties falling asleep

14% W vs. 6% M

13.5% awakenings + difficulties falling asleep

21% W vs 4.1% M

Only 3% of the sample reported using sleeping pills at least “sometimes”

Women complained significantly more than men

People living in Tel Aviv and Haifa complained more than other areas

No effect of age

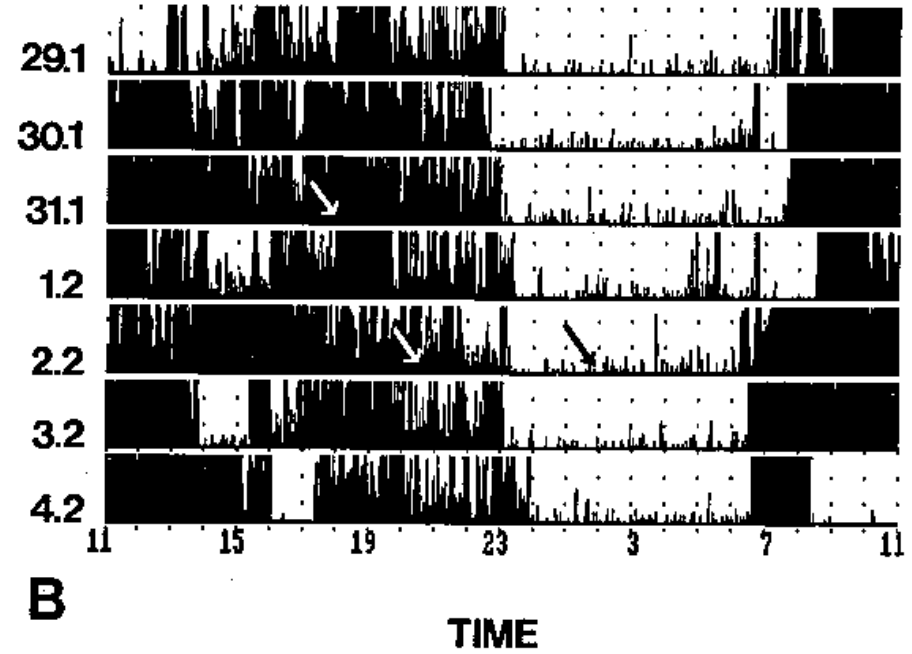
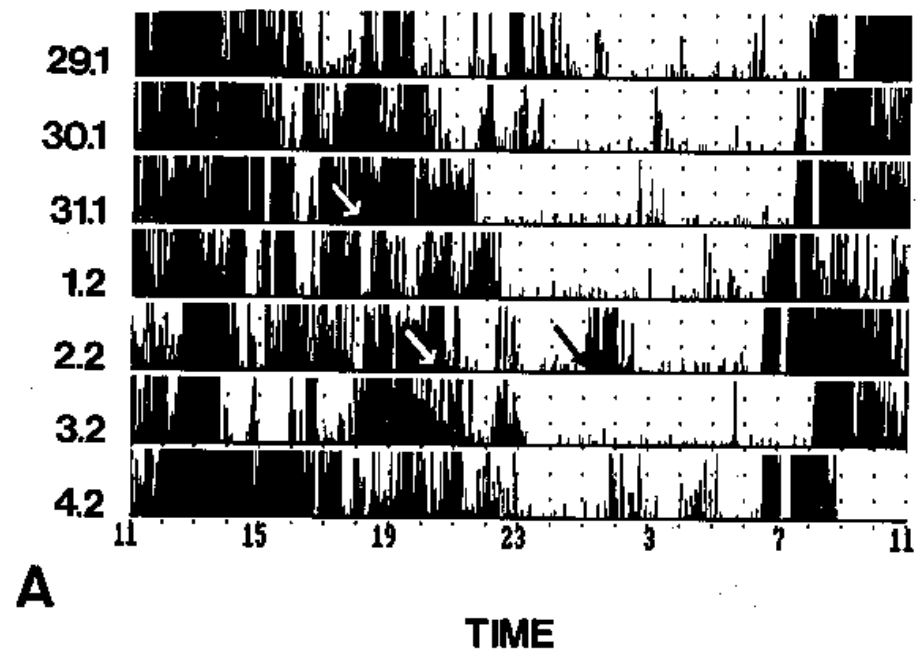


Fig. 2. Actigraphic record showing A) a pronounced response and B) no response to the 1:36 AM missile attack on February 2nd. Arrows indicate missile attacks.

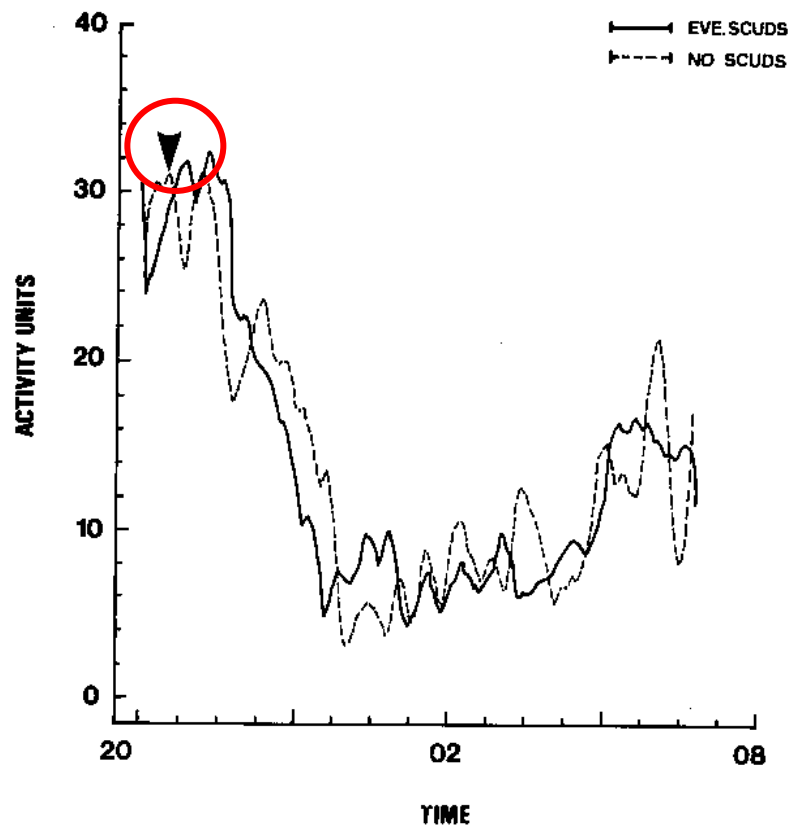


Fig. 3. Mean actigraphic data across all available nights with a preceding evening attack and all available nights without a preceding attack. Arrow indicates time of attack.

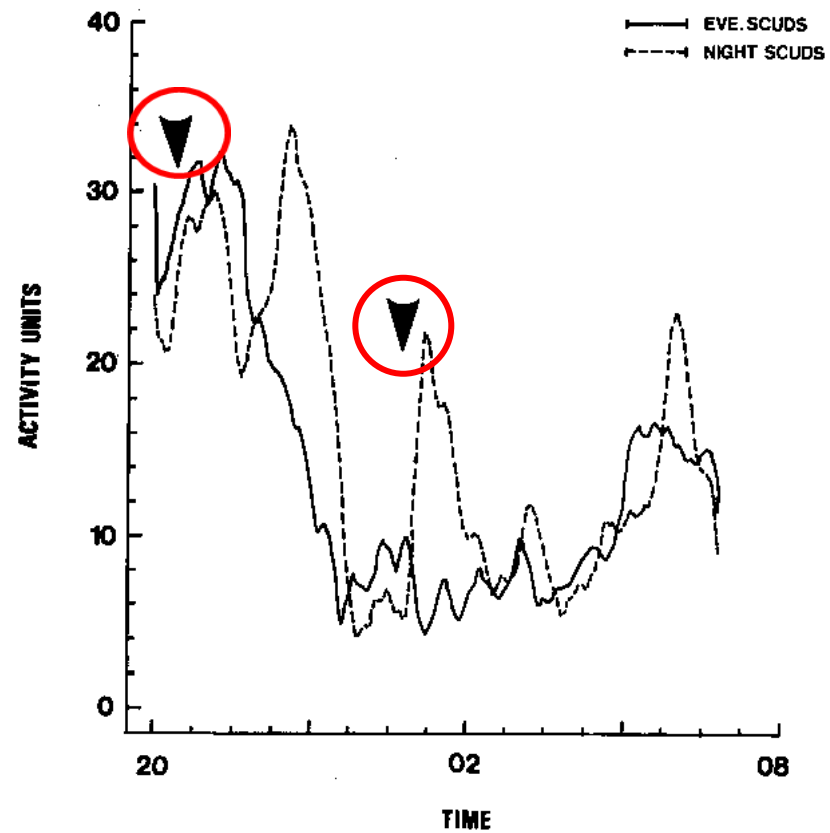


Fig. 4. Mean actigraphic data across all available nights with a preceding evening missile attack and the night with the 1:36 AM attack. Arrows indicate times of attack.



פרופ אבי שדה 1957-2016

Sadeh A et al., J Ambul Monit 1989

Sadeh A et al., Pediatrics 1991

Actigraphic sleep data

<u>Night</u>	<u>Sleep Onset</u>	<u>Sleep Duration</u>	<u>SE</u>
No attack	23:30	449 min	89.3%
Evening attack	00:15	423 min	91.1%
Attack at 01:36 AM	00:09	344 min	85.5%

Subjective and objective data

**Marked discrepancy between the
telephone survey and the actigraphic
recordings**

Possible explanation:

“fear of sleep” rather than insomnia

9483
e1

Children's sleep under the threat of attack by ballistic missiles

P. LAVIE, Y. AMIT, R. EPSTEIN and O. TZISCHINSKY

Sleep Laboratory, Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel.

Accepted in revised form 1 December 1992; received 22 April 1992

SUMMARY The present paper reports on the influence of the Scud missile attacks during the Gulf War on the sleep of Israeli children. Two studies were performed. In the first, sleep habits and sleep disturbances of 61 (mean age 20 months) infants were assessed by questionnaires completed by their parents 5 months before the war and immediately after the end of the War. Comparison of pre- and post-war data revealed no major changes in sleep habits or in sleep quality. In the second study, sleep of 55 children was monitored at home by actigraphs during the last month of the War. All children were aroused during missile attacks, but returned to sleep immediately, with no evidence of carry-over effects once the 'all clear' sign was given. Comparison of sleep quality measures obtained during the War with those of age- and sex-matched children monitored a year before the war did not reveal any significant differences apart from the immediate response to the attack.

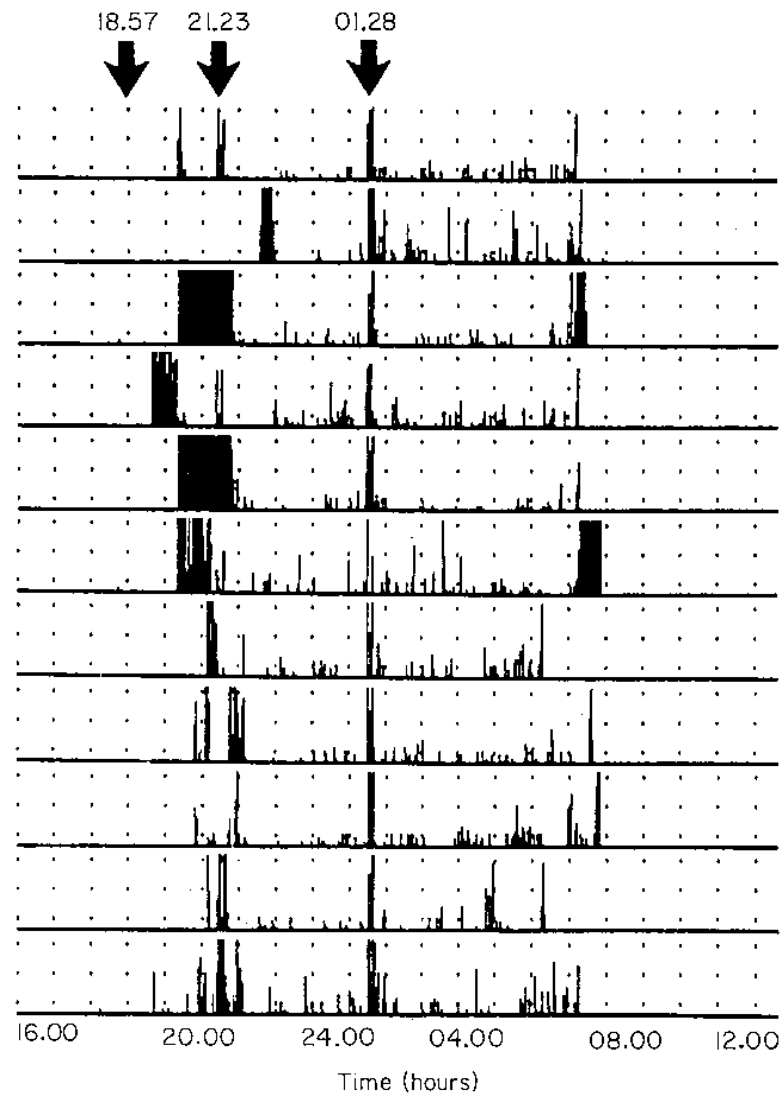


Figure 1. An example of actigraphic recordings obtained from 11 children on the night of 12 February 1991, when there were three missile attacks on Israel (indicated by arrows). All children wore actigraphs at bedtime, at approximately 21.00–22.00 hours, and removed them after waking up in the morning at approximately 07.00–08.00 hours. Although all children woke up during the 01.28 hours attack, they were able to return to sleep without any noticeable carryover effect.

We conclude that environmental insomnia under such extraordinary circumstances, as revealed by the increased rate of subjective sleep complaints (Lavie *et al.* 1991), mainly consisted of ‘fear of sleep’ rather than actual disturbances in the sleep process itself. People expressed this fear because they were afraid that if the attack occurred during their sleep they would fail to hear the sirens, or would awake too confused to deal effectively with the emergency situation. Some of this fear was relieved, however, once the radio’s ‘Silent Channel’ was initiated during the second week of the War. This channel remained absolutely silent throughout the night unless it was activated by a siren alarm, thus enabling people to go to sleep confidently knowing that they would wake up in the event of an attack.

	Wake-up times (hours)					Bedtimes (hours)				
	05.00	06.00	07.00	08.00	Total	19.00	20.00	21.00	22.00	Total
Before War	3.6	39.3	39.3	17.9	100	5.9	34.1	41.2	18.9	100
After War	3.3	38.3	48.3	10.0	100	4.9	29.5	50.8	14.17	100

Table 1 Distributions (in %) of wake-up times and bedtimes before and after the War.

Danger to sleep – The 1991 Gulf War

Of the 39 missiles that hit Israel during the Gulf war 38 were launched during the dark hours. Under such dangerous circumstances, sleeping became dangerous. People were afraid of not being awakened by the sirens or, even if having been awakened, of not having enough time to find shelter in the sealed rooms. Another concern was that awakening from sleep would impair the essential preparation for the attack such as donning a gas mask, sealing the room, etc. These were rational fears, given the brief warning time and the nature of the threat.

The story behind the military radio station that played almost nothing:

The year is 1990 and the State of Israel is facing a new threat - the threat of chemical warfare. The IDF no longer has to protect only the country's borders, but also the home front - the civilians who live in the heart of Israel. Whenever an alarm is sounded, civilians must run to their shelters and protect themselves from possible attacks from enemy forces. Israeli citizens know that if they aren't paying attention 24/7, they might not hear the alarm - something that could be especially dangerous. Professor Peretz Lavie, former head of the Sleep Research Laboratory at the Technion and current chairman of the National Council for Civilian Research and Development, collaborated with the Israel Defense Forces and the Israel Broadcasting Authority to create the "Quiet Wave" radio station - the radio station that gave peace of mind to the citizens of the State of Israel.

•A brand-new treatment for post-traumatic stress disorder has aroused enthusiasm in Washington and skepticism among veterans in the field. •

THE VIETNAM VETERANS ADVISER

Long before the counseling profession had coined the term post-traumatic stress disorder, Vietnam veterans displaying classic P.T.S.D. symptoms, such as anxiety, depression, insomnia, and rage, were urged to talk about the experiences that haunted them. The aim of such therapy was to allow the traumatized vet to purge his painful memories, or at least put them in perspective. Such treatment was often, though not always, successful. Now Dr. Peretz Lavie, a psychology professor at Technion-Israel Institute of Technology in Haifa, has unveiled a controversial new theory on P.T.S.D. treatment: He says it may be more helpful to some Vietnam vets who still suffer from combat-related stress to repress their painful or horrifying memories—starting with those that appear in dreams—instead of trying to recall them.

"This is the key issue behind post-traumatic stress syndrome," says Lavie, who directs Technion's Sleep Disorders Center and has done sleep studies with traumatized Israeli war vets and Jewish Holocaust survivors. "If you are able to repress the demons that come out during the night, maybe you'll be able to repress the demons that come out during the day. And they won't return in flashbacks, in disturbing memories, in hyper-vigilance, in living on your tiptoes all the time, looking for signs and things that remind you of the war."

Lavie based his unusual conclusions, which he unveiled at a scientific meeting in Washington, D.C., last June, on a study of the sleep patterns of Jewish Holocaust survivors undertaken



by one of his students, Ph.D. candidate Hanna Kaminer. She found that those who had adjusted best to post-war life had learned to suppress both their waking and dream recall of the concentration camps and other horrors they experienced under Hitler. Whereas the control subjects and the less well-adjusted Holocaust survivors had a high incidence of dream recall (up to 80 percent), the well-adjusted survivors, when awakened during dream-rich REM (rapid eye movement) sleep, could remember only about 30 percent of their dreams, and this only vaguely.

"Even the dreams they did remember were devoid of emotion, very brief and almost telegraphic," says Lavie. "And when we interviewed them and asked them how they related to the dreams, they said nothing; they remained neutral toward their dreams. So what we suggest is that part of the long-term adaptation mechanism is suppressing dreaming."

Lavie says he will use drugs and hypnosis in a future study of Israeli war veterans to help them push their upsetting memories back into the Pandora's box of the unconscious and close the lid. He believes that U.S. psy-

chotherapists would be well advised to consider similar techniques, especially in treating Vietnam vets long suffering from P.T.S.D. "People are treated for eight, nine, ten years by conventional methods, and nothing helps," he says. "What are you going to lose by just reversing the direction and suppressing certain dreaming by voluntary forgetting?"

A lot, if you ask some of those who work in the trenches with traumatized Vietnam vets every day.

Shad Meshad, a former U.S. Army psychology officer in Vietnam who helped found the national Vet Center outreach program in 1979 and now directs the Los Angeles-based Vietnam Veterans Aid Foundation, says Lavie's theory is "interesting" but questions the assertion that a traumatized vet struggling with his war experience can somehow adopt a coping mechanism involving the unconscious that has worked for someone else. "I can't say to any of the patients I have with severe P.T.S.D.: 'Do what Bob Jones is doing over there, and just walk away from it.' It doesn't work. So as a clinician, [Lavie's theory] doesn't mean anything to me," he says.

Steve Bentley, who directs

the Veterans Employment and Training Services in Portland, Maine, and chairs the Special Committee on Post-Traumatic Stress Disorder and Substance Abuse for the Vietnam Veterans of America, laughs at Lavie's suggestion that traumatized vets should be encouraged, in Bentley's words, to "stuff" their disturbing memories. "There are people around with large chunks of emotional shrapnel that are eating them alive," he says. "The whole idea is to go in, open that wound up, cleanse it, get that stuff out, give them a chance to grieve, provide the atmosphere and the space for someone to get in touch with that."

"I don't think any one treatment works for every single person," says Jim Dwyer, chief of the Vietnam Veterans Liaison Unit at Brentwood V.A. hospital in Los Angeles. "But I would say that for the vast majority of people with post-traumatic stress disorder, [the best approach is] some kind of therapy that really encourages them to look at the trauma and try to understand the trauma and how it is affecting their lives."

Until Dr. Lavie conducts his experiment with Israeli war vets, no one can say for sure that suppressing dreams does, or does not, help alleviate P.T.S.D. But the flood of inquiries Lavie has received from U.S. psychiatrists and psychologists eager to try anything that might help their P.T.S.D. patients speaks volumes about the stubbornness of the problem and about the lack of consensus within the counseling profession, even after years of research, concerning the most effective treatment. Some

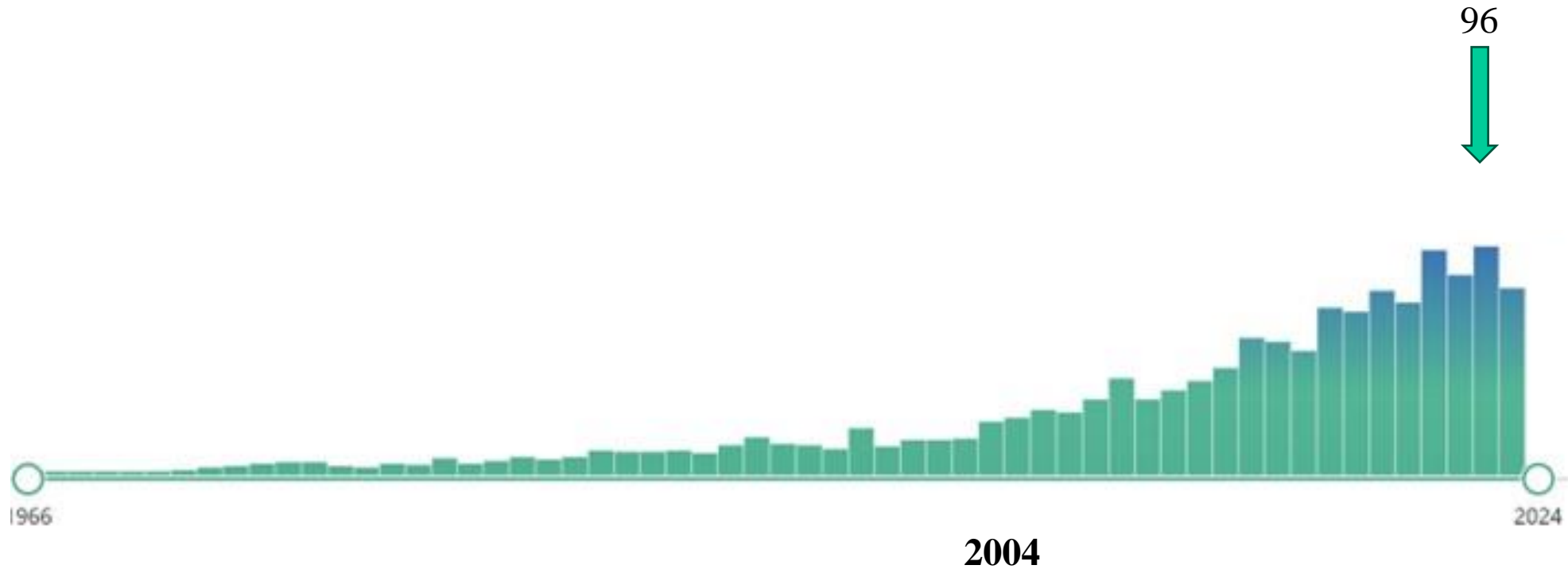
than J. Z. Agronsky

m.
at
BL

SL
its
you
fift
ml
ne

pla
5-11

Inducing forgetting
Active forgetting
Directed forgetting
Adaptive forgetting



Miller G.

Forgetting and remembering. Learning to forget.

Science. 2004, 304, 34-6.

“Remembering the good times is nice but forgetting the really awful times— or at least keeping those memories in check – may matter more for quality of life.”

Recent work has identified key brain regions involved in suppressing memories....Applying their work to the clinic, some researchers have seen promising results with drugs that weaken the emotional hold of traumatic memories that may open the way to treatments of millions of people suffering from anxiety disorders.” (p. 34)

Kida S. Reconsolidation/destabilization, extinction and forgetting of fear memory as therapeutic targets for PTSD. *Psychopharmacology (Berl)*. 2019 Jan;236(1):49-57. doi: 10.1007/s00213-018-5086-2. Epub 2018 Oct 29. PMID: 30374892; PMCID: PMC6373183.

Ishikawa R, Uchida C, Kitaoka S, Furuyashiki T, Kida S. Improvement of PTSD-like behavior by the forgetting effect of hippocampal neurogenesis enhancer memantine in a social defeat stress paradigm. *Mol Brain*. 2019 Aug 2;12(1):68. doi: 10.1186/s13041-019-0488-6. PMID: 31370877; PMCID: PMC6676601.

Rosenberg LB. Necessary forgetting: on the use of propranolol in post-traumatic stress disorder management. *Am J Bioeth*. 2007 Sep;7(9):27-8. doi: 10.1080/15265160701518524. PMID: 17849335.

Sarmanlu M, Kuypers KPC, Vizeli P, Kvamme TL. MDMA-assisted psychotherapy for PTSD: Growing evidence for memory effects mediating treatment efficacy. *Prog Neuropsychopharmacol Biol Psychiatry*. 2024 Jan 10;128:110843. doi: 10.1016/j.pnpbp.2023.110843. Epub 2023 Aug 21. PMID: 37611653.

3,4-methylenedioxymethamphetamine (MDMA)

3,4 מתילן- דיאוקסי- מטהאמפטמין

To sleep or not to sleep.....

After a trauma

A therapeutic dilemma

To sleep or not to sleep, that is the question: A systematic review and meta-analysis on the effect of post-trauma sleep on intrusive memories of analog trauma

Sarah K. Schäfer et al

Behaviour Research and Therapy, Volume 167, August 2023

Nine studies were included in our traditional meta-analysis (8 in the IPD meta-analysis). Our analysis provided evidence for a small effect favoring sleep over wakefulness, $\log\text{-ROM} = 0.25$, $p < .001$. Our findings suggest that post-trauma sleep has the potential to be protective by reducing intrusion frequency. More research is needed to determine the impact following real-world trauma and the potential clinical significance.

The potential beneficial effect of sleep deprivation following traumatic events to preventing PTSD: Review of current insight regarding sleep, memory, and trauma resonating with ancient rituals—Àisùn Oku (African) and Tsuya (Japanese)

Hagit Cohen et al.

Neuropsychopharmacology Reports. 2023;43:2–11.

From an evolutionary perspective, we suggest that (natural) SD following stressogenic/traumatic event is critical for enabling organisms to adapt to future conditions. We suggest that at least some of the biological responses following traumatic events result in an increase in vigilance and wakefulness and, therefore, cause SD, which may not represent dysfunction but rather biologically adaptive strategies for dealing with adversity.

Repressing dreams that poison sleep

“If you can repress the demons that come out during the night, maybe you’ll be able to repress the demons that come out during the day. And they won’t return in flashbacks, in disturbing memories, in hyper-vigilance, in living on your tip toes all the time, looking for signs or things that remind you of the trauma”

