

Les troubles du sommeil: le point de vue scientifique

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HUG, Genève



Serge Brand, PD Dr. phil.

TROUBLES DE SOMMEIL



Juliette Courbet, fille de Gustave Courbet 1819-1877

Insomnia – the scientific approach

- › Advance organizer:
- › Why do we sleep?
- › What's insomnia? DSM-IV
- › Prevalence rates and other

Insomnia – the scientific approach

DSM-5

- **Predominant complaint of dissatisfaction with sleep quantity or quality, associated with one (or more) of the following symptoms:**
 - **Difficulty initiating sleep.**
 - **Difficulty maintaining sleep, frequent awakenings or problems returning to sleep after awakenings.**
 - **Early-morning awakening with inability to return to sleep.**

Insomnia – the scientific approach

DSM-5

- › Predominant complaint of dissatisfaction with sleep quantity or quality, associated with one (or more) of the following symptoms:
 - Difficulty initiating sleep.
 - Difficulty maintaining sleep, characterized by frequent awakenings or problems returning to sleep after awakenings. Early-morning awakening with inability to return to sleep.
- **The sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning.**
- **The sleep difficulty occurs at least 3 nights per week.**
- **The sleep difficulty is present for at least 3 months.**
- **The sleep difficulty occurs despite adequate opportunity for sleep.**

INSOMNIA – SLEEP DURATION?

No - extreme short vs. extreme long sleepers



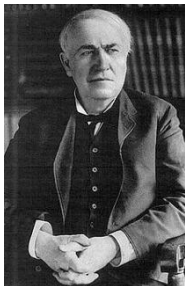
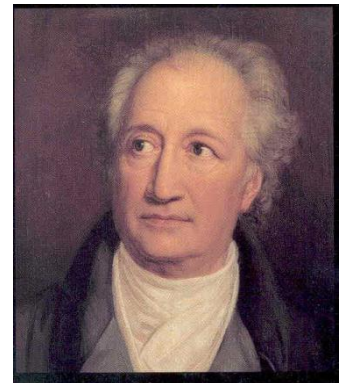
INSOMNIA – SLEEP DURATION?

Not a question of quantity!

DO I FEEL RESTORED?

DO I FEEL IN A GOOD MOOD?

DO I LOOK FORWARD TO STARTING THE DAY?



Prevalence rates of sleep disorders

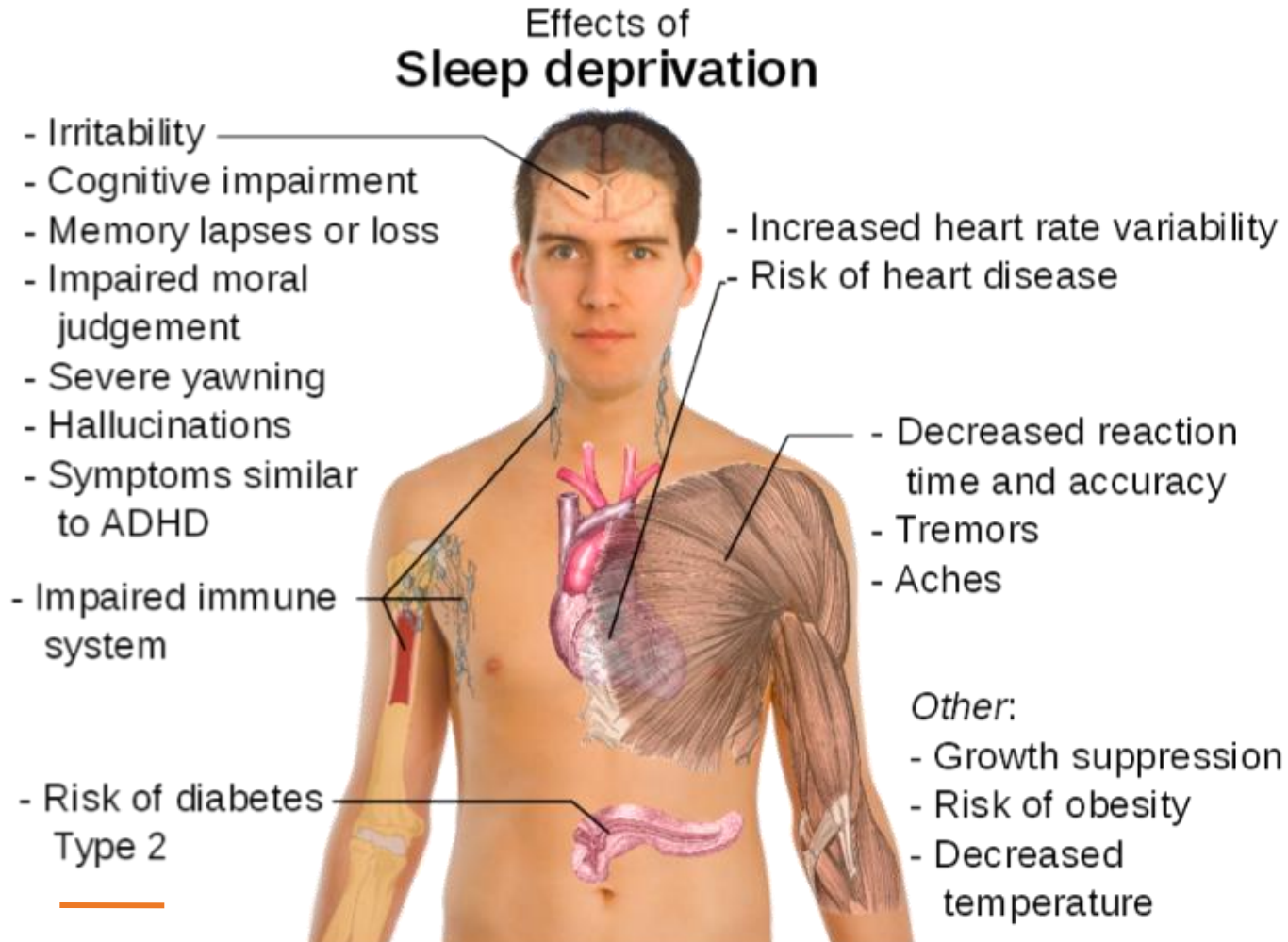
Europe and USA
19 - 46% of the population

Moderate to severe sleep disorder
13%

Difficulties to initiate and to maintain sleep
1,6%

Insomnia

Physical and psychological issues related to insomnia



RISK FACTORS

- FEMALE GENDER
- AGE
- PSYCHOLOGICAL ISSUES
- PSYCHIATRIC DISORDERS

SLEEP DISORDERS DSM 5.0

DYSSOMNIA

Insomnia

Hypersomnia

SLEEP-WAKE-DIS.

narcolepsy

Breathing-related sd

PARASOMNIA

Night mares

Pavor nocturnus

Sleep walking

Diagnostic sources

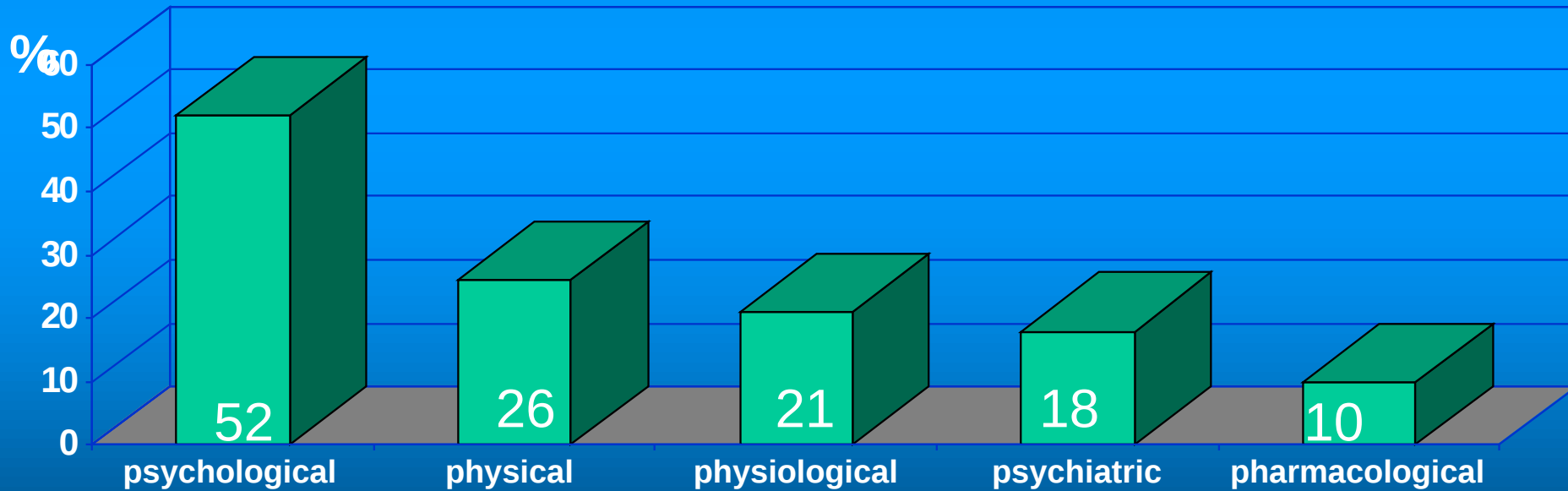
- Detailed medical history (self-report)
- Detailed medical history (experts' report)
- Sleep log
- Neurological, internistic and/or psychiatric examination
- Polysomnography

Sleep behavior – medical history

1. General complaints
2. Previous diseases
3. Substance use (coffee, tobacco, alcohol, others)
4. Kind of sleep disorder (start, maintain, early awakening?)
5. Sleep schedules
6. Duration of illness
7. Sleep behavior during the day
8. Medications?

Aetiology

„5 P“



Causes of insomnia

(5 „P“) (I)

Psychological causes:

Critical life events, stress

Physical causes:

internistic diseases (cardiovascular, pulmonar, endocrinological) neurological; degenerative, PLM, RLS

Physiological causes:

Jet lag, shift work, hospitalizations

Causes of insomnia

(5 „P“) (II)

Psychiatric causes:

Virtually every psychiatric disorder (except antisocial PD)

Pharmacological causes:

Virtually any kind of psychoactive drug; diuretica, steroids, Beta-blockers, antihypertensiva

Psychological factors and environment

Causes of transient poor sleep (%)

irritability	48,3
Personal concerns	45,7
Pain, illness/disease	29,9
Work pressure	26,1
Overeating	25,3
Traffic noise	22,6
Weather	19,9
Sleeping abroad	18,9



INSOMNIA – QUIZ

1. Sleeping is healthy
2. No sleeping – no learning
3. Sleeping improves daily fitness
4. Physical activity and good sleep are associated
5. Sleeping before midnight is best
6. Adolescents should sleep about 9h
7. Sleep quality and sleep quantity decrease with age
8. There are extreme short- and long sleeper
9. Women need more sleep compared to men
10. Electronic devices impair sleep

INSOMNIA – QUIZ

- 11. To improve sleep, do meditate
- 12. A power nap is healthy for all people
- 13. Pre-sleeping is possible
- 14. Post-sleeping is possible
- 15. Snoring disturbs only the partner
- 16. Sleep restriction of 4 days and nights causes long-term damage to the mind and body
- 17. Dreaming means sleeping better
- 23. Use antidepressants instead of benzodiazepines
- 24. It's more important to assess sleep duration instead of sleep quality

Insomnia

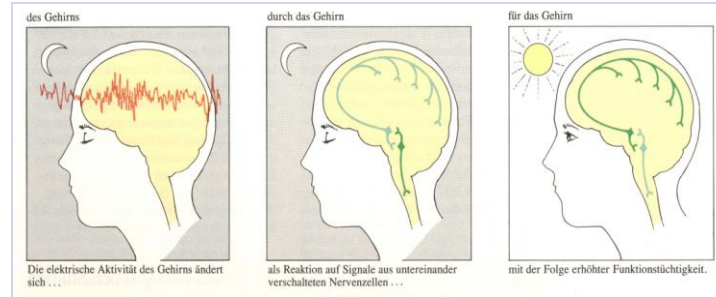


Sleep = an active state of mind and body

Information processing

Physiological processes

Insomnia

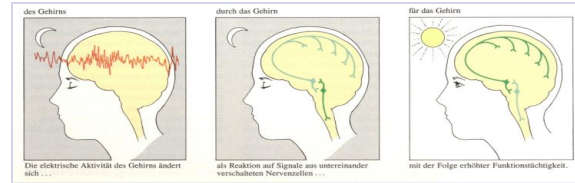


Sleep is a characteristic processing of the brain

We sleep for optimal and maximal mental and physical performance

Hobson 1990

Insomnia



„... for optimal and maximal mental performance.....“

Hmm, how should we know that we were sleeping enough?

thinking = quick, precise, and accurate information processing

feeling = secure and appropriate coping with emotions and empathy

behavior = quick, precise and accurate actions and action processing

Sleep

Objective measurements

Objective sleep measurements

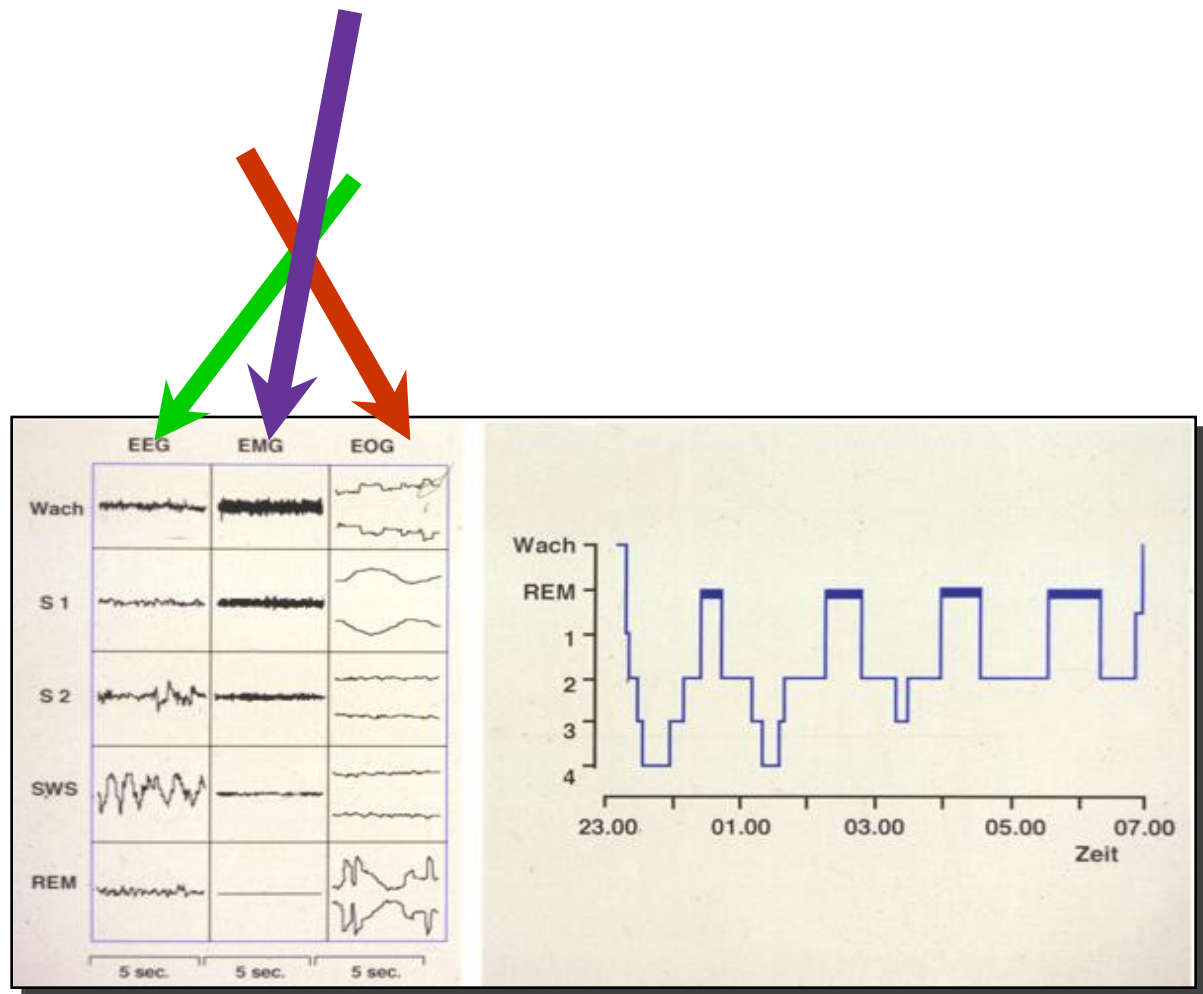


Polysomnography

Actimetry

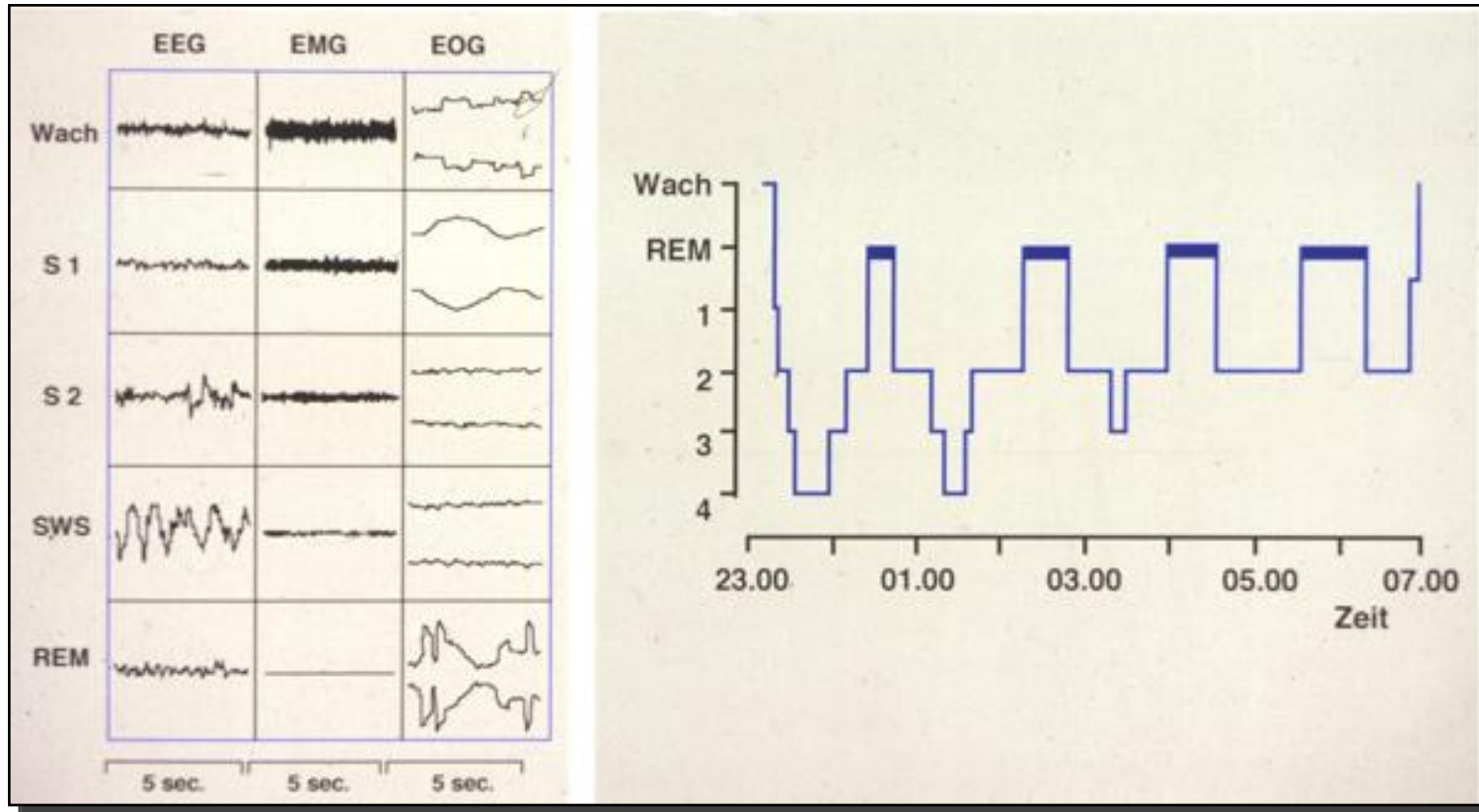


Sleep objective measurements



Sleep

Objective measurements



EEG = **E**lektro**E**ncephalo**G**ramm

EMG = **E**lektro**M**yo**G**ramm

EOG = **E**lektro**O**culo**G**ramm

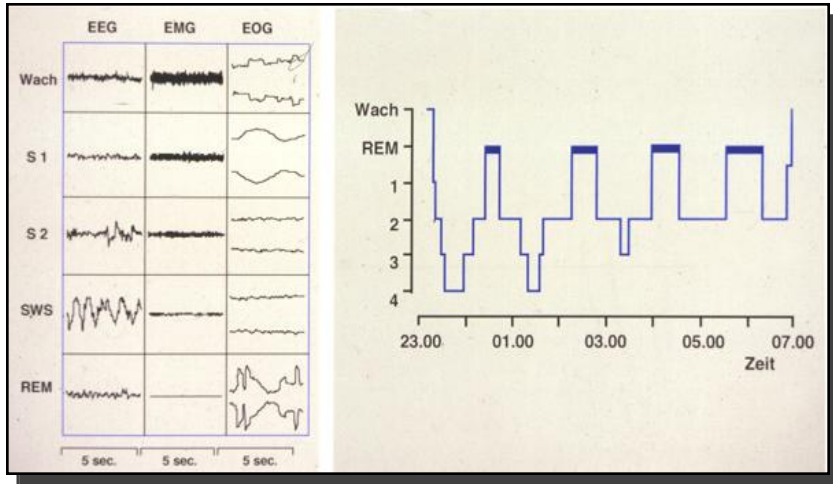
S = **S**tadium

SWS = **S**low **W**ave **S**leep

REM = **R**apid **E**ye **M**ovement (sleep)

Sleep

Objective measurements



Nathaniel Kleitman (ca. 1938),
Physiologieprofessor, University of
Chicago, School of Medicine
Eugene Aserinsky; Assistant, 1953

EEG = **E**lektro**E**ncephalo**G**ramm

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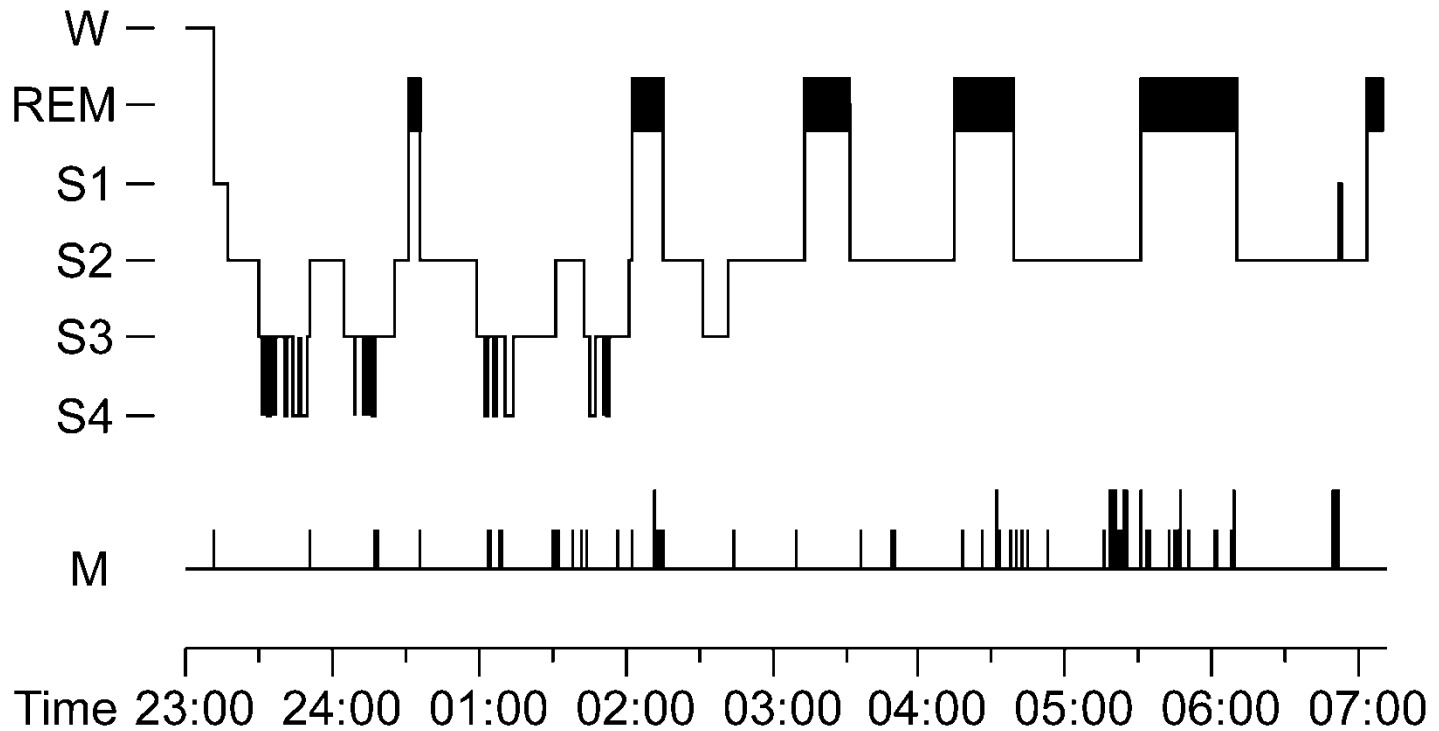
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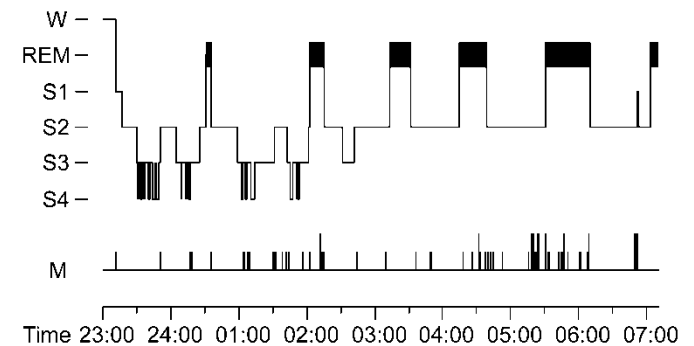
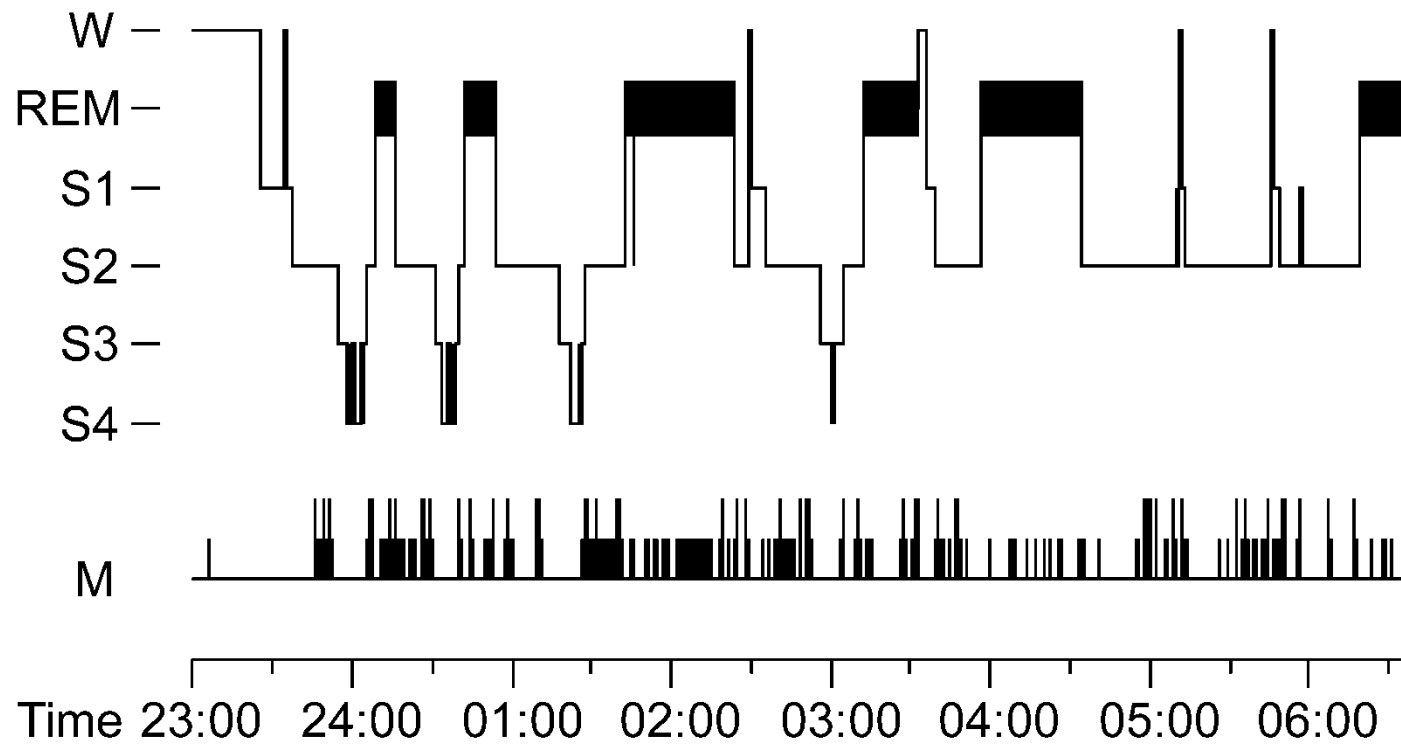
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Sleep

Objective measurements



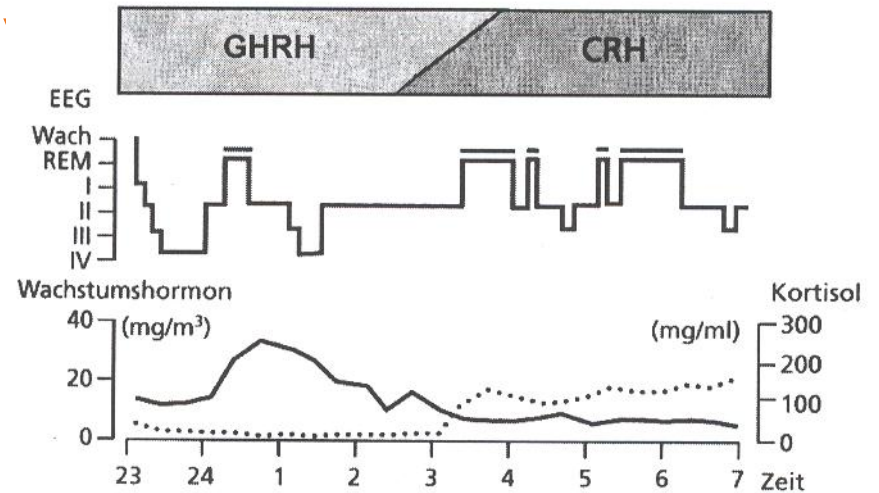
Sleep



SLEEP

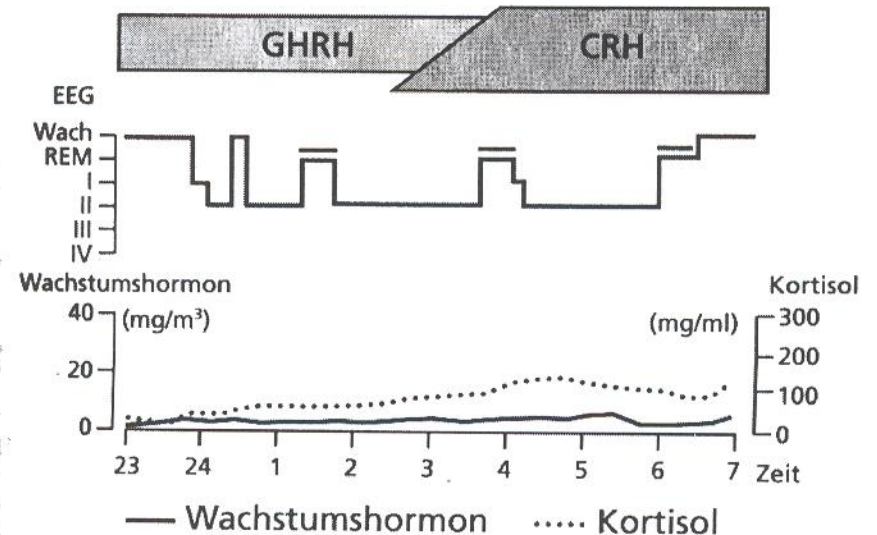
sleep and endocrinology

Healthy Person



GHRH = growth hormone releasing hormone
CRH = corticotropin releasing hormone

Patient suffering from MDD



The force of the will....

« Volli, e volli sempre, e fortissimamente volli »



Vittorio Alfieri
1749-1803



The force of the will....

« Volli, e volli sempre, e fortissimamente volli »

Timing the end of nocturnal sleep Born et al 1999

15 healthy young adults

3 nights in sleep lab

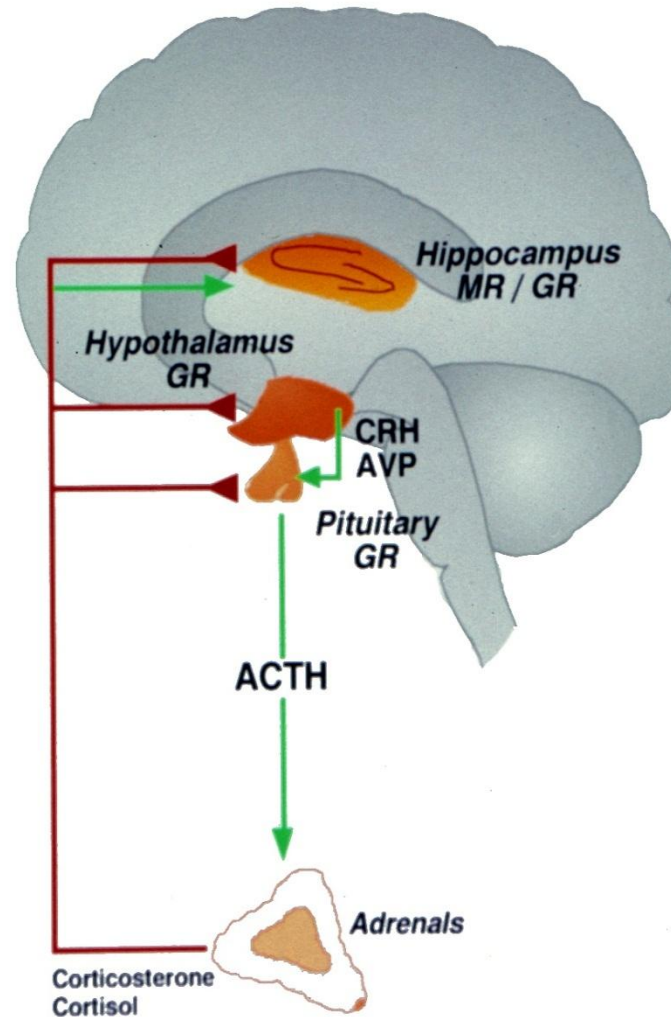
To bed at midnight

Waking up? – hmm, depending from the study condition

Blood sampling all 15' via venflon

Analyse von ACTH: Adrenocorticotropin =
Hormone responsible for cortisol release

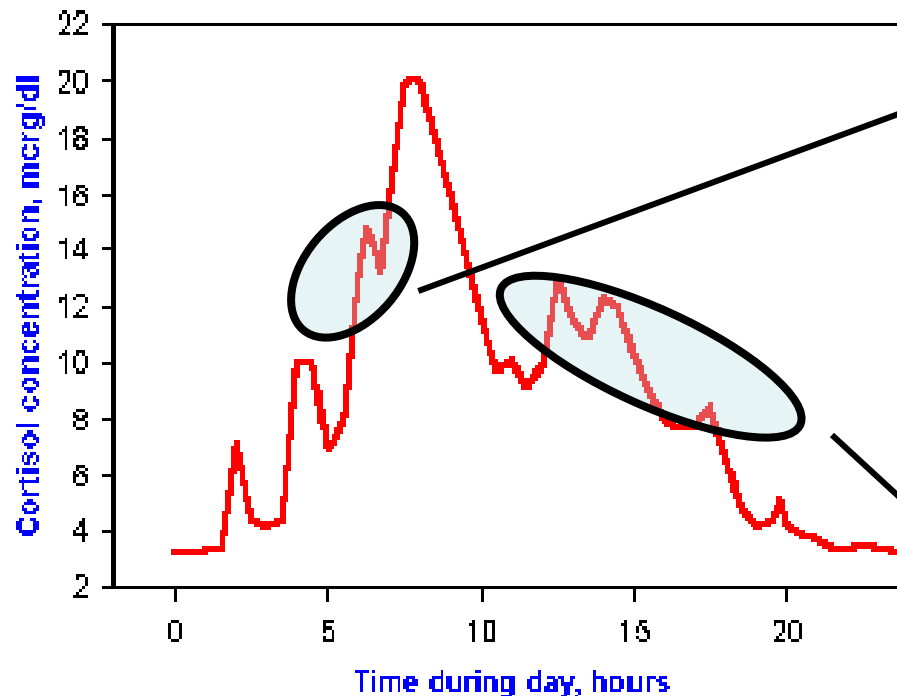
Hypothalamus-Pituitary-Adrenocortical-Axis Activity = HPA-AA



Emotional and
cognitive processes
trigger the HPA-AA

Mineralocorticoid- and
Glucocorticoid
receptor-activity
regulates the HPA-axis
activity

What do we know about the HPA-AA
over 24 hours?

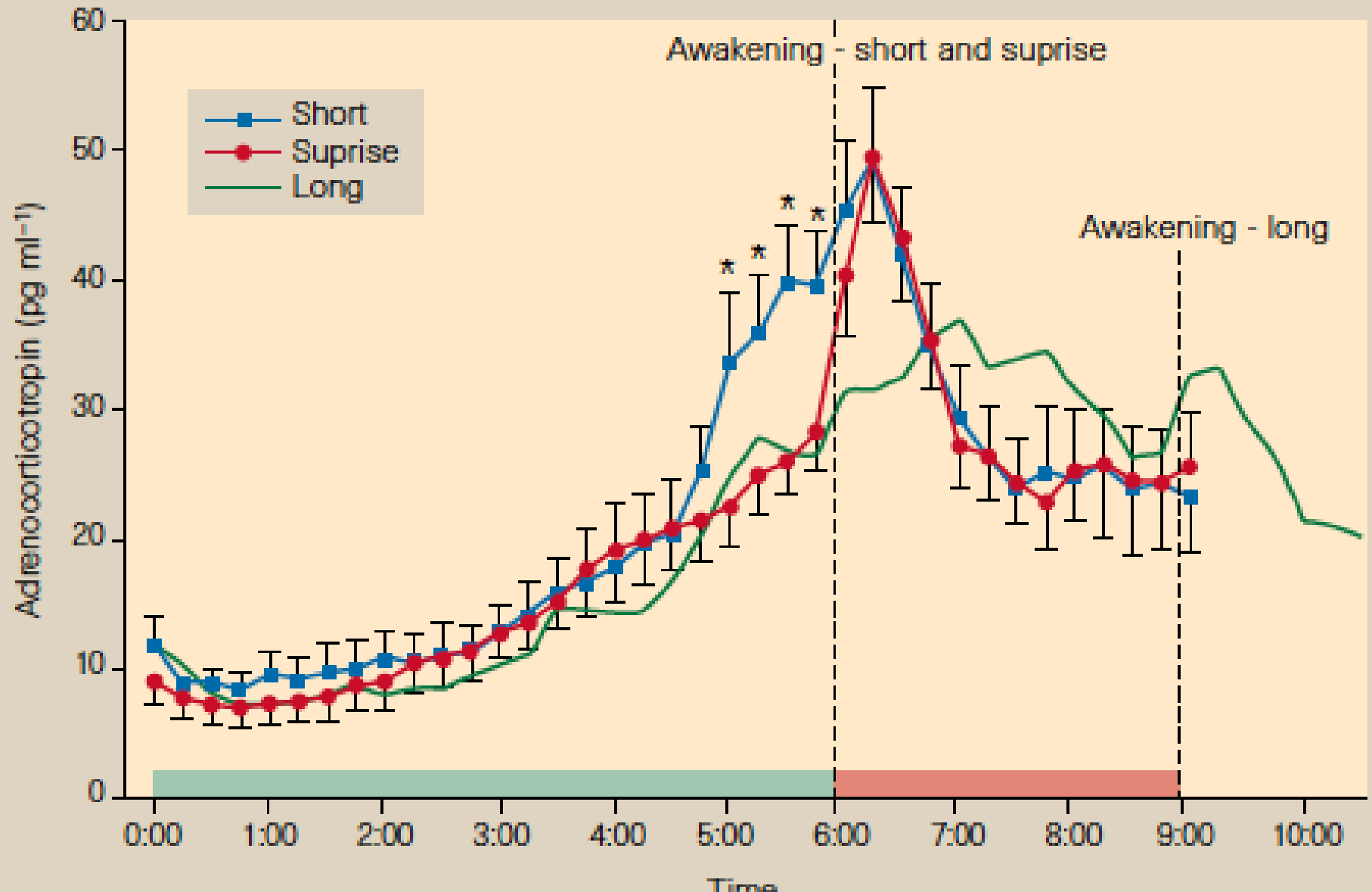


Morning cortisol secretion

**Saliva cortisol sampling
4 samples; 10' intervals
strict reference to the
awakening time
marker for baseline
cortisol
(Hellhammer et al., 2009)**

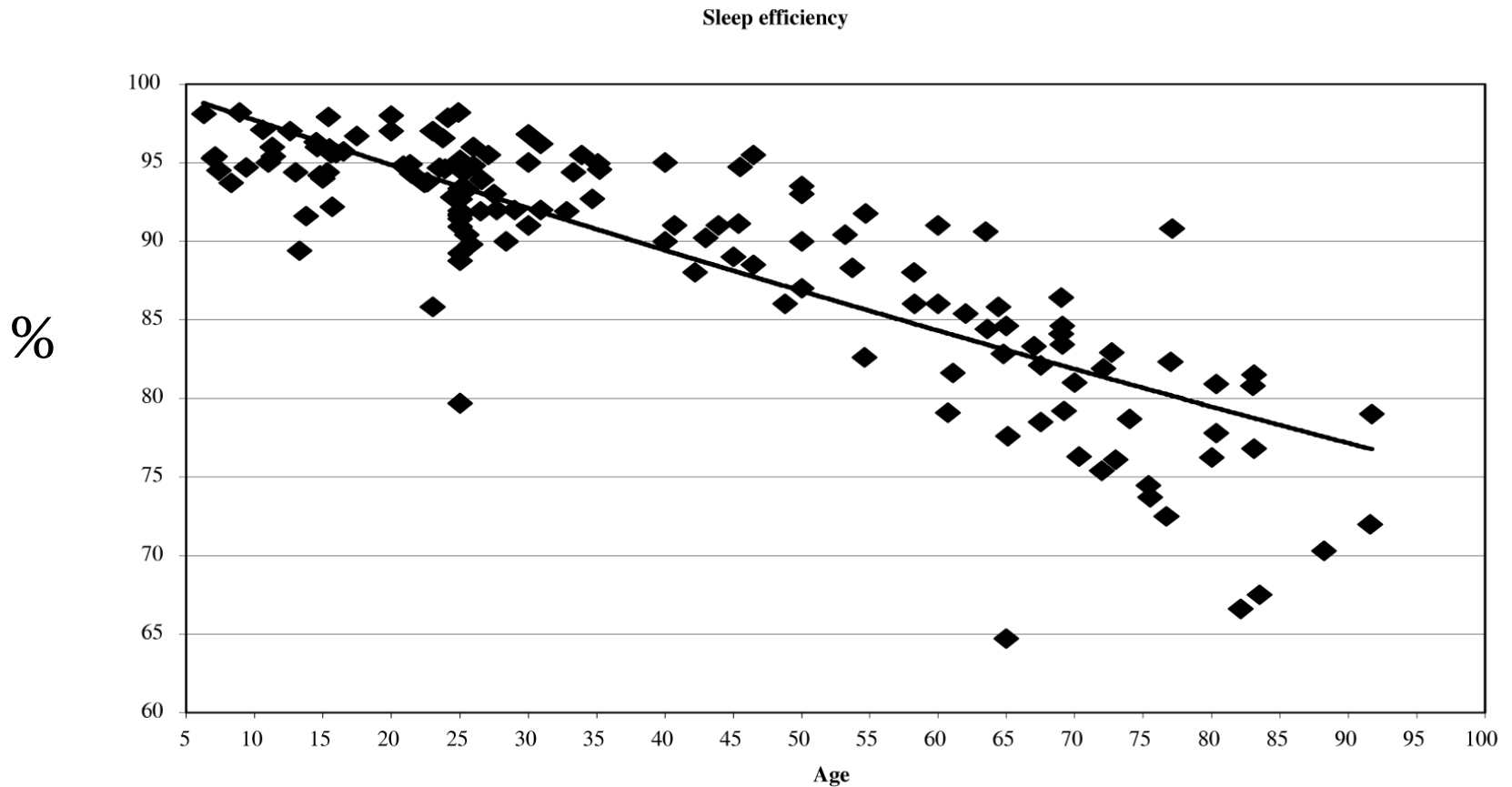
Time of assessment as covariate

The force of the will....



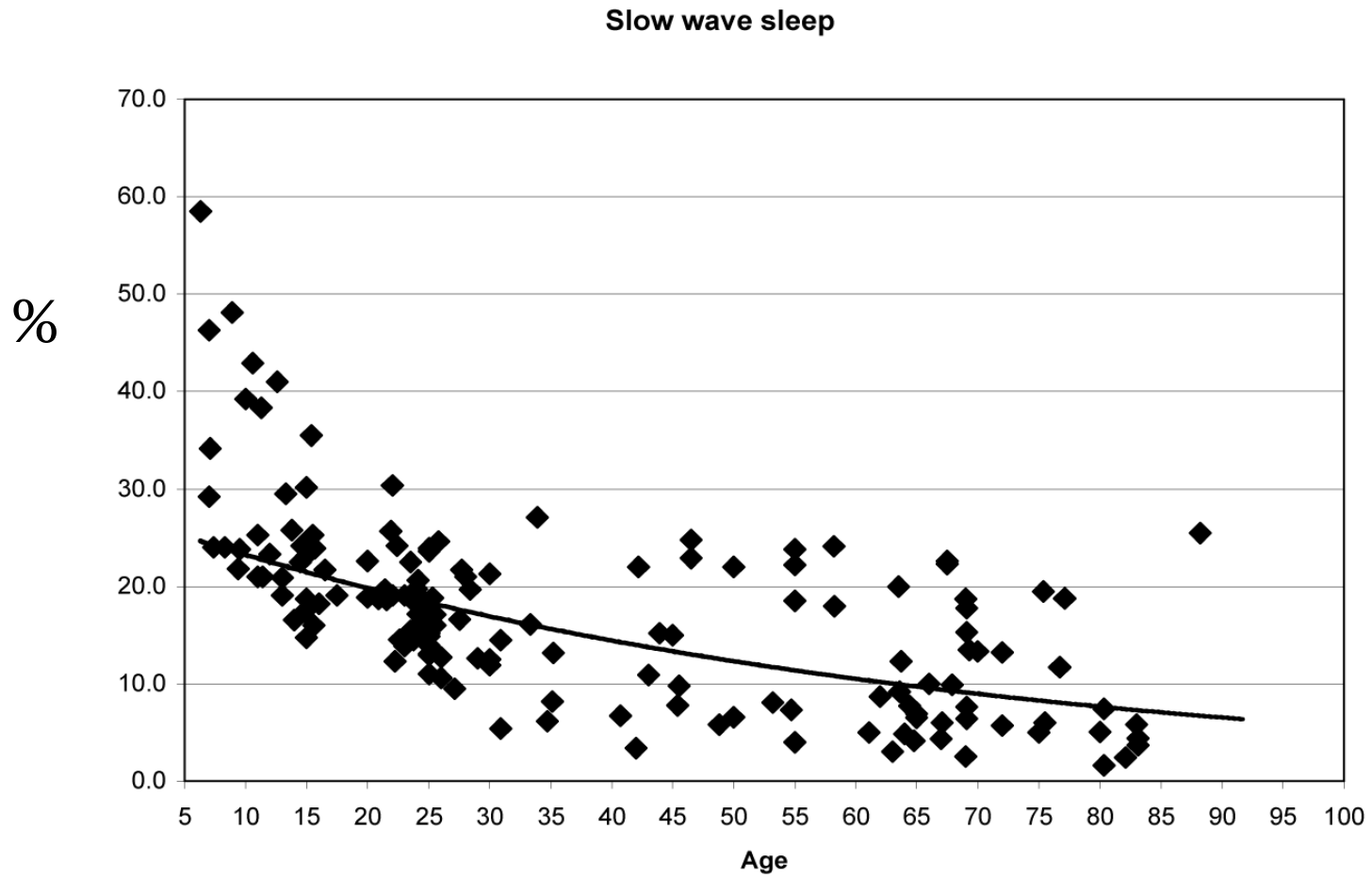
Sleep over life span

Meta-Analyse von Ohayon et al. 2004) SLEEP EFFICIENCY



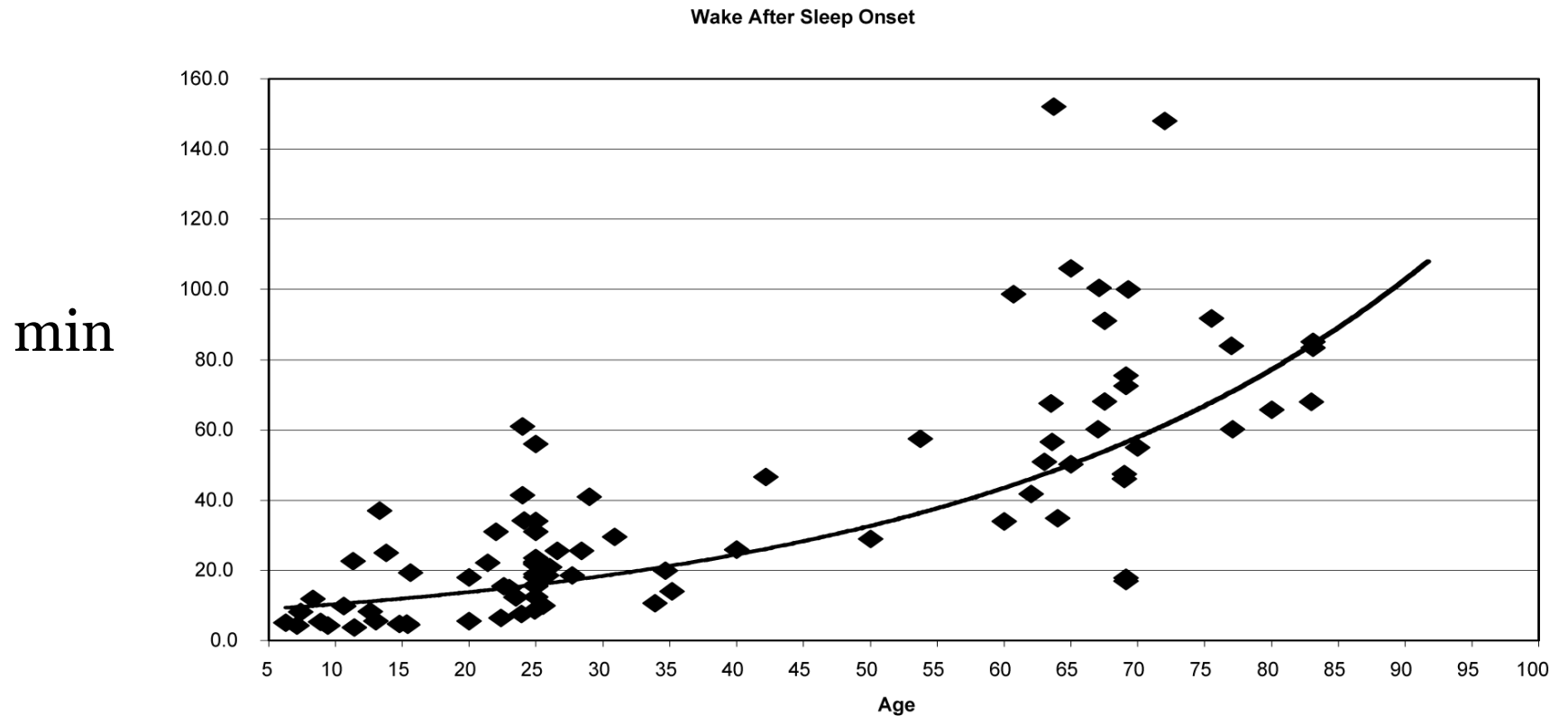
Sleep over life span

Meta-Analyse von Ohayon et al. 2004

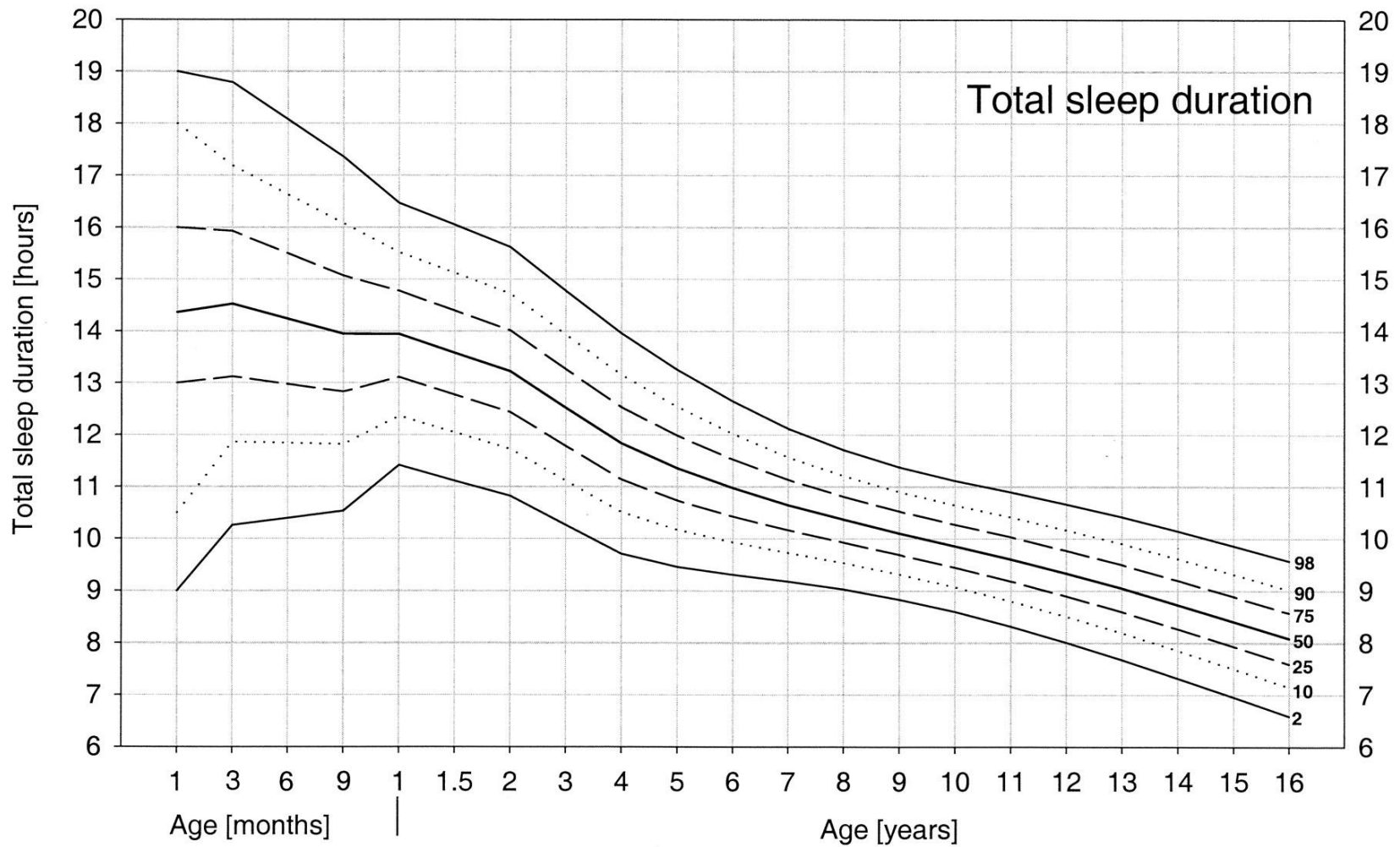


Sleep over life time

Meta-Analyse von Ohayon et al. 2004; wake time after sleep onset

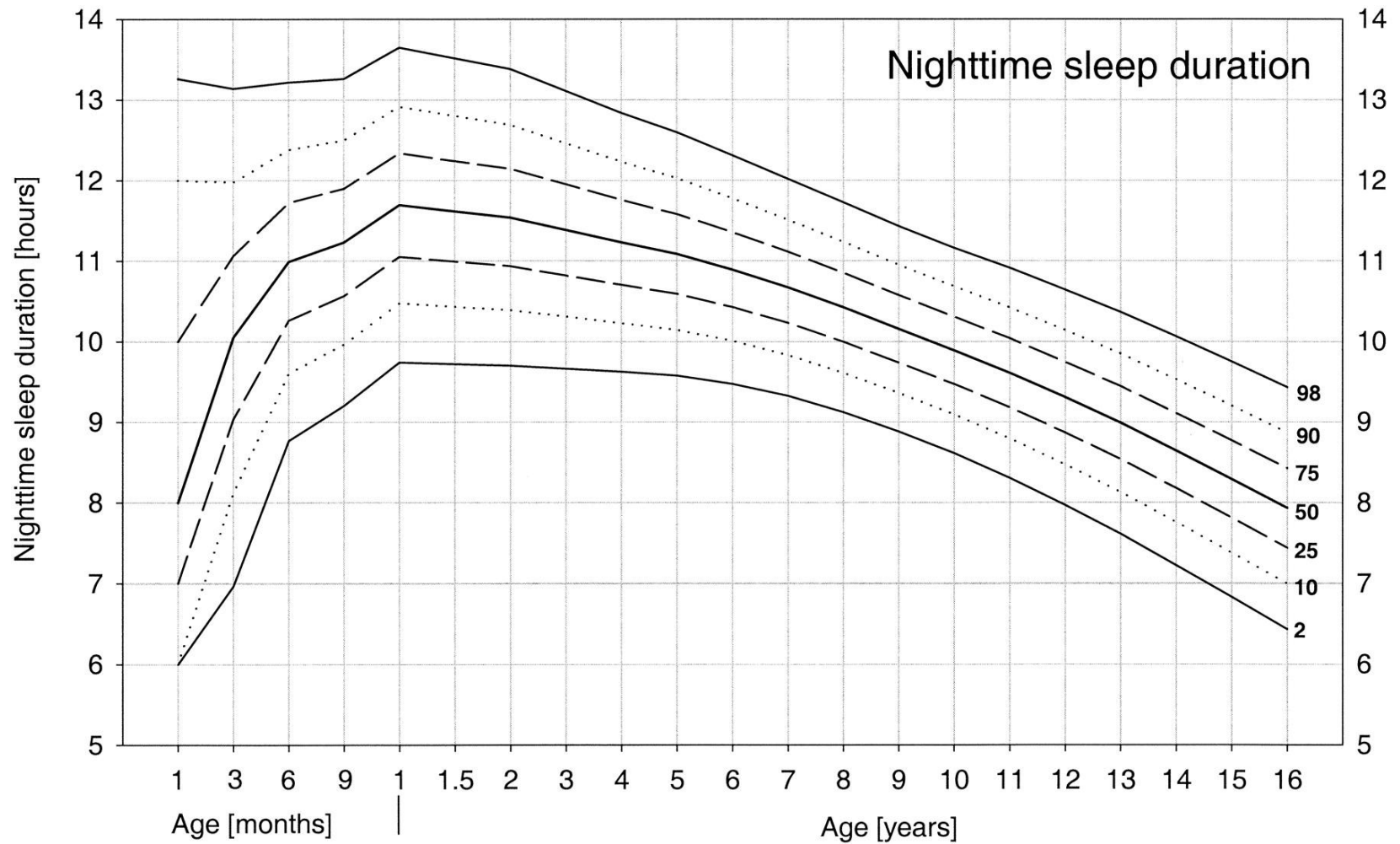


Percentiles for total sleep duration per 24 hours from infancy to adolescence.



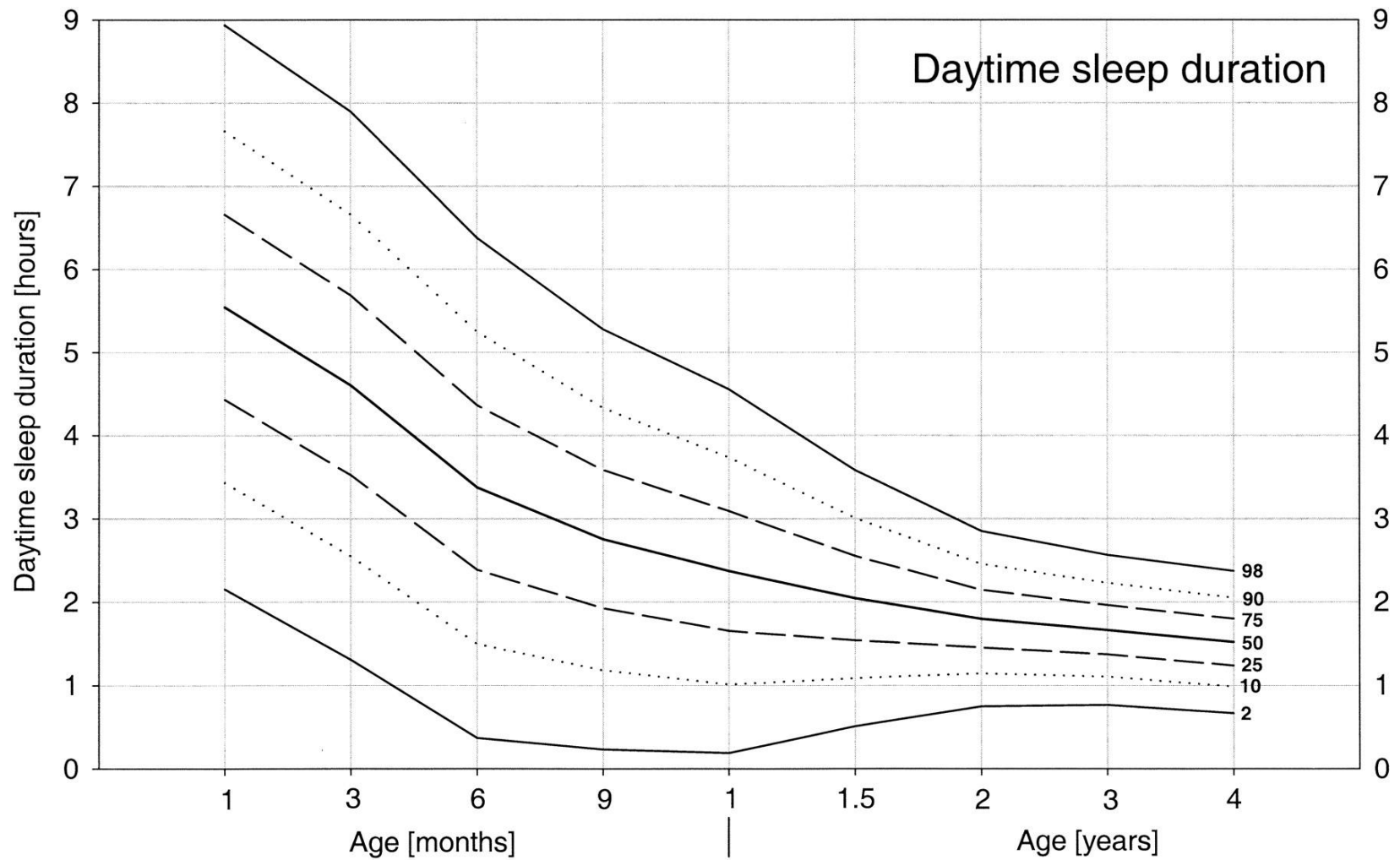
Iglowstein I et al. Pediatrics 2003;111:302-307

Percentiles for nighttime sleep duration per 24 hours from infancy to adolescence.



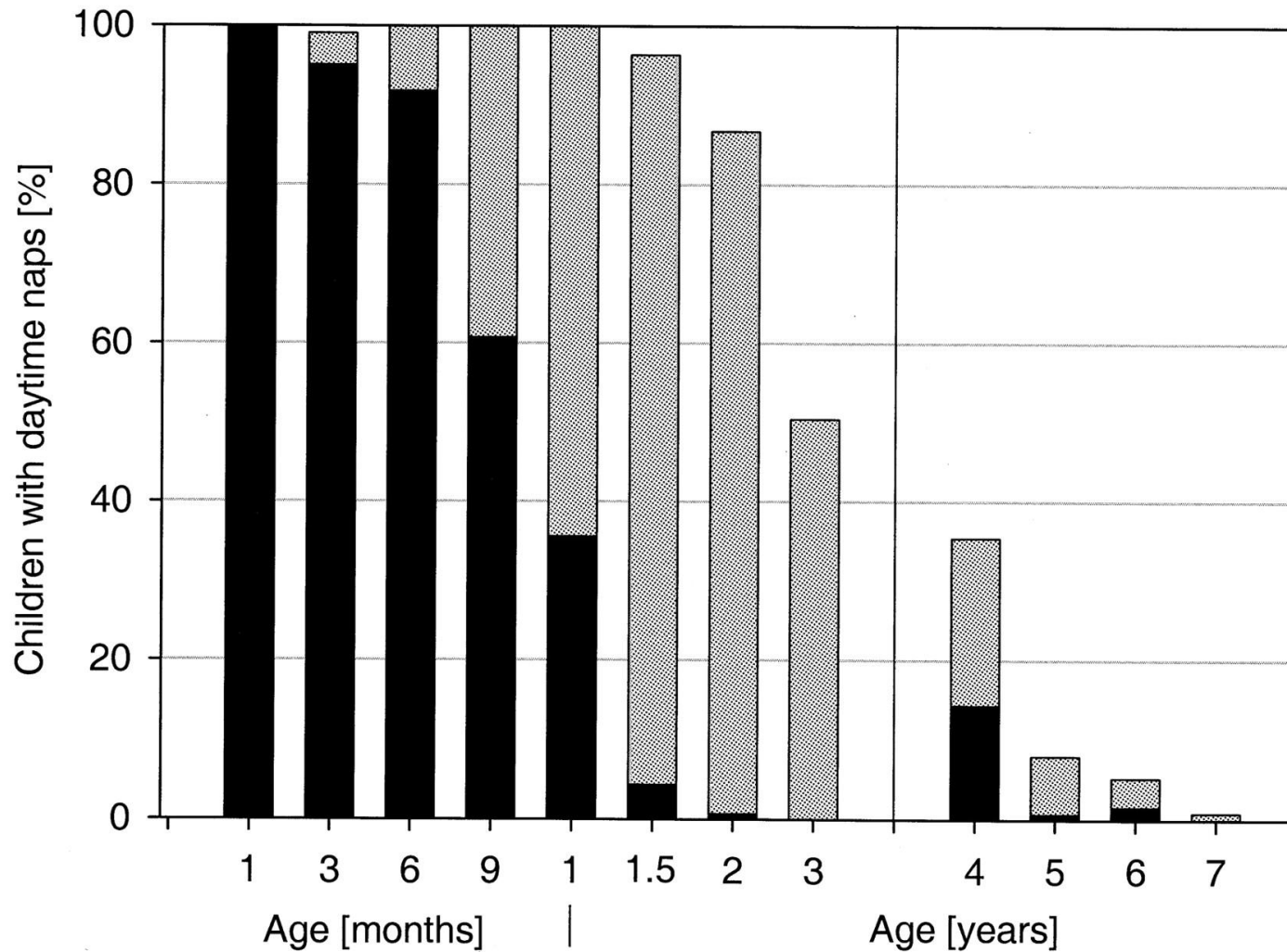
Iglowstein I et al. Pediatrics 2003;111:302-307

Percentiles for daytime sleep duration per 24 hours.



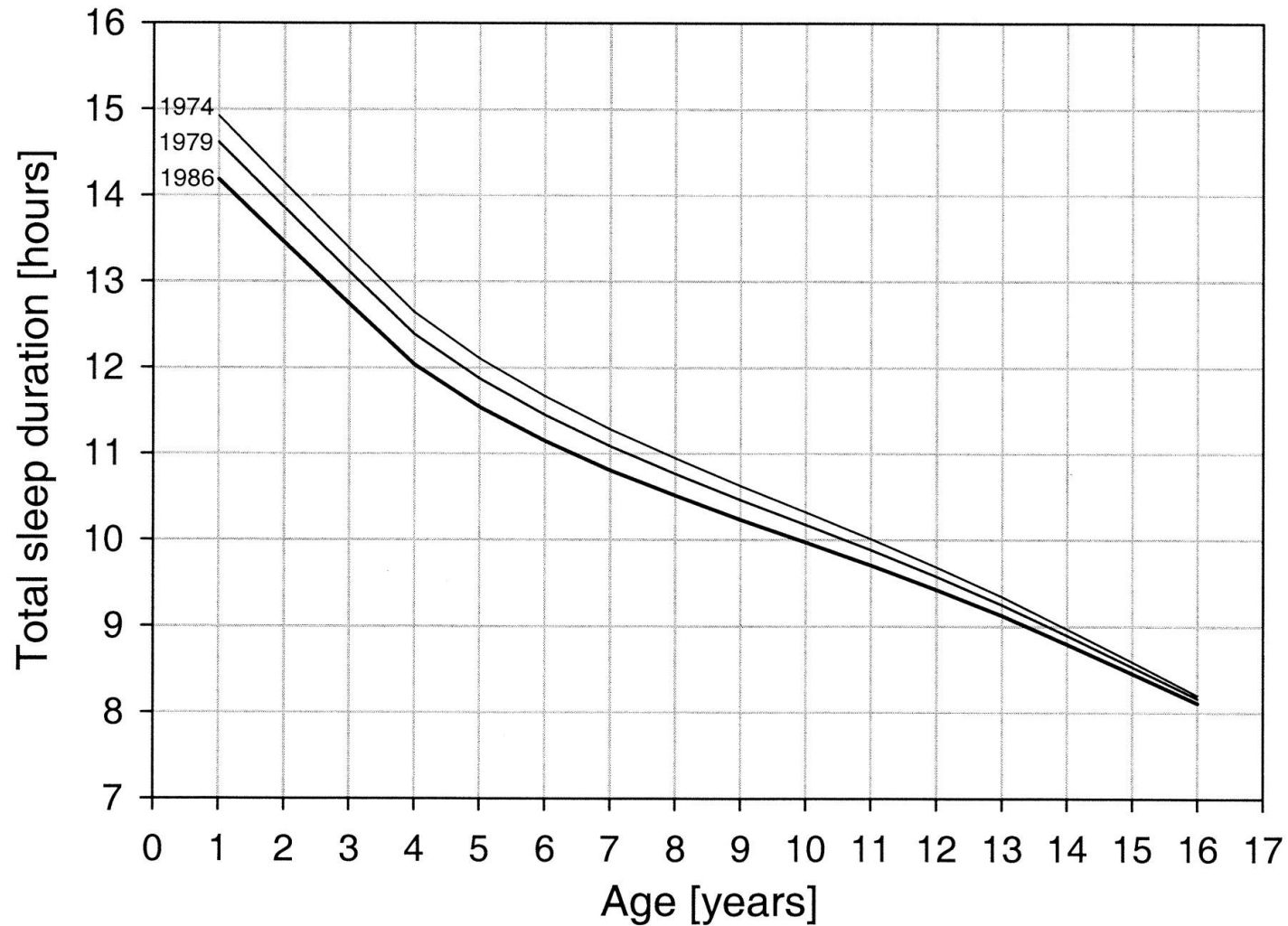
Iglowstein I et al. Pediatrics 2003;111:302-307

Percentage of children who napped during the first 7 years after birth.



Iglowstein I et al. Pediatrics 2003;111:302-307

Time trend of mean total sleep duration across 3 birth cohorts for birth years 1974, 1979, and 1986.

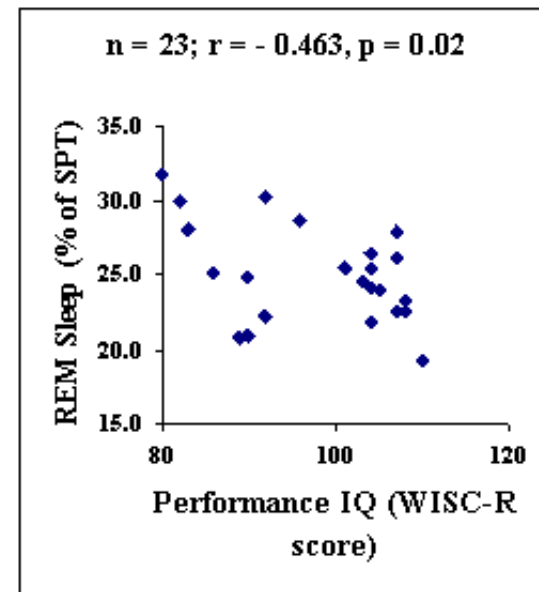
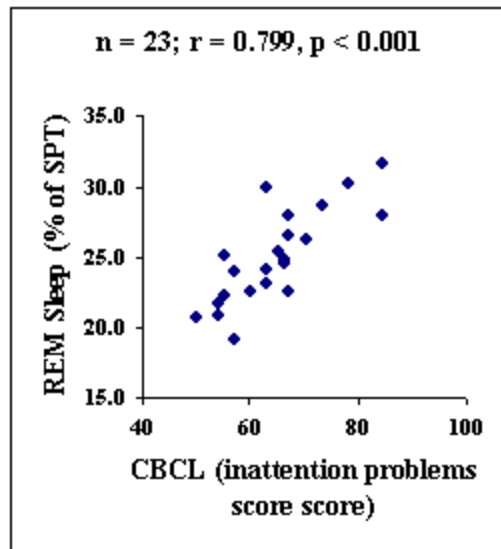


Iglowstein I et al. Pediatrics 2003;111:302-307

SLEEP AND ADHD

REM-SLEEP AND ADHD IN CHILDREN WITH ADHD

Figure 1 Children with Attention-Deficit/Hyperactivity Disorder: Rapid Eye Movement (REM) Sleep Correlates Positively with Psychopathological Scores and Negatively with Performance Intelligence Quotient (IQ)

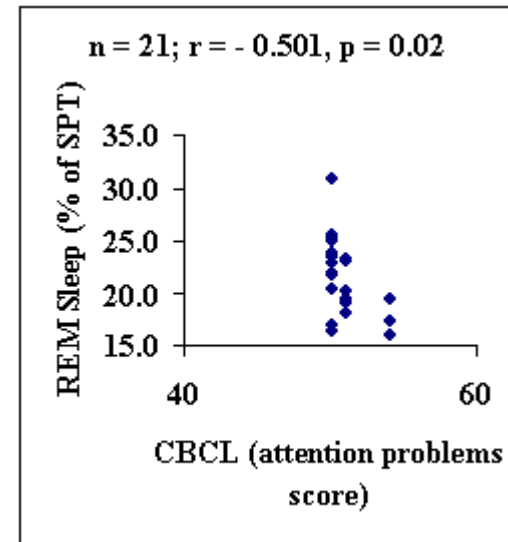
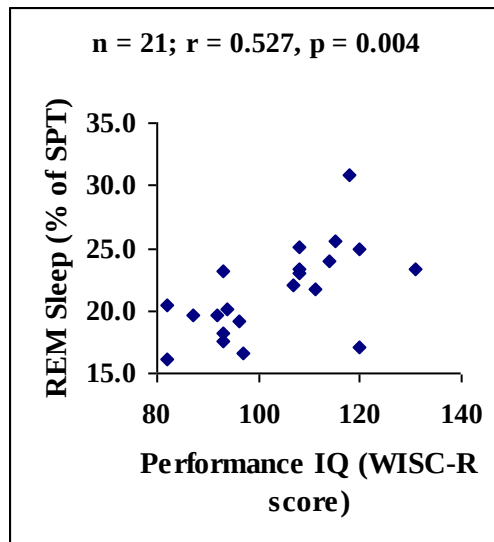


Kirov et al. 2012

SLEEP AND ADHD

REM-SLEEP IN HEALTHY CHILDREN

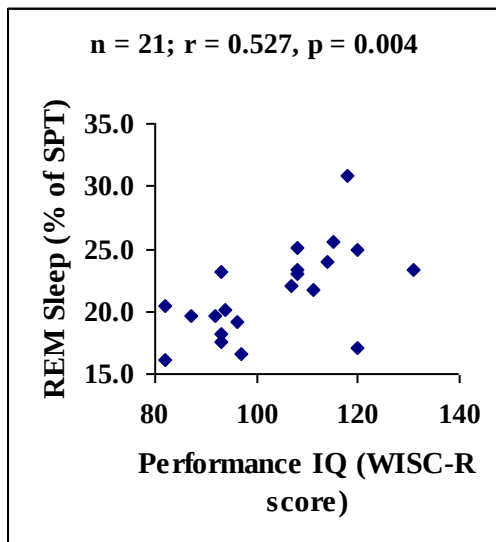
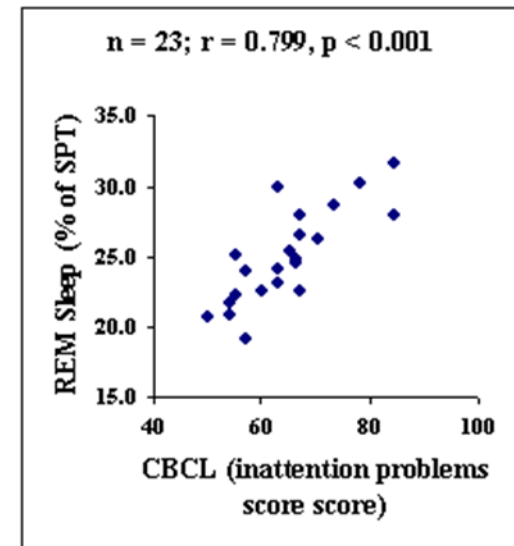
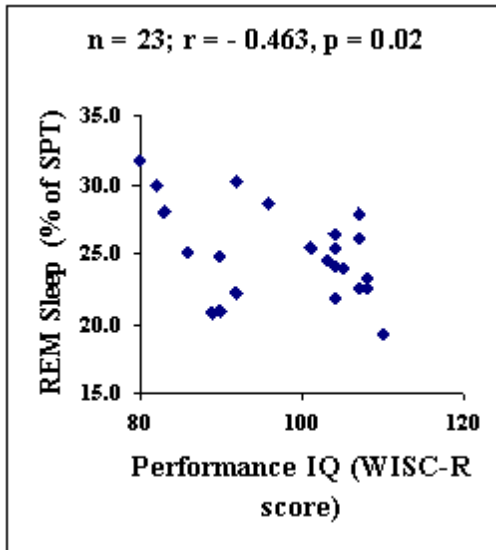
Figure 2 Healthy Children: Rapid Eye Movement (REM) Sleep Correlates Positively with Performance Intelligence Quotient (IQ) and Negatively with Psychopathological Scores



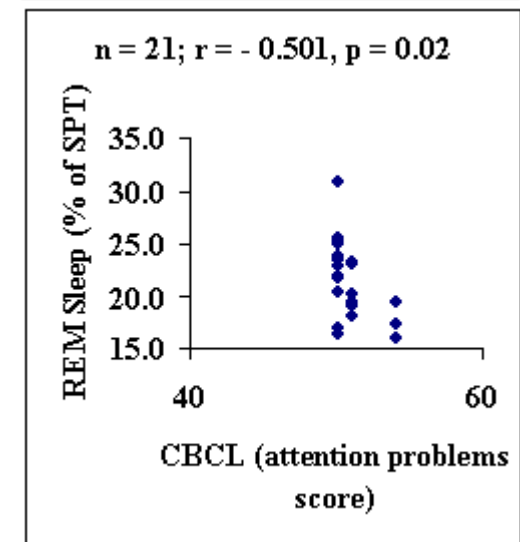
Kirov et al. 2012

SLEEP AND ADHD

ADHD



Healthy controls



Kirov et al. 2012

SLEEP AND ADHD

EXPERT REVIEWS

Sleep problems and their effect in ADHD

Expert Rev. Neurother. Early online, 1–13 (2014)

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Sleep problems are common in attention-deficit/hyperactivity disorder (ADHD) to the extent that they mimic or exacerbate daytime symptoms expression. In this review, we advocate the need for a better understanding of sleep alterations in youths with ADHD and their impact on neurobehavioral functions including learning, memory and emotional regulation. An in-depth exploration of existing data showed that although extensively studied, the actual nature of sleep problems in ADHD and their effects on daytime behavior are still less well understood. Important issues, among which developmental changes in sleep architecture and role of subtle sleep electroencephalogram signatures, are generally neglected. Future research of sleep effects on behavior in ADHD would benefit from considering developmental aspects and links between brain activation patterns during sleep and wake.

KEYWORDS: ADHD • development • memory and emotion • neurobehavioral functions • rapid eye movement sleep • sleep architecture • sleep electroencephalogram signatures • sleep problems



In a randomized case-control trial with 10-years olds suffering from attention deficit hyperactivity disorder (ADHD) sleep and psychological functioning improved during a 12-week sleep-training program

Journal:	<i>The World Journal of Biological Psychiatry</i>
Manuscript ID:	SWBP-2013-0113
Manuscript Categories:	Original Investigation/Summaries of Original Research
Date Submitted by the Author:	09-Jan-2014
Complete List of Authors:	Keshavarzi, Zahra; Psychiatry & Psychology Research Center (PPRC), Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, Iran, Bajoghli, Hafez; Psychiatry & Psychology Research Center (PPRC), Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, Iran, Mohamadi, Mohammad Reza; Psychiatry & Psychology Research Center (PPRC), Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, Iran, Salmanian, Maryam; Psychiatry & Psychology Research Center (PPRC), Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, Iran, Kirov, Roumen; Institute of Neurobiology Bulgarian Academy of Sciences, Sofia, Bulgaria , Gerber, Markus; Department of Sport and Health Sciences, University of Basel, Basel, Switzerland, Holsboer-Trachsler, Edith; Psychiatric Hospital of the University of Basel, Center for Affective-, Stress- and Sleep Disorders (ZASS), Basel, Switzerland, Brand, Serge; Psychiatric University Clinics Basel, Depression Research Unit
Keywords:	ADHD, Children, Sleep deprivation, social improvement, emotions

Keshavarzi et al WJBiolPsych in press

40 children with ADHD/S randomized; control- vs. treatment

20 healthy children

12 weeks

1x/w contact with the study staff

Keshavarzi et al WJBiolPsych in press

Intervention:

Intensive training program with PARENTS

1. Sleep log
2. 2h before sleeping: electronic devices shut
3. Hot shower/bath 2h before going to sleep
4. Board/table games
5. Reading together a book

Keshavarzi et al WJBiolPsych in press

40 Kinder mit ADHD/S randomisiert: Kontroll- vs. Treatment

20 Kinder; gesund; unauffällig

6. Child reads alone

7. Repeat highlights of the day („catch him/her at being good)

8. Highlights of the next day = looking forward to....

9. Token system (to fix before); for every ‚good/successful‘ night
= 1 token; for 3 tokens = reward

Keshavarzi et al WJBiolPsych in press

RESULTS:

COMPARED TO CONTROL CONDITION:

Parents: sleep increased (quantity, quality)

Mood increased; increased emotion regulation;
increased relation to peers, parents, teachers

Self-report: sleep increased (quantity, quality)

Mood increased; increased emotion regulation;
increased relation to peers, parents, teachers

Associations between Infants' Crying, Sleep and Cortisol Secretion and Mother's Sleep and Well-Being

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Edith Holsboer-Trachsler^a

^aCenter for Affective, Stress and Sleep Disorders, Psychiatric Clinics of the University of Basel,

^bUniversity Children's Hospital Basel, and ^cInstitute of Osteopathy, Basel, Switzerland

SLEEP IN INFANTS AND THEIR MOTHERS

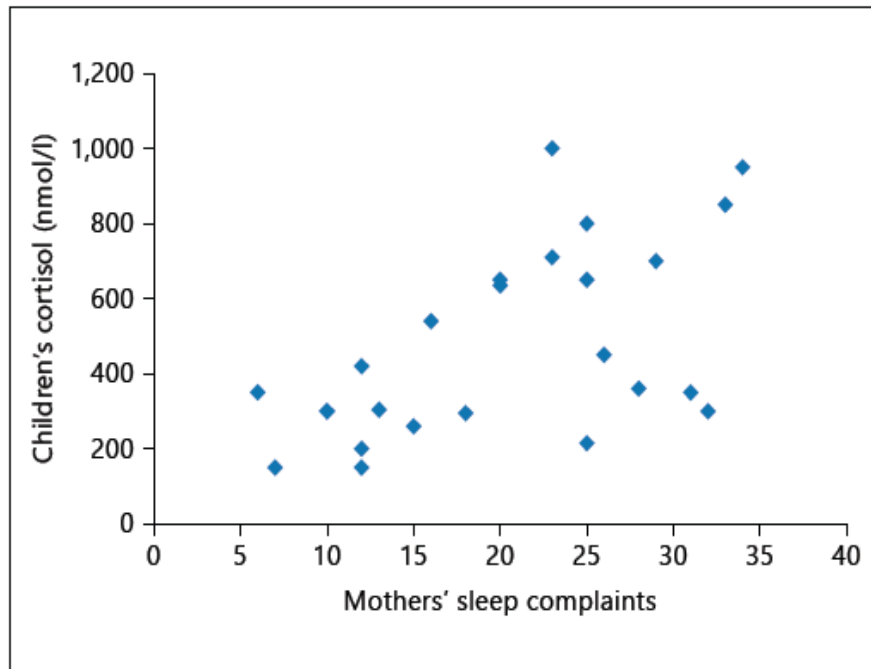


Fig. 1. Mothers' sleep complaints increased with infants' cortisol secretion ($r = 0.40$, $p = 0.03$).

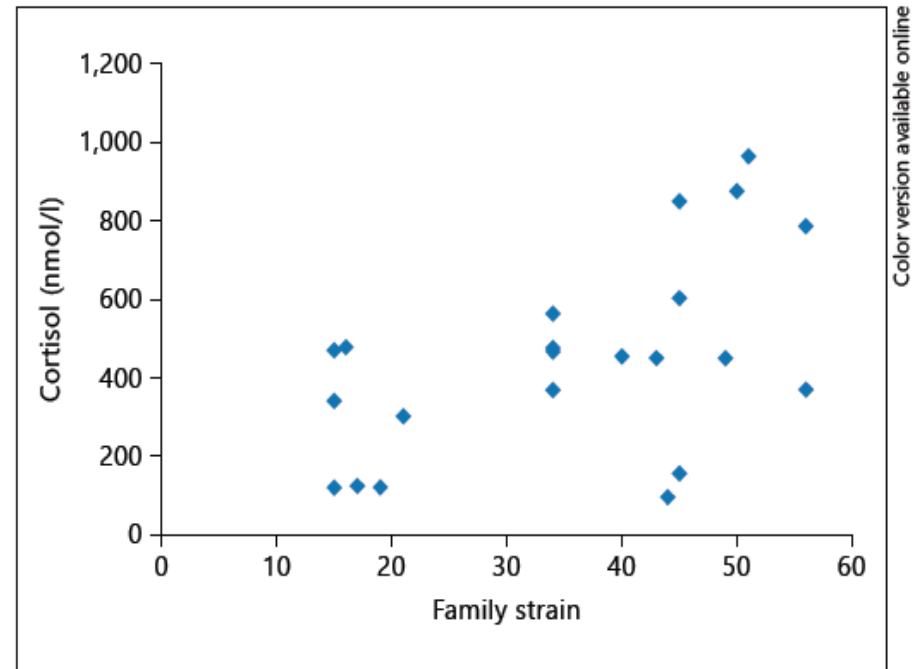
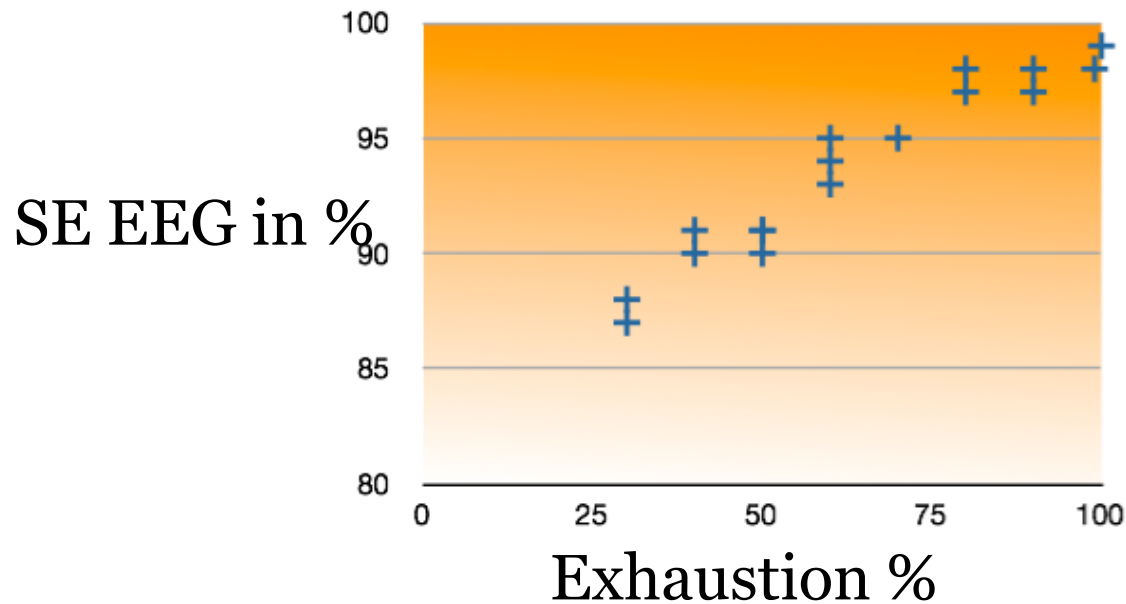


Fig. 2. Mothers' family strain increased with infants' cortisol secretion ($r = 0.47$, $p = 0.001$).

Exercising before sleeping

- › 52 adolescents 18.5 year alt; 46 % females; ca. 8h exercising/week
- › 3 x exercising in the evening



$$R_2 = .77$$

$$r = .88$$

Exercising before sleeping does **NOT** impair sleep!

- › Brand et al 2014; Sleep Medicine
- › Buman et al 2014; Sleep Medicine: Exercisers sleep better, regardless of the timing of exercising

Summary

- › **We sleep to perform better during the day**
- › **Sleep and learning are associated**
- › **Sleep disturbances are mainly caused by psychological factors**
- › **Exercising and good sleep are associated**
- › **6-46% suffer from insomnia**
- › **Treating sleep improves sleep, behavior and mood in children with ADHD**

Thank you very much for your attention!

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WEITERBILDUNG SCHLAF

Schlafmangel wird ursächlich mit Unfällen am Arbeitsplatz assoziiert

Headline hitting disasters:

Three Miles Island, Chernobyl Atomkraftwerke

Exxon Waldes; Estonia Schiffsunglücke

werden mit Schlafmangel der Crews in
Verbindung gebracht

Rund 25% der Verkehrsunfälle werden auf das
Einschlafen am Steuer zurückgeführt

WEITERBILDUNG SCHLAF

Schlafmangel wird ursächlich mit Unfällen am Arbeitsplatz assoziiert

Unregelmässige Arbeitszeiten: rund 20-25% der registrierten arbeitenden Bevölkerung arbeitet in den Industrieländern ausserhalb der Tageszeiten; Schichtarbeit; Wochenendarbeit

Arbeitsbelastungen führen zu vermindertem Schlaf; High demand-low control-jobs

Tourismus und Hotellerie: Schicht-/Wochenend-

WEITERBILDUNG SCHLAF

QUIZFRAGE

**Körperliche
Aktivität (KA) hat
einen günstigen
Einfluss auf den
Schlaf!**

Körperliche Aktivität und Schlaf

PLAUSIBILITÄT

Häufige und regelmässige KA



Erholsamer, befriedigender Schlaf

Körperliche Aktivität und Schlaf

PLAUSIBILITÄT

Häufige und regelmässige KA



Erholsamer, befriedigender Schlaf

Klinische und nicht-klinische Beobachtung

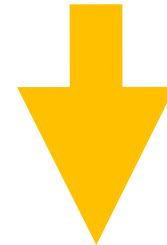
Körperliche Aktivität und Schlaf

PLAUSIBILITÄT

Häufige und regelmässige KA



**Verarbeitung von Denken und Fühlen
= Informationsverarbeitung**



Erholsamer, befriedigender Schlaf
Klinische und nicht-klinische Beobachtung

VORÜBERLEGUNGEN

Körperliche Aktivität und Schlaf

PLAUSIBILITÄT

Häufige und regelmässige KA



Erholsamer, befriedigender Schlaf

**Auf Anhieb plausibel, doch wenig
wissenschaftliche Evidenz**

Körperliche Aktivität und Schlaf

EPIDEMIOLOGIE BEI ERWACHSENEN

Hauptresultate (1):

Viel Bewegung und Wohlbefinden sind assoziiert (vgl. Arakawa et al., 2002; Kim et al., 2000)

Geringe KA signifikant assoziiert mit Insomnie (Morgan, 2003) über 4 und 8 Jahren

$N = 1042$; $N = 673$ (-35%); $N = 390$ (-62.5%)

Körperliche Aktivität und Schlaf

EPIDEMIOLOGIE BEI ERWACHSENEN

Hauptresultate (2):

Urponen et al. 1988 (Finnland; N = 1190):

“Was hilft Ihnen am besten, um rasch einzuschlafen und gut zu schlafen?”

1. Platz: KA

2. Platz: Sauna

3. Platz: Musik hören, entspannen

Zusammenfassend in Youngstedt & Frelove-Charton
(2005)

Körperliche Aktivität und Schlaf
EPIDEMIOLOGIE BEI ERWACHSENEN
HAUPTSCHWIERIGKEIT

Heterogene Populationen

Keine Erhebung von Psychopathologie

Keine validierten und reliablen Fragebogen

**‘Körperliche Aktivität’ sehr rudimentär
erfasst**

SCHLAF BEI HALBPROFIFUSSBALLSPIELER

‘Football Is Good for Your Sleep’

Favorable Sleep Patterns and Psychological Functioning of Adolescent Male Intense Football Players Compared to Controls

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Abstract

It is commonly assumed that physical activity exerts a favorable impact on sleep, although scientific evidence is lacking. This study investigated the impact of football sports on the sleep patterns of 36 male chronic and intense football players and 34 controls. Participants completed a sleep log for seven consecutive days. Compared to controls, football players reported shorter sleep onset latency, fewer awakenings, higher scores of sleep quality and a lower variability of sleep from weekdays to weekends. The findings suggest that football sports activity is positively associated with both quantitative and qualitative dimensions of sleep.

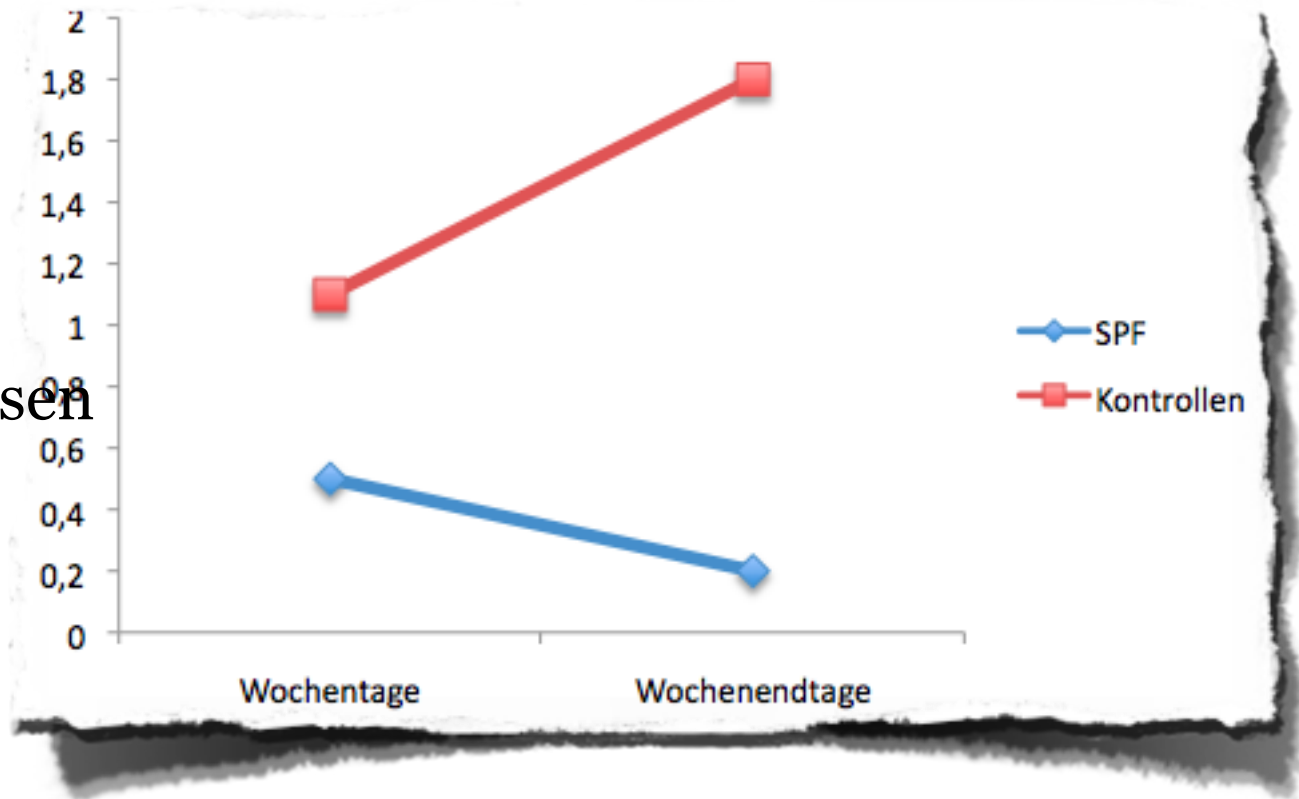
SCHLAF BEI HALBPROFIFUSSBALLSPIELER IM VERGLEICH ZU KONTROLLEN

36 männliche Halbprofis
rund 15.5 Jahre alt;
rund 14h netto intensive körperliche Aktivität
(switzen, atemlos, erschöpft); 4 x Training; 1
Match am Wochenende

34 Kontrollen; geschlechts-, alters-, und
Schulniveau-gematched

Schlaf- und Aktivitätsprotokoll für 7 Tage

SCHLAF BEI HALBPROFIFUSSBALLSPIELER IM VERGLEICH ZU KONTROLLEN



Aufwachphasen

SPF = Semiprofessionelle
Fussballspieler

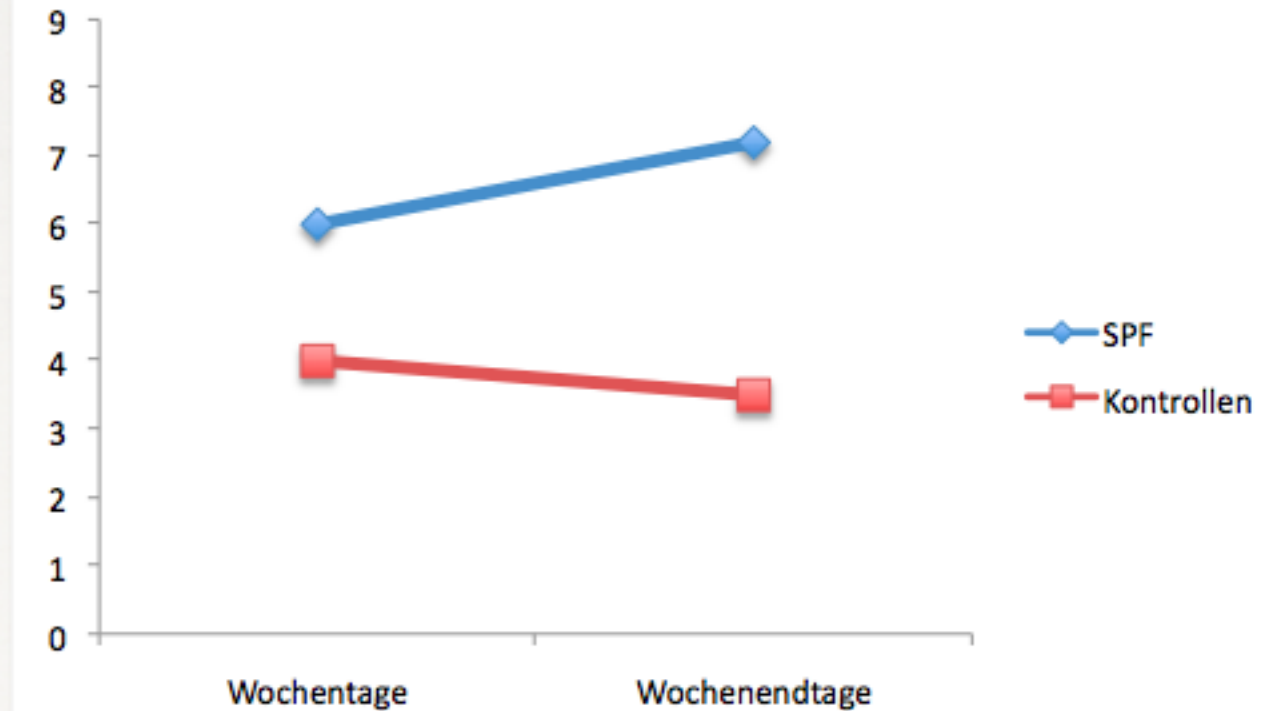
Wochentage

SCHLAF BEI HALBPROFIFUSSBALLSPIELER IM VERGLEICH ZU KONTROLLEN

Sehr gut erholt

Erholtsein

Sehr schlecht erholt



SPF = Semiprofessionelle
Fussballspieler

Wochentage

SCHLAF BEI HALBPROFIFUSSBALLSPIELER IM VERGLEICH ZU KONTROLLEN

The World Journal of Biological Psychiatry, 2010; 11(2): 465–475



ORIGINAL INVESTIGATION

Evidence of favorable sleep-EEG patterns in adolescent male vigorous football players compared to controls

SERGE BRAND¹, JOHANNES BECK¹, MARKUS GERBER²,
MARTIN HATZINGER³ & EDITH HOLSBOER-TRACHSLER¹

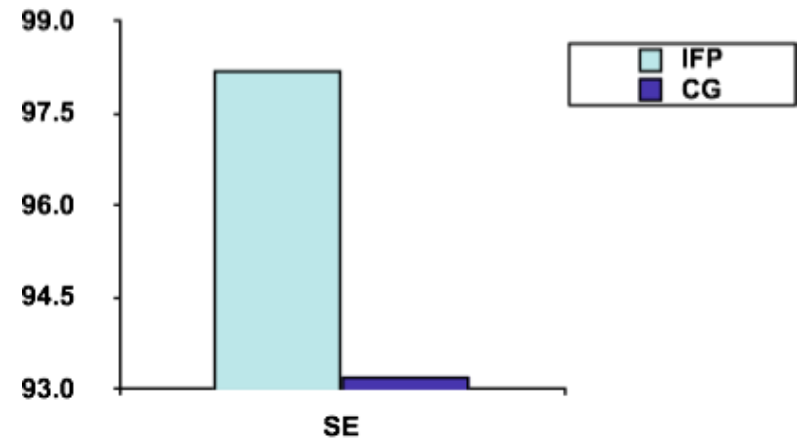
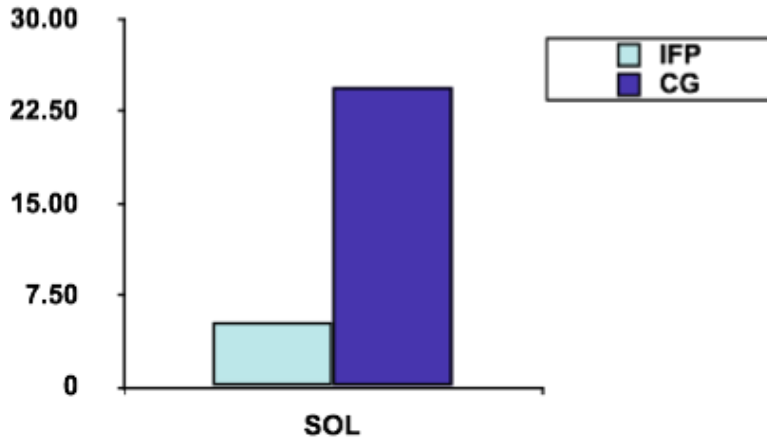
¹*Depression and Sleep Research Unit, Psychiatric Hospital of the University of Basel, Basel, Switzerland,*

²*University of Basel, Institute of Sports Exercise and Health Sciences, Basel, Switzerland, and*

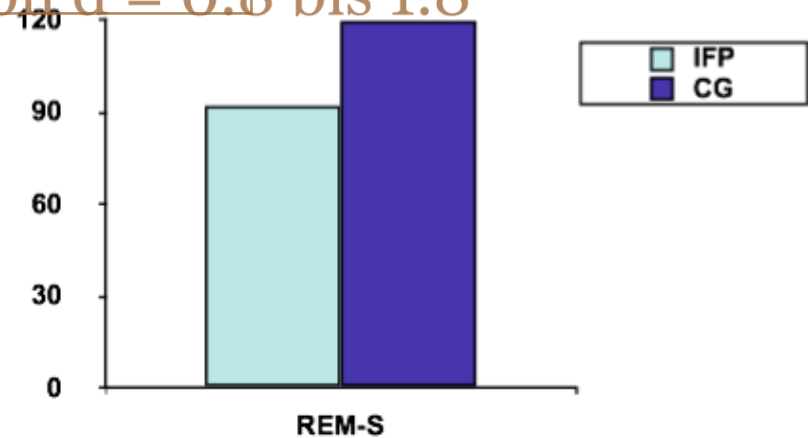
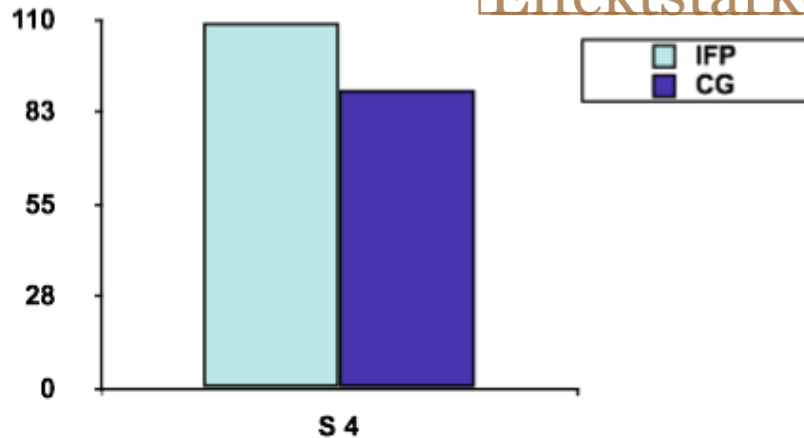
³*Psychiatric Outpatient Department of the University of Basel, Basel, Switzerland*

Subsample
16 Halbprofifussballer
16 Kontrollen
Nachtableitung OHNE Tagestraining!

SCHLAF BEI HALBPROFIFUSSBALLSPIELER IM VERGLEICH ZU KONTROLLEN



Effektstärken von $d = 0.8$ bis 1.8



SCHLAF BEI HALBPROFIFUSSBALLSPIELER IM VERGLEICH ZU KONTROLLEN

Fazit: Körperliche Aktivität ist mit günstigen Schlafmustern assoziiert
Objektiv sind die Schlafmuster auch dann günstiger, wenn am Tag der Schlafableitung kein Training stattgefunden hat

Hypothese: Längerfristige (ca. 8 Jahre) körperliche Aktivität scheint mit jenen neuronalen Aktivitäten assoziiert zu sein, die den Schlafrhythmus steuern

SCHLAF BEI ELITESPORTLERINNEN UND - SPORTLER

IM VERGLEICH ZU KONTROLLEN

439 Jugendliche; hiervon rund 250 Elitesportler aus
Swiss Olympic Classes; rund 190 Kontrollen

Zielgruppe: rund 19h intensiven Sport

Kontrollgruppe: rund 6h intensiven Sport (!)

Aktivitäts- und Schlaftagebuch für 7 Tage

Fragebogen zu Befindlichkeit (*psychological
functioning*)

Brand et al. JAH 2010

SCHLAF BEI ELITESPORTLERINNEN UND -SPORTLER

IM VERGLEICH ZU KONTROLLEN

Resultate:

Elitesportler: regelmässige Schlaf-Wach-Rhythmen;
erhöhte Schlafqualität; bessere Erholung
Grundsätzlich selbstbewusster

Risikogruppe? Männliche Nicht-Sportler mit sehr geringer körperlicher Aktivität:

geringes Selbstwertgefühl
erhöhter Substanzgebrauch
Ungünstiger Medienkonsum
Verringerte Konzentration tagsüber

HAUPTKRITIK (1)

EXTREMGRUPPENVERGLEICHE

Sind Semiprofessionals und Elitesportler “normale” Jugendliche?

38 Jugendliche; ca. 18.7 J alt

17 wiesen eine KA von rund 8h/Woche auf; 21 wiesen eine KA von rund 2.5h/Woche auf

 Schlaf-EEG's und Fragebogen zu Befindlichkeit, Persönlichkeit, usw.

The World Journal of Biological Psychiatry, 2010; 11: 129–140

ORIGINAL INVESTIGATION

Exercising, sleep-EEG patterns, and psychological functioning are related among adolescents

SERGE BRAND¹, MARKUS GERBER², JOHANNES BECK¹, MARTIN HATZINGER^{3,4},
UWE PÜHSE² & EDITH HOLSBOER-TRACHSLER¹

¹Depression and Sleep Research Unit, Psychiatric Hospital of the University of Basel, Switzerland, ²Institute of Exercise and Health Sciences, University of Basel, Switzerland, ³Psychiatric Out-Patient Clinic of the University of Basel, Switzerland, and ⁴Psychiatric Hospital, Solothurn, Switzerland

SCHLAF BEI ‚NORMALEN‘ JUGENDLICHEN

KEINE EXTREMGRUPPEN

‘Normale’ Sportlerinnen und Sportler wiesen gegenüber den Nicht-Sportlern über günstigere Schlaf-EEG-Profile auf

Diese Profile wurden in Nächten OHNE vorangegangene KA beobachtet

-> keine Akuteffekte!

Sportler wiesen günstigere Werte auf für

- Neugierde
- Stressverarbeitung
- Schmerzverarbeitung

SCHLAF BEI ‚NORMALEN‘ JUGENDLICHEN KEINE EXTREMGRUPPEN

136 S. Brand et al.

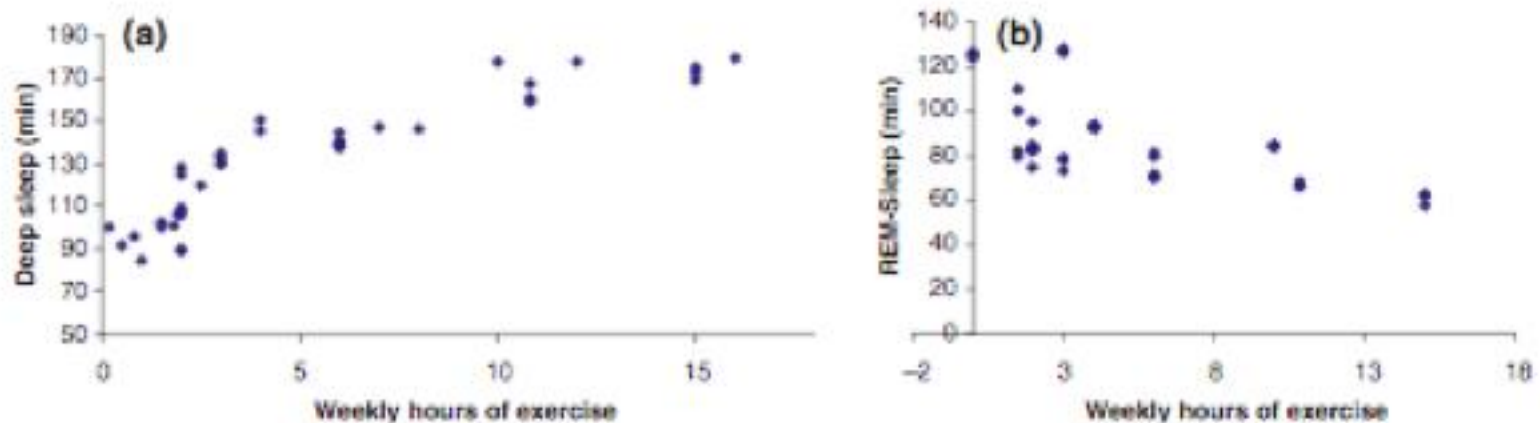


Figure 1. (a) Weekly exercise duration is related to increased slow wave sleep ($r=0.88$, $P=0.001$). (b) Weekly exercise duration is related to decreased REM sleep ($r=-0.31$, $P<0.05$).

FAZIT

REGELMÄSSIG SPORT
TREIBENDE ADOLESCENTE
SIND DIE ‚BESSEREN‘
MENSCHEN

.....ODER ETWA DOCH ALLES
ANDERS?

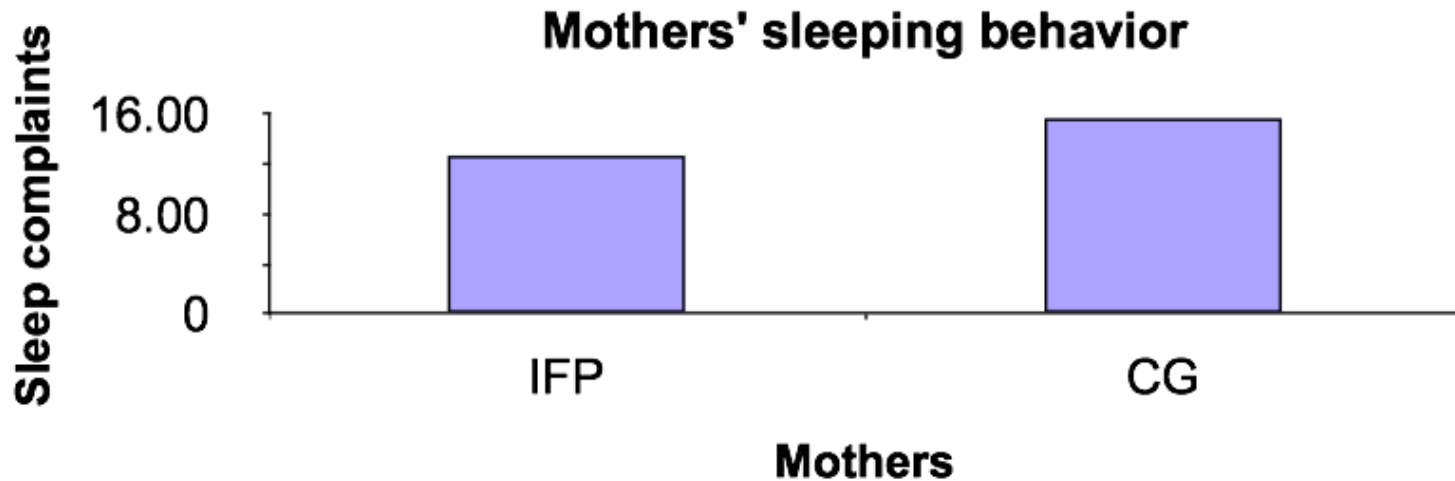
....DOCH ALLES ANDERS?

Schlaf von Jugendlichen ist nicht unabhängig vom Familienklima und vom Schlafverhalten der Eltern (Brand et al, 2009, Sleep Med)

Erhöhte Suizidalität bei Jugendlichen ist mit Mangel an *bed time limit setting-verhalten* der Eltern assoziiert (Gangwish et al. 2010)

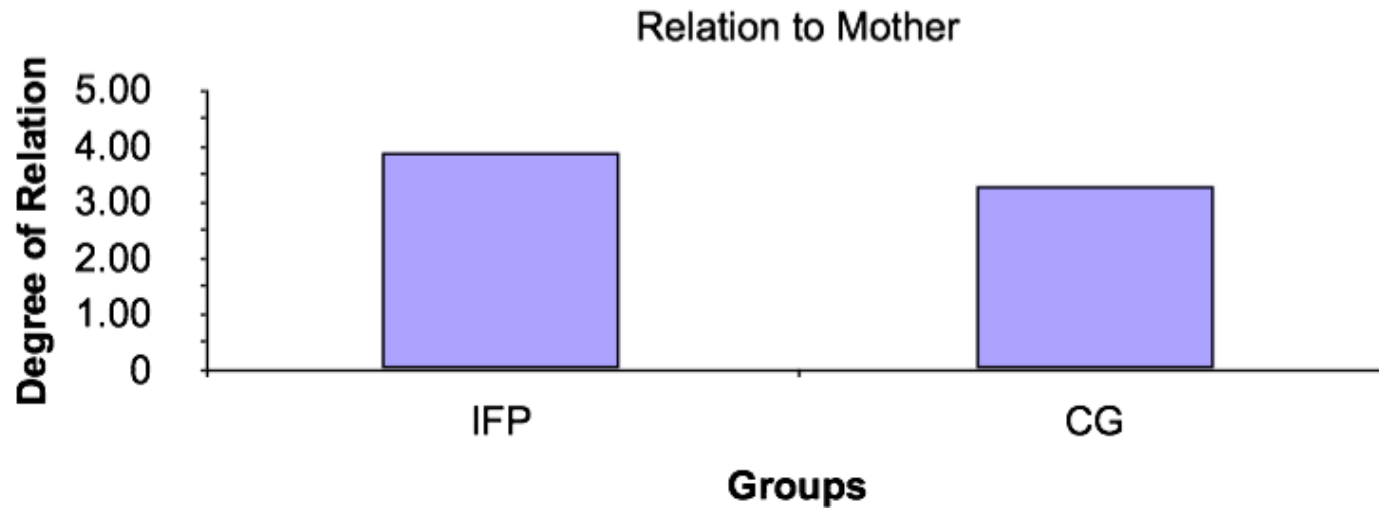
Weitere Datenanalyse des Samples der Semiprofessionals

....DOCH ALLES ANDERS?



IFP = intense football players CG = control group

....DOCH ALLES ANDERS?



IFP = intense football players CG = control group

....DOCH ALLES ANDERS?

Fazit:

Semiprofessionelle Fussballspieler leben mit Eltern/Mütter, die selbst ein günstiges Schlafmuster aufweisen (gegenüber Müttern der Kontrollgruppe)

Mutter-Sohn-Beziehung wurde bei den Semiprofessionals als günstiger eingeschätzt als bei den Kontrollen

Ganz wichtig: Semiprofessionals mit unterschiedlichem Migrationshintergrund

SCHLAF IN FAMILIEN

Journal of Psychiatric Research 46 (2012) 1374–1382



Contents lists available at SciVerse ScienceDirect

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journal homepage: www.elsevier.com/locate/psychires



The relation of objective sleep patterns, depressive symptoms, and sleep disturbances in adolescent children and their parents: A sleep-EEG study with 47 families

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SCHLAF IN FAMILIEN

A B S T R A C T

Objectives: Numerous studies have shown that the sleep and well-being of children and their parents are closely related. Previous studies have relied on subjective sleep data and have focused mostly on younger preadolescent children. The aim of the present study was therefore to investigate the relationship between the sleep patterns of adolescents and those of their parents using objective assessment of sleep.

Methods: Forty-seven families took part in this study. The sample comprised 80 adolescents (age: 16.3 ± 2.0 years; 44 males/36 females), 47 mothers (age: 49.5 ± 4.0 years), and 39 fathers (age: 50.8 ± 5.1 years). All participants individually completed questionnaires related to psychological functioning and sleep. Sleep-EEGs were assessed for all family members in their homes.

Results: Adolescents' and parents' objective sleep patterns were associated. In particular, the sleep continuity and architecture of adolescents and their mothers were strongly related. Additionally, significant relationships between objectively assessed sleep patterns, subjective sleep disturbances, depression scores and family climate held true for equally adolescents and mothers. Also, substantial links were found between adolescents' and parents' subjective sleep disturbances, depressive symptoms, and perceived family climate.

Conclusion: The present findings document objectively for the first time the existence of relationships between adolescents' sleep and well-being and parents' sleep and well-being. These relationships were apparent regardless of whether subjective or objective sleep data were considered. The overall pattern of results strongly indicates that adolescents' sleep and well-being and family functioning are related.

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SCHLAF IN FAMILIEN

Journal of Adolescence 36 (2013) 1103–1113



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Journal of Adolescence

journal homepage: www.elsevier.com/locate/jado



Sleep patterns and psychological functioning in families in northeastern Iran; evidence for similarities between adolescent children and their parents

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SCHLAF IN FAMILIEN

A B S T R A C T

Sleep and well-being of adolescents and their parents are related, but data from non-Western countries are scarce. The aim of the present study was to investigate the relationship between adolescents' and their parents' sleep patterns and psychological functioning in northeastern Iran.

A total of 81 families (81 mothers, 78 fathers, 130 children aged 12–20 years) took part in the study. They individually and separately completed questionnaires related to sleep and psychological functioning.

Sleep quality was related within families. Poor sleep among children and parents was related in each case to more depressive symptoms and stress. Mothers' sleep and psychological functioning were more related to adolescent children's sleep and psychological functioning than were those of fathers.

Results confirm research showing that adolescent's and parents' sleep and psychological functioning are inter-related. This association holds also true for families in northeastern Iran, suggesting that the association reflects universal features of family functioning.

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.....DOCH ALLES ANDER? Sleep well, our tough heroes!

284 Jugendliche Alter: $M = 18.26$, $SD = 4.17$

185 weiblich (65%), 99 männlich (35%)

Gymnasien/höhere Schulen



Fragebogen:

- ❑ **Mentale Stärke (MTQ48, Clough et al. 2002; dt Bearbeitung: Gerber et al, submitted)**
- ❑ **Insomnia Severity Index (ISI, Bastien et al. 2001)**
- ❑ **Optimismus-Fragebogen (Glaesmer et al. 2008)**
- ❑ **Curiosity and Exploration Inventory (CEI; Kashdan et al 2004)**
- ❑ **Beck Depression Inventory (BDI; Hautzinger et al. 1995)**
- ❑ **Perceived Stress Scale (PSS, Cohen et al. 1988)**
- ❑ **Stressverarbeitungsfragebogen (SVF, Erdmann et al. 2008)**
- ❑ **Körperliche Aktivität (IPAQ; Ekelund et al. 2006)**
- ❑ **Einschätzung der eigenen Fitness (Plante et al. 2000)**

**.....DOCH ALLES ANDER?
Sleep well, our tough heroes!**



Mental toughness (MT) is understood as the display of confidence, commitment, challenge, and control. The aim of this study was to explore the extent to which greater MT is associated with subjectively assessed sleep among adolescents. A total of 284 adolescents ($M = 18.26$ years) completed a series of questionnaires assessing MT, psychological functioning, and sleep. Greater MT was significantly associated with better sleep quality, shorter sleep onset latency, fewer awakenings after sleep onset, and longer sleep duration. Greater MT was also associated with less perceived stress and less depressive symptoms. MT was directly and indirectly associated with sleep quality. Mentally tough adolescents report good sleep quality and sleep schedules, along with psychological wellbeing.



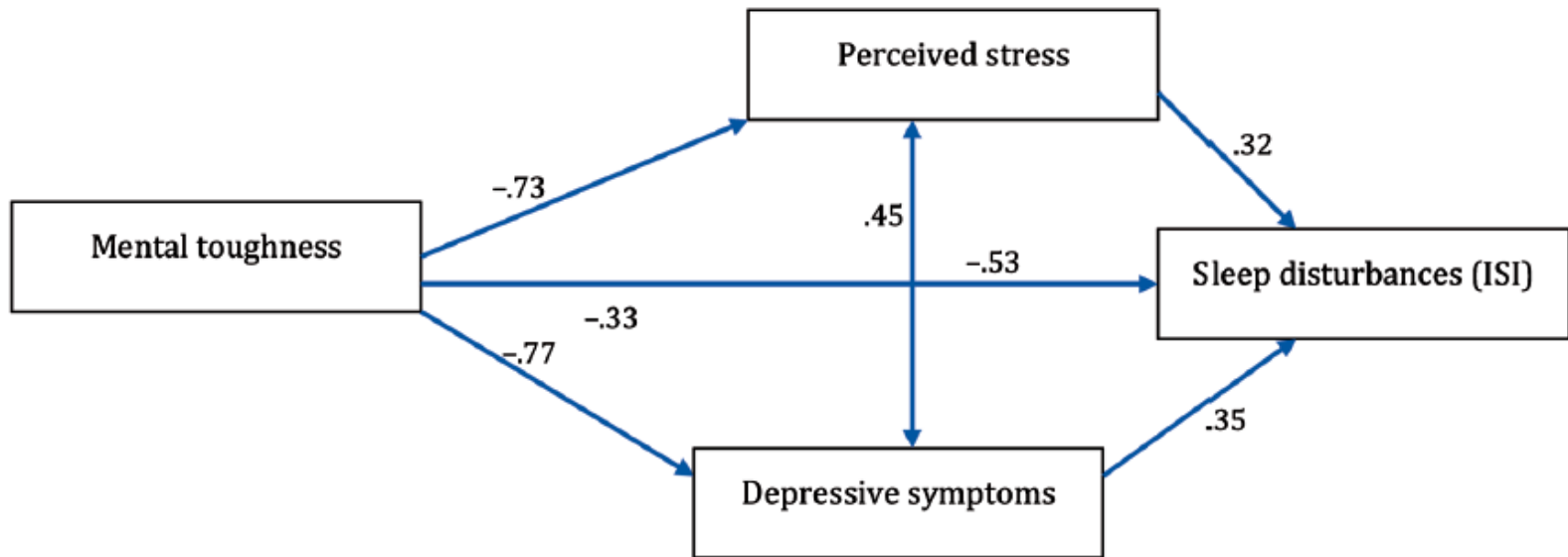


FIGURE 1 Structural equation model linking mental toughness, depressive symptoms, and perceived stress to sleep disturbances. Note. Indexes are regression weights (betas). ISI = Insomnia Severity Index. (Color figure available online.)





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Original article

Adolescents With Greater Mental Toughness Show Higher Sleep Efficiency, More Deep Sleep and Fewer Awakenings After Sleep Onset

Serge Brand, Ph.D. ^{a,*}, Markus Gerber, Ph.D. ^{b,1}, Nadeem Kalak, M.Sc. ^a, Roumen Kirov, M.D., Ph.D. ^c, Sakari Lemola, Ph.D. ^d, Peter J. Clough, Ph.D. ^e, Uwe Pühse, Ph.D. ^b, and Edith Holsboer-Trachsler, M.D. ^a

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Article history: Received April 4, 2013; Accepted July 15, 2013

Keywords: Mental toughness; Sleep electroencephalogram; Sleep efficiency; Deep sleep

A B S T R A C T

Purpose: Mental toughness (MT) is understood as the display of confidence, commitment, challenge, and control. Mental toughness is associated with resilience against stress. However, research has not yet focused on the relation between MT and objective sleep. The aim of the present study was therefore to explore the extent to which greater MT is associated with objectively assessed sleep among adolescents.

Methods: A total of 92 adolescents (35% females; mean age, 18.92 years) completed the Mental Toughness Questionnaire. Participants were split into groups of high and low mental toughness. Objective sleep was recorded via sleep electroencephalograms and subjective sleep was assessed via a questionnaire.

Results: Compared with participants with low MT, participants with high MT had higher sleep efficiency, a lower number of awakenings after sleep onset, less light sleep, and more deep sleep. They also reported lower daytime sleepiness.

Conclusions: Adolescents reporting higher MT also had objectively better sleep, as recorded via sleep electroencephalograms. A bidirectional association between MT and sleep seems likely; therefore, among adolescence, improving sleep should increase MT, and improving MT should increase sleep.

IMPLICATIONS AND CONTRIBUTION

Mentally tough adolescents showed objectively assessed improved sleep. Improving adolescents' mental toughness might also improve adolescents' sleep, and vice versa.

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A B S T R A C T

Both scientists and the general public assume that physical activity (PA) is an effective, non-pharmacological approach to improvement in sleep quality. However, objective and reliable data on this relationship are scarce, particularly for adolescents. Therefore, the aims of the present study were to test the relationship by assessing both PA and sleep subjectively and objectively. A total of 56 adolescent vocational school students (Mean age = 17.98, SD = 1.36; 28 males, 28 females) participated in the study. Sleep and PA were subjectively assessed via questionnaires. Accelerometers objectively assessed PA, while sleep-EEG devices objectively assessed sleep. The data supported our prediction that adolescents with high PA levels would have longer TST, fewer wakening at night (WASO), fewer symptoms of insomnia, and higher sleep quality. However, gender influenced this pattern of results in that significant findings were only found between high self-reported PA levels and shorter perceived sleep onset latency (SOL). Though self-reported PA levels were a better predictor of good sleep than objectively assessed PA levels, gender was associated with sleep complaints; females reported more sleep complaints. Results indicate that among a non-clinical sample of adolescents increased PA is favorably associated with restoring sleep. Therefore, PA seems beneficial not only for physical and mental health, but also for sleep restoration.

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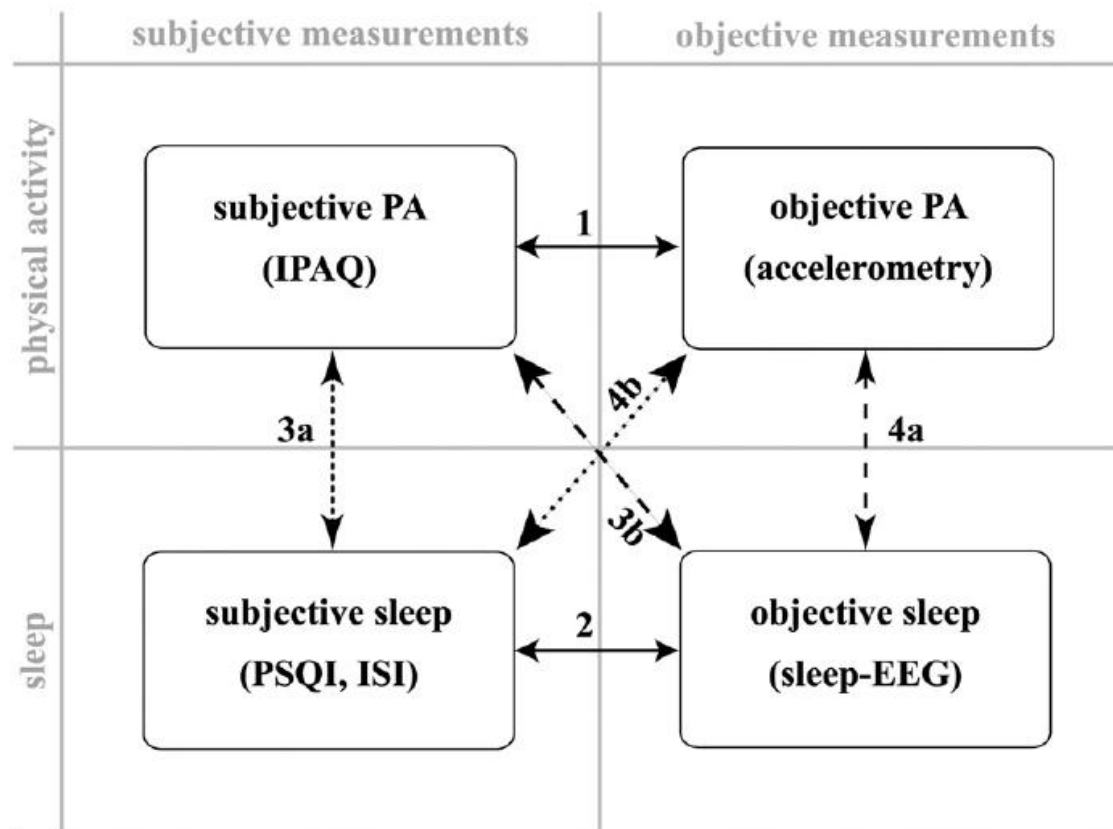


Fig. 1. Visual representation of hypotheses (excluding hypothesis 5). IPAQ = International Physical Activity Questionnaire [55], PSQI = Pittsburgh Sleep Quality Index [56], ISI = International Severity Index [54].

HAUPTKRITIK (2)

KEINE INTERVENTIONEN

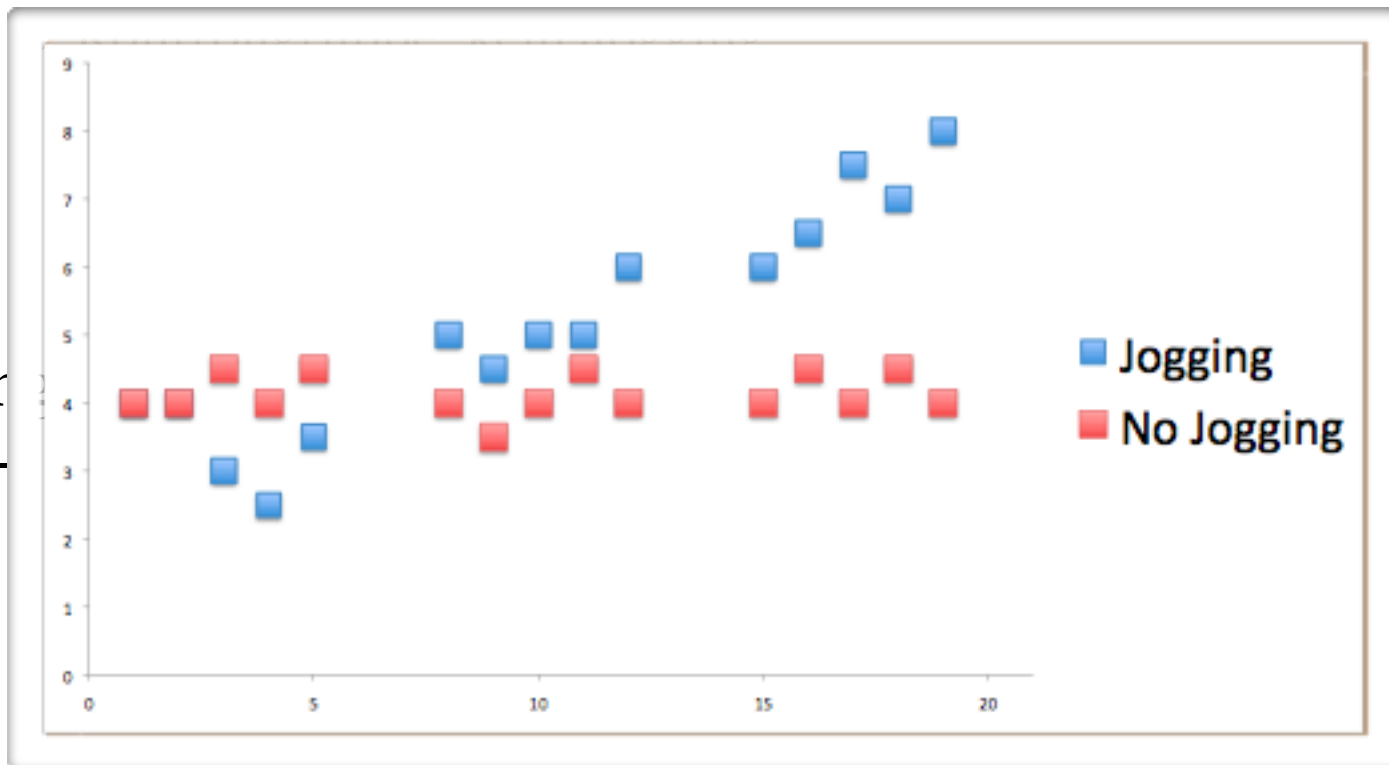
HAUPTKRITIK (2)

KEINE INTERVENTIONEN

HAUPTKRITIK (2)

KEINE INTERVENTIONEN

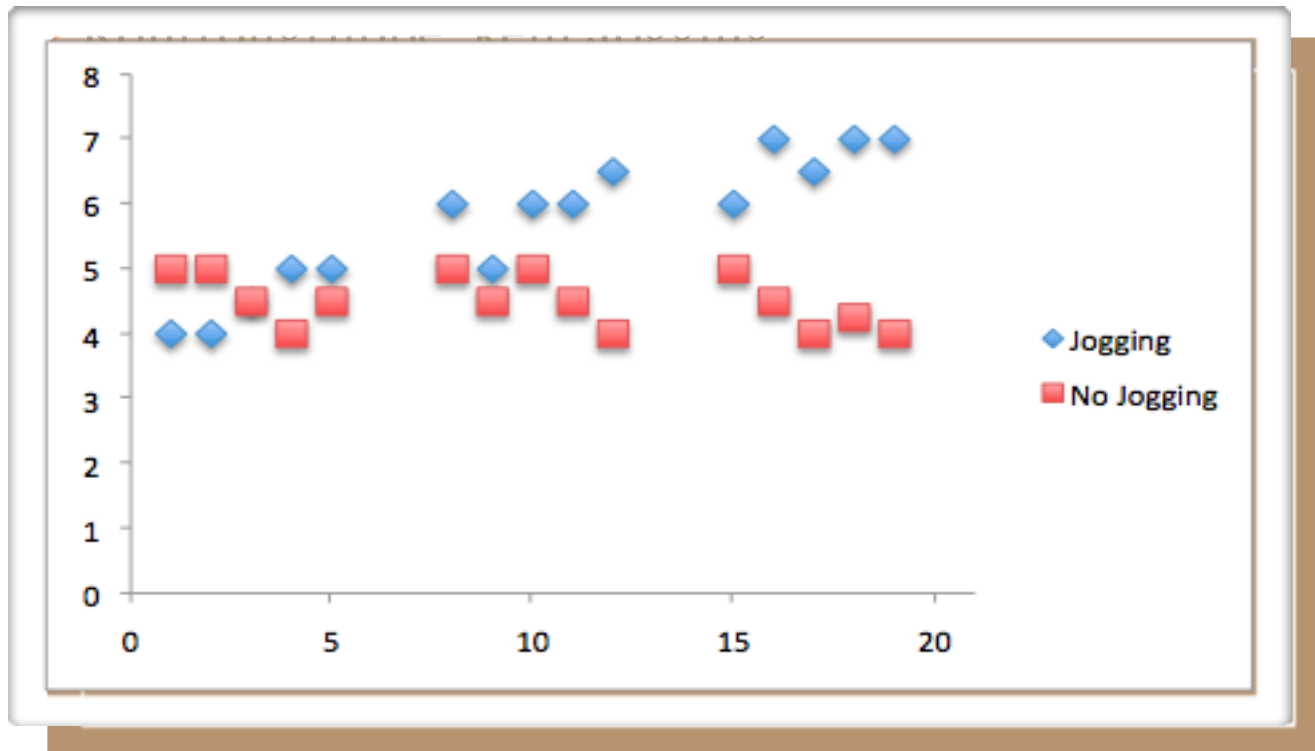
- › 51 Jugendliche, 18 Jahre alt; 26 Frauen
- › Jogging-Gruppe: wochentags um ca. 06.30h für 30 Min joggen



HAUPTKRITIK (2)

KEINE INTERVENTIONEN

- › 51 Jugendliche, 18 Jahre alt; 26 Frauen
- › Jogging-Gruppe: wochentags um ca. 06.30h für 30 Min joggen



30' running

Complex relation between concentration and REM-S

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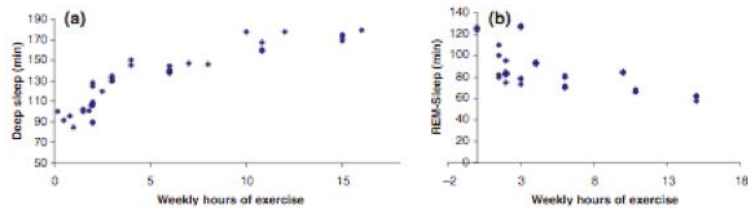
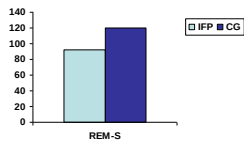
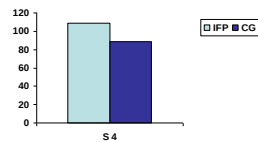


Figure 1. (a) Weekly exercise duration is related to increased slow wave sleep ($r=0.88$, $P=0.001$). (b) Weekly exercise duration is related to decreased REM sleep ($r=-0.31$, $P<0.05$).

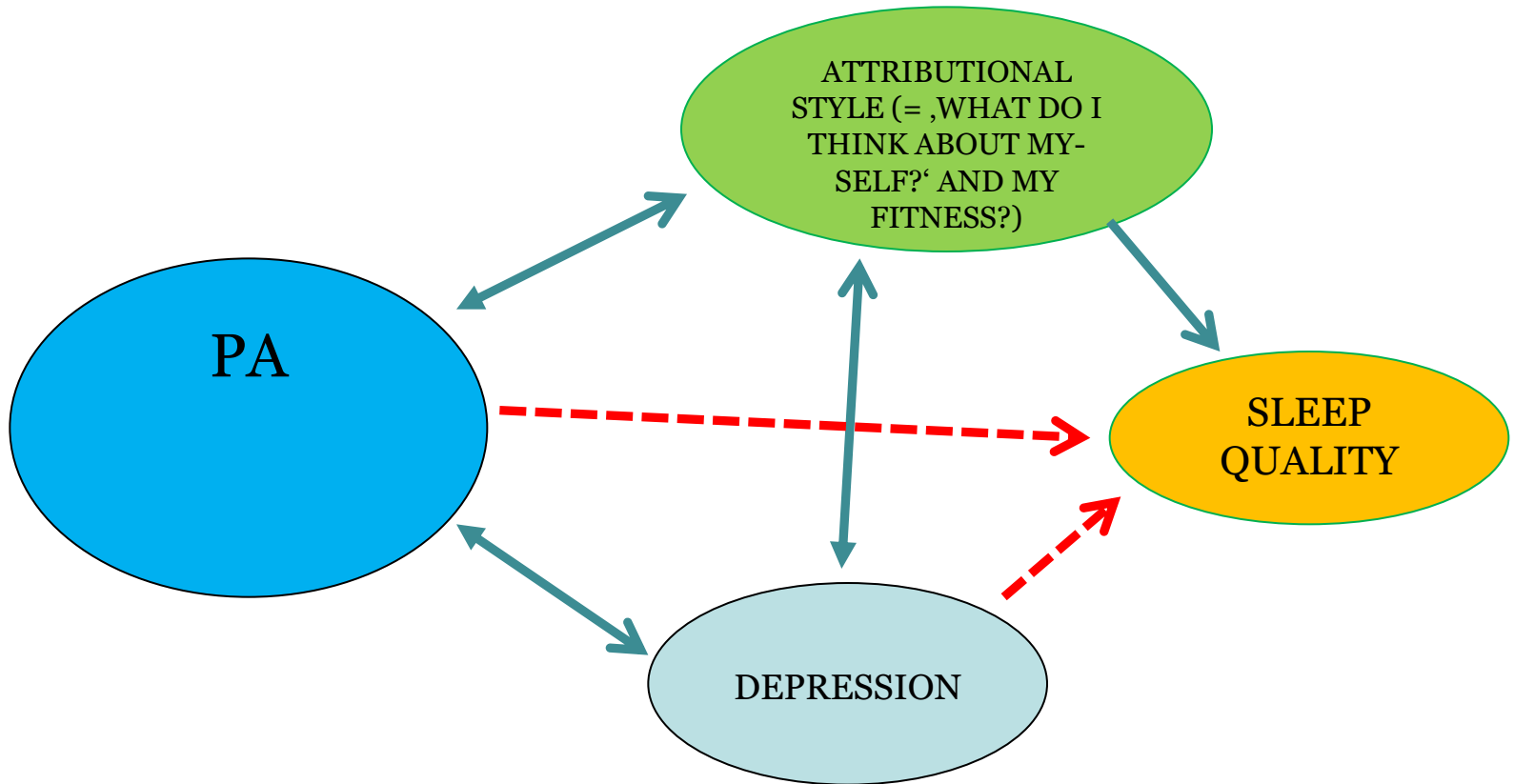


SLEEP AND PHYSICAL ACTIVITY IN YOUNG ADULTS

The New York Times Phys Ed: Does Exercise Help
You Sleep Better?

By GRETCHEN REYNOLDS
| May 26, 2010, 12:01 am
Comments (161)

SLEEP AND PHYSICAL ACTIVITY IN YOUNG ADULTS

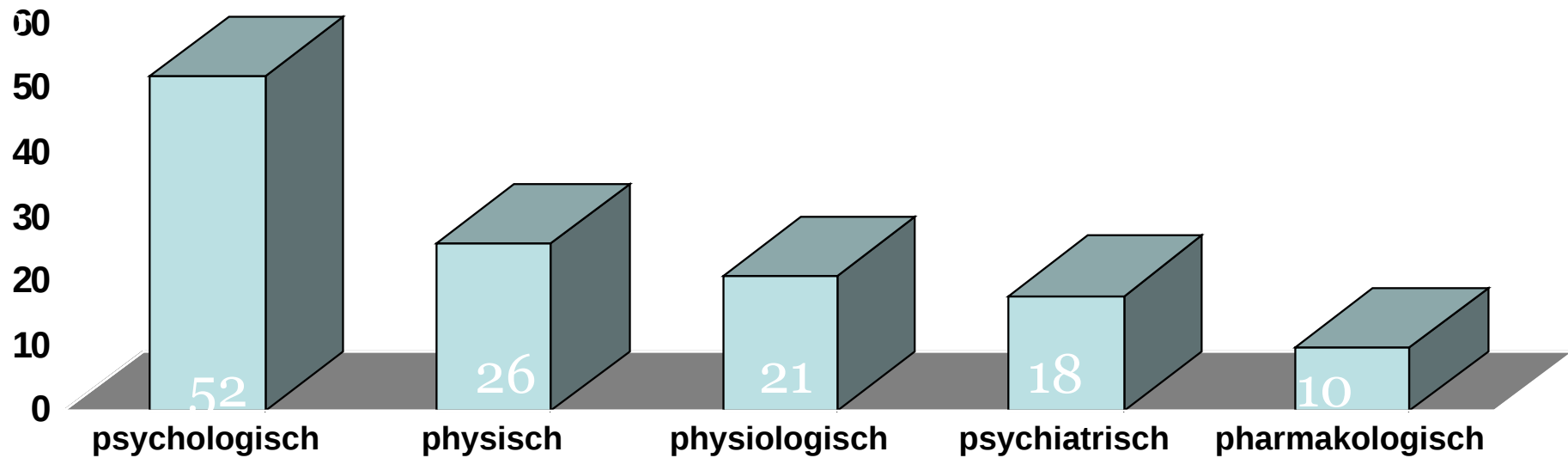


GERBER ET AL 2010

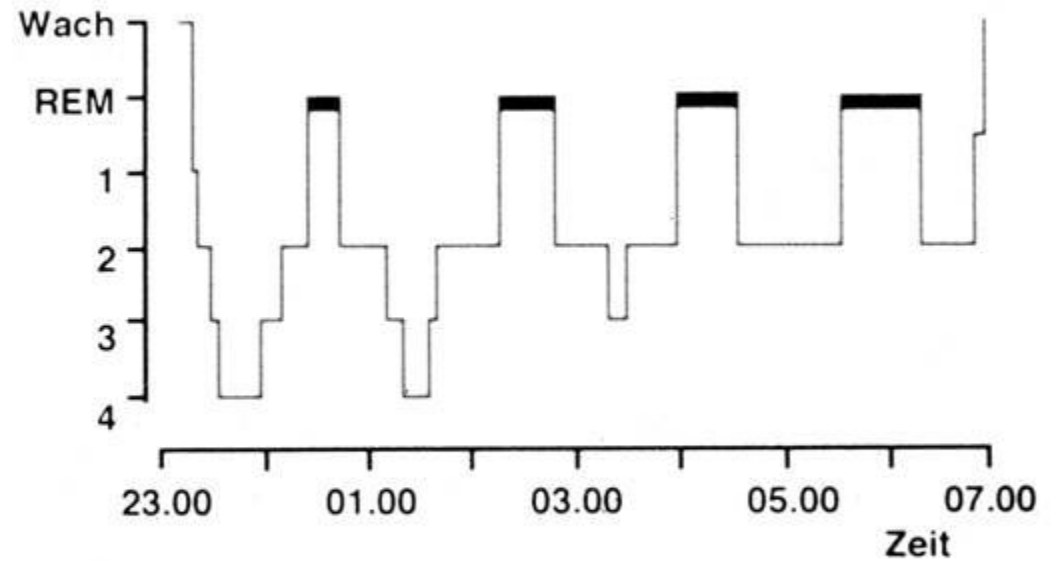
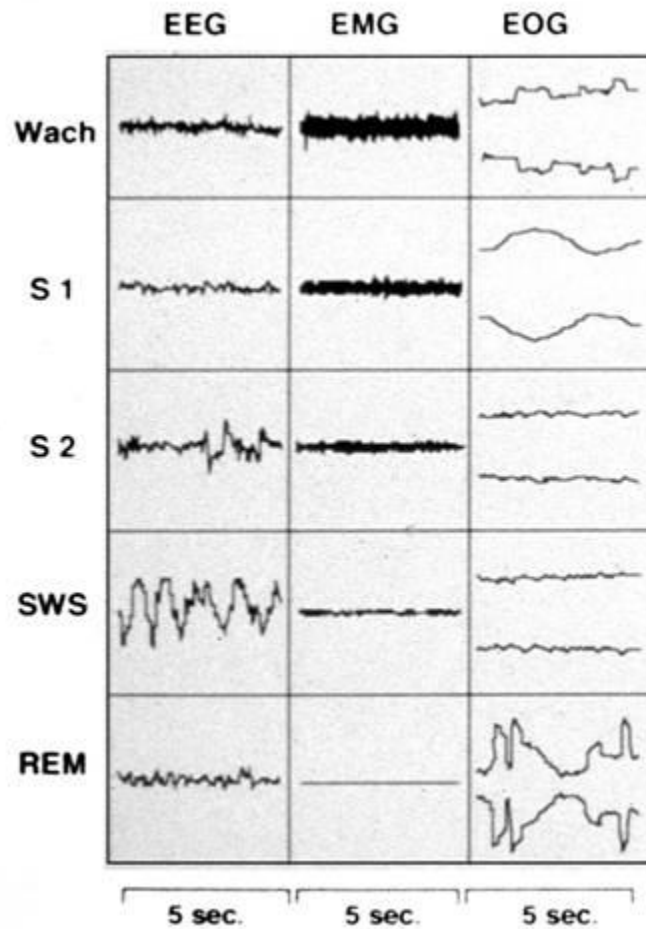
ZUSAMMENFASSUNG

- › Körperliche Aktivität ist bei Jugendlichen bei günstigen Schlafmustern und mit günstigem *psychological functioning* assoziiert
- › Keine Geschlechtsunterschiede beobachtet worden
- › Interaktion Jugendlicher - Eltern spielt eine Rolle - > Familienklima; Rolle der Unterstützung der Eltern
- › schon kurzfristige Interventionen führen zu Verbesserungen in Stimmung und subjektiver Schlafqualität
- › es ist zu vermuten, dass regelmässige körperliche Aktivität die neuronale Aktivität dauerhaft günstig beeinflusst
- › Friedman et al. (2008) weisen auf Langzeiteffekte der regelmässigen körperlichen Aktivität im Kindes- und Jugendalter hin

Aetiologie der Insomnie

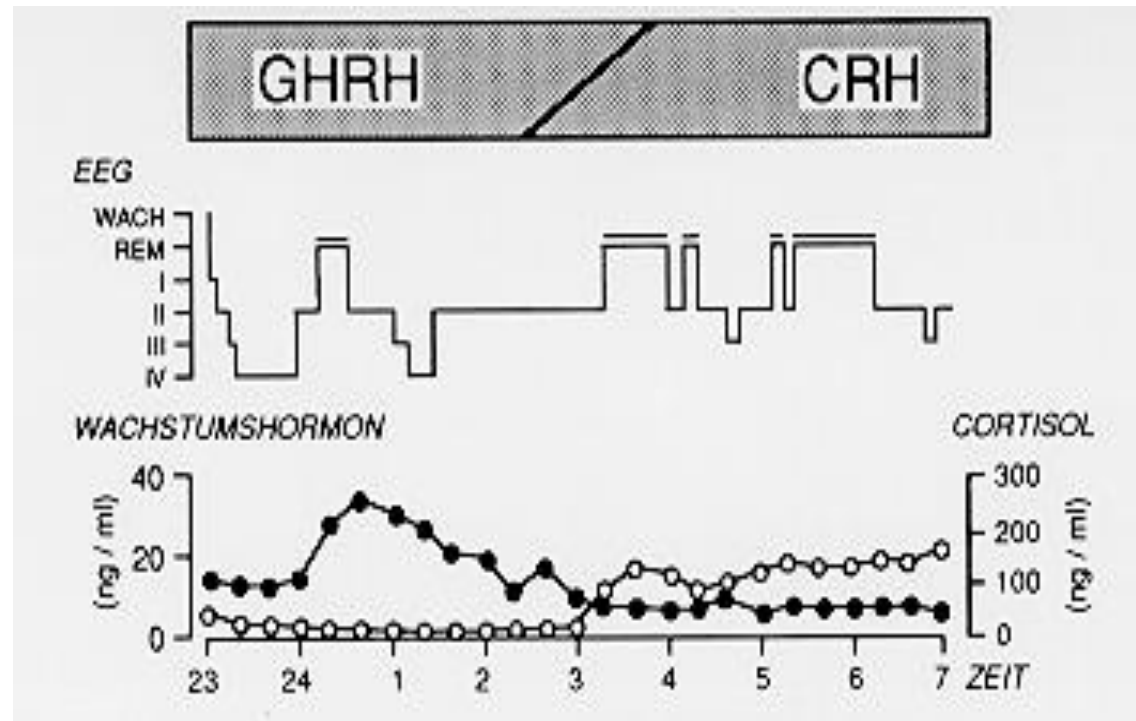


Der physiologische Schlaf



Schlafendokrinologie

Gesunde, junge Personen



Altersphysiologische Veränderungen des Schlafes

Subjektive Klagen

Schlaf weniger tief

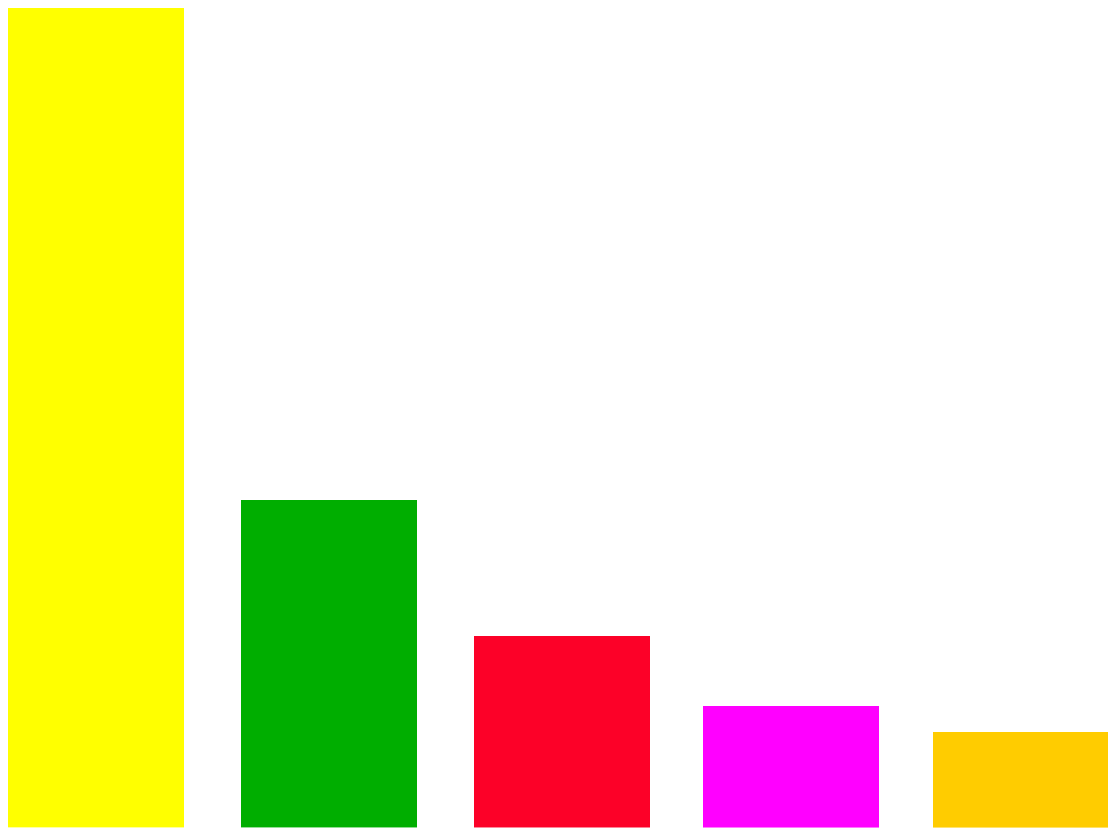
Schlaf häufig
unterbrochen

Schlaf weniger
erholsam

**Junge gesunde
Kontrollperson**

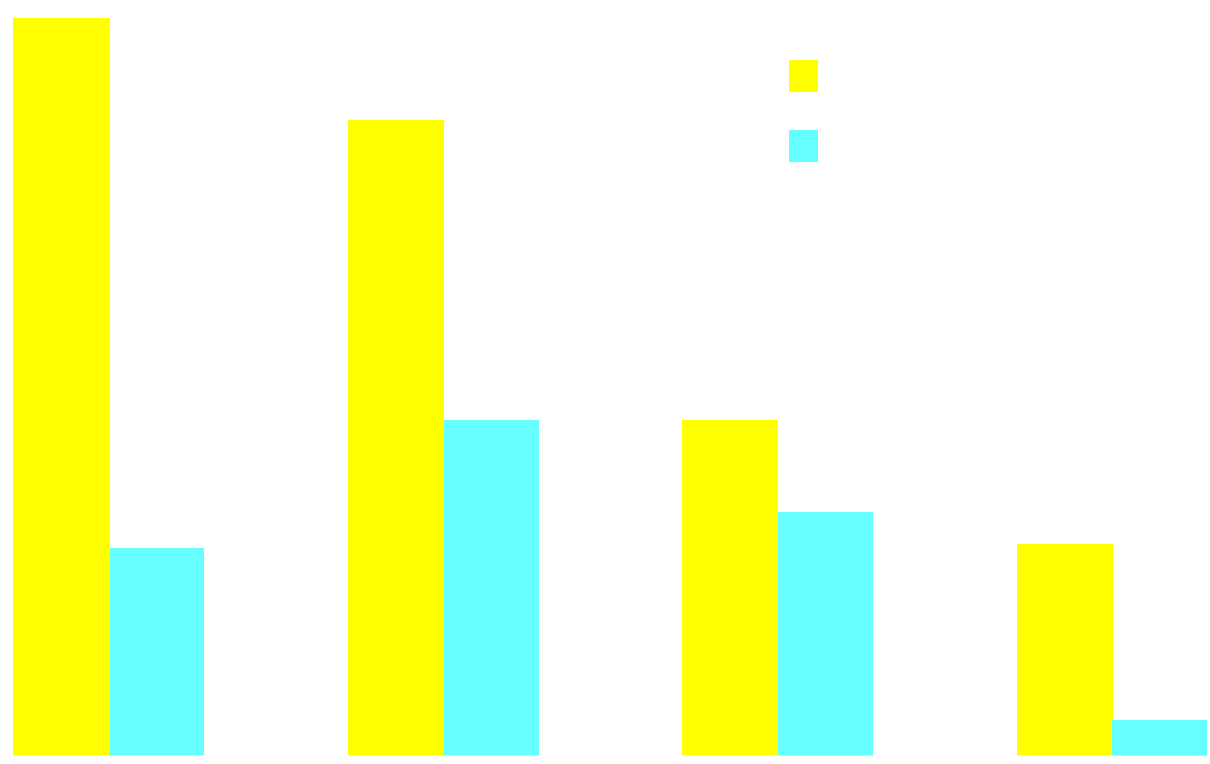
Alter

Komorbidität psychischer Störungen bei Insomnie



Insomnie

Risikofaktor für psychische Störungen



Parasomnien



Parasomnien (I)

Aufwachstörungen

- › Schlaftrunkenheit
- › Schlafwandeln
- › Pavor nocturnus

Schlaf-Wach-Übergangsstörungen

- › Störungen mit rhythmischen Bewegungen
- › Einschlafmyoklonus
- › Sprechen im Schlaf
- › Nächtliche Wadenkrämpfe

Parasomnien (II)

REM-Schlaf-gebundene Parasomnien

- › Alpträume
- › Schlaflähmung
- › REM-Schlaf-gebundene Asystolie
- › Verhaltensstörungen im REM-Schlaf (Schenck-Syndrom)

Andere Parasomnien

- › Bruxismus
- › Schlafgebundenes Verschlucken
- › Nächtliche paroxysmale Dystonie
- › Syndrom des plötzlichen und unerklärlichen nächtlichen Todes
- › Primäres Schnarchen

Pavor nocturnus ("night terrors")

Symptome:

- › Plötzliche Episode intensiver Furcht im Schlaf mit Schreien und vegetativen Zeichen.
- › Beim Aufwecken Verwirrung und (partielle) Amnesie für das Ereignis.

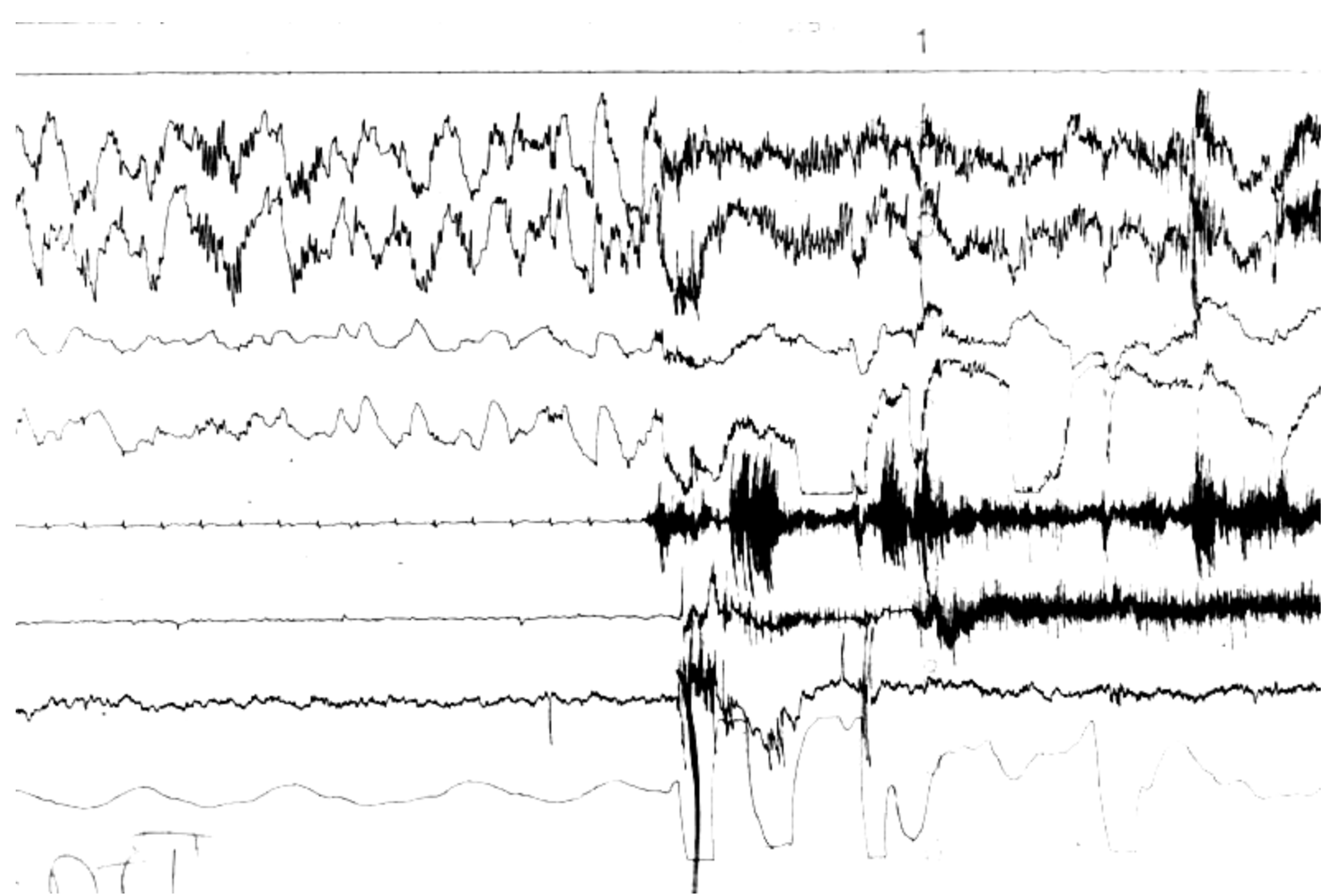
Polysomnographie:

Beginn der Episode im Stadium 3 oder 4 ("Delta-Schlaf")

Epidemiologie:

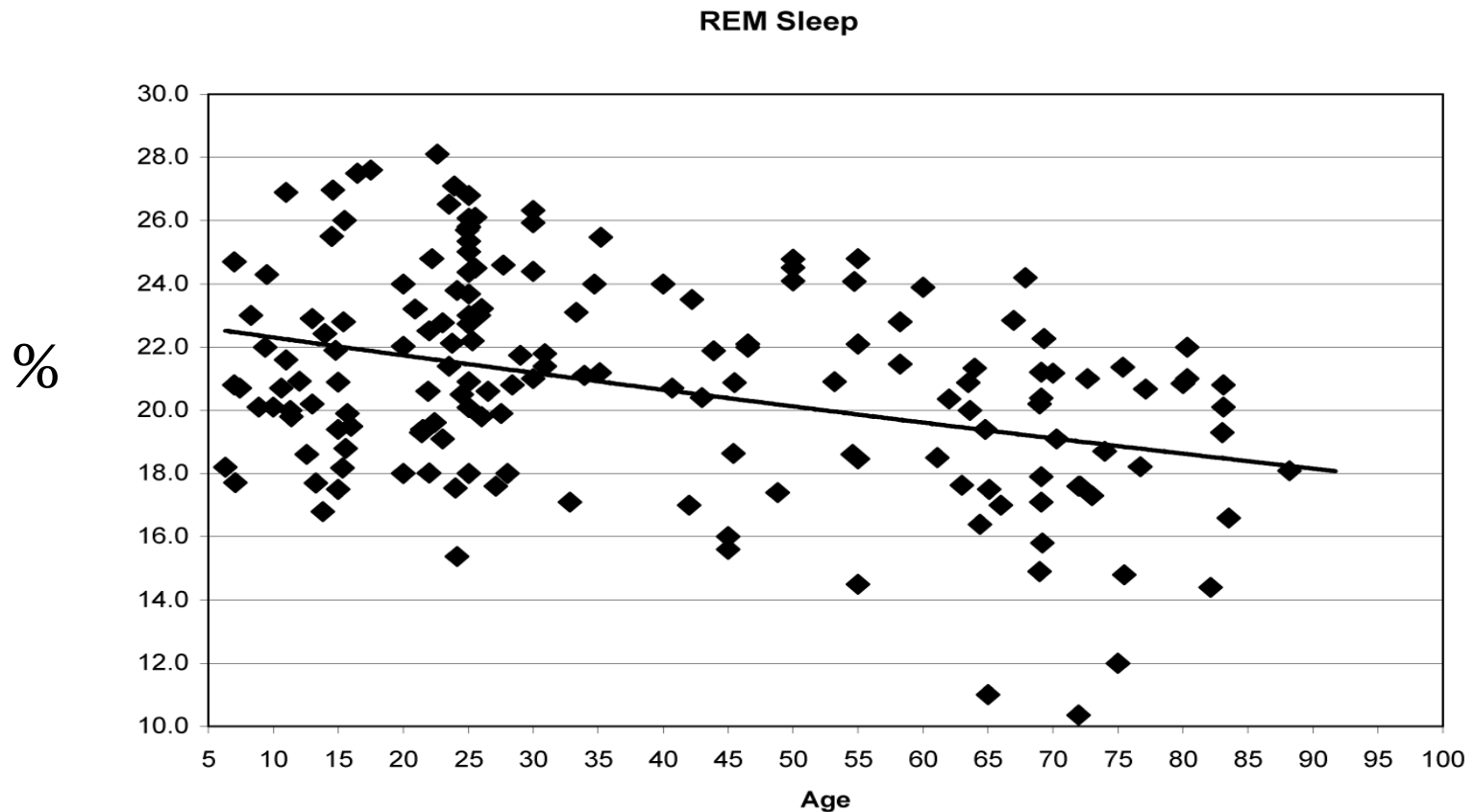
Kinder: 3%, meist zwischen 4 und 12 Jahren
Erwachsene: unter 1%, Männer häufiger als Frauen

Pavor nocturnus



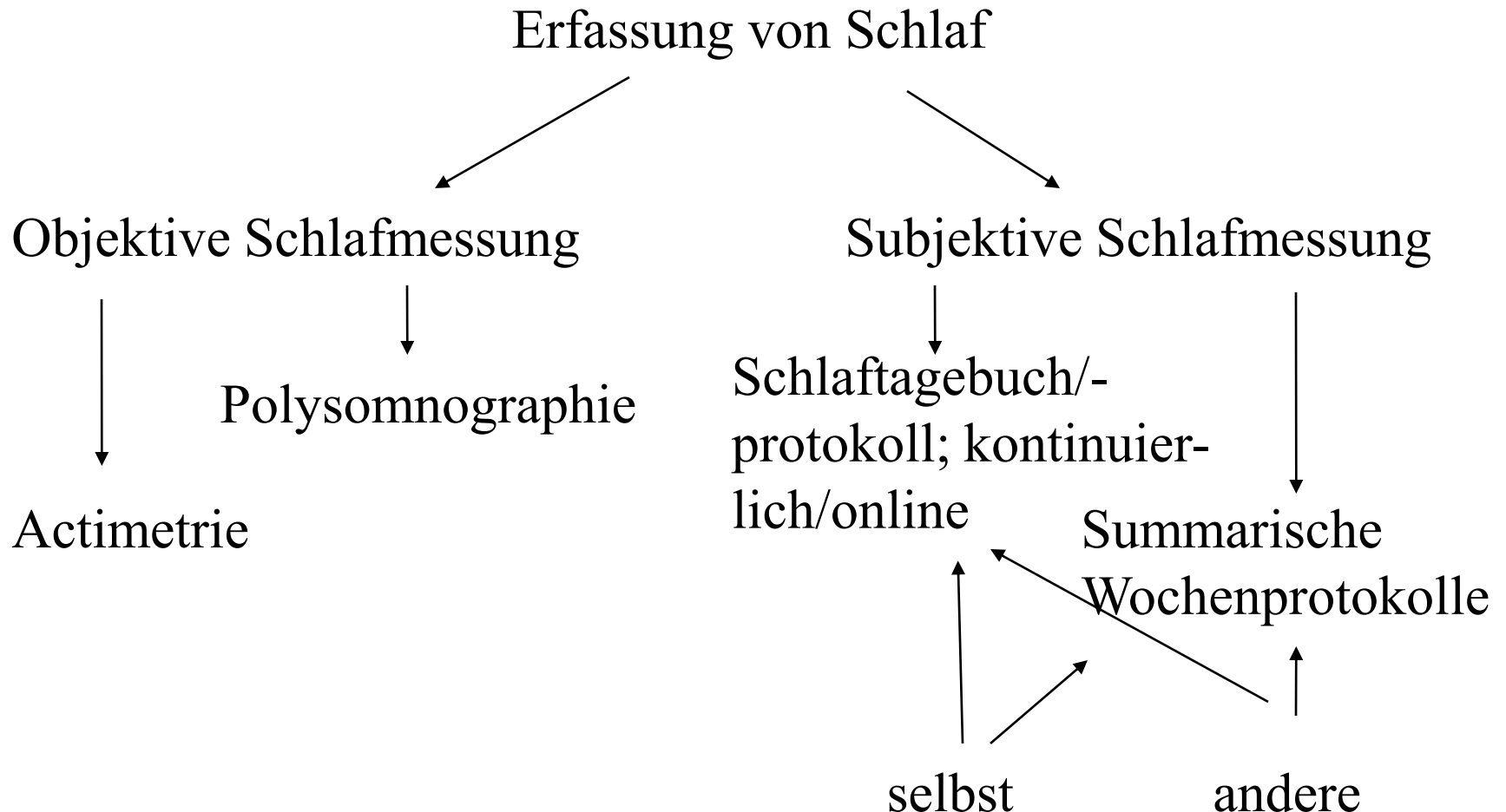
SCHLAF UND ENTWICKLUNG IM SÄUGLINGS-, KINDES- UND JUGENDALTER

- › Schlaf im Laufe des Lebens (Meta-Analyse von Ohayon et al. 2004)



WEITERBILDUNG SCHLAF

Objektive und subjektive Schlafmessung



SCHLAF



Beispiel für Beeinträchtigung der
kognitiven Leistungsfähigkeit

Teilnehmende: N = 48
junge, gesunde Erwachsene

zu zweit: mind 10 Items zur
Beschreibung der Graphiken
(= „was sehe ich?“)

3 key points

Van Dongen et al. 2003; Sleep

WEITERBILDUNG SCHLAF

Schlafmangel

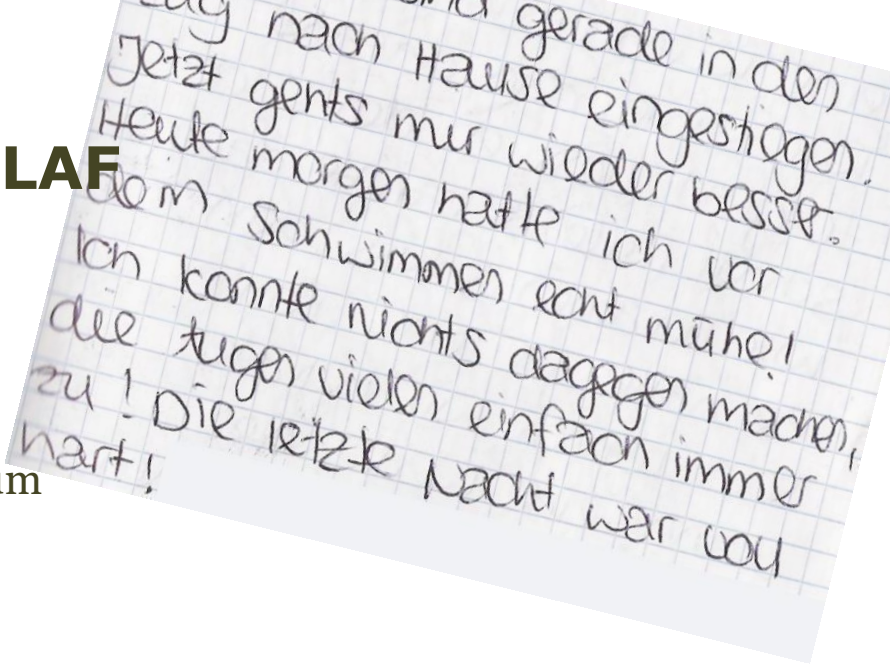
Diplomarbeit (2006)

Laurina Fässler & Marina Auf der Maur; Theresianum

Ingenbohl Brunnen (Sz)

Schlafentzug über 87 Stunden

Tagebucheintrag



... gerade in den
nach Hause eingestiegen.
Jetzt gehts nur wieder besser.
Heute morgen hatte ich vor
dem Schwimmen echt müde!
Ich konnte nichts dagegen machen,
die Augen vielen einfach immer
zu! Die letzte Nacht war wah-
narr!

WEITERBILDUNG SCHLAF

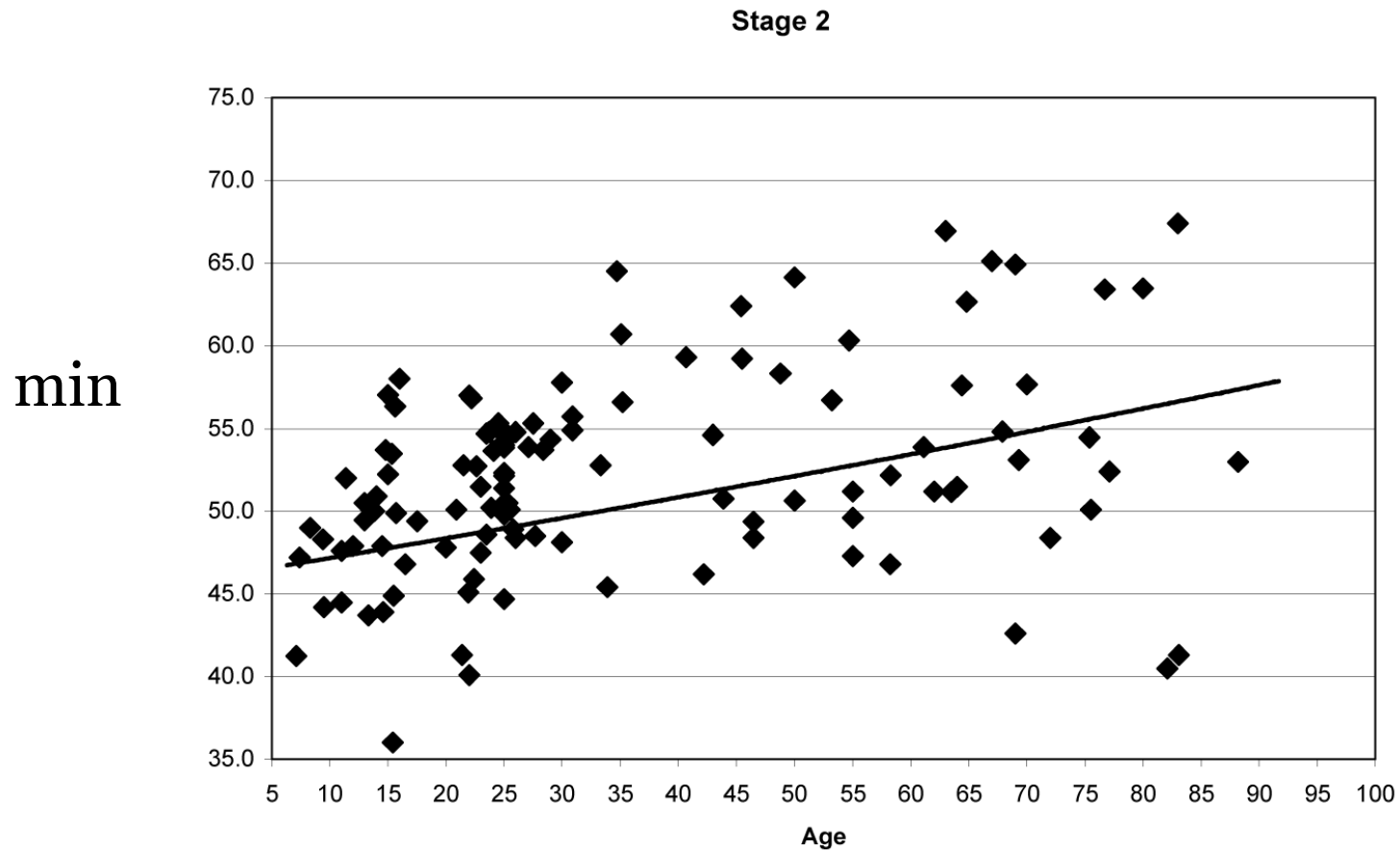
Schlafentzug

- › **Sekundenschlaf**
 - › **Körperliche Erschöpfung**
 - › **Gedächtnislücken**
 - › **Wahrnehmungsstörungen**
 - › **Unaufmerksamkeit**
 - › **Schlechte Laune**
 - › **Extremes Kälteempfinden**
 - › **Seh- und Hörschwäche**
 - › **Hyperaktivität**
 - › **Gefühlsschwankungen**
 - › **Gleichgewichtsstörungen**
 - › **Müdigkeitsschwankungen**
 - › **Extreme Augenringe**
 - › **Kleine Augen**
 - › **Schlappe Körperhaltung**
- Kopfschmerzen**
 - Gliederschmerzen**
 - Verlorenes Zeitgefühl**
 - Unreine Haut**
 - Gereiztheit**
 - Lustlosigkeit**
 - Schwindelgefühle**



WEITERBILDUNG SCHLAF

- › Schlaf im Laufe des Lebens (Meta-Analyse von Ohayon et al. 2004)



WEITERBILDUNG SCHLAF

Zusammenfassung (1)

Schlaf ist ein aktiver Zustand

Wir schlafen, um Energie zu sparen

Wir schlafen, um uns körperlich zu regenerieren

Wir schlafen, um tagsüber optimal und maximal zu funktionieren

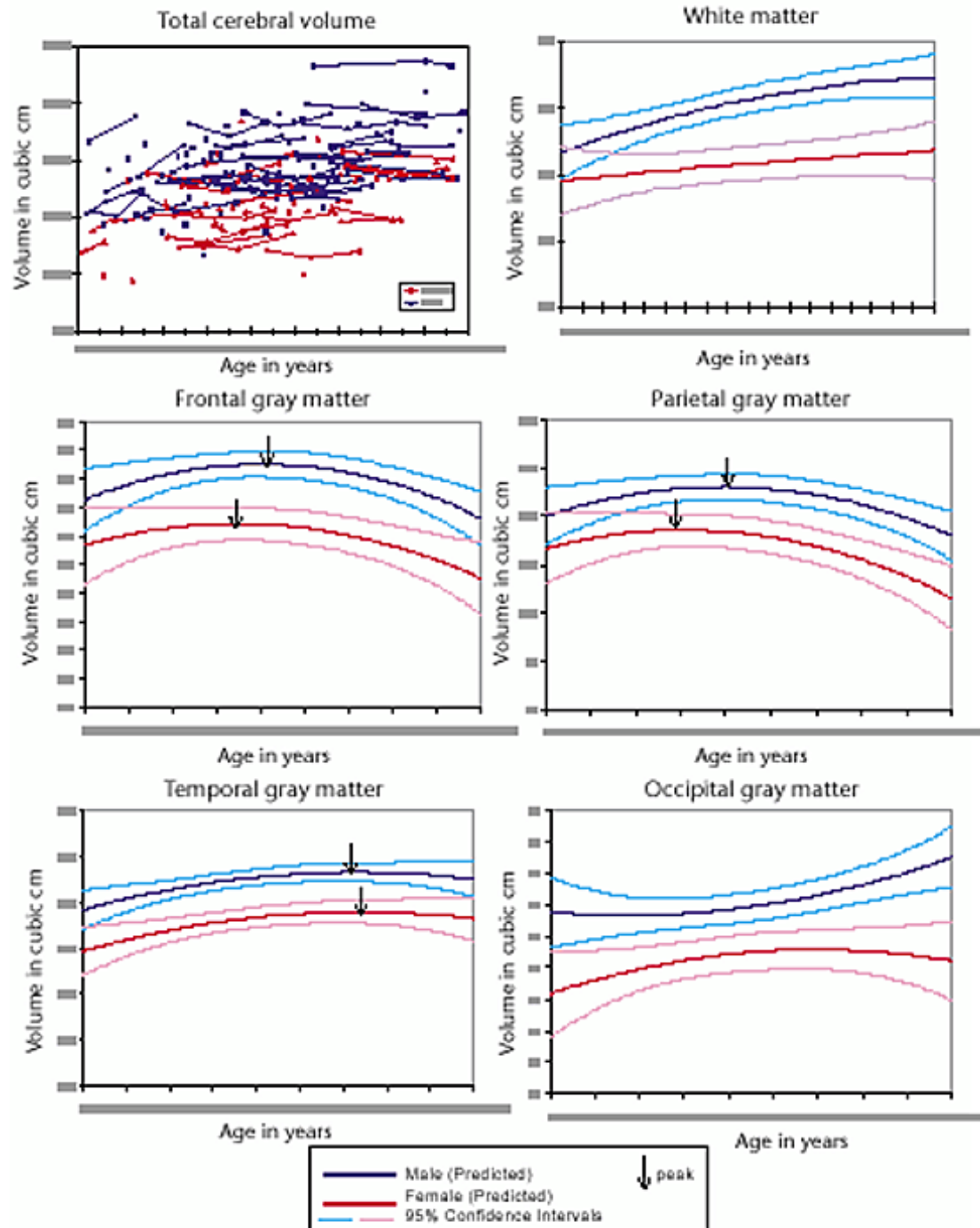
Funktionieren = Denken, Fühlen und Handeln sind schnell und präzise

Wir erfassen Schlaf subjektiv und objektiv; beide Verfahren haben Vor- und Nachteile

Begriffliches

Pruning =
Verringerung
überschüssiger
Verbindungen

Giedd et al 2008



WEITERBILDUNG SCHLAF

- › Schlafdauer und Schlafarchitektur während Hirnentwicklung erhöht, bzw. charakteristisch: länger & mehr REM-Schlaf -> Schlaf wichtig für Neurogenese und synaptische Plastizität (cell expansion; pruning)
- › Prominente Rolle
- › des REM-Schlafs

WEITERBILDUNG SCHLAF

Je geringer die Umweltstimulation, desto mehr müssen endogene Mechanismen die Hirnentwicklung steuern

WEITERBILDUNG SCHLAF

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Evidenz:

PGO-Wellen: Ponto-Geniculo-Occipital-Wellen

Ausschüttung Acetylcholin = Neurotransmitter, der neuronale Entwicklung und synaptische Plastizität beeinflusst

WEITERBILDUNG SCHLAF

Selektive REM-Schlaf-Deprivation bei Säugetieren (Ratten) durch Gabe von Antidepressiva (Clomipramin (trizyklisches Antidepressivum) Anafranil(R) Geigy; jetzt Novartis):

Effekte auf das adulte Tier: Ängstlichkeit, Schlafstörungen, verringertes Verhalten nach Lustgewinn; verringerte sexuelle Aktivität; Verzweiflung; erhöhte Präferenz nach Alkohol

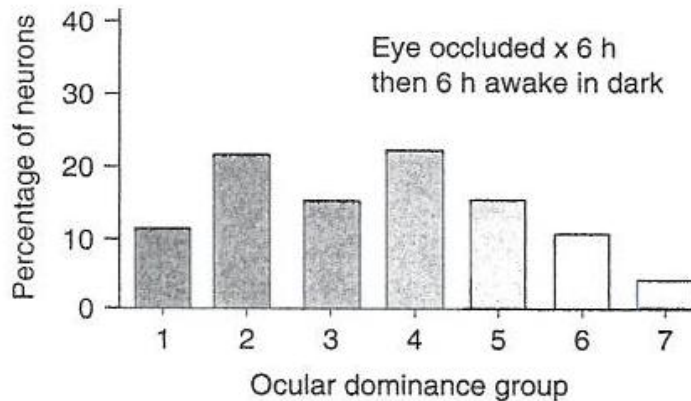
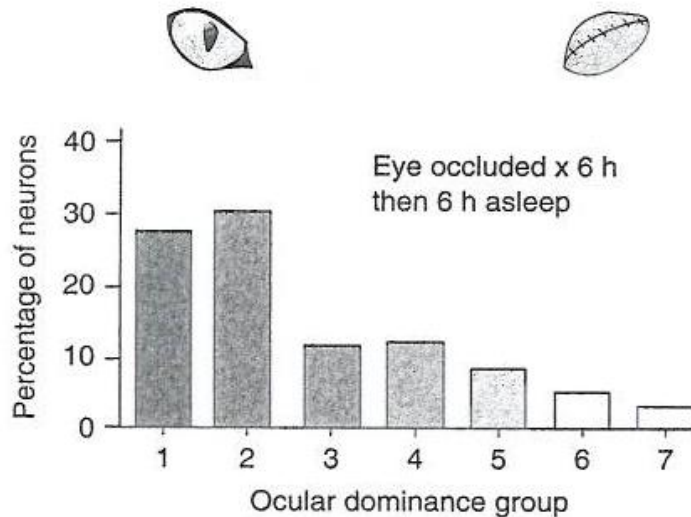
Verringertes Hirnvolumen (Neocortex; Hirnstamm)

Quintessenz:

REM-Schlaf-Entzug bei neugeborenen Nagern
führt im Erwachsenenalter zu depressiven
Störungen

WEITERBILDUNG SCHLAF

Entwicklung der Netzwerke für die visuelle Verarbeitung bei Katzen; Bedeutung von Umwelt x Schlaf-Interaktion



Schlaf-und Schreiprotokoll

Name:

Datum:

	Vormittag						Nachmittag						Abend						Nacht					
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6
Wach																								
Schlaf																								
Im eigenen Bettchen																								
Im Bett der Eltern																								

Schreidauer																								
Lautstärke des Schreies 1 bis 9 ¹																								
Schreiintensität 1 bis 9 ²																								

¹ 1 = ganz leise bis 9 = ganz laut; ² 1 = sehr langsam bis 9 sehr schnell

Füttern																								
Spiel mit Eltern																								
Herumtragen, Schoss																								

Beruhigungshilfen																								
Herumtragen																								
Singen																								
Stillen, Nuggi, Tee																								
Kuscheltierchen																								
Spazierfahren																								
Autofahren																								

Unterstützung von Partner*																								
Unterstützung von anderen*																								
Sich bewusst was Gutes getan																								

* = z. B. trösten; Kind abnehmen; andere Arbeiten übernehmen; ermutigen; zureden; in den Arm nehmen; usw.

Brauchte es Hilfe beim Einschlafen?

Falls Ja, welche?

Wie oft ist es in der Nacht aufgewacht?

Falls Ja, welche?

Brauchte es Hilfe um wieder einzuschlafen?

Wann war der schönste Moment des Tages mit ihrem Baby?

Wie sah er aus?

Ihre Stimmung am Morgen sehr schlecht sehr gut

Ihre Stimmung am Abend sehr schlecht sehr gut

WEITERBILDUNG SCHLAF

Bedeutung des Non-REM-Schlafs; Konsolidierung neuronaler Netzwerke, welche während des Wachens angelegt worden sind

Zum Vergleich: Bedeutung des REM-Schlafs: Aufbau und Konsolidierung neuronaler Netzwerke per sé.

