Teknologiske muligheter i fremtidens psykiatri: Bruk av IT, smarttelefoner, elektroniske armband og bevegelsessensorer i diagnostikk og behandling

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Divisjon psykisk helsevern, St Olavs Hospital

Diagnostikk, overvåking og behandling

- Egenrapport fra pasienter
- Beskrivelser fra andre
- Legen sin observasjon og fortolkning
- Psykoterapi
  - Kostbart
    - Stigma
    - Kulturelle og sosiale forhold
    - Kjønnsforskjeller
  - Tilgjengelig for en liten del av de som har behov
  - Blir neppe et tilbud til de mange

Muligheter

- Observasjon og monitorering
  - Flytte informasjon fra papir til elektronisk medium
  - Objektiv registrering av atferd
  - Overvåking av pasientrom
  - Manipulering av lys i pasientrom
  - Registrere fysiologiske forandringer
- Behandling ved bruk av elektroniske medier med eller uten tilgang til nettet

Observasjon: Hvilke medier?

- Alt som produseres for sport/ overvåking av trening
  - Et stort marked
    - 200 millioner enheter i løpet av kort tid
  - Hurtig utvikling av utstyr
  - Fall i pris
    - Skritt teller
    - Aktigrafer
    - GPS
    - Pulsmålere
    - Respirasjon
    - Blodsukker
    - Søvnmønster
  - Klokker, annet utstyr, mobiltelefoner og nettbrett
- Mer krevende kartlegging av bevegelsesmønsteret som gangeffektivitet på tredemølle

Observasjon: Hvilke medier?

- Mobiltelefoner
  - Samtaler: hyppighet, tid på døgnet og varighet
    - Hvem en ringer til; familie, venner eller mer fjerne
      - Endringer av mønstre
    - Tilsvarende sms
  - Analyse av stemmen
    - Volum
    - Toneleie
    - Tempo
  - Mikrofonen til analyse av lyder omkring
  - Hvilke mobiltelefoner som er i nærheten
    - Blåtann o.a.

Behandling: Hvilke medier?

- PC
- Nettbrett
- Mobil
- Klokker og annet utstyr utviklet for idrett
- Kombinasjoner av disse
- Med eller uten:
  - Konsultasjoner
  - Telefon
  - E mail
  - SMS
  - Video/Skype
  - Farmakoterapi og annen behandling
- “Kopier” av tradisjonell samtale behandling, CBT
- Automatisert respons på endret atferd
- Mye raskere utvikling av utstyr og programmer enn etterprøving av effekt
  - Tradisjonell RCT tar gjerne 5 år fra planleggimng til resultat artikkel

Observasjon/Diagnostikk

- Tradisjonelle spørreskjema finnes elektronisk
  - Eks: BDI, BAI
    - Fordel: informasjonen kommer rett i journal eller forskningsfil utfylt av pasienten
    - Utfyllingen kan tidfestes nøyaktig
    - Checkware
  - Alternativ for å unngå punching av data: Spørreskjema på papir kan avleses optisk
    - Administrativt enklere

Endringer av atferd

- “Min kone kan se det på hvordan jeg går”
- “Jeg ville ikke våkne, jeg hadde det bedre når jeg sov”
- “Beina mine er aldri i ro, jeg snakker fort, jeg til og med spiser hurtig”
- “Jeg har nesten ingen sosial kontakt”

Smarttelefon, registrere endret atferd

- Vi har de telefonen med oss hele tiden
- Registrerer bevegelse
- Søvn
- Tale
- Fysisk nærhet til andre telefoner

- "Min kone kan se det på hvordan **jeg går**"
  - Bipolar lidelse
- "Jeg ville ikke våkne, jeg hadde det bedre når jeg **sov**"
  - Depresjon
- "Beina mine er aldri i ro, **jeg snakker fort**, jeg til og med spiser hurtig"
  - Mani
- "Jeg har nesten ingen **sosial kontakt**"
  - Schizofreni

Dagbøker

- Brukes mye ved Bipolare lidelser, hjørnestein I opplæring av pasienter
  - Også ved andre tilstander
- Kan kombineres med arbeidsbøker der informasjon fra dagbøkene gradvis utvikles til behandlingsplan sammen med legen
- Planlagte tiltak ved endringer av symptomer eller funksjon settes opp I en behandlingsplan som pasienten har kopi av
- Basert på en rekke studier fra sist på 1990 tallet og utover
- Det å oppdage nye episoder tidlig synes å ha større effekt ved manier enn depresjoner
- Tidlig oppdagelse som eneste tiltak undersøkt i en sentral studie av A.Perry BMJ 1998

NAME

MOOD CHART

Month / Yr: 9/98

TREATMENTS

(Enter number of tablets taken each day)

Lithium 450 mg	Verbal Therapy	Daily Notes	Irritability (0 = none, 1 = mild, 2 = moderate, 3 = severe)	Anxiety	Hours Slept Last Night	Mood: Depressed — Severe: Significant Impairment NOT ABLE TO WORK	Depressed — Mod.: Significant Impairment ABLE TO WORK	Depressed — Mild: Without Significant Impairment	WNL: MOOD NOT DEFINITELY ELEVATED OR DEPRESSED. NO SYMPTOMS. Each dash is indicated	Elevated — Mild: Without Significant Impairment	Elevated — Mod.: Significant Impairment ABLE TO WORK	Elevated — Severe: Significant Impairment NOT ABLE TO WORK	Psychotic Sxs Strange Ideas, Hallucinations
2			1	2	8				1				
2			1	2	8				2				
2			1	2	8				3				
2			2	2	10				4				X
2		Cold/Aches/Pains	3	1	10				6				
2			2	1	9				6				
2			1	1	8				7				
2			1	1	8				8				
2			0	0	8				9				
2			0	0	8				10				
2			0	0	8				11				
2			0	0	8				12				
2			0	0	8				13				
2			1	0	8				14				
2		Vacation	1	0	7				16				
2			2	0	7				16				
2			2	0	4				17				X
1			3	1	4				18				X
2			3	1	4				19				X
2			3	1	5				20				
2			3	1	5				21				
2		End Vacation	2	1	5				22				
2			2	2	6				23				
2			2	2	7				24				
2			2	2	7				26				
0			1	2	8				26				
2			1	1	8				27				
2			1	1	8				28				
2			1	1	8				29				
2		Weight	0	1	8				30				
2			0	0	8				31				

Antipsychotic ____ mg

Benzodiazepine ____ mg

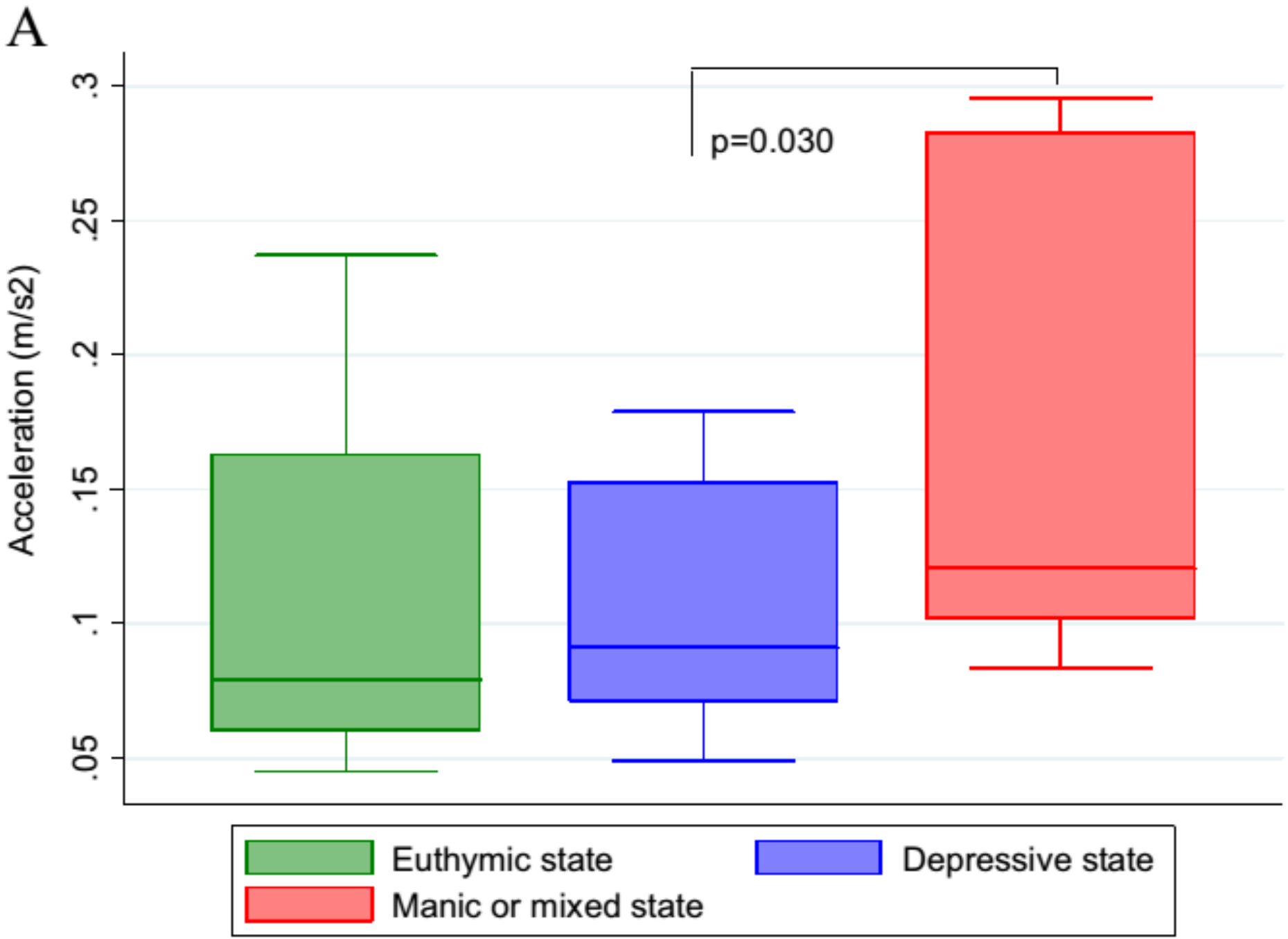
Antidepressant ____ mg

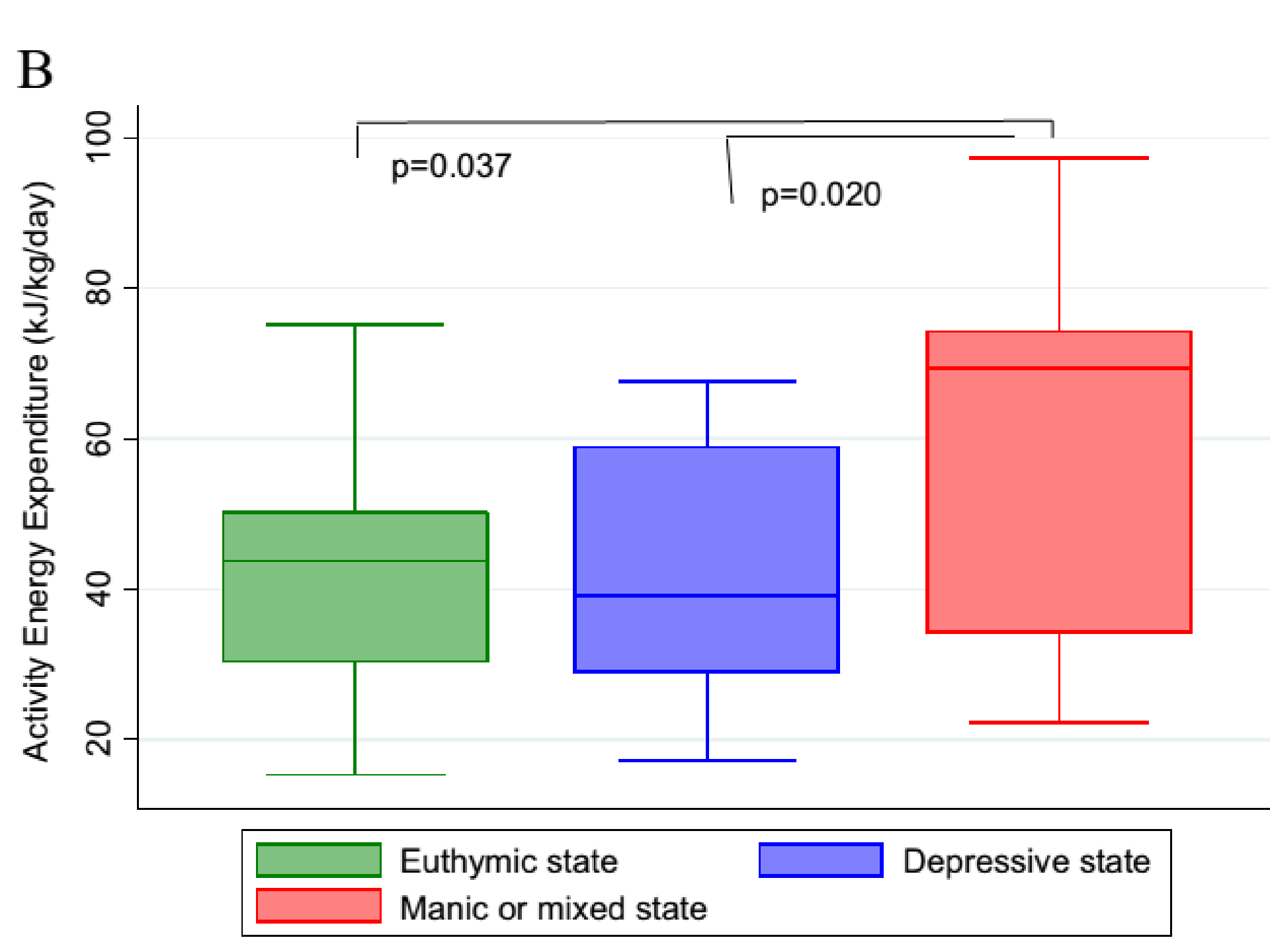
Anticonvulsant Depakote 250 mg

Daily electronic self-monitoring in bipolar disorder using smartphones - the MONARCA I trial: a randomized, placebo-controlled, single-blind, parallel group trial

Faurholt-Jepsen Psychol Medicine 2015

- RCT
- Software for Android monitor:
  - subjective and objective activities
  - treatment adherence
  - bidirectional feedback loop between patients and providers
- Subjective items
  - Mood, irritability, sleep, alcohol
  - Objective measures
    - speech, social and physical activity in the software system
    - Decreased activity in speech (paucity of speech) seems to be a sensitive and valid measure of prodromal symptoms of depression
    - increased speech activity (talkativeness) predicts a switch to hypomania
    - social activity
      - engaging in relations to others
    - physical activity represents central and sensitive aspects of illness activity


A
Acceleration (m/s2)
.05
.1
.15
.2
.25
.3
p=0.030
Euthymic state
Depressive state
Manic or mixed state


B
Activity Energy Expenditure (kJ/kg/day)
100
80
60
40
20
p=0.037
p=0.020
Euthymic state
Depressive state
Manic or mixed state

Hypothesis

- Daily electronic monitoring by online interactive Smartphone
  - including a feedback loop between patients and clinicians
  - reduces the severity of depressive and manic symptoms and stress
  - increases social functioning, quality of life, adherence to medication and cognitive functioning.
- Placebo smartphone

Frontpage.

Maria Faurholt-Jepsen et al. BMJ Open 2013;3:e003353

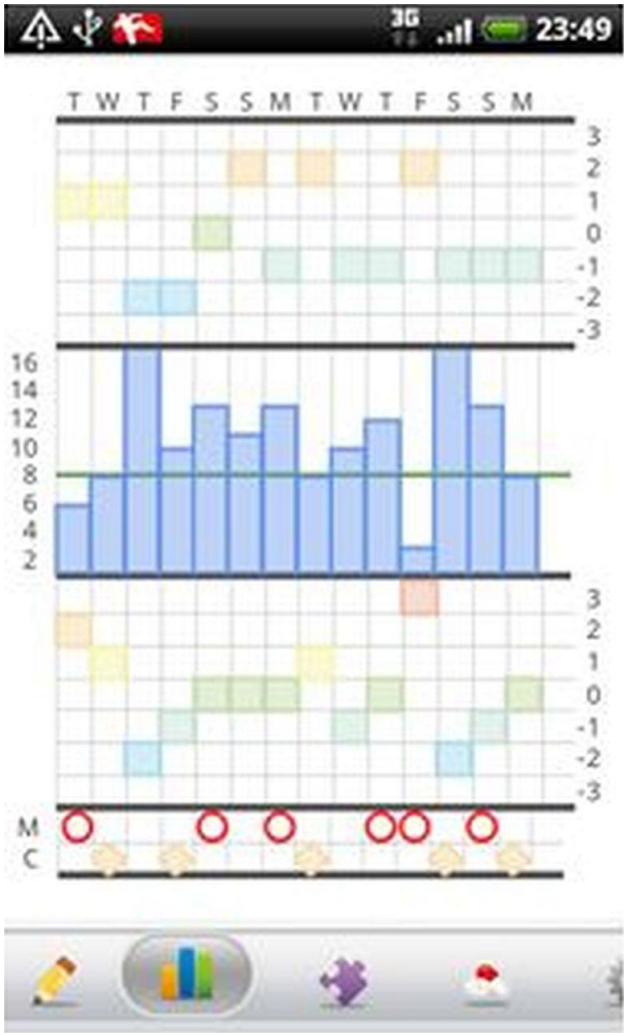
BMJ Open

Self-assessment.

Maria Faurholt-Jepsen et al. BMJ Open 2013;3:e003353

BMJ Open

Visualisation.



Maria Faurholt-Jepsen et al. BMJ Open 2013;3:e003353

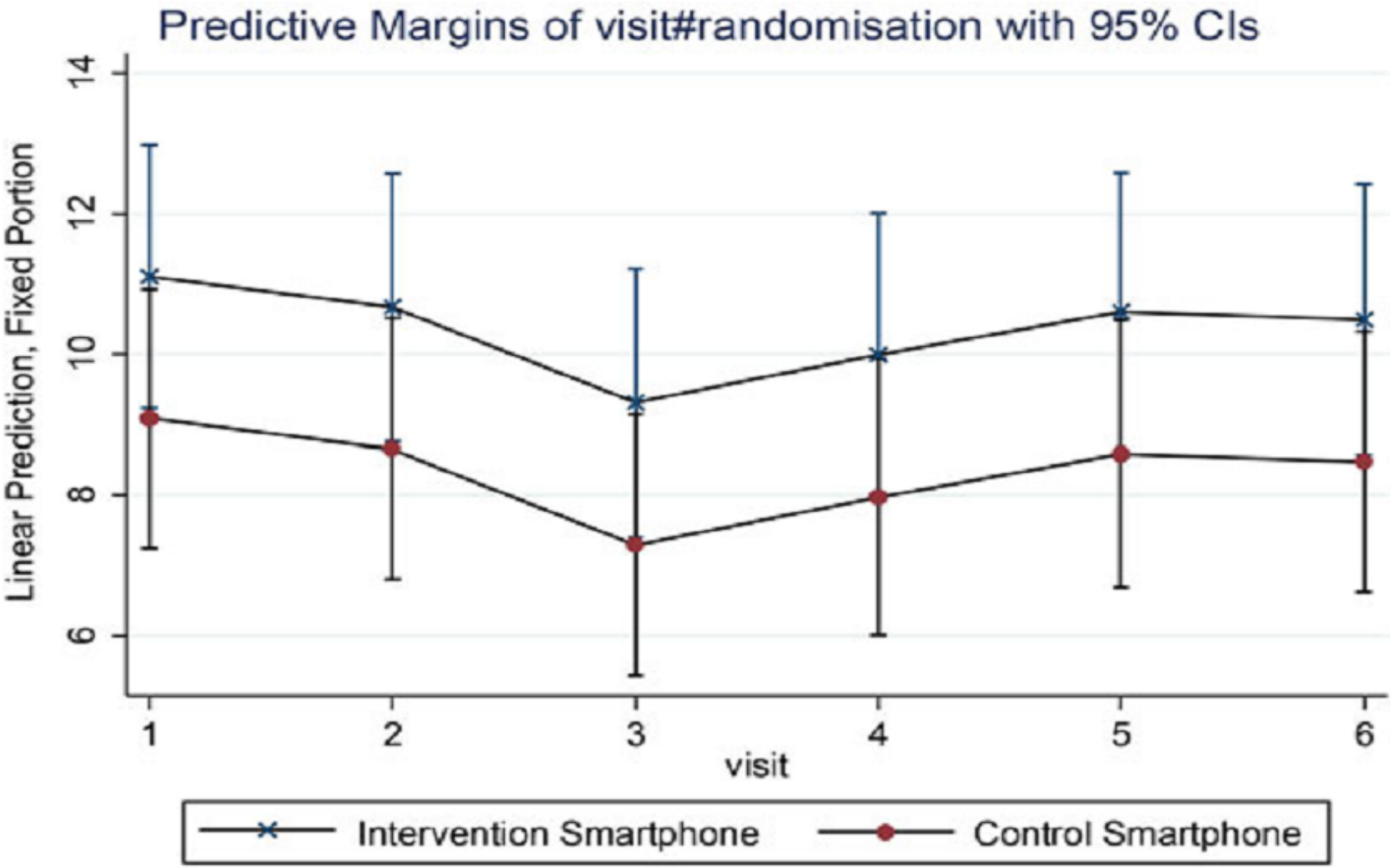
BMJ Open

Medication.

Maria Faurholt-Jepsen et al. BMJ Open 2013;3:e003353

BMJ Open

Depressive symptoms (HAMD-17 score) in the intervention group (–×–) and the control group (–●–) over 6 months



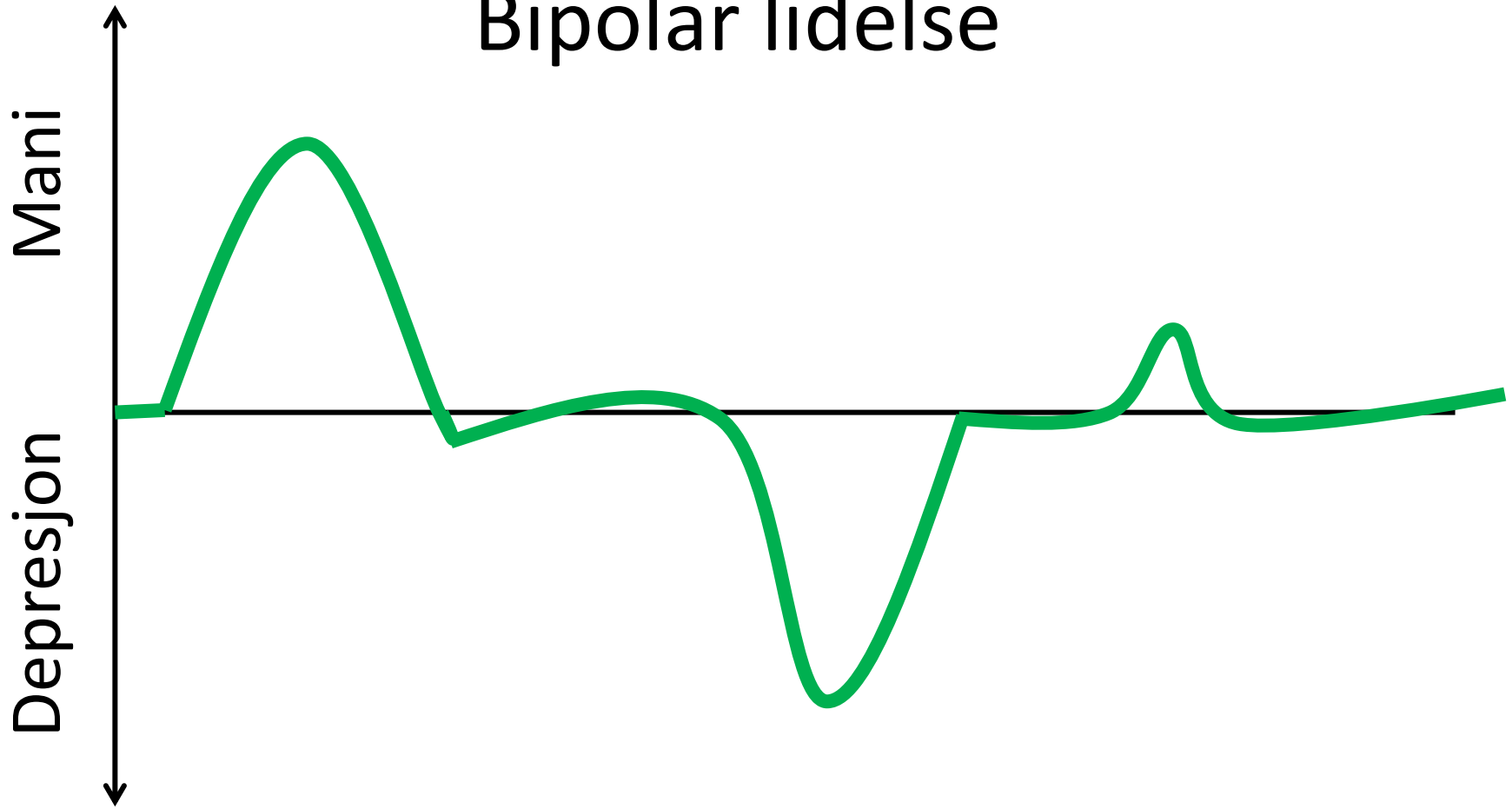
Tendency for more depressed in intervention group

- Excluding patients with manic or mixed symptoms:
  - Intervention group more depression $p < 0.02$
- Including only patients with HAMD>7 baseline
  - Intervention group more depression $p < 0.02$
- Including only patients with manic symptoms
  - Intervention group less manic: $p<0.01$

BIObip:
Variability in Motor Activity as a Potential Biomarker for Bipolar Disorder

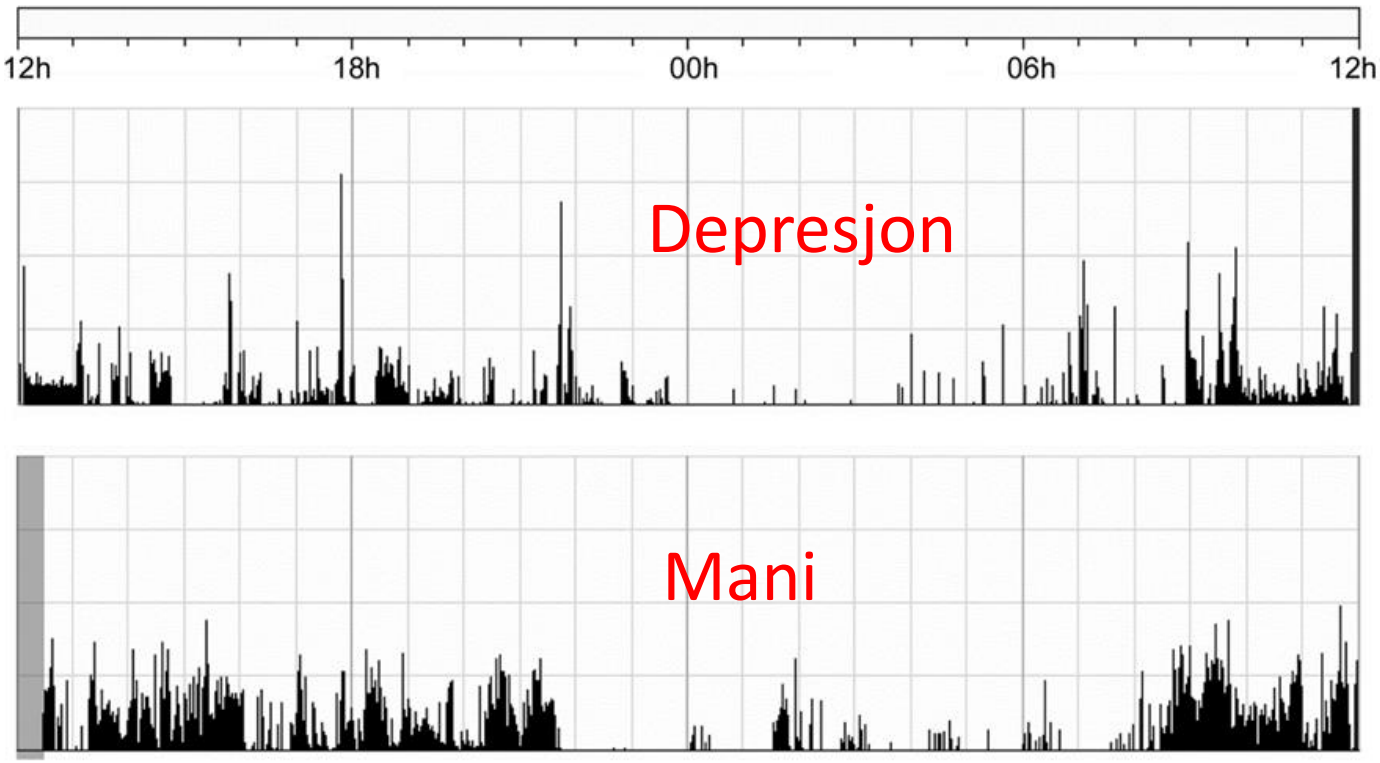
Karoline Krane-Gartiser, INM
Gunnar Morken, INM

Bipolar lidelse



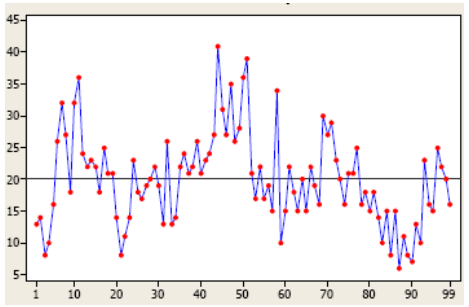
1) Kort om prosjektet

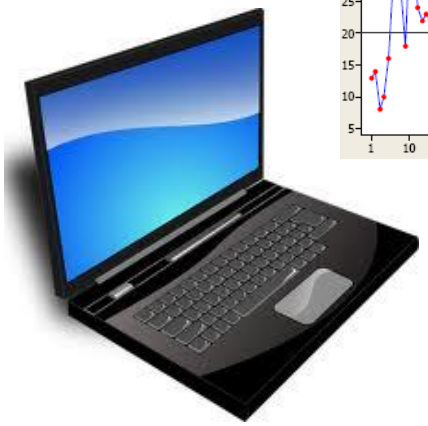
Aktigraf/aktivitetsanalyse



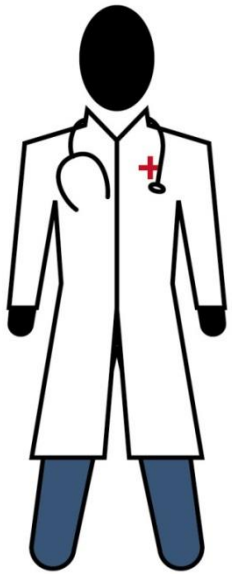
Real-time data transfer

Secure data storage





Mathematical analysis



SINTEF

ST. OLAVS HOSPITAL
TRONDHEIM UNIVERSITY HOSPITAL

NTNU

Actigrafi- muligheter

- Søvn - våkenhet
- Andre circadiane forstyrrelser
- Gjennomsnittsaktivitet – grad av aktivitet
- Variasjon eller stabilitet av bevegelsesmønstre
  - Standard deviasjon (SD) for for hver tidsserie, et intra-individuelt mål på fluktuasjon i aktivitet
  - The root mean square successive difference (RMSSD); differanse i fortløpende minutt til minutt registreringer
  - The RMSSD/SD ratio
- I 64-minutters perioder:
  - Autocorrelation (lag 1) and Fourier analyser
  - To mål på kompleksitet: “sample entropy” og “symbolic dynamic analysis”

Formål

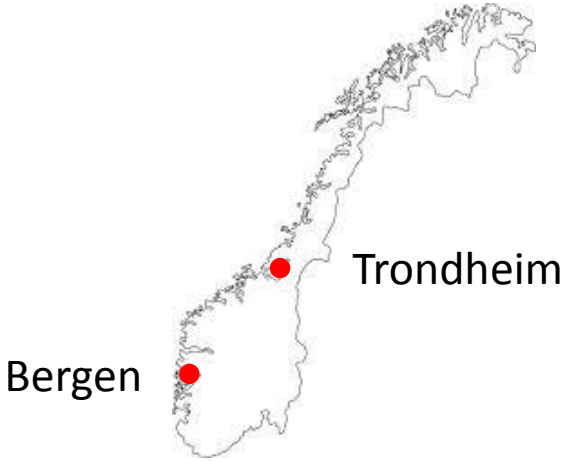
- Motoriske forstyrrelser er vanlige ved stemningslidelser
- Tradisjonelt beskrevet av pasienten eller observert av kliniker

- Å vurdere aktivitetsmønstre ved aktigrafi ved hjelp av linjære og ikke-linjære analytiske metoder og sammenligne med tradisjonelle kliniske observasjoner

PASIENTER

- Fra en studie av agitasjon/uro ved akutt innleggelser i sykehus
- 424 akutt innlagte pasienter
- 280 brukte actigraf i 24 timer
- Friske kontroller fra ansatte Valen sykehus

Østmarka Department of Psychiatry, St. Olav's University Hospital, Trondheim, Norway



STUDY # 1

OPEN ACCESS Freely available online

PLOS ONE

Actigraphic Assessment of Motor Activity in Acutely Admitted Inpatients with Bipolar Disorder

Karoline Krane-Gartiser[1]*, Tone Elise Gjotterud Henriksen[2], Gunnar Morken[1], Arne Vaaler[1], Ole Bernt Fasmer[2]

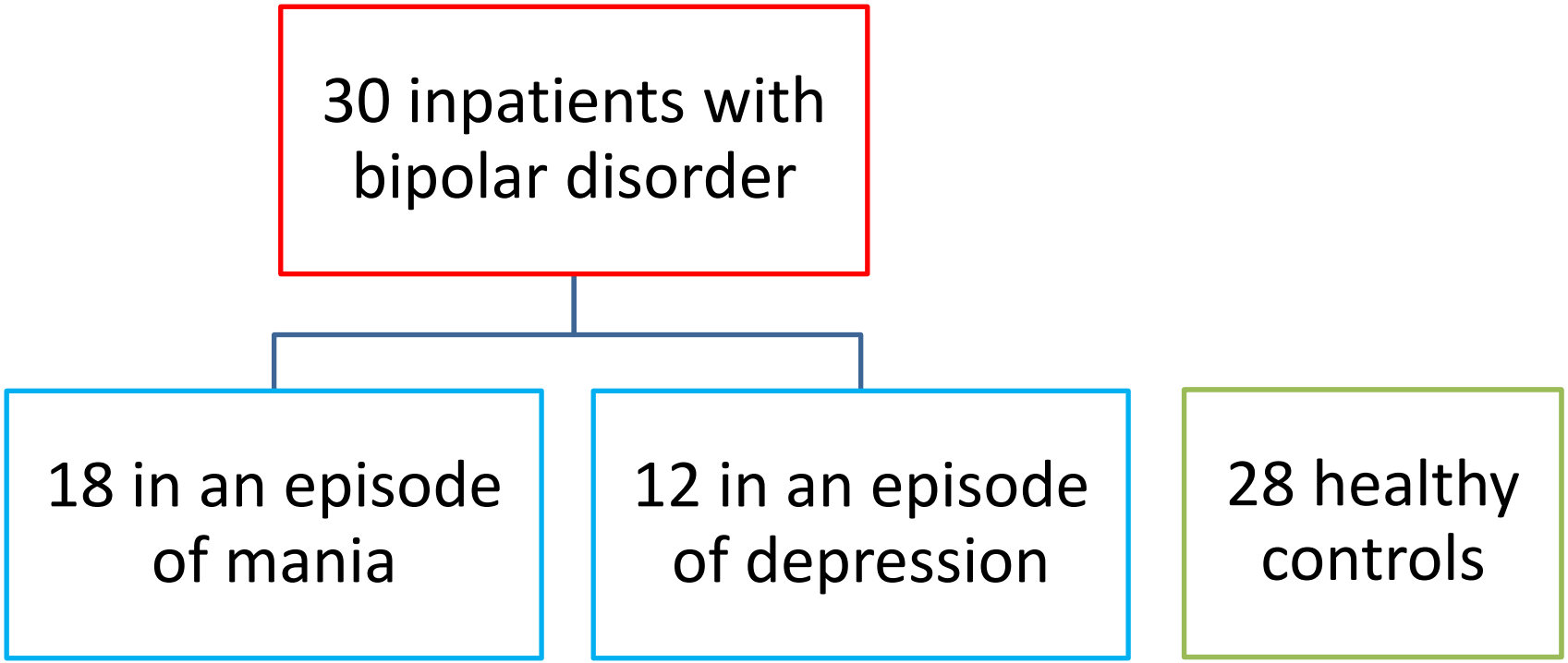
1 Department of Neuroscience, the Norwegian University of Science and Technology, Trondheim, Norway and Department of Psychiatry, St. Olav's University Hospital, Trondheim, Norway, **2** Department of Clinical Medicine, Section for Psychiatry, Faculty of Medicine and Dentistry, University of Bergen, Bergen, Norway, Division of Mental Health Care, Valen Hospital, Fonna Regional Health Authority, Norway and MoodNet Research Group, Division of Psychiatry, Haukeland University Hospital, Bergen, Norway

Abstract

Introduction: Mania is associated with increased activity, whereas psychomotor retardation is often found in bipolar depression. Actigraphy is a promising tool for monitoring phase shifts and changes following treatment in bipolar disorder. The aim of this study was to compare recordings of motor activity in mania, bipolar depression and healthy controls, using linear and nonlinear analytical methods.

Materials and Methods: Recordings from 18 acutely hospitalized inpatients with mania were compared to 12 recordings from bipolar depression inpatients and 28 healthy controls. 24-hour actigraphy recordings and 64-minute periods of

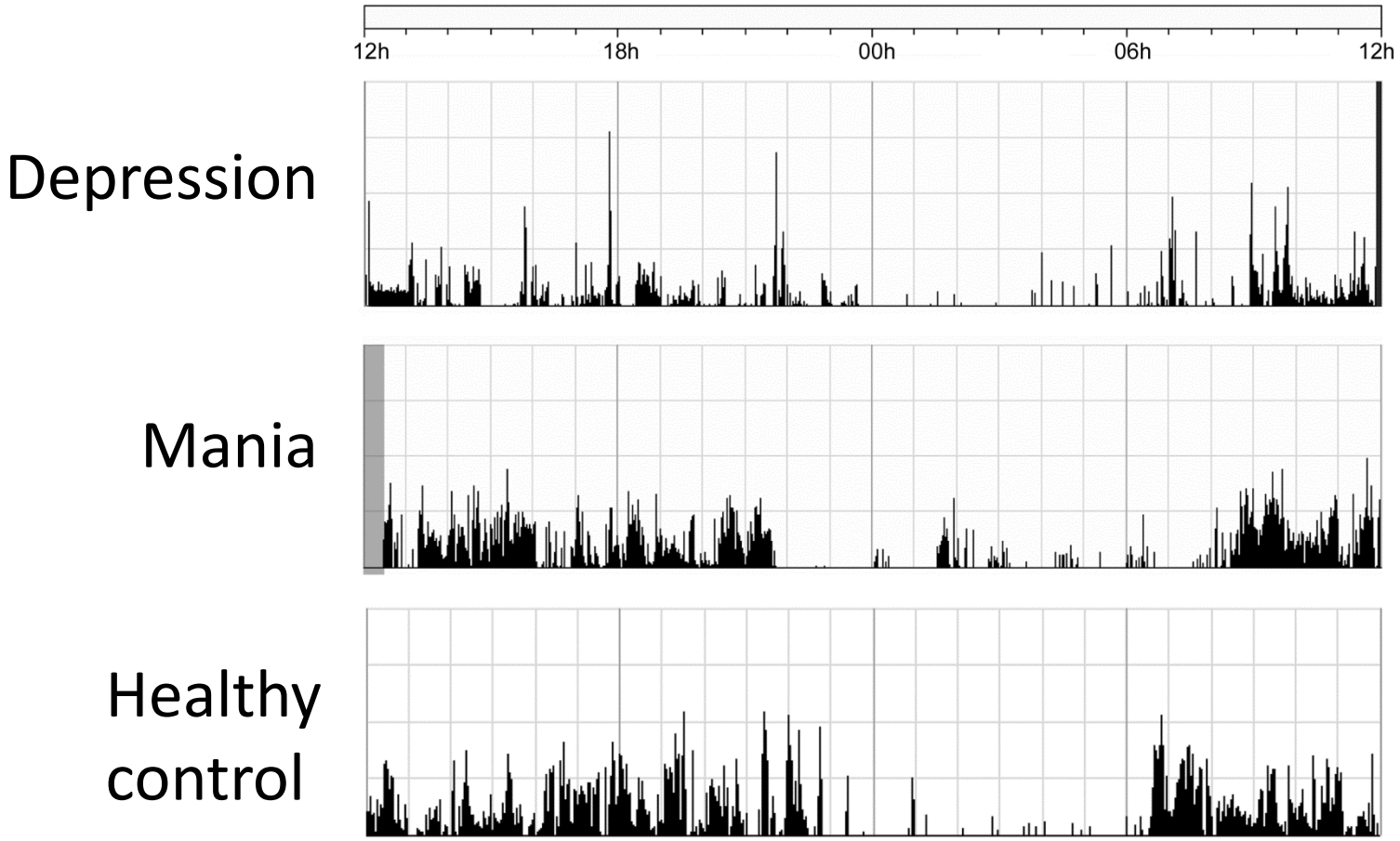
STUDY DESIGN # 1



STUDY DESIGN # 1

- 24-hour recording
- 64-minute periods of continuous motor activity in the morning and evening (active periods)

RESULTS STUDY # 1



24-HOUR RECORDING

Variable	Mania	Depression	Healthy controls	p-value (ANOVA)	Post hoc test (Bonferroni)
Mean activity count/min	157	128	203	**0.014**	Depression vs. healthy controls: **p < 0.05**
SD/min in % of mean	145.1	179.4	147.3	**0.043**	
RMSSD/min in % of mean	113.7	150.5	99.1	**0.002**	Depression vs. healthy controls: **p < 0.05**
RMSSD/SD	0.774	0.828	0.675	**< 0.001**	Depression vs. healthy controls: **p < 0.001** Mania vs. healthy controls: **p < 0.001**

64-MIN ACTIVE PERIOD IN THE MORNING

Variable	Mania	Depression	Healthy controls	p-value (ANOVA)	Post hoc test (Bonferroni)
Mean activity count/min	215	235	391	**< 0.001**	Mania vs. healthy controls: p < 0.001 Depression vs. healthy controls: p < 0.01
SD/min in % of mean	87.3	117.0	89.4	**0.012**	Depression vs. mania: p < 0.05 Depression vs. healthy controls: p < 0.05
RMSSD/min in % of mean	86.1	107.4	74.7	**0.012**	Depression vs. healthy controls: p < 0.01
RMSSD/SD	0.980	0.919	0.844	**0.026**	Mania vs. healthy controls, p < 0.05
Sample entropy	1.474	1.032	1.114	**0.034**	
Symbolic dynamics	36.81	30.08	33.61	**0.031**	Depression vs. mania: p < 0.05
Fourier analysis	0.87	0.70	0.55	**0.025**	Mania vs healthy controls: p < 0.05
Autocorrelation Lag 1	0.493	0.561	0.628	**0.013**	Mania vs healthy controls p < 0.01

HOVEDFUNN (STUDY # 1)

- Mani
  - Lavere gjennomsnittsaktivitet enn friske kontroller
  - Mindre variasjon i aktivitet enn pasienter med depresjon
  - Et mer kompleks bevegelsesmønster
  - Økt variabilitet I øvre frekvenser av bevegelsesspektrum (Fourier analysis), økt RMSSD/SD ratio og redusert autokorrelasjon (lag 1)
  - Ligner pasienter med schizofreni og friske kontroller som fikk en glutamat antagonist
- Bipolar depresjon
  - Redusert 24-timers aktivitet og høy intra-individuell variabilitet

HOVEDFUNN (STUDY # 1)

- Det er store motoriske forskjeller mellom mani og bipolar depresjon og begge skiller seg klart fra friske kontroller
- Et tydelig døgnmønster: De største forskjellene mellom gruppene i perioder med kontinuerlig aktivitet om morgenen

Actigraphically Assessed Activity in Unipolar Depression:
A Comparison of Inpatients With and Without Motor Retardation

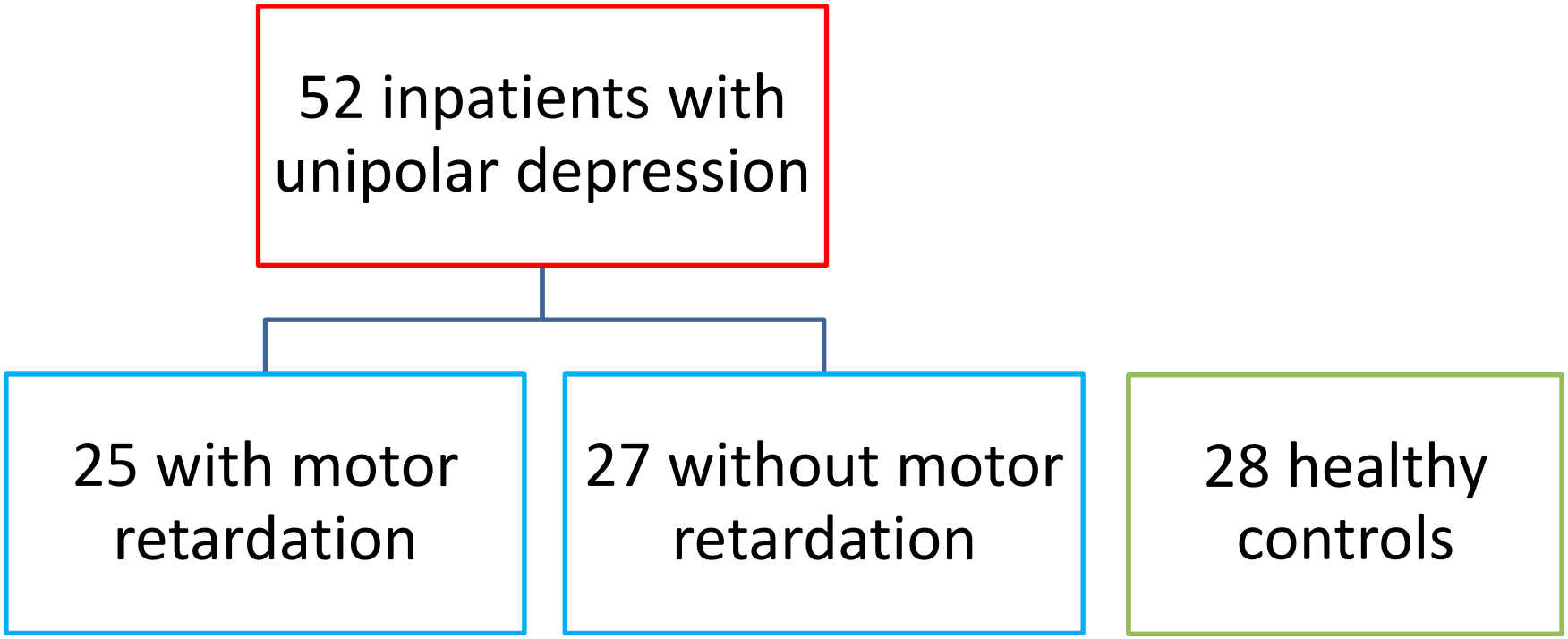
Karoline Krane-Gartiser, MD[a,b,*]; Tone E. G. Henriksen, MD[c,d,e]; Arne E. Vaaler, MD, PhD[a,b]; Ole Bernt Fasmer, MD, PhD[c,e]; and Gunnar Morken, MD, PhD[a,b]

ABSTRACT

Objective: To compare the activity patterns of inpatients with unipolar depression, who had been divided into groups with and without motor retardation prior to actigraphy monitoring.

In unipolar depression, the presence of psychomotor retardation and agitation is traditionally expressed by the patient's subjective experience and observations by the clinician. Retardation is common in melancholic depression,[1] while activated or agitated depressions have features of mixed states, in which the depressions include manic

STUDY DESIGN # 2



24-HOUR RECORDING

Activity variable	Unipolar retar-dation	Unipolar non-retardation	Healthy controls	p-value (ANOVA)	Post hoc test (LSD)
Mean activity count/minute	91	127	203	**<0.001**	Healthy controls vs. both patient groups: $p < 0.001$ Retardation group vs. non-retardation group: $p = 0.040$
SD/min in % of mean	206.1	173.0	147.3	**<0.001**	Healthy controls vs. retardation group: $p < 0.001$ Healthy controls vs. non-retardation group: $p = 0.018$ Retardation group vs. non-retardation group: $p = 0.003$
RMSSD/min in % of mean	160.7	125.9	99.1	**<0.001**	Healthy controls vs. both patient groups: $p \leq 0.001$ Retardation group vs. non-retardation group: $p = 0.025$
RMSSD/SD	0.772	0.730	0.675	**0.003**	Healthy controls vs. retardation group: $p = 0.001$ Healthy controls vs. non-retardation group: $p = 0.045$

64-MIN ACTIVE PERIODS

Activity variable	Sequence	Unipolar retar-dation	Unipolar non-retardation	Healthy controls	p-value ANOVA	Post hoc test (LSD)
Mean activity count/ minute	Morning	200	256	391	**<0.001**	Healthy controls vs. both patient groups: p <0.001
	Evening	162	165	247	**0.013**	Healthy controls vs. retardation group: p = 0.011 Healthy controls vs. non-retardation group: p = 0.010
SD/min in % of mean	Morning	113.7	101.4	89.4	**0.005**	Healthy controls vs. retardation group: p = 0.001
	Evening	136.1	118.2	112.5	0.125	
RMSSD/min in % of mean	Morning	97.5	92.6	74.7	**0.007**	Healthy controls vs. retardation group: p = 0.003 Healthy controls vs. non-retardation group: p = 0.015
	Evening	128.2	113.1	96.4	0.051	
RMSSD/SD	Morning	0.857	0.919	0.844	0.186	
	Evening	0.953	0.956	0.866	0.161	
Sample entropy	Morning	0.911	1.311	1.114	**0.022**	Retardation group vs. non-retardation group: p = 0.006
	Evening	0.919	1.071	0.976	0.594	
Fourier analysis	Morning	0.60	0.83	0.55	0.075	
	Evening	0.88	0.93	0.72	0.422	

HOVEDFUNN (STUDY # 2)

Pasienter med motorisk retardasjon:

- Lav gjennomsnitt aktivitet,
- Høy intra-individuell variasjon av aktivitet og økt differanse fra minutt til minutt (RMSSD)
- Ligner pasienter med bipolar depresjon

HOVEDFUNN (STUDY # 2)

Pasienter uten motor retardasjon

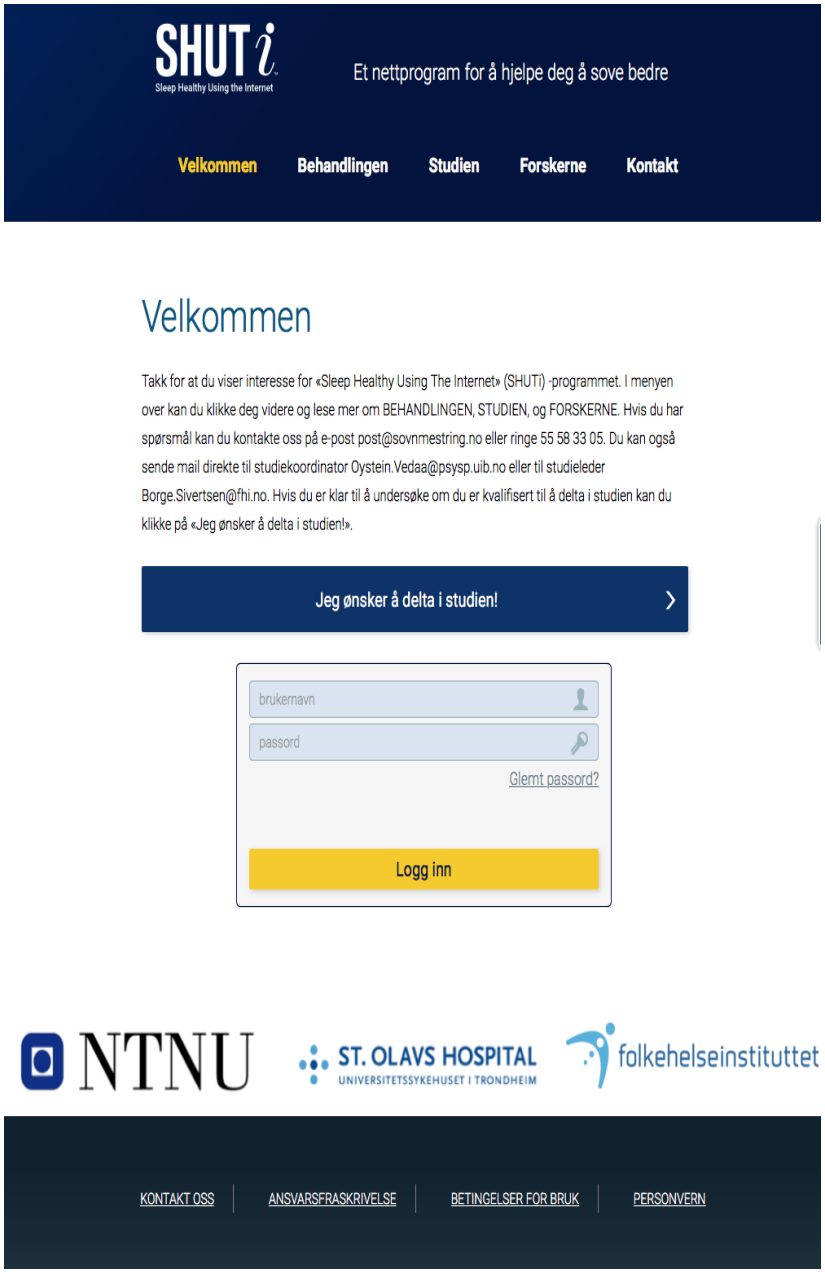
- Mindre aktive og mer variasjon enn friske kontroller
- Ligner funn (kompleksitet og variabilitet) hos pasienter med schizofreni, mani og friske som fikk en glutamat antagonist

Konklusjon

- Aktigraphi synes å kunne kvantifisere motoriske endringer ved affektive tilstander
- Symptomene kan identifiseres med linjære og ikke-linjære analyse metoder
- Kan skille motorisk retarderte og ikke-retarderte pasienter med depresjon
- Monitorere alvorlighet og klinisk bedring eller forverring ved affektive lidelser

FREMTID

- Monitorere pasienter over tid
- Bedre analyser, samarbeid med matematiske miljø
- Endringer i aktivitet og motorikk kan bli brukt til
  - Første tegn til ny episode
  - Monitorere effekter av behandling
- Kan aktigrafi brukes ved alle tilstander som har motoriske endringer?



Behandling av kroniske søvnvansker på internett:

Fra www til zzz?

Håvard Kallestad

Psykologspesialist, PhD

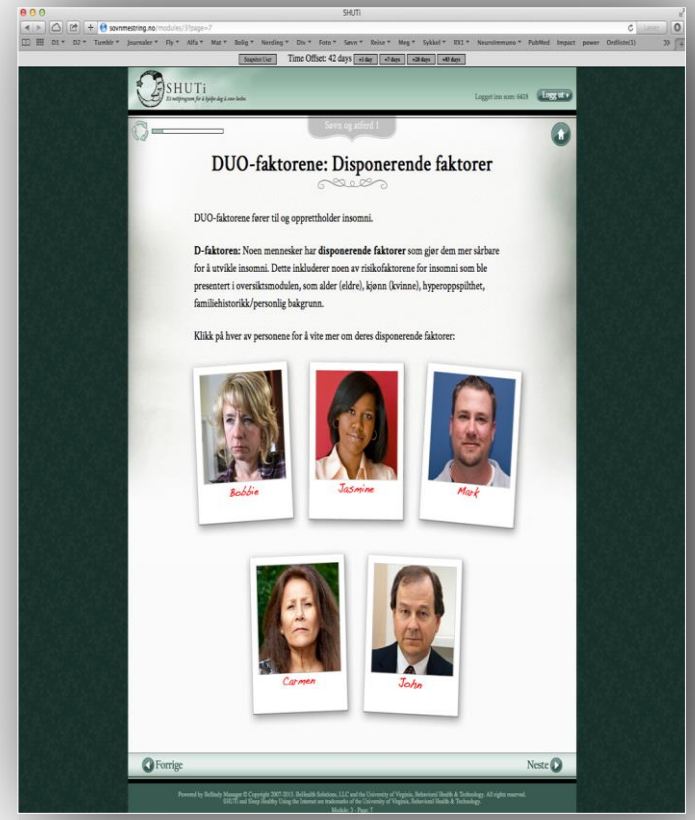
NTNU / St. Olavs Hospital / Folkehelseinstituttet

Tilgjengelighet av behandling

- Kognitiv atferdsterapi for insomni (CBT-I) er den best dokumenterte behandlingen for insomni og bør være førstevalg (NIH, 2005).
- Problemet er at svært få har tilgang til denne behandlingen
- Vi ønsker å undersøke om vi kan gjøre behandlingen tilgjengelig for flere gjennom å ha den på internett.

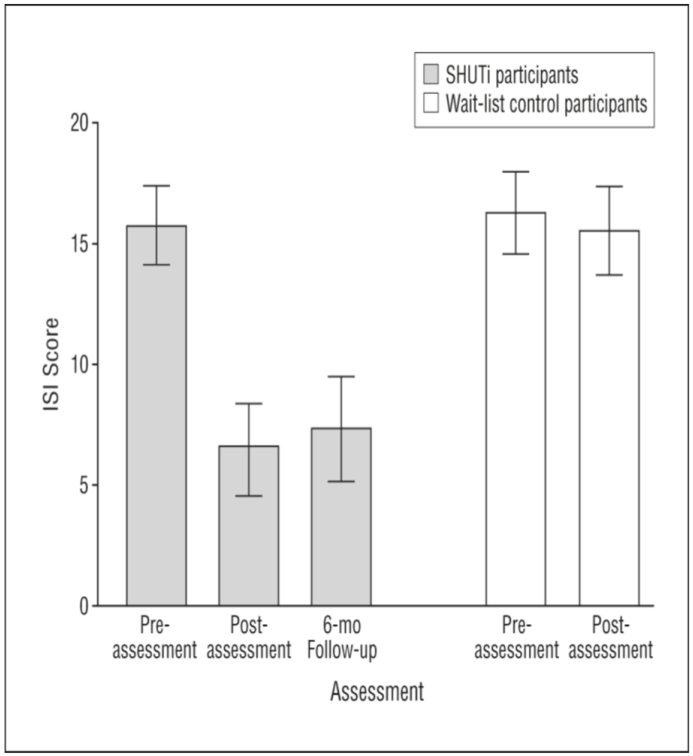
Online CBT-I

- Sleep Healthy Using The internet (SHUTi)
- Utviklet i USA / Canada.
  Oversatt til norsk.
- Basert på CBT-I. Laget av samme person som laget manualen for CBT-I.
- Hel-automatisk. Ingen behandlerkontakt.



SHUTi

- Svært gode resultater i innledende studier.
- 60% ble helt friske fra insomni (Ritterband et al., 2009, JAMA Psychiatry)
- Startet to RCTer i samarbeid mellom NTNU, Folkehelseinstituttet og St. Olavs Hospital.

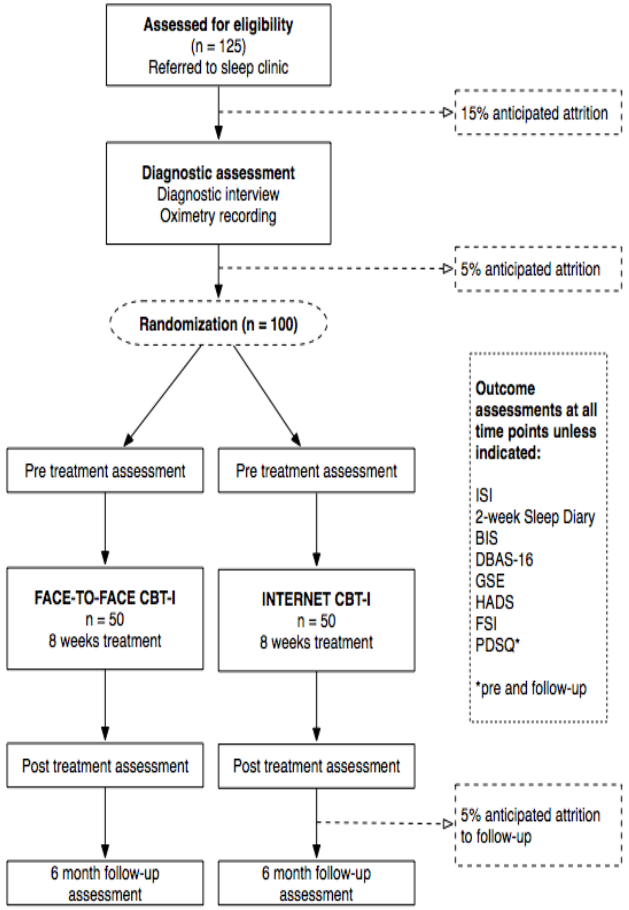


Ubesvarte spørsmål # 1

- Første studien (Ritterband et al., 2009) fant tilsvarende effekter til det en forventer om en får ansikt-til-ansikt CBT-I.
- Vi vet ikke om en faktisk får slike resultater om en gjør en direkte sammenlikning i en klinisk populasjon.

Studie # 1

- Formål: Å undersøke effekten av online CBT-I sammenliknet med ansikt-til-ansikt CBT-I
- 100 pasienter som er henvist til en søvnklinikk og diagnostisert med insomni.
- Randomiseres til online CBT-I eller ansikt-til-ansikt CBT-I
- 62 er randomisert hittil.



Ubesvarte spørsmål # 2

- Vi vet ikke effekten i en stor og lite selektert gruppe mennesker.
- Vi vet lite om lang-tids effektene av CBT-I utover bedring av søvn.
- Vi vet lite om hvem som har nytte av behandlingen.

- Å undersøke slike spørsmål krever svært store studier.
- Praktisk vanskelig å gjennomføre tidligere.

Formål med studien

- Å teste om SHUTi er effektiv i en stor populasjon hvor utredning og behandling er automatisert.
- Vi er spesielt interesserte i lang-tidseffekter på helse, bruk av helsetjenester, medikamentbruk og arbeidsfunksjon.
- Vi ønsker også å undersøke om det finnes forhold som kan forutsi fremtidig behandlingsresultat.

Studie # 2

- Inntil 1500 deltakere randomiseres til online CBT-I eller en online kontrollbetingelse (nettbaserte søvnhygiene-råd).
- Startet 26. feb 2016. Ca 350 deltakere randomisert første to uker.

Nytteverdi

- Dersom disse studiene viser positive resultater vil vi kunne tilby en ny lav-terskelbehandling til en stor pasientgruppe, uten venteliste, også i områder som er langt unna spesialister.

Oppsummert

- Svært hurtig utvikling av teknologi og programvare
  - Overvåkning
    - Kan trolig tas i bruk hurtig
  - Behandling
- Etterprøving av effekt går langsommere
  - Å teste ut behandnlingseffekt tar flere år
  - Ny teknologi vil utvikle seg mens studiene pågår

Internett CBT

- CBT principles
- delivered via the Internet by an individual or program remote from the client
- Beck's Cognitive Triad
  - people's thoughts, emotions and behaviours influence each other; patients cannot control the world, but they can take control of how they interpret things in that world
  - CBT isolates specific problems, and a therapist helps the patient to develop strategies to address those problems by changing thinking patterns and behaviours
  - CBT has self-contained modules and clearly defined goals; it can be scripted and requires minimal therapist intervention
  - CBT is uniquely suited for implementation online
- Internet-delivered CBT programs share many features
  - short-term, patient-guided, goaloriented sessions
  - often 8 to 12 modules
  - Available online or via a smartphone or tablet application (app)
    - free or for a fee
    - with or without therapist support
    - Content and delivery may differ according to the condition being treated.

Angst

- Metaanalyse I 2009, 19 Internet- or computer-based CBT trials (n = 1167) for depression and anxiety
  - length of treatment and post-treatment evaluation times varied
  - depression, anxiety, general distress, dysfunctional thinking, and functioning or quality of life
  - any anxiety disorder, posttraumatic stress disorder, panic disorder and phobia
  - patients who received Internet-delivered CBT had fewer symptoms in all clinical measures than did wait-listed controls
  - effect sizes ranging from 0.48 to 1.14 (95% confidence interval [CI] 0.24 to 0.72 and 0.43 to 1.85, respectively)
  - comparisons of Internet-delivered CBT with placebo, the effect sizes ranged from 0.49 to 0.88 (95% CI 0.14 to 0.84 and 0.70 to 1.31, respectively)
  - Reductions in symptoms with Internet-delivered CBT were equivalent to or better than in-person CBT (i.e., treatment as usual), with mean effect sizes ranging from -0.02 to 0.57 (95% CI -0.33 to 0.30 and 0.22 to 0.92, respectively)
  - With regard to comparisons with wait-listed controls for the individual diagnostic groups, the mean effect sizes were 0.75 (95% CI 0.49 to 1.01) for post-traumatic stress disorder, 1.20 (95% CI 0.87 to 1.58) for panic disorder and 0.66 (95% CI 0.30 to 1.02) for phobia. For comparisons with placebo control, the mean effect sizes were 0.93 (95% CI 0.49 to 1.38) for panic disorder and 0.81 (95% CI 0.44 to 1.19) for phobia.
  - For comparison of Internetdelivered CBT with treatment as usual for panic disorder, the outcomes were comparable (mean effect size 0.30, 95% CI -0.001 to 0.61).
- Meta-analysis 2009 of 23 RCTs (n = 1432) examined the effect of computer-aided psychotherapy on anxiety disorders
  - Computer-based CBT showed a large mean effect size of 1.08 (95% CI 0.84 to 1.32) relative to non-computer-based CBT controls, with no difference between face to-face and computer-based CBT (effect size -0.06, 95% CI -0.22 to 0.10).
- Meta-analysis 2007 of 12 RCTs (n = 2334) evaluated the effectiveness of Internet-delivered CBT in alleviating depression and anxiety
  - reduced symptoms, with an effect size of 0.96 (95% CI 0.69 to 1.24) for Internet-delivered CBT
  - split into unguided and guided Internet-delivered CBT, the effect sizes were 0.24 (95% CI 0.11 to 0.37) and 1.00 (95% CI 0.75 to 1.24), respectively, which suggests that the guided form is more effective for anxiety disorders than the unguided form. In contrast, the 2009 meta-analysis evaluating depression and anxiety showed no significant differences for patients receiving Internet-delivered CBT with and without therapist contact and the 2009 meta-analysis of anxiety disorders showed a small but significant difference in effect size with therapist guidance.
- One large cohort study (n = 570) evaluated Internet-delivered CBT for panic disorder in routine psychiatric care
  - Panic-related anxiety and depression symptoms declined with guided Internet-delivered CBT. Therapist guidance averaged about two hours (total) per patient.
- Internet-delivered CBT for anxiety may increase benefits for patients and efficiency for health care professionals, and these data suggest that it may not sacrifice quality of care, despite needing fewer resources.

Depresjon

- Meta-analysis 2009 of Internet- and computer-based CBT for adult depression
- 12 studies, 2446 participants, with a pooled effect size of 0.41 (95% CI 0.29 to 0.54) for Internet-delivered CBT versus all controls. The effect size increased to 0.61 (95% CI 0.45 to 0.77) for therapist-guided studies alone
- Meta-analysis evaluating Internet- and computer-based interventions in university students 2014
  - Nine RCTs (n = 712), eight were CBT-based (n = 537), and only three reported nonskewed outcomes (n = 144). The standardized mean difference of the nonskewed data was -0.67 (95% CI -1.15 to -0.20), favouring intervention over nontreatment. When all nine trials were included, the data still favoured Internet-delivered CBT, with a standardized mean difference of -0.43 (95% CI -0.63 to -0.22)
- RCT comparing Internet-delivered CBT with treatment as usual in 160 young adults,15 patients were evaluated at weeks 0, 5, 10, 16 and 32 after enrolment
  - A small effect size (0.20, 95% CI 0.00 to 0.50) was seen in patients who received Internet-delivered CBT relative to controls (treatment as usual), over 50% of whom had received traditional pharmacotherapy and/or psychotherapy.
- Therapistguided Internet-delivered CBT programs achieved substantially higher recovery rates based on the Beck Depression Inventory and the Patient Health Questionnaire Nine Item, and the improved outcomes were sustained for at least eight months
- Overall, the Prioritization Summary and the three meta-analyses, indicate that Internet-delivered CBT is effective for depression, relative to inactive controls.
- In addition, the large RCT showed that Internet-based CBT is equivalent to or marginally better than treatment as usual

Somatisk sykdom

- Diabetes mellitus, cancer and multiple sclerosis
- RCT Depression in 255 patients with diabetes
  - eight lessons delivered over eight weeks,
  - patients who received Internet-delivered CBT showed significant improvements in depression at one-month follow-up (effect size 0.29, 95% CI 0.17 to 0.40)
  - per-protocol analysis, both depression symptoms and diabetes-related distress were reduced from baseline at one month posttreatment compared with wait-listed controls (effect size 0.70 [95% CI 0.59 to 0.82] and 0.58 [95% CI 0.38 to 0.78], respectively)
- Cancer Coping Online, to target distress among patients with cancer
  - using six modules delivered weekly
  - RCT (n = 60): significant, sustained interaction effects for cancer-specific distress ($F_{1,92} = 4.94$, $p = 0.04$) compared with an Internet-attention control (information-only version of the online program, covering the same six module topics but lacking interactive elements).
- Fully automated Internet-delivered CBT program called Deprexis to combat depression in patients with multiple sclerosis
  - 10 sequential modules
  - The effect size for the total Beck Depression Inventory score was 0.53 ($p = 0.01$) compared with waitlisted controls (n = 90).
- Internet-delivered CBT could be an effective treatment for emotional distress caused by medical conditions
  - an opportunity for patients with mobility issues to access psychological care

Long-term treatment effectiveness

- One study looked at the efficacy of Internetdelivered CBT for social anxiety disorder over five years
- Nine textbased modules
- Randomly assigned to treatment and wait-listed control groups
  - control group received Internet-delivered CBT after completion of pre- and post-treatment assessments for the experimental group
  - All patients were included in the one-year and fiveyear follow-up assessments
  - large effect sizes relative to baseline across all measures, and these were retained for up to five years
  - effect sizes at five-year follow-up ranged from 0.63 (95% CI 0.15 to 1.10) for the Beck Anxiety Inventory and the Quality of Life Inventory scores in the Internet-delivered CBT group to 1.40 (95% CI 0.86 to 1.90) for the Liebowitz Social Anxiety Scale-Self Report score in the wait-listed control group following administration of Internet-delivered CBT
- "booster" sessions may be an effective longterm solution
- a recent RCT evaluating booster sessions for patients with obsessive-compulsive disorder
  - 93 patients received 10 weeks of guided Internet-delivered CBT
  - randomly assigned to booster and nonbooster groups
  - A three-module weekly booster treatment was administered at six months after completion of initial treatment
  - All patients were evaluated before treatment, immediately after treatment and at 4, 7, 12 and 24 months. For all groups, there was a large effect size for the primary measure, the Yale- Brown Obsessive Compulsive Scale (effect size 2.09 at 24 months compared with pretreatment assessment, $n = 87$ $p < 0.001$)
  - relapse rate was different between the booster and control groups at the 7- and 12-month assessments
  - an estimated risk reduction for relapse of 87% (95% CI 1% to 98%) and 79% (95% CI 3% to 95%), respectively
  - however, the groups were not statistically different at 24 months

patient empowerment and increased clinical efficiency

- Patients can schedule their care and receive their therapy from any location
- benefits patients in rural areas with limited services
- Internet-delivered CBT could provide care for patients who might not seek treatment because of physical or psychiatric conditions or social stigma
- Self-referral as a recruitment option
- Privacy and anonymity
- Clinical efficiency:
  - allows clinicians to treat more patients effectively in less time
  - Even with intermittent therapist support, it is less time-consuming and requires fewer resources overall than traditional CBT
  - 10 minutes per patient per week ?
  - incorporation of questionnaires, homework and self-assessments allowed the patient's progress and outcome to be easily monitored

disadvantages of Internet-delivered CBT

- Lack of direct patient monitoring
  - lack of a human relationship (i.e., therapeutic alliance)
  - difficulty in adjusting therapy according to the patient's progress
  - Patients in the face-to face group greater enjoyment communicating with their therapist
  - The difficulty of adjusting a patient's therapy can be mitigated somewhat by using guided Internet-delivered CBT, whereby a therapist assesses the patient's progress and adapts treatment accordingly.3
- Low adherence
  - mitigated by some level of therapist support
  - RCT comparing the effectiveness of the MoodGYM program with wait-listed controls
    - 73% of unguided MoodGYM users did not complete the full program
    - therapistguided MoodGYM users had completion rates equal to those for traditional CBT
    - Internet-delivered Worry program to treat anxiety showed that therapy guided by primary care physicians achieved 40% to 60% adherence, and therapy guided by clinical psychologists had rates as high as 90%.28,30,62 In contrast, one RCT directly compared unguided, minimally guided and flexibly guided Internetdelivered CBT for social phobias using a fivelesson program administered over 10 weeks.63 The three treatments were equally effective, with no statistical difference in adherence. Further studies are needed to reconcile these conflicting results.
- Technology accessibility
  - 30% of the Western population may not have home Internet access or own a computer
  - programs may have hardware or bandwidth requirements that limit their availability to patients
  - RCTs of Internet-delivered CBT in rural Scotland and China, computers had to be provided or computer centres created to allow patients to complete the program
  - patients who are not technologically savvy may resist replacing clinical visits with computerized treatments.
- Possibility of improper treatment
  - online diagnostic tools based on self-reporting
  - One study compared an Internet-administered Composite International Diagnostic Interview with an in-person SCID
    - 53 patients who performed an online diagnostic interview two days before a formal in-person interview, there was low agreement between the two evaluation methods for all but panic disorder
    - a recent study comparing automated pretreatment assessments (n = 173) with clinician diagnoses (n = 135) for assignment to an Internetdelivered CBT program showed similar results in the two groups.
- poor program quality or fake services
  - no one has investigated these concerns
  - Legitimate programs often have government endorsements, are affiliated with a hospital or academic institution, or feature relevant peer-reviewed literature
  - For programs with therapist guidance, the therapists' biographies are frequently available, and the patient can check their credentials. These features can help in distinguishing legitimate programs from scams. However, a patient who feels that a service has not delivered what was advertised has limited options for redress

- Is Internet-delivered CBT as effective as in-person CBT
  - limited number of studies directly comparing inperson and Internet-delivered CBT, future trials should involve head-to-head comparisons.
- clinical challenges
  - blending this form of CBT with other therapies, such as pharmacotherapy or in-person support
  - studies are needed to identify the most effective combination with other treatments
- clinical implementation
  - physicians available for guided Internet-delivered CBT is limited
  - A recent RCT on generalized anxiety disorder compared the efficacy of guidance by clinicians and nonpsychologist technicians
    - 69 Patients were divided into three groups
    - clinician-guided Internet-delivered CBT,
    - technician-guided Internet-delivered CBT
    - waitlisted controls.
    - The two Internet-delivered CBT groups had access to the Worry program (six modules, 10 weeks) and were evaluated before and immediately after treatment and at three month follow-up.
    - The technician-guided and clinician-guided Internet-delivered CBT groups were similar in terms of adherence (80% v. 74%) and outcomes (Penn State Worry Questionnaire pre-treatment to follow-up effect size 0.97 v. 1.42; Generalized Anxiety Disorder Seven-Item effect size 1.61 v. 1.48). These data showed that a modestly trained individual with no prior counselling qualifications could guide Internet-delivered CBT, with adherence and outcomes similar to those achieved with clinician guidance, indicating that well-trained assistants may be used to supplement clinicians
- Several large-scale government rollouts have supported Internet-delivered CBT as a feasible national health care option. The e-Mental Health Alliance in Australia has outlined its own challenges for scaling up Internet-delivered CBT, specifically increasing awareness of available services and optimizing the programs to increase adherence and maximize outcomes.42 These factors should be considered in future large-scale investigation

Instrumenter

- Rundt håndleddet/Klokker
  - Smartwatch/Apple watch
    - Kontakt med mobiltelefon
  - Ulike sportsur
  - Fitbit og andre armbånd
  - Spesialiserte aktigrafer
- Smart telefoner
  - Alle funksjoner som er i klokker
  - Samtaler, stemmebruk, sms
  - Bevegelse, nærhet til andre telefoner
- Tredemølle
  - Effektiv bevegelse?

Bipolar lidelse

- Tilbakevendende lidelse
- Gjennombrudd sist på 1990 tallet:
  - A Perry: ved overvåking av egne symptomer kombinert med plan for hurtig endring av behandling reduserte en manier, men ikke sikker effekt på depresjoner
  - Colom et al: Opplæring i grupper om forebyggende livsstil kombinert med tiltak ved tegn til symptomer reduserte en både depresjon og mani

Bipolar lidelse

- Utviklet en rekke dagbøker der flere er I bruk I Norge
- Vi oversatte STEP-BD sin i 2005
- Eksempel
- Brukt I kurs/opplæring
- Erfaring
  - Avklarende for pasientene
  - Bedre grunnlag for vurdering av medikasjon og andre tiltak
  - Betydelig mer ustabilitet enn en får frem anamnestisk
  - Sammenheng mellom endringer av humør, søvn, irritasjon, angst og evt ytre hendelser eller ei
- En rekke apper, de aller fleste gratis
  - Egentlig papir dagbøkene som er overført til elektronisk medium

Bipolar lidelse

- Motoriske endringer
- Ved mani og depresjon
- Er motorisk og følelsesmessig aktivering en selvstendig dimensjon som er uavhengig av stemning?
  - Blandet fase (mixed)
  - Agitert depresjon
  - Dysforisk mani
  - Ultra rapid cycling

Bipolar lidelse behandling

- Tiltak knytet til endringer
- Automatiserte beskjeer om aktivering
  - Søvn regulering
  - Redusere tempo
  - Endre medikasjon etter plan

Søvn, eksempel på full automatisert behandling

Ulike cbt behandlinger

2) Hvorfor et innovasjonsprosjekt?

- Avansert matematisk aktivitetsanalyse
- Moderne observasjon og mer pålitelig diagnostikk og behandling
- Forebygge sykdomsepisoder: løsning på globalt problem
- Persontilpasset psykiatri
- Brukerinvolvering

3) Realiserbarhet

- **Solid datainnsamling:** tre kliniske studier
- **Avansert analysekapasitet**: SINTEF, NTNU, UiB, National Institute of Mental Health (NIMH)
- **Sikker lagring av data**: SINTEF, NTNU, St Olavs
- **Lokalt, nasjonalt og internasjonalt samarbeid**
- **Tverrfaglighet** (brukere, klinikere og forskere)

PSYKIATRI

- St. Olavs hospital
- NTNU

- UiB
- UiO/NORMENT
- Bipolarforeningen, Norge

- Newcastle, UK
- Rigshospitalet, DK
- INSERM, Frankrike
- Sydney, Australia
- NIMH, USA

MATEMATIKK

- IME
- Enhet for anvendt matematikk, SINTEF

IKT/TEKNOLOGI

- SINTEF ICT
- MIT media lab, USA?

- https://www.youtube.com/watch?feature=player_detailpage&v=nfdrnggoXg4#t=349

- Døgnrytme basert på aktivitetsmønstre

- Tale
  - Når
  - Hvordan
  - Raskt sakte
  - Monotont

  - Hvor mange samtaler
  - Hvor lenge
  - Med hvem

  - Endring av mønstrene

  - Høy korrelasjon med depresjonsnivå

  - Schizofrni
  - Bipolar
  - Depresjon

  - Tidlig varsling

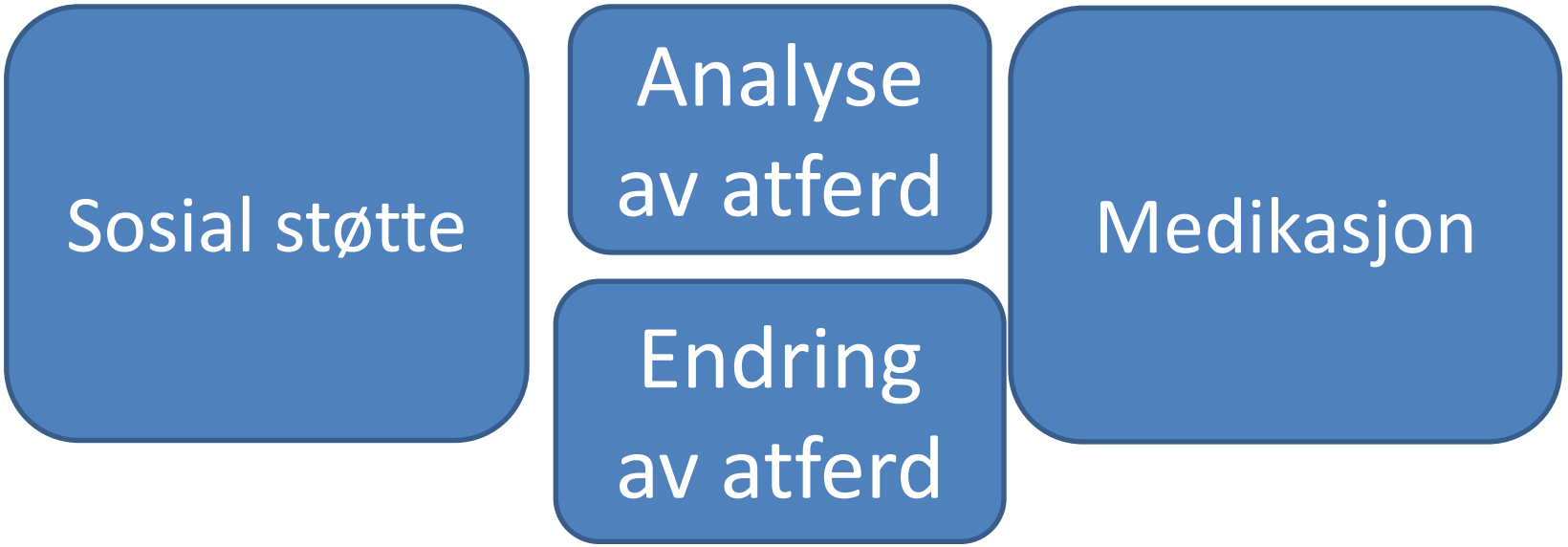
  - Hukommelse svekket når dårlig

  - Fra data til intervensjon:
  - Tilgang til behandling dårlig
    - Stigma
    - Pris

Intervensjon

- Terapeut I lommen
- Forslag til atferdsendring til riktig tid
- Interaksjon med andre målt med smartfonen

- Informasjonen kan den enkelte velge å dele med andre eller ei


Sosial støtte
Analyse av atferd
Endring av atferd
Medikasjon

- Antall skritt
- Søvn
- Sportsbutikk
- GPS
- Puls
- 200 millioner sportsenheter på få år
- Skritt når hvor hardt du går
- Hjerneaktivitet under søvn
- Pulsoksymeter, O2 metning
- Posisjon
- Alkoholnivå
- Høyt du hopper
- Hvor hurtig du spiser
- Alt apper på telefonen
  - Hundrvis pr uke
- Hjerterytme på avstand, måler fargeendringer I ansiktet + respirasjon pr minutt
- Vil overvåkning redusere vekten?
  - Antall skritt
  - Søvn

- Konstant blodsukker

- Aktivitetsnivå
  - Knyttet til depresjon
- Ringemønster
- Fysisk tetthet med andre
- Mønster av fikling med telefonen
  - Evne til å være fokusert/konsentrert
- Blåtann registrerer tetthet av andre telefoner I nærheten

Diagnostikk og behandling

- **Lys-mørke**
  - Beh av affektive tilstander
    - kontroll av lys mørke,
    - mulighet for å justere intensitet og lysfrekvens (anti blått) på lys i pasientrom, korridor og oppholdsrom.
- **Dagslyslampe (> 10 000 Lux på 1 meter)**
  - Beh av depresjon
  - vegg i avgrenset område i spisesal
- **Aktivitetsmål** av pasienter: diagnostikk og behandlingseffekt mål
- **Pustefrekvens** om natten: apnø screening.
- **Søvnregistrering**

Subjective items for monitoring in the active intervention group

- Mood (from depressive to manic: −3, −2, −1, 0, +1, +2 and +3)
- Sleep duration (number of hours per night, measured in half-hour intervals)
- Medicine (taken as prescribed: yes, no, if changed, the patient was asked to specify these)
- Activity (a scale of −3, −2, −1, 0, 1, 2 and 3)
- Irritability (yes or no)
- Mixed mood (yes or no)
- Cognitive problems (yes or no)
- Alcohol consumption (number of units per day)
- Stress (a scale of 0, 1, 2, 3, 4 and 5)
- Menstruation
- Individualised early warning signs (yes or no)
- A reminder in the Smartphone to evaluate these items every evening
- After midnight, the entered data were ‘locked’ and further changes could be made
- Possible to retrospectively enter data for 2 days. It was then noted in the system that the data were collected retrospectively

Objective parameters

- Smartphones automatically collected data:
  - speech duration (minutes of speech per 24 h on the Smartphone)
  - social activity: numbers of outgoing and incoming calls and text per day
  - physical activity measured by the accelerometer installed in the Smartphones as well as the amount of physical movement measured through the accelerometer in the Smartphone.
- A study nurse monitored daily self-reported subjective electronic patient data
  - When data suggested upcoming or deterioration of depressive or manic symptoms, she contacted the patients by text messages, telephone or email as part of the feedback loop

Identification of the early warning signs and triggers, and the interactive feedback loop

- A personal homepage for each patient
  - Presents all the monitored items graphically
- A standard of scoring thresholds on the subjectively monitored items for when the study nurse should contact patients
  - Example: if ≥−2 or+ 2 in their mood for 2 days, if changes in their sleep patterns of 1 h more or less for 3 days, if medication not taken or changed for more than 2 days, if activity level registered was ≥−2 or +2 for 2 days, if mixed mood for more than 3 days and if alcohol intake was >2 units for more than 3 days
  - Thresholds individualised within the first 4 weeks. Reviewed data every day and in signs of bipolar disorder instability, contacted the patient
- His/her most important items for identifying prodromal symptoms of mania (eg, sleep or alcohol consumption) as well as depression (eg, social activity)
- The threshold for future signal warnings of prodromal symptoms
  - eg, slept 1 h less than the average monitored historic sleep time for 3 nights, drinking alcohol for 3 days, did not call anyone 4 days, did not take medication 3 days, etc
  - actions to be taken (eg, contact the caregiver within 3 days)

Assessments

- Every month
  - HDRS and YMRS
  - Questionnaires
    - Psychosocial Functioning (Functioning Assessment Short Test, FAST)
    - Cohens' Perceived Stress Scale
    - quality of life (WHOQOL)
    - coping strategies (CISS)
    - self-rated depressive and manic symptoms and cognitive functioning

State-related differences in the level of psychomotor activity in patients with bipolar disorder – Continuous heart rate and movement monitoring

Fauroldt-jepsen Psychiatry Res 2016

- Change in psychomotor activity is a potential tool in monitoring bipolar disorder
- Objectively-measured psychomotor activity in bipolar disorder was performed
- Compared to euthymia and depression, mania was associated with higher activity
- There was a diurnal variation in acceleration and activity between affective states
- Psychomotor activity is a core symptom that is altered during affective states

Intro

- Changes in the level of psychomotor activity could be a useful tool in the monitoring of the course of affective states
- Clinical assessments and self-reporting
- Different types of accelerometers/movement sensors
- Clinical assessments and self-reporting monitoring tools of psychomotor activity based on subjective data, often retrospectively, risk of poor validity
- Objective methods: real-time data on behavior
- Accelerometers of varying size/weight and intrusiveness, wrist or thorax, monitoring methods for estimating the level of psychomotor activity
- Estimation of energy expenditure and other physiological constructs such as heart rate
- Hospitalization vs naturalistic settings during everyday life
- Intra-individual alterations of the level of psychomotor activity between a depressive, manic and euthymic state
- Combined heart rate and movement monitoring offers higher precision for estimating the level of physical activity energy expenditure (AEE)
- Previously: Bipolar patients have lower acceleration (ACC) and AEE than unipolar during a remitted to mild/moderate depressive state (Faurholt-Jepsen et al., 2012)
- Previously: Sleeping heart rate (SHR) correlated with the severity of depressive symptoms, may indicate the presence of insomnia and/or lower cardiorespiratory fitness (Faurholt-Jepsen et al., 2015)
- A combined heart rate and movement sensor for assessment of alterations the patients' affective state may provide important information of the affective state and severity of symptoms
- Aims with repeated objective measurements:
  - level of psychomotor activity in different affective states

Inclusion criteria

- Inclusion criteria: Bipolar disorder
- Followed for 12 weeks
  - Received various types, combinations and doses of psychopharmacological treatment
  - At the first day of every psychomotor activity monitoring period the severity of depressive and manic symptoms were assessed according to clinical ratings
- A control group of healthy individuals
  - 18–60 years
  - no first-degree relatives with psychiatric disorders

Monitoring of psychomotor activity

- The height (kg) and weight (m) body mass index (BMI)
- a combined heart rate and movement sensor mounted at the thorax (Actiheart, Cambridge Neurotechnology Ltd, Papworth, UK)
  - Capable of monitoring the level of psychomotor activity (movement/acceleration (m/s2) and heart rate (bpm))
    - period of time of up to 11 days
    - the method of estimating AEE from heart rate and movement monitoring
    - the combination of heart rate and movement monitoring gives the opportunity to estimate the amount of energy (kJ) spent on physical activity per day

The procedure of psychomotor activity monitoring

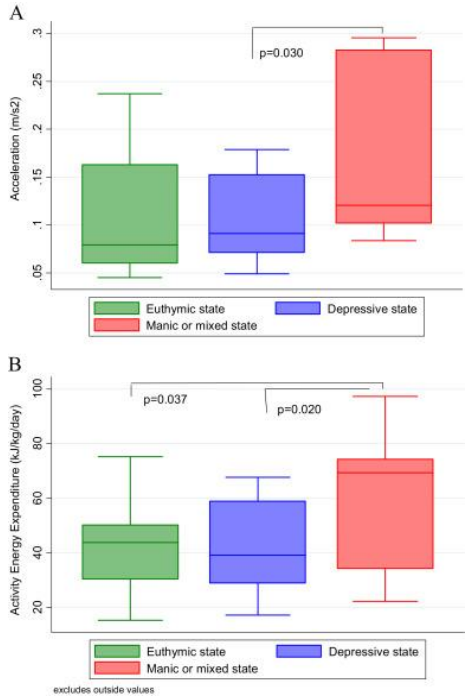


Fig. 1. A and B: Box plot of acceleration (ACC) (m/s2) and Activity Energy Expenditure (AEE) (kJ/kg/day) (y axis) in different affective states (x axis) in patients with bipolar disorder based on predicted values from linear mixed regression models adjusted fo...

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State-related differences in the level of psychomotor activity in patients with bipolar disorder – Continuous heart rate and movement monitoring

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Daily electronic self-monitoring in bipolar disorder using smartphones – the MONARCA I trial: a randomized, placebo-controlled, single-blind, parallel group trial

- A shift from a focus on affective episodes to focus on inter-episodic mood instability
- Subsyndromal mood swings on a daily basis
  - Associated with impaired global functioning and high risk of relapse
- Paper-based daily mood charting instruments
  - National Institute of Mental Health Life Chart Method
  - Systematic Treatment Enhancement Program STEP-BD
  - ChronoSheet
- Several apps

- detailed longitudinal information on daily mood swings and other symptoms
- Paper-based mood-charting instruments c
  - gain insight into illness, facilitate patient empowerment
  - teach patients to recognize early warning signs of recurrence of mania, depression and mixed states and also enable characterization of mood instability in detail
  - Problems with paper-based mood-charting instruments:
    - low compliance
    - Recall bias when filling in data retrospectively,
    - patients complete batches of daily ratings at a single time

- Electronic self-monitoring instruments for a variety of illnesses
- computers , personal digital assistants, text messages, web interfaces, smartphone applications
- large number of commercial smartphone applications without feedback loop options
- App Store and Google Play
  - Optimism, Mood-Rhythm, iMoodJournal, eMoods Bipolar Disorder Tracker, Bipolar Bear, Moody Me, etc.
- Smartphones:
  - continuous and long-term assessment of depressive and manic symptoms
  - real-time data in naturalistic settings.
  - eliminate the need for patients to interact with a separate monitoring device
  - most people carry phone with them

Feed back

- Self-monitored data sent to the clinic allowing for the study nurse to review the data and contact the patients if there were signs of deterioration,
  - allowing for intervention on prodromal depressive and manic symptoms
- Self-monitored data visualized graphically to the patients themselves providing an overview of the entered data
  - possibilities for an increased illness insight and understanding

Motoriske endringer ved affektive lidelser

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Bevegelsesforstyrrelser ved psykiske lidelser

- Tics, spasmer, choreatiske bevegelser
- Akutte og tardive dyskinesier
- Akatisi og parkinsonisme

- Vårt fokus
  - Ineffektiv bruk av energi ved bevegelse
  - Psykomotorisk retardasjon og agitasjon
    - Avvikende bevegelse ved depresjon, mani og mixed state

Ineffektiv bruk av energi ved bevegelse

- Ved somatisk og psykisk lidelse:
  - Redusert max oksygenopptak
  - Redusert muskelstyrke
- Redusert gangeffektivitet
  - En mindre andel av forbrukt energi ved gange brukes til forflytning enn hos friske
    - Mer energikrevende å gå og gjøre praktiske oppgaver pga ineffektivitet
  - Bedres ved fysisk trening
  - Bedres antakelig også ved tilfriskning av den psykiske lidelsen

Elektronisk registrering av symptomer

- Direkte på mobil, pc i stedet for papir
  - Begrenset fornyelse, nytt medium
- Analyse av bruk av mobiltelefon
  - Antall samtaler og sms, hvem du har kontakt med, tid for aktiviteten
  - Tempo og stemmevolum under samtalene
  - Fysisk nærhet til andre mobiler, uttrykk for sosial kontakt
- Fysiologiske data
  - Hjerterytme
  - Søvn
  - Temperatur
- Variasjon I bevegelse
  - Actigrafi
- Neste skritt:
  - Mobiltelefon og armbåndsur responderer på endringer og gir behandlingsanbefalinger.
  - Trolig et alternativ ved begynnende depresjon

Hvordan objektivt måle psykomotorisk retardasjon, aktivering og annen endring ved affektive tilstander?

- Rask utvikling av smart telefoner, ulike armbånd, smartwatch og ulike treningsklokker
- Nærmest alle instrumenter kan registrere bevegelse, med eller uten GPS
- Vi har brukt en aktigraf som ser ut som en klokke, finnes også i mobiltelefoner og i egne instrumenter til å ha i belte etc
  - Brukes også til å registrere søvnkvalitet

3 ACTIGRAFI STUDIER

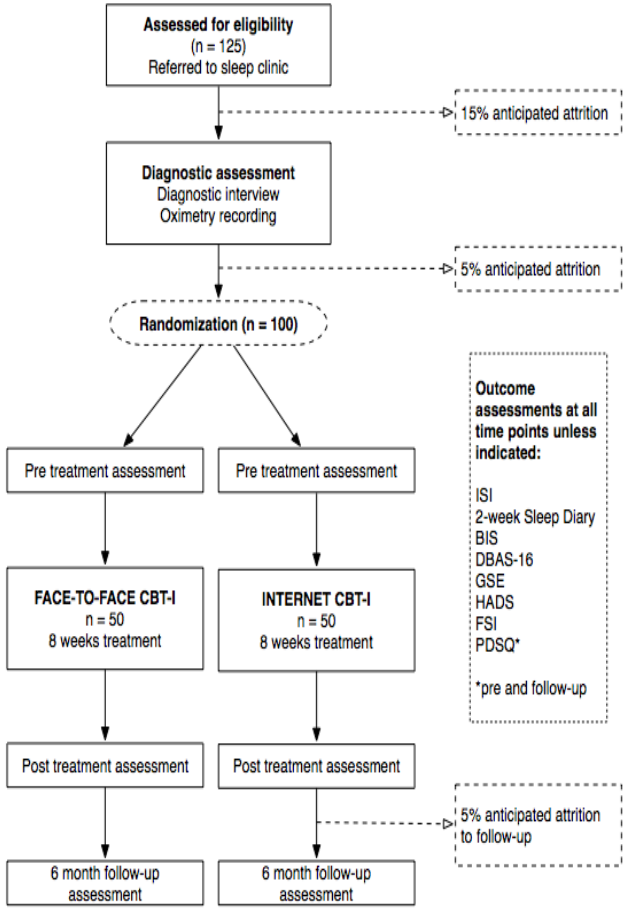
1) Akutt innlagte pasienter med bipolar lidelse

2) Akutt innlagte pasienter med bipolar depresjon

3) Ustabilt hvile –aktivitetsmønster ved bipolar lidelse. Betydning for søvn, humør og aktivitet

Studie # 1

- Formål: Å undersøke effekten av online CBT-I sammenliknet med ansikt-til-ansikt CBT-I
- 100 pasienter som er henvist til en søvnklinikk og diagnostisert med insomni.
- Randomiseres til online CBT-I eller ansikt-til-ansikt CBT-I
- 62 er randomisert hittil.



Ubesvarte spørsmål # 2

- Vi vet ikke effekten i en stor og lite selektert gruppe mennesker.
- Vi vet lite om lang-tids effektene av CBT-I utover bedring av søvn.
- Vi vet lite om hvem som har nytte av behandlingen.

- Å undersøke slike spørsmål krever svært store studier.
- Praktisk vanskelig å gjennomføre tidligere.

Formål med studien

- Å teste om SHUTi er effektiv i en stor populasjon hvor utredning og behandling er automatisert.
- Vi er spesielt interesserte i lang-tidseffekter på helse, bruk av helsetjenester, medikamentbruk og arbeidsfunksjon.
- Vi ønsker også å undersøke om det finnes forhold som kan forutsi fremtidig behandlingsresultat.

Studie # 2

- Inntil 1500 deltakere randomiseres til online CBT-I eller en online kontrollbetingelse (nettbaserte søvnhygiene-råd).
- Startet 26. feb 2016. Ca 350 deltakere randomisert første to uker.

Nytteverdi

- Dersom disse studiene viser positive resultater vil vi kunne tilby en ny lav-terskelbehandling til en stor pasientgruppe, uten venteliste, også i områder som er langt unna spesialister.