

Øgning af fysisk aktivitet gennem digital nudging af indlagte patienter og sundhedspersonale – et randomiseret multicenterstudie og kvalitativ evaluering IPAMINA studiet

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Heilsugranskíngareindin, Sjúkrahúsverkið, Færøerne

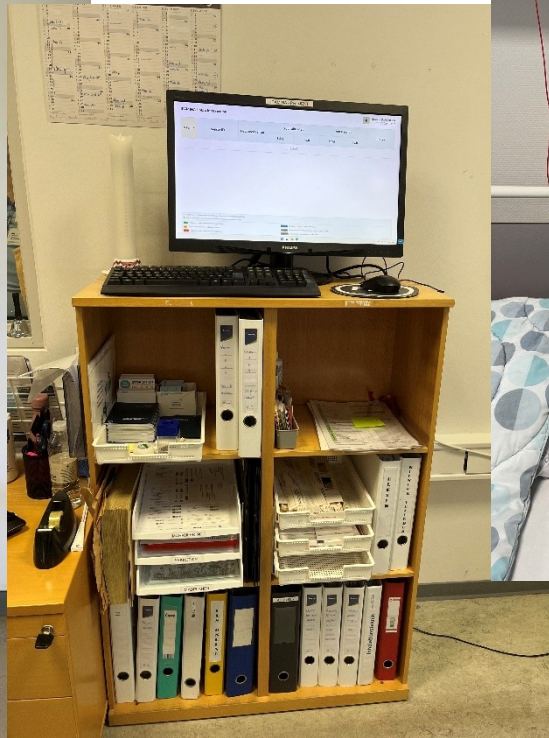


**Bispebjerg og Frederiksberg
Hospital**



HEILSUGRANSKINGAREINDIN

IPAMINA - Aalborg Universitetshospital i Hobro og Dronning Ingrid's Hospital i Nuuk



IPAMINA - Bispebjerg Hospital og Landssygehuset i Thorshavn



- **IPAMINA studiet**

- 

Nice job
You only need to be active for
5 min

B
to arrive at the Bound Tower

Visited sights
Yesterday Today
4 2

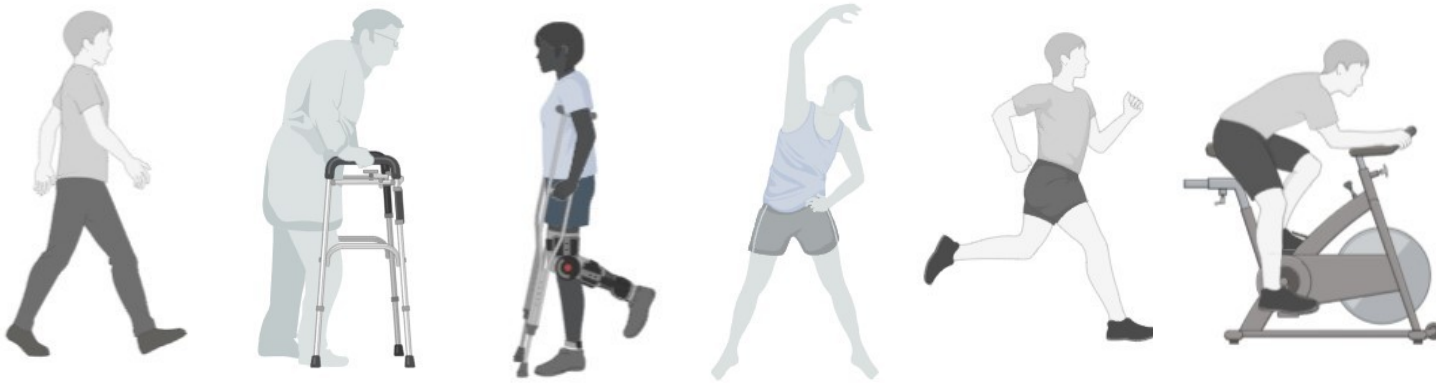
Number of steps
Yesterday Today
5086 5086

Overall activity today
8 hour
1 min

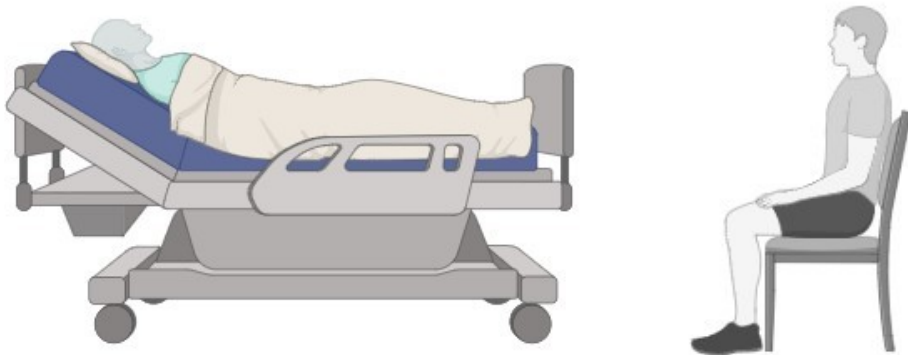
Remain to be completed today

Defintioner

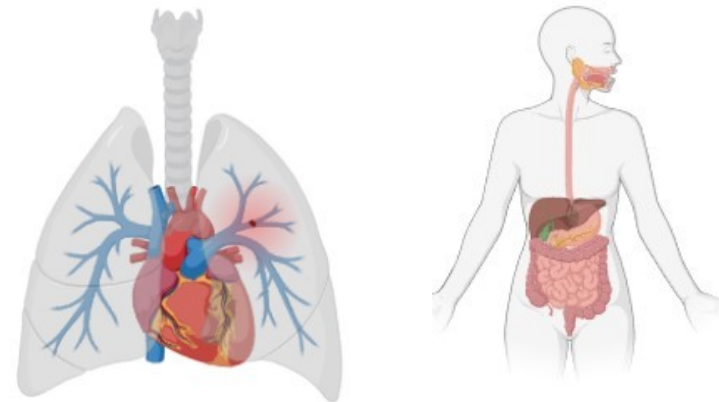
- **Fysisk aktivitet**



- **Stillesiddende adfærd**



- **Indlagte medicinske patienter**



Indlagte patienter er særdeles stillesiddende



17-23 timer/døgn

Konsekvenser af stillesiddende adfærd og inaktivitet



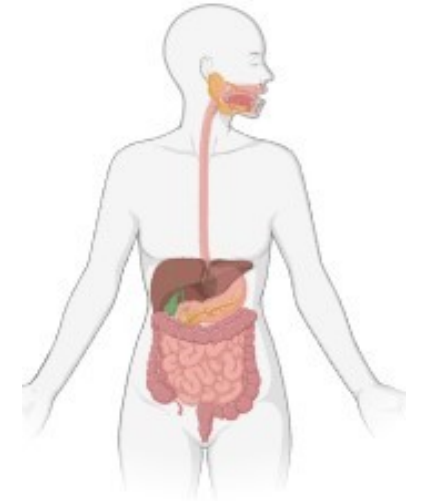
Forlænget indlæggelsestid



Nedsat funktionsniveau



Behov for genoptræning



Reduceret livskvalitet

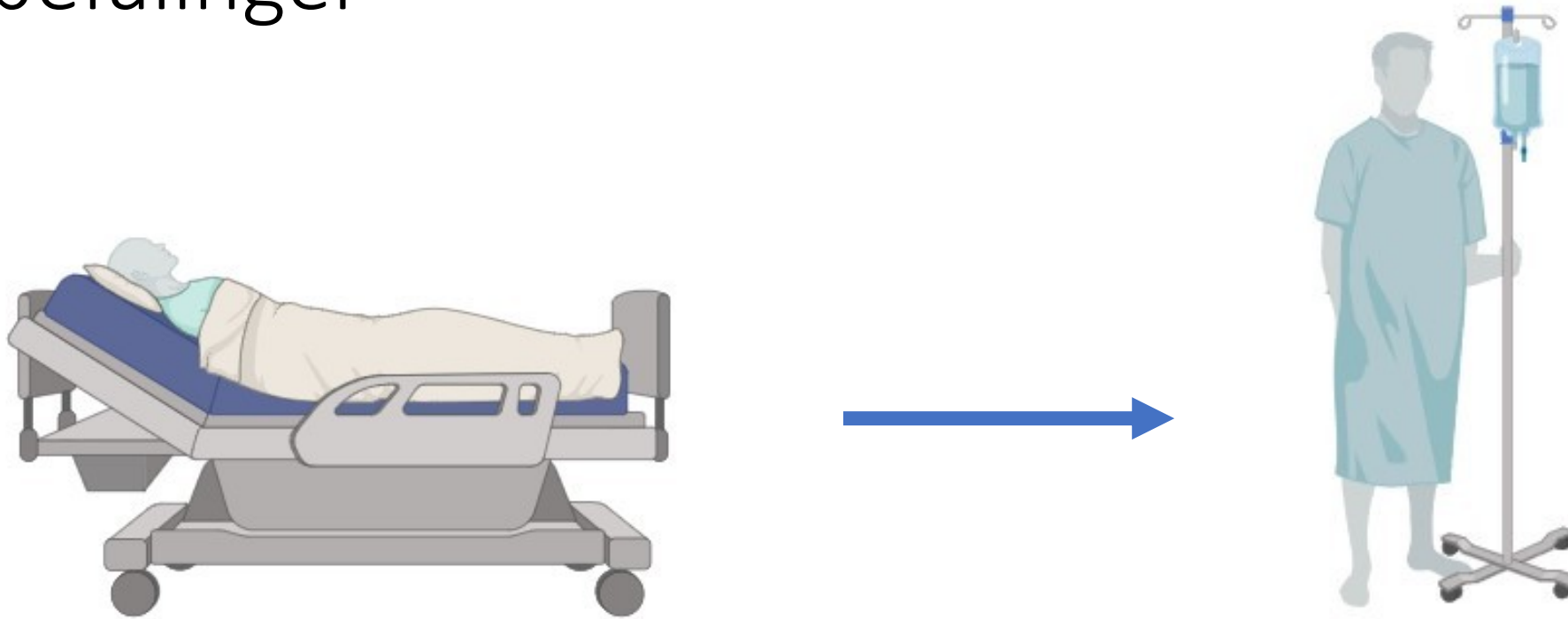
Hospital-Acquired Disability (HAD)

- Tab af selvstændighed i daglige aktiviteter (ADL) efter akut hospitalsindlæggelse
- Forekomsten er 30% blandt akutindlagte ældre – har været stabil de sidste 30 år trods reduceret indlæggelsestid
- Risikofaktorer for HAD er relateret til:
 - Patientens sygdom
 - Prædisponerende faktorer (alder, kognitivt- og funktionelt deficit)
 - **Hospitalsfaktorer** (underernæring, **lavt aktivitetsniveau**)
 - Post hospitalsfaktorer (udskrivelsesplanlægning, støtte og tilgængelige ressourcer)
- Alvorlig prognose – kun 30% udskrevet med HAD var tilbage på habituel niveau 1 år senere

Et system, der fordrer stillesiddende adfærd



Anbefalinger



- Ældre indlagte patienter bør være så fysisk aktive som muligt
- 25 min gang/dag kan forebygge funktionsfald
- Lange perioder med stillesiddende tid bør minimeres

↑ fysisk aktivitet og
↓ stillesiddende
adfærd under
indlæggelse →
kompleks opgave!



Vores gruppe har arbejdet med aktivering af indlagte vha. teknologi i mange år

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Original Article

Evaluation of a technology assisted physical activity intervention among hospitalised patients: A randomised study

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ARTICLE INFO

Keywords:
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Hospitalisation
Technology assisted physical activity
Visual feedback

ABSTRACT

Background: Physical inactivity is common during hospitalisation and poses a threat to functional capacity and independency in the elderly.
Aim: We aimed to assess the effect of physical activity measurements with visual feedback about time spent in various activities on the average daily time spent out of bed during hospitalisation.
Methods: We recorded physical activity during hospitalisation by accelerometers and compared the effect of the visual feedback (intervention) with no feedback (control) on time spent out of bed. Patients admitted to the pulmonary ward were invited and assigned to intervention with feedback or control with no feedback in 6 alternating waves of approximately 18 patients each. The order of feedback/no feedback was randomised at the outset of the study. The visual feedback intervention group was provided with visual feedback of the daily time spent in bed, sitting, standing, and walking. The control group did not receive feedback.
Results: 93 patients completed the study with a median length of stay of 5 days. Across all patients there were no statistically significant group differences in daily time out of bed; however, patients with independent mobility spent 51 minutes (95% CI 0 to 102; $P = .049$) more out of bed when provided with visual feedback compared to no feedback.
Conclusions: A simple technology assisted physical activity intervention with visual feedback to encourage mobility was not effective at increasing time spent out of bed among hospitalised patients. With feedback, a subgroup of patients with independent walking abilities increased time out of bed and may benefit from this type of intervention.

Trial registration: clinicaltrials.gov Identifier: NCT01945749.



ESC

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FULL RESEARCH PAPER

Telehealth

Technology-assisted physical activity among hospitalized medical patients: a cluster randomized trial

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Aims

Hospitalization is associated with physical inactivity, resulting in loss of functional capacity and elevated risk of complications for medical patients. The aim of the study is to assess the effect of an accelerometer-based physical activity monitoring system with visual feedback and encouragement to increase walking activity on time spent out of bed during hospitalization.

Methods and results

This study is a cluster randomized trial performed in a tertiary hospital in Denmark. A total of 354 adults with independent ambulatory function were admitted to one of four medical wards (two cardiology, one respiratory, and one geriatric). Intervention group was encouraged to walk via the accelerometer-based physical activity recording system with visual feedback on a tablet placed on the bedside table for 1–7 days. Control group had the same physical activity recording but without feedback or encouragement. Primary outcome was the average time spent out of bed in minutes per day. Secondary outcomes included number of steps, length of stay, readmission, and mortality. Mean age of the participants was 72.9 years, and 53% were females. On average, the intervention and control groups spent 143.5 (SD 96.6) and 120.8 (SD 75.2) min/day out of bed, respectively. Intervention group spent 23.6 min more out of bed per day (95% CI 13.7–33.5), and took 440 steps/day more than the control group. No significant differences were observed between groups for length of stay, readmissions, falls, or mortality.

Conclusion

Among hospitalized patients, technology-assisted physical activity monitoring with visual feedback significantly increases daily time out of bed, approaching clinically meaningful thresholds for improving functional outcomes and reducing adverse events.

Registration

ClinicalTrials.gov.: NCT04555330

Lay summary

- A cluster randomized hospital study in Denmark tested whether bedside visual feedback from a wearable activity monitor could help medical patients who could walk independently spend more time out of bed during hospital admission.
- Patients receiving visual feedback and encouragement spent 23.6 more min out of bed per day and took 440 more steps per day than controls.
- No clear differences were observed in length of stay, 90-day readmissions, in-hospital falls, or in-hospital mortality.

Technology assisted physical activity among hospitalized medical patients

A cluster randomized trial

Background



Prolonged bed rest and physical inactivity are common



Associated with loss of function



Increased risk of complications

Methods

Intervention group

with feedback



vs

Control group



without feedback

354 medical patients included in this cluster randomized trial

Results



+23.6 min/day in daily activity compared to control



+440 steps/day compared to control

Who benefitted most from intervention



Cardiac patients



Female patients



High basic mobility at admission

Increasing Physical Activity among Medical Inpatients by Digital Nudging of Patients and Staff (the IPAMINA trial): A Stepped Wedge Cluster Randomised Multicentre Study Protocol

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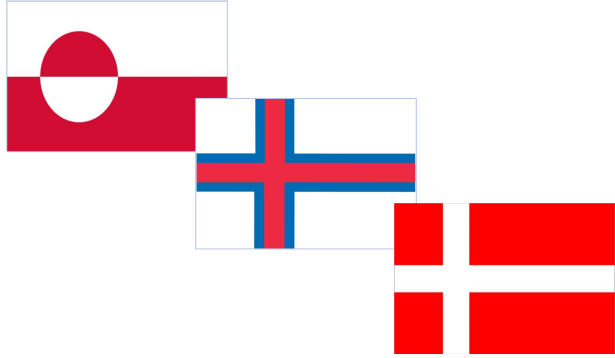
Christian Have Dall

Bispebjerg and Frederiksberg Hospital

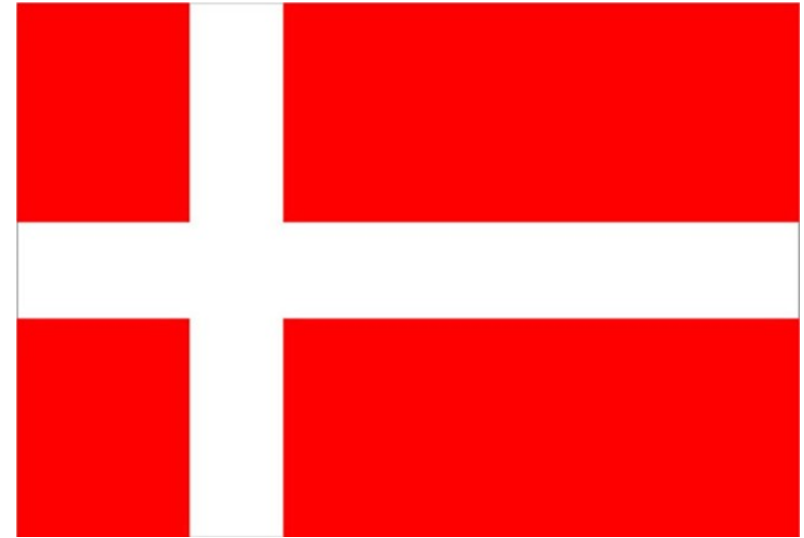
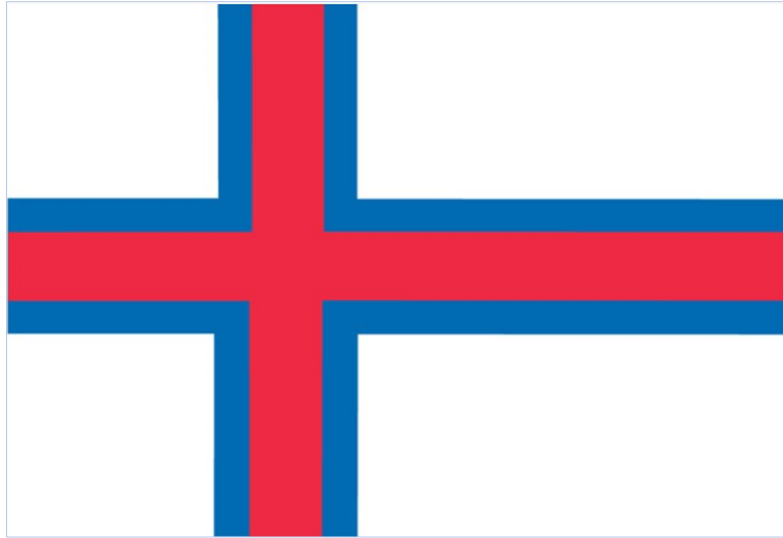
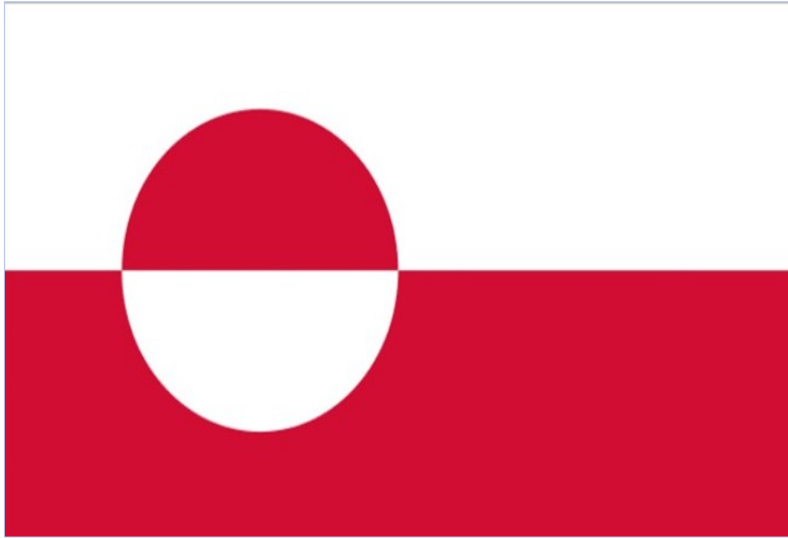
PREPRINT

Study protocol

Keywords: Digital health, physical activity, medical inpatients



IPAMINA - Increasing physical activity among medical inpatients by digital nudging of patients and staff



Formål: At undersøge om medicinske patienter bliver mere fysisk aktive og mindre stillesiddende under hospitalsindlæggelse når både patienter og personale nudges via en digital intervention.

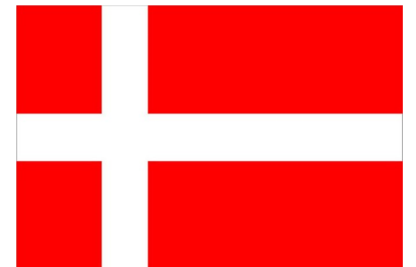
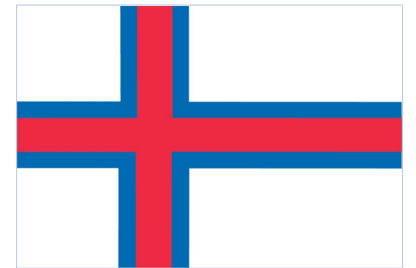
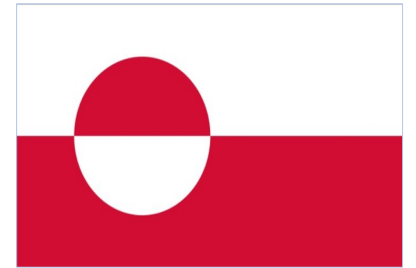
4 deltagende afdelinger: Medicinske afdelinger (Dronning Ingrid's Hospital i Nuuk; Landssygehuset i Thorshavn; Aalborg Universitetshospital, Hobro; Bispebjerg Hospital, Kbh)

IPAMINA - Increasing physical activity among medical inpatients by digital nudging of patients and staff

Primære resultatmål: Tid patienten er fysisk aktiv (stående/gående)

Sekundære mål: Tid patienten er stillesiddende (siddende/liggende), innlæggelsestid, udskrivelsesdestination, genindlæggelse, mortalitet

Inklusionskriterier: Indlagt på deltagende afdeling, kognitivt forstår deltagelse i projektet, standfunktion, medicinsk stabil, etisk forsvarligt



Stepped-wedge design

Site	Periode 1 Maj-Juli	Periode 2 Aug-Sep	Periode 3 Okt-Nov	Periode 4 Dec-Jan	Periode 5 Feb-Mar
Site A	Kontrol	Intervention	Intervention	Intervention	Intervention
Site B	Kontrol	Kontrol	Intervention	Intervention	Intervention
Site C	Kontrol	Kontrol	Kontrol	Intervention	Intervention
Site D	Kontrol	Kontrol	Kontrol	Kontrol	Intervention

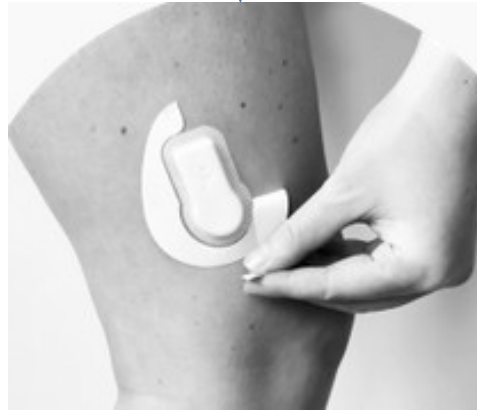
Stepped-wedge design. Hver periode varer 8 uger

Stepped-wedge design - resultat af randomiseringen

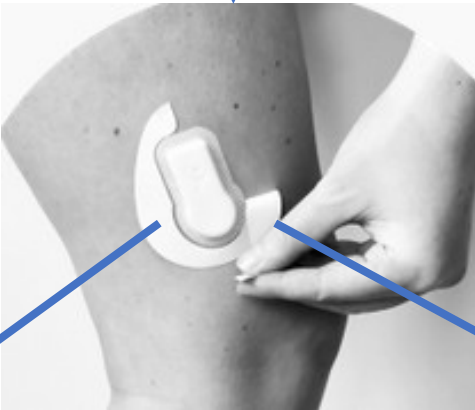
	✓	✓	✓	✓	✓
Site	Periode 1 Mai-Juli	Periode 2 Aug-Sep	Periode 3 Okt-Nov	Periode 4 Dec-Jan	Periode 5 Feb-Mar
Site A → Bispebjerg	Kontrol	Intervention	Intervention	Intervention	Intervention
Site B → Torshavn	Kontrol	Kontrol	Intervention	Intervention	Intervention
Site C → Aalborg	Kontrol	Kontrol	Kontrol	Intervention	Intervention
Site D → Nuuk	Kontrol	Kontrol	Kontrol	Kontrol	Intervention

Stepped-wedge design. Hver periode varer 8 uger

Kontrol-fasen: Kontinuerlig måling af patienternes aktivitetsniveau



Interventions-fasen: Kontinuerlig måling af patienternes aktivitetsniveau + tilbagemelding



Tilbage melding til patienterne
Via tablet på sengebordet

Tilbage melding til personalet
Oversigtsskærm på personalekontoret

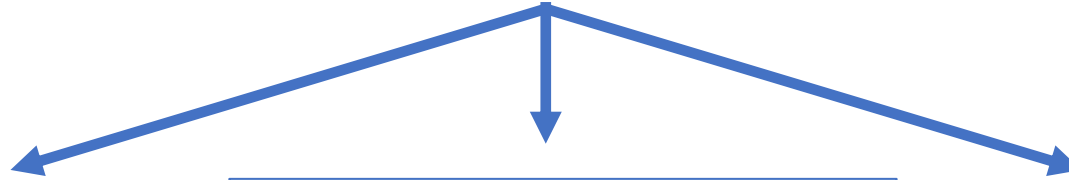


DEMO1							Device ID: DEMO1 14.03.2024 09:29
Navn ^	Sensor ID	Dage med sensor	Total aktivitet		Antal skridt		Status
			I dag	I går	I dag	I går	
Person 1	00-1234	2	30m	1t 30m	1500	2500	Sidst mobiliseret 09:24
Person 2	00-2345	3	30m	1t 30m	1500	2500	Sidst mobiliseret 08:29
Person 3	00-3456	3	30m	1t 30m	1500	2500	Sidst mobiliseret 07:29 (+1)
Person 4	00-4567	1	10m	0m	50	0	Ny patient
Person 5	00-5678	2	10m	60m	50	75	Søvn-periode
Person 6	00-6789	2	0m	60m	0	250	Tjek sensor
1 En patient er mobiliseret hvis der er mindst 15 sekunders stående/gående aktivitet. 1 Der kan være op til 15 min forsinkelse inden aktivitet vises på overbliksskærmen.							
Gren Patienten er mobiliseret inden for de sidste 3 timer. Gul Patienten har ikke været mobiliseret i 3 timer. Orange Patienten har ikke været mobiliseret i 12 timer.				Ny patient Ny patient indlagt under 3 timer siden. Tjek sensor Sensor offline/har ikke har været i nærheden af tablet i 12 timer. Søvn-periode Ingen målinger vist mellem kl. 00.00-06.00.			

Continuous and independent feedback regarding patients' activity, in real time, round the clock, all week, all year



Patients (+ relatives) and staff



↑ focus, responsibility and expectation: physical activity is an essential part of hospital treatment

The patients' different needs for help and assistance become ↑ visible

A tool for the staff to allocate the right resources at the right place at the right time



Patients ↑ physically active and ↓ sedentary during hospitalisation



Prevention of complications and hospital acquired disability

Status

- >600 deltagere i alt (ultimo marts 2026)
 - $\approx$ 180 fra Bispebjerg Hospital
 - $\approx$ 170 fra Landssygehuset i Thorshavn
 - $\approx$ 180 fra Aalborg Universitetshospital i Hobro
 - $\approx$ 95 fra Dronning Ingrid's Hospital i Nuuk
- Hovedresultaterne - effekten af interventionen på de indlagte patienters aktivitetsniveau foreligger ikke endnu
- Statistiker (blindet) laver analyserne



Kvalitativt studie – personalets perspektiver

- Formål: At undersøge de sundhedsprofessionelles oplevelser med, og perspektiver på, faktorer med betydning for implementeringen af IPAMINA-interventionen
- Fokusgruppeinterviews med personale fra de deltagende afdelinger
 - 1 interview pr. site (5-8 deltagere pr. fokusgruppe)
 - Umiddelbart efter af projektperioden var slut (april-maj 2026)
- Lydoptagelser -> transskription
- Inklusionskriterier: Ansat på deltagende afdeling, opnået kendskab/erfaring med interventionen, taler/forstår dansk/færøsk
- Teoretisk ramme: Normalization Process Theory
- Reflexive Thematic Analysis (Deduktiv/induktiv tilgang)

Kvalitativt studie – deltagerne

- 19 informanter i alt (4-5 pr. site)
- Sygeplejersker (74%) og sosu-assistenter (26%)
- 100 % kvinder
- Alder, median (spænd): 33 år (25-60 år)
- År i aktuelle afdeling, median (spænd): 2,75 år (0,5-8 år)
- År i professionen, median (spænd): 4,3 år (0,5-25 år)

- 3 foreløbige tendenser/temaer i data

Foreløbige tendenser - 1

- Meningsfuldt at interventionen understøtter en pre-eksisterende kerneopgave (mobilisering og aktivering).
- Travl kontekst med mange konkurrerende opgaver - vigtigt at IPAMINA ikke var endnu en opgave, der skulle presses ind, men gnidningsfrit indgik i arbejdsflowet på afdelingen uden de store ressourceomkostninger.
- Kunne dog også betyde at deltagerne på nogle sites ikke fik brugt interventionen aktivt i det daglige, når der ikke var krav om dokumentation. Interventionen kørte sideløbende som et tilbud og ikke en skal-opgave – risiko for nedprioritering.

Foreløbige tendenser - 2

- Interventionen medierede kontakten imellem personalet og patienterne - ny tilgang til fysisk aktivitet under indlæggelse - bliver en mere naturlig del af det at være indlagt
- Positiv påvirkning af kommunikationen og understøttelsen af fysisk aktivitet. Kontakten gik fra at være normativ "løftet pegefinger" – *det er vigtigt du kommer op, ellers...* til at være undersøgende og dialogbaseret - *hvor meget har du været oppe i dag? Skal vi se om vi kan nå Rundetårn?*
- 'Fælles tredje'

Foreløbige tendenser - 3

Graden af hvorvidt interventionen var blevet en naturlig del af hverdagspraksis igennem handlinger og samarbejde afhang bl.a. af:

- Hvor vant afdelingen er til at køre projekter/nye tiltag
 - Erfaringer og mindset
- Ledelsesopbakning og opfølgning. Var dette noget afdelingsledelsen gik op i?
 - Sikring af infrastruktur
 - Støtte + opfølgning ifm. lokale nøglepersoner
 - Aktivt italesatte status for patienternes aktivitetsniveau v. morgenkonf
- Personale turnover
 - Gennemgående samme personale, hvor viden og kompetencer akkumuleres og bruges
 - Eller højt turnover hvor viden og kompetencer løbende forsvinder ud af afdelingen

Analysearbejdet
fortsætter...

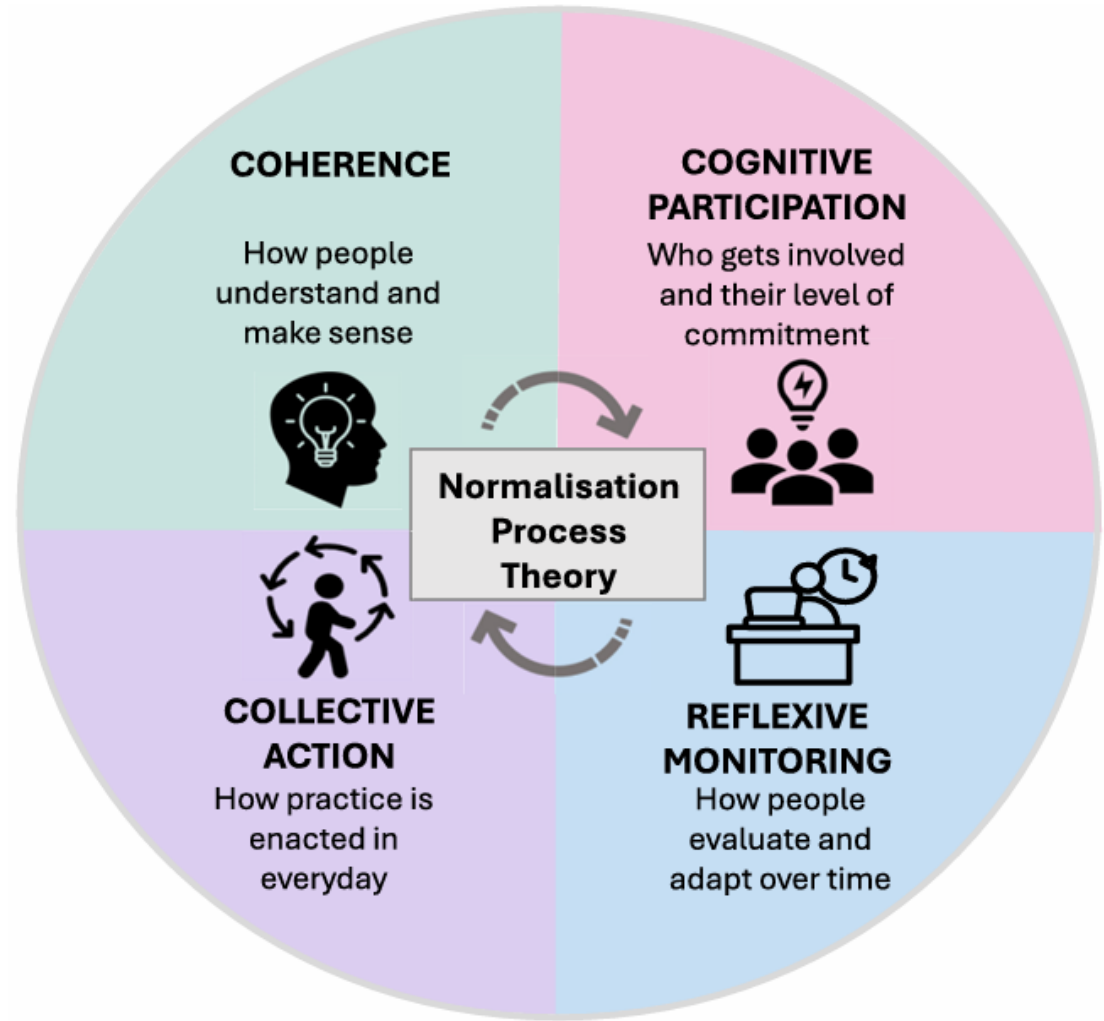


FIGURE 1 | Normalisation process theory mechanisms (informed by May and Finch, 2009).

Tak!



**Bispebjerg og Frederiksberg
Hospital**



**SJÚKRAHÚS
VERKIÐ**



**REGION
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Nunatsinni Ilisimatusarnermik Siunnersuisoqatigiit
Greenland Research Council

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