Hvordan aktivitetsmålere kan bruges til at øge det fysiske aktivitetsniveau

CareWare 2023

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Take-home messages

Aktivitetsmonitoriering anvendes bredt og er kommet for at blive

Det er motiverende, har en klar effekt og er relativt billigt at anvende

De mindst aktive har størst gavn ift. relevante sundhedsparametre

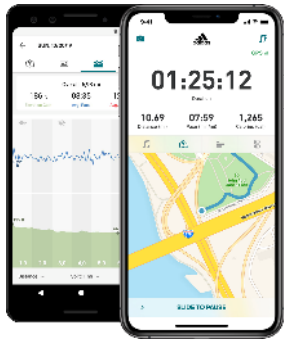
Der er ikke noget der tyder på, at nogle grupper har en større effekt end andre

Det bør være en organisatorisk strategi at implementere aktivitetsmonitoriering i specifikke forløb

Definition

Mekaniske

Digitale/elektroniske



Research grade

Consumer available

Inddeling

Groft og alle kategorier har overlap.

Mekaniske

Fordele

- Billige
- Nemme at anvende
- Ret pålidelige på hoften eller foden

Ulemper

- Kræver log (kan være en fordel)
- Kræver oftest reset dagligt

Consumer available elektroniske

Fordele

- Anvendes af mange og har mere "fitness-faktor"
- Gamification
- Valide

Ulemper

- Tech literacy
- Smartphones
- Dataindsamling
- Validitet hos slow walkers

Research grade

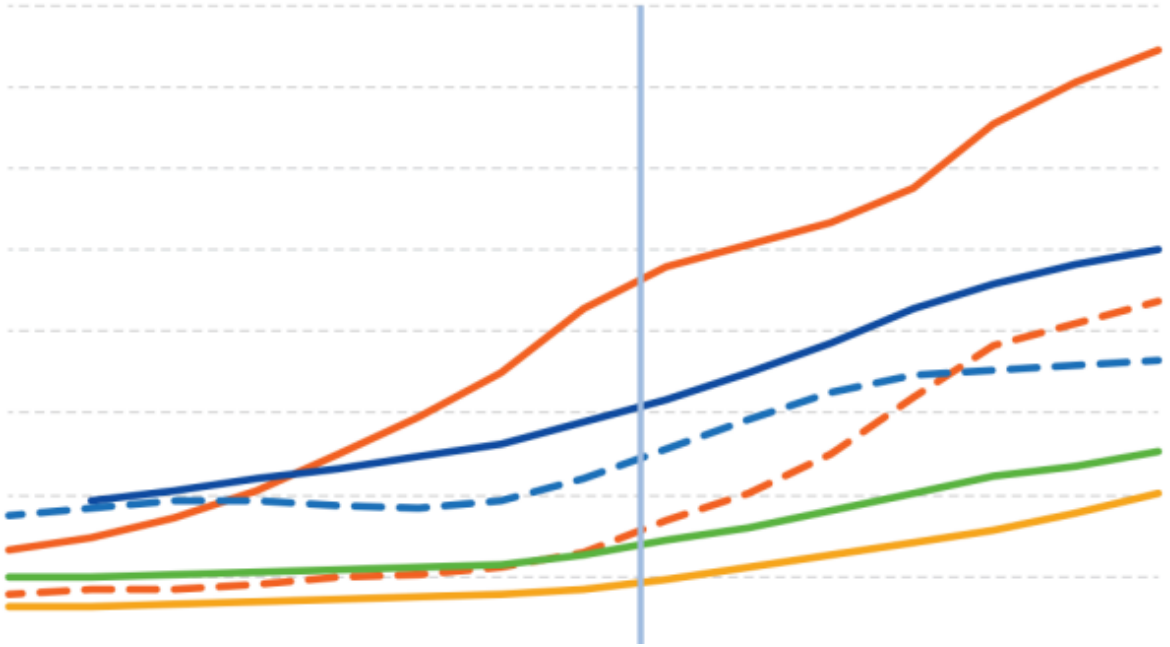
Fordele

- Pålidelige
- Kan måle mange ting
- Validerede
- Anerkendte i litteraturen

Ulemper

- Oftest ingen feedback
- Kræver større digital set up fra enhed
- Batteri

Den brændende platform



Historien om de 10.000 skridt

Figure 3. Manpo-kei (”10,000 steps meter”) marketed in Japan by Y. Hatano in 1965 (129).

Mindre kan også gøre det

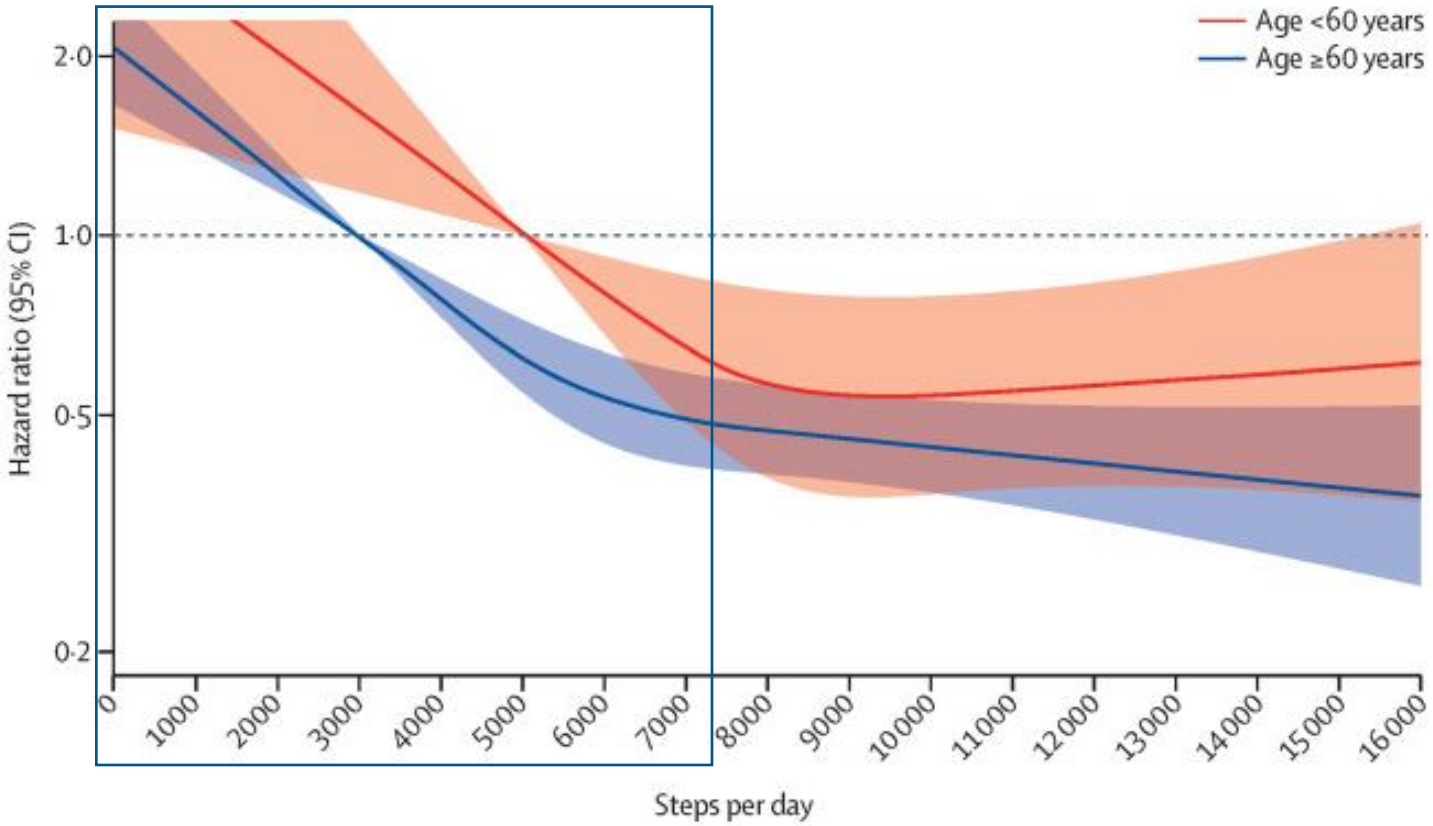


Figure 3 Dose-response association between steps per day and all-cause mortality, by age group

Paluch AE, Bajpai S, Bassett DR, Carnethon MR, Ekelund U, Evenson KR, Galuska DA, Jefferis BJ, Kraus WE, Lee IM, Matthews CE, Omura JD, Patel AV, Pieper CF, Rees-Punia E, Dallmeier D, Klenk J, Whincup PH, Dooley EE, Pettee Gabriel K, Palta P, Pompeii LA, Chernofsky A, Larson MG, Vasan RS, Spartano N, Ballin M, Nordström P, Nordström A, Anderssen SA, Hansen BH, Cochrane JA, Dwyer T, Wang J, Ferrucci L, Liu F, Schrack J, Urbanek J, Saint-Maurice PF, Yamamoto N, Yoshitake Y, Newton RL Jr, Yang S, Shiroma EJ, Fulton JE; Steps for Health Collaborative. Daily steps and all-cause mortality: a meta-analysis of 15 international cohorts. Lancet Public Health. 2022 Mar;7(3):e219-e228. doi: 10.1016/S2468-2667(21)00302-9. PMID: 35247352; PMCID: PMC9289978.

Mindre kan også gøre det

I alle grupper er afstanden mellem referencen (de mindst aktive) og resten størst.

	Steps per day quartile	Number of studies	Median steps per day	Participants	Deaths/ person-years	Hazard ratio (95% CI)		Risk difference per 1000 people (95% CI)	Heterogeneity, I^2
						Model 1	Model 2		
Total	1	15	3553	11858	1447/70991	1·00 (ref)	1·00 (ref)	1 (ref)	
	2	15	5801	11877	676/74732	0·56 (0·47 to 0·65)	0·60 (0·51 to 0·71)	−65 (−72 to −58)	52%
	3	15	7842	11877	511/75587	0·47 (0·40 to 0·56)	0·55 (0·49 to 0·62)	−79 (−86 to −72)	12%
	4	15	10901	11859	379/76526	0·39 (0·32 to 0·48)	0·47 (0·39 to 0·57)	−90 (−97 to −83)	47%
Age, years									
<60	1	7	4849	2588	127/22718	1·00 (ref)	1·00 (ref)	1 (ref)	
	2	7	7245	3036	77/26993	0·57 (0·47 to 0·70)	0·59 (0·39 to 0·88)	−24 (−34 to −14)	34%
	3	7	8911	3188	67/26499	0·42 (0·28 to 0·63)	0·51 (0·37 to 0·71)	−28 (−38 to −18)	0%
	4	7	11482	3356	88/30246	0·53 (0·38 to 0·73)	0·60 (0·44 to 0·83)	−22 (−33 to −13)	0%
≥60	1	13	2841	9093	1241/49878	1·00 (ref)	1·00 (ref)	1 (ref)	
	2	13	5217	8652	637/47171	0·56 (0·34 to 0·92)	0·62 (0·52 to 0·73)	−63 (−72 to −54)	55%
	3	13	7116	8504	467/46351	0·45 (0·37 to 0·55)	0·52 (0·43 to 0·62)	−81 (−90 to −73)	50%
	4	13	10501	8335	313/45566	0·35 (0·28 to 0·45)	0·43 (0·34 to 0·53)	−99 (−107 to −91)	48%
Sex									
Male	1	11	3897	3584	739/25681	1·00 (ref)	1·00 (ref)	1 (ref)	
	2	11	5943	3655	379/27456	0·57 (0·48 to 0·69)	0·62 (0·52 to 0·76)	−102 (−119 to −86)	43%
	3	11	7871	3694	272/27731	0·48 (0·38 to 0·61)	0·55 (0·44 to 0·68)	−132 (−148 to −117)	54%
	4	11	11209	3838	226/28961	0·46 (0·36 to 0·58)	0·52 (0·41 to 0·66)	−147 (−162 to −132)	44%
Female	1	11	3623	7888	691/45420	1·00 (ref)	1·00 (ref)	1 (ref)	
	2	11	5901	7824	292/46463	0·60 (0·46 to 0·77)	0·62 (0·47 to 0·81)	−50 (−58 to −43)	57%
	3	11	7880	7793	201/47008	0·44 (0·35 to 0·56)	0·53 (0·41 to 0·68)	−62 (−69 to −55)	34%
	4	11	11217	7645	140/46583	0·36 (0·26 to 0·52)	0·43 (0·31 to 0·61)	−69 (−76 to −62)	50%

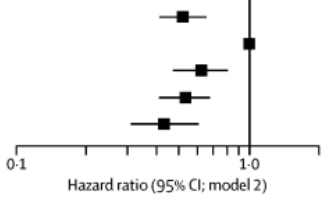


Figure 2 Association between steps per day and all-cause mortality, in all participants, and by age and sex

Paluch AE, Bajpai S, Bassett DR, Carnethon MR, Ekelund U, Evenson KR, Galuska DA, Jefferis BJ, Kraus WE, Lee IM, Matthews CE, Omura JD, Patel AV, Pieper CF, Rees-Punia E, Dallmeier D, Klenk J, Whincup PH, Dooley EE, Pettee Gabriel K, Palta P, Pompeii LA, Chernofsky A, Larson MG, Vasan RS, Spartano N, Ballin M, Nordström P, Nordström A, Anderssen SA, Hansen BH, Cochrane JA, Dwyer T, Wang J, Ferrucci L, Liu F, Schrack J, Urbanek J, Saint-Maurice PF, Yamamoto N, Yoshitake Y, Newton RL Jr, Yang S, Shiroma EJ, Fulton JE; Steps for Health Collaborative. Daily steps and all-cause mortality: a meta-analysis of 15 international cohorts. Lancet Public Health. 2022 Mar;7(3):e219-e228. doi: 10.1016/S2468-2667(21)00302-9. PMID: 35247352; PMCID: PMC9289978.

Stigende antal publikationer understøtter anvendelse

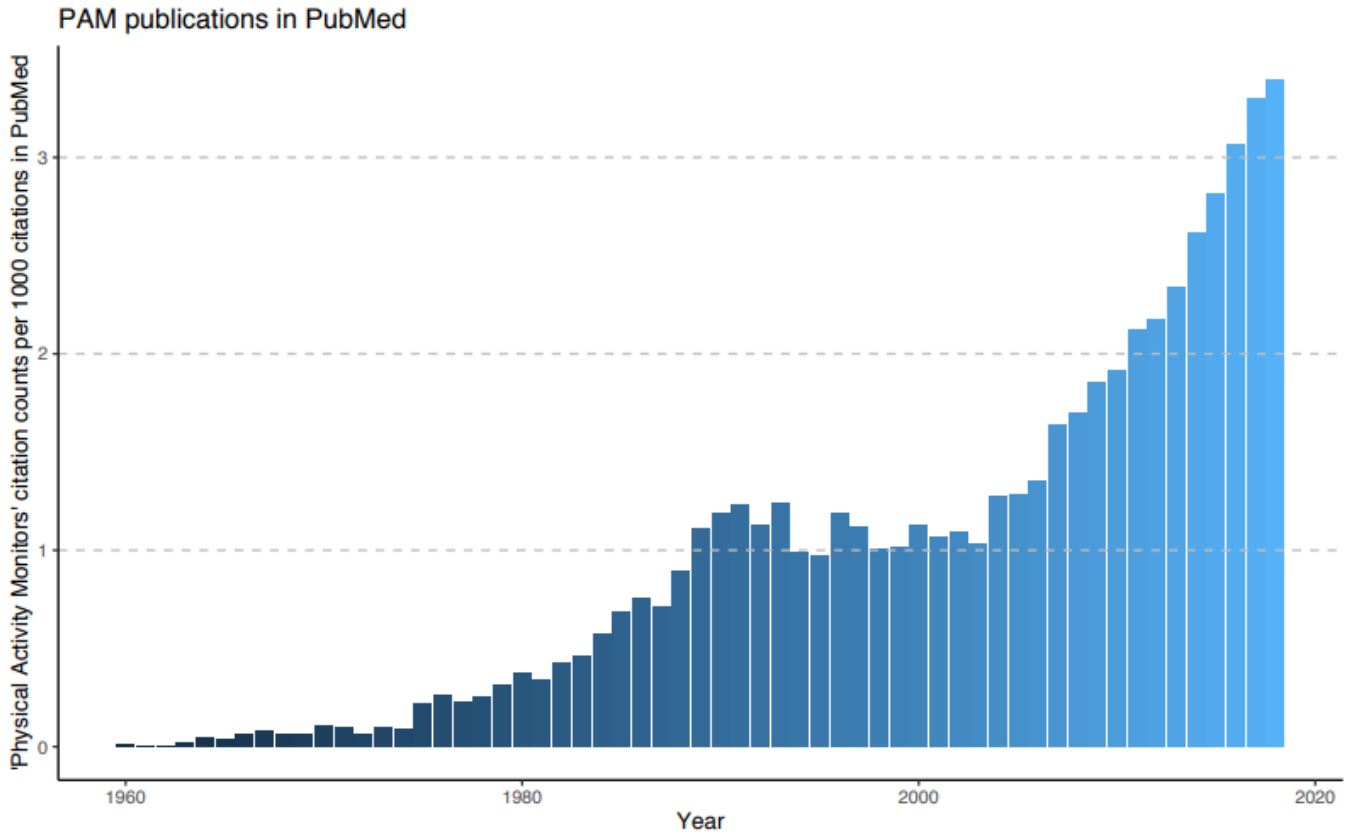


Figure 5. "Physical Activity Monitor" citation counts per 1000 citations in PubMed per year since 1960.

Hvordan bør man undersøge om det virker?

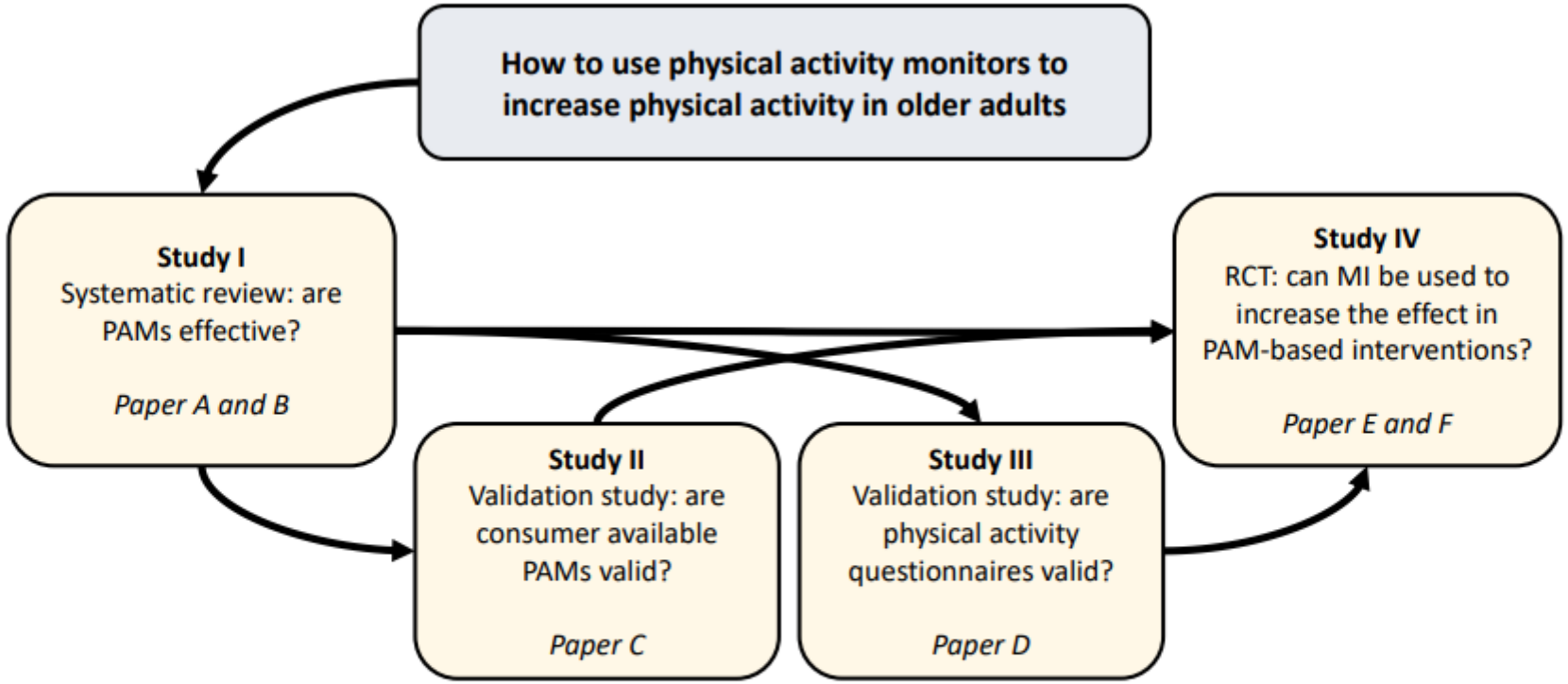


Figure 6. Illustration of the rationale, flow and methods of the thesis. Chronologically, **study I** was initiated in the beginning of the process to investigate whether physical activity monitors already had been shown to be effective among older adults and to inform the other studies. **Study II** was conducted after the main results of **study I** had been interpreted to inform the design of **study IV**. **Study III** and **study IV** use data from the same participants. The results of **study III** are relevant to interpretation of the findings in **study IV**.

Klar effekt blandt ældre

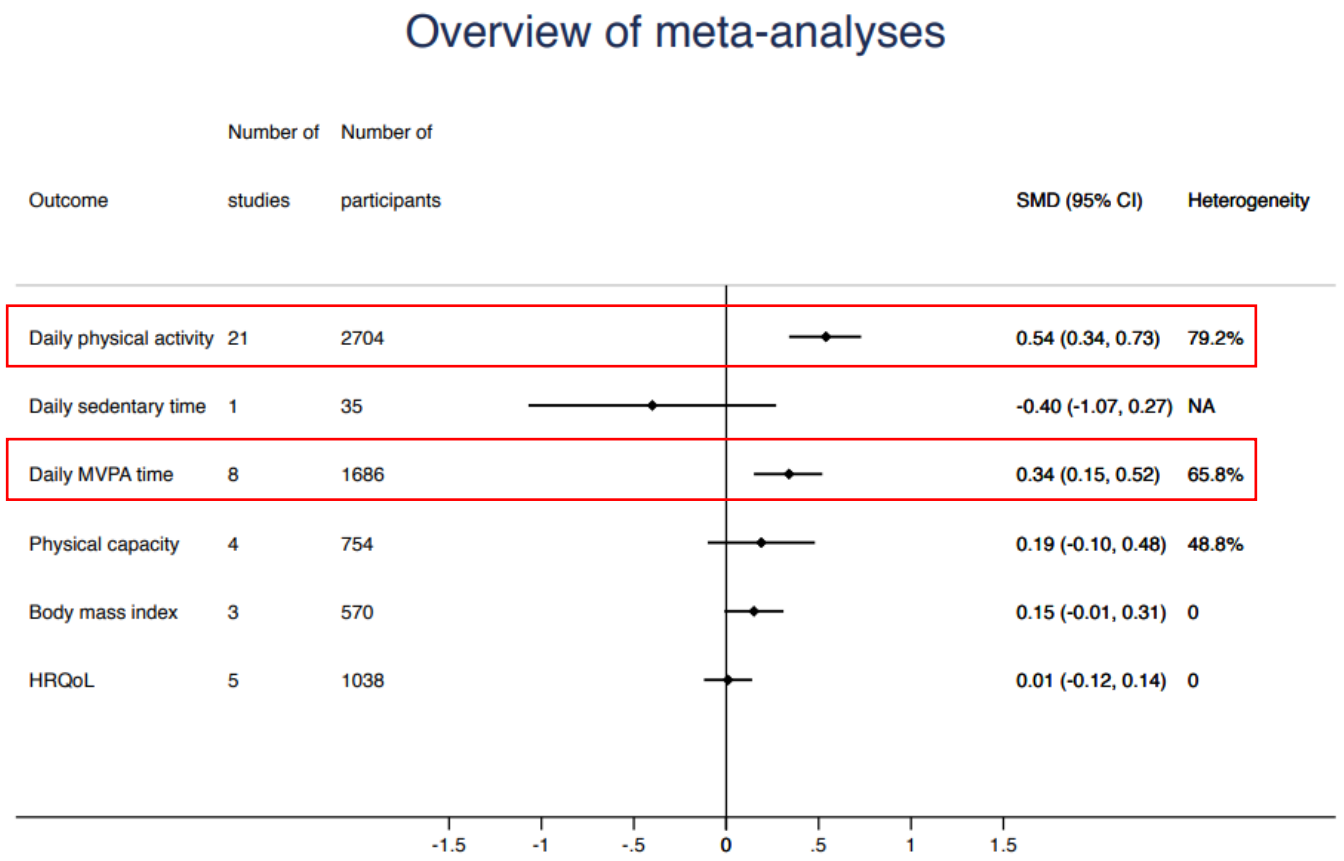
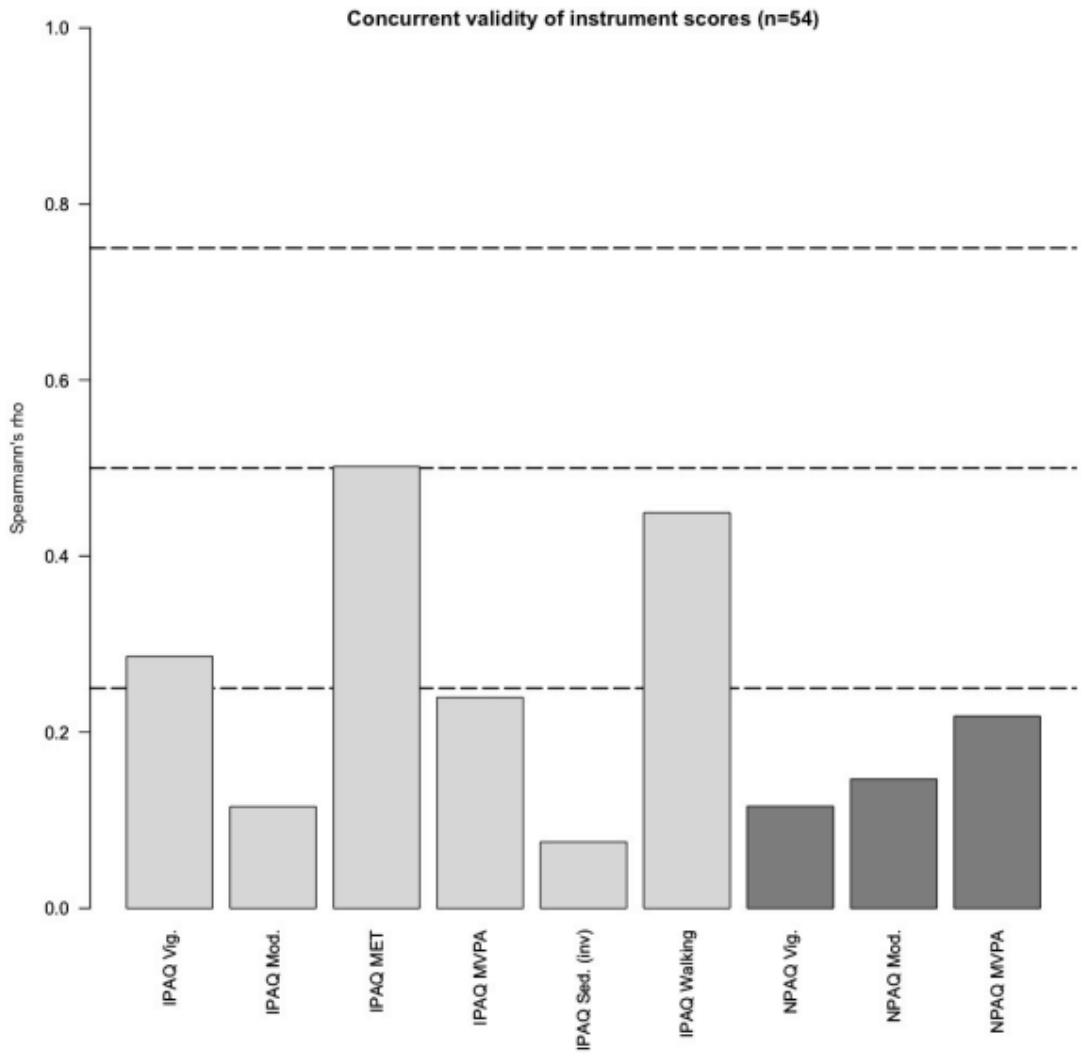


Figure 7. Overview of random effects meta-analyses for each outcome performed in **study I**. SMD: standardised mean difference, MVPA: Moderate to Vigorous Physical Activity, HRQoL: Health-related Quality of Life. Heterogeneity expressed as I^2 values. Positive SMD equals higher values in the intervention groups. Positive values are favoured for daily physical activity, MVPA, physical capacity, and HRQoL. Negative values are favoured for daily sedentary time.

Anvendelse af spørgeskemaer



Kan man øge effekten ved fx den motiverende samtale?

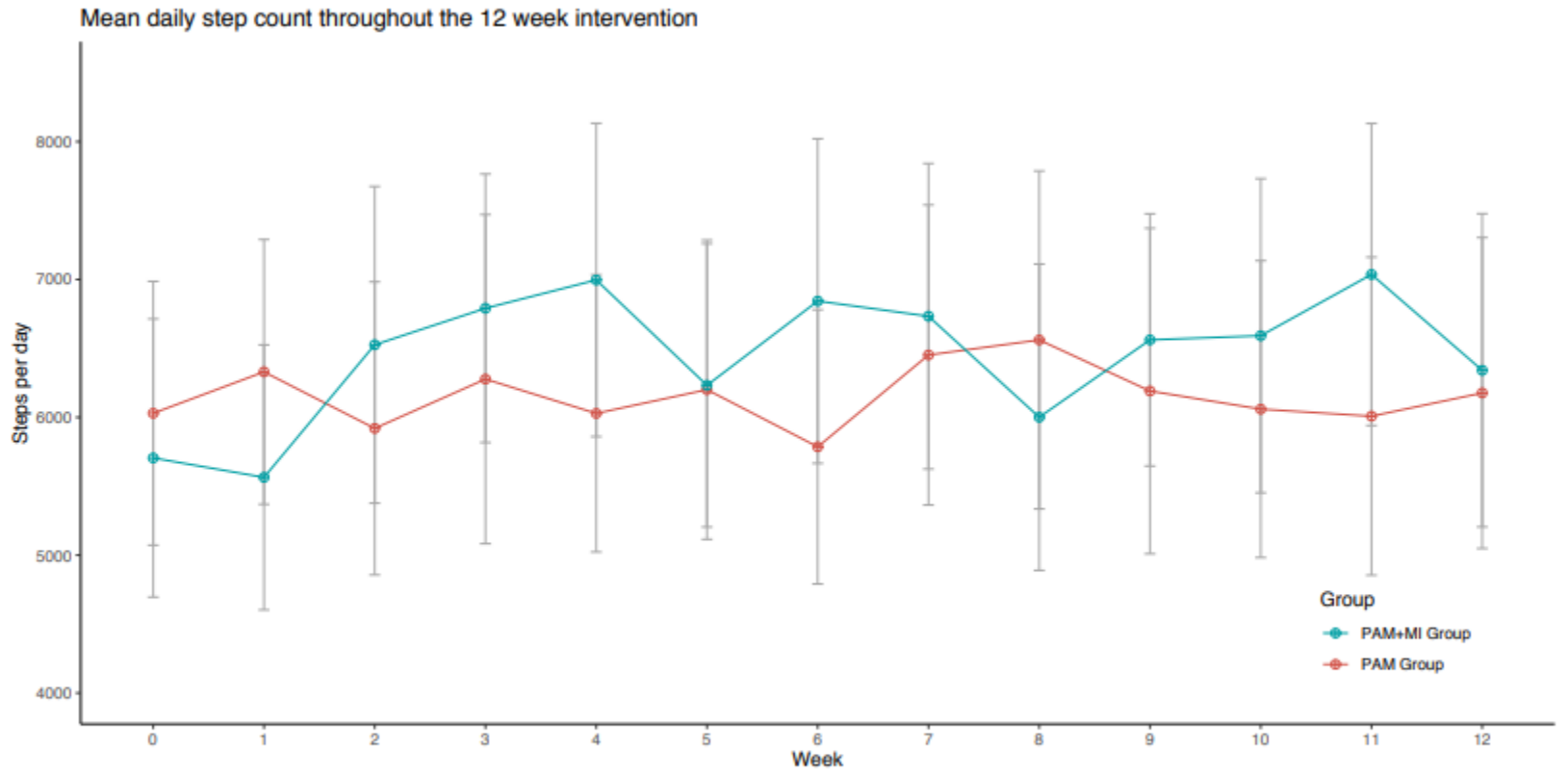


Figure 14. Unadjusted mean daily step counts throughout the 12-week intervention in **study IV**. Week 0: baseline week. Intervention period: week 1 to week 12. Circles represent mean values and error bars represent 95% confidence intervals. Unimputed data are used. This figure is similar to the figure in **study IV**.

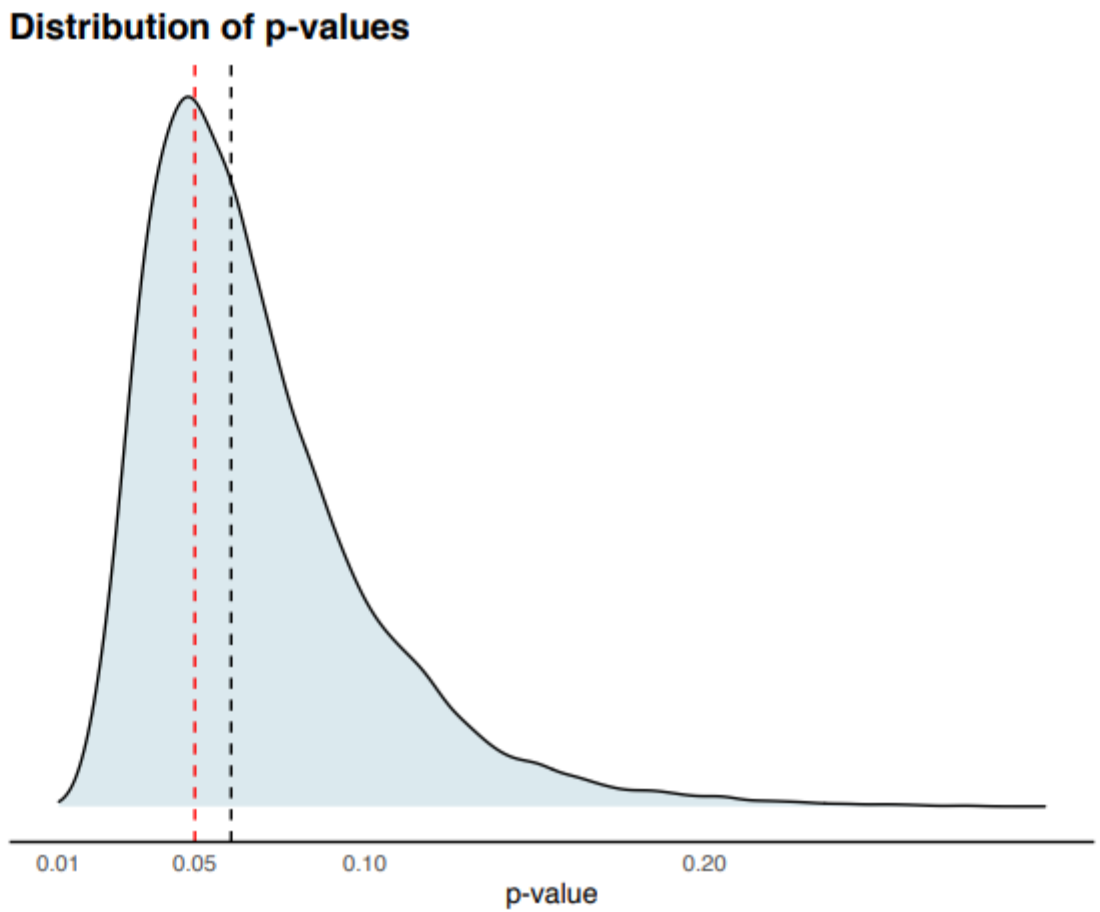


Figure 15. Density plot illustrating the distribution of p-values for between-group differences obtained from the multiple regression model in **study IV** with 5000 multiple imputations with 5 iterations for predictive mean matching. The red line equals the alpha level on 0.05. The black line equals the median p-value on 0.061.

Virker det blandt alle?

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Research

Effectiveness of physical activity monitors in adults: systematic review and meta-analysis

BMJ 2022 ; 376 doi: https://doi.org/10.1136/bmj-2021-068047 (Published 26 January 2022)
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Author affiliations

Outcome	No of studies	No of participants	SMD (95% CI)	SMD (95% CI)	I^2 (%)
Physical activity	103	12 840		0.42 (0.28 to 0.55)	81
Moderate to vigorous physical activity	63	8250		0.23 (0.16 to 0.30)	67
Sedentary time	38	5634		-0.12 (-0.25 to 0.01)	66

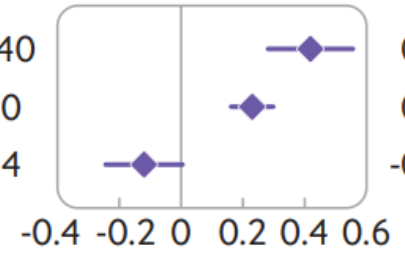
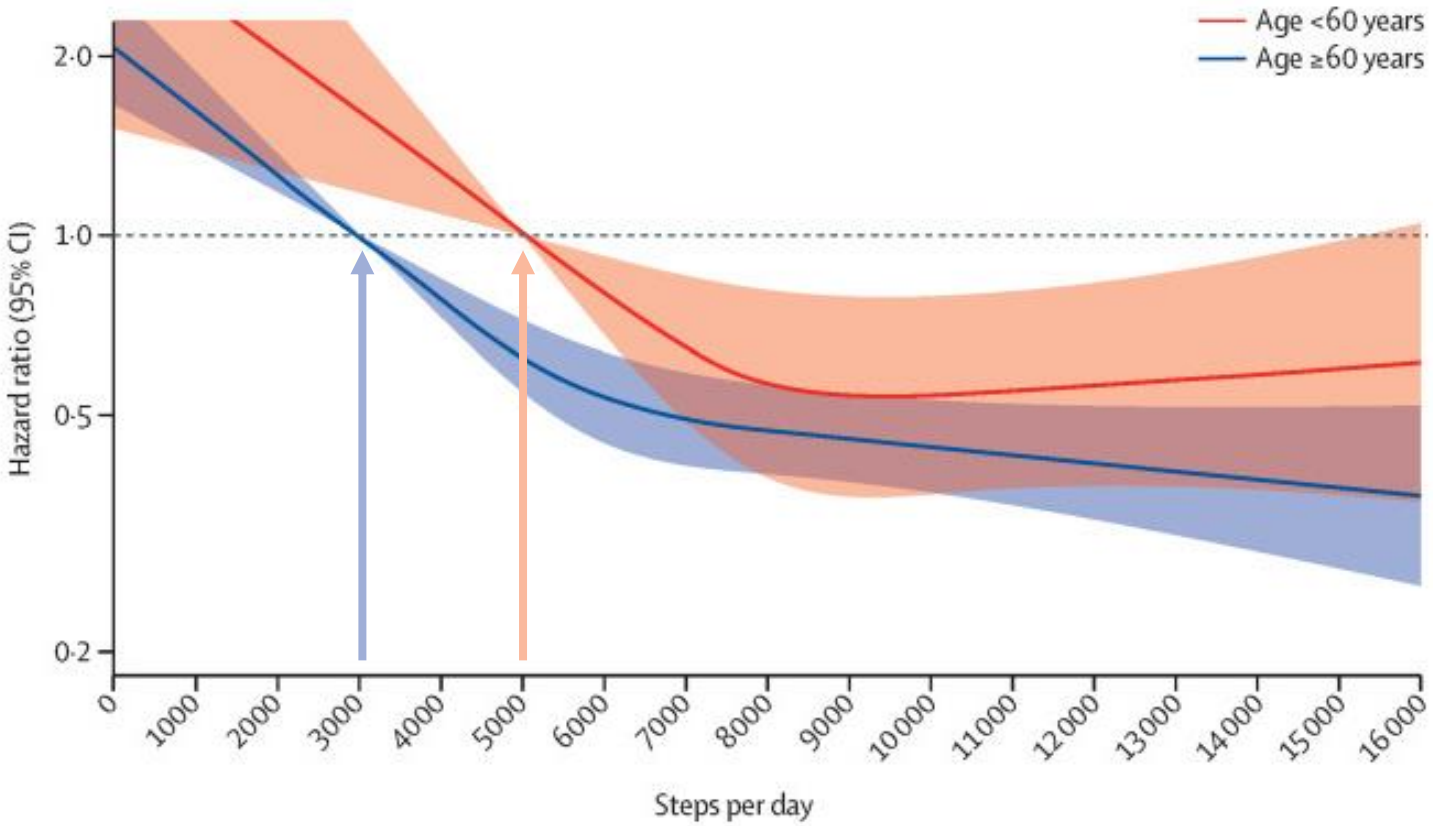


Fig 3 | Random effects meta-analysis adjusted to Hedges' g on effect of interventions on physical activity, moderate to vigorous physical activity, and sedentary time. SMD=standardised mean difference

The PAM based interventions showed a moderate effect (standardised mean difference 0.42, 95% confidence interval 0.28 to 0.55) on **physical activity, equivalent to 1235 daily steps**; a small effect (0.23, 0.16 to 0.30) on **moderate to vigorous physical activity, equivalent to 48.5 weekly minutes**; and a small insignificant effect (−0.12, −0.25 to 0.01) on sedentary time, equal to 9.9 daily minutes. All outcomes favoured the PAM interventions.

Genbesøg



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Implementering og overvejelser

Overvejelser og strategi

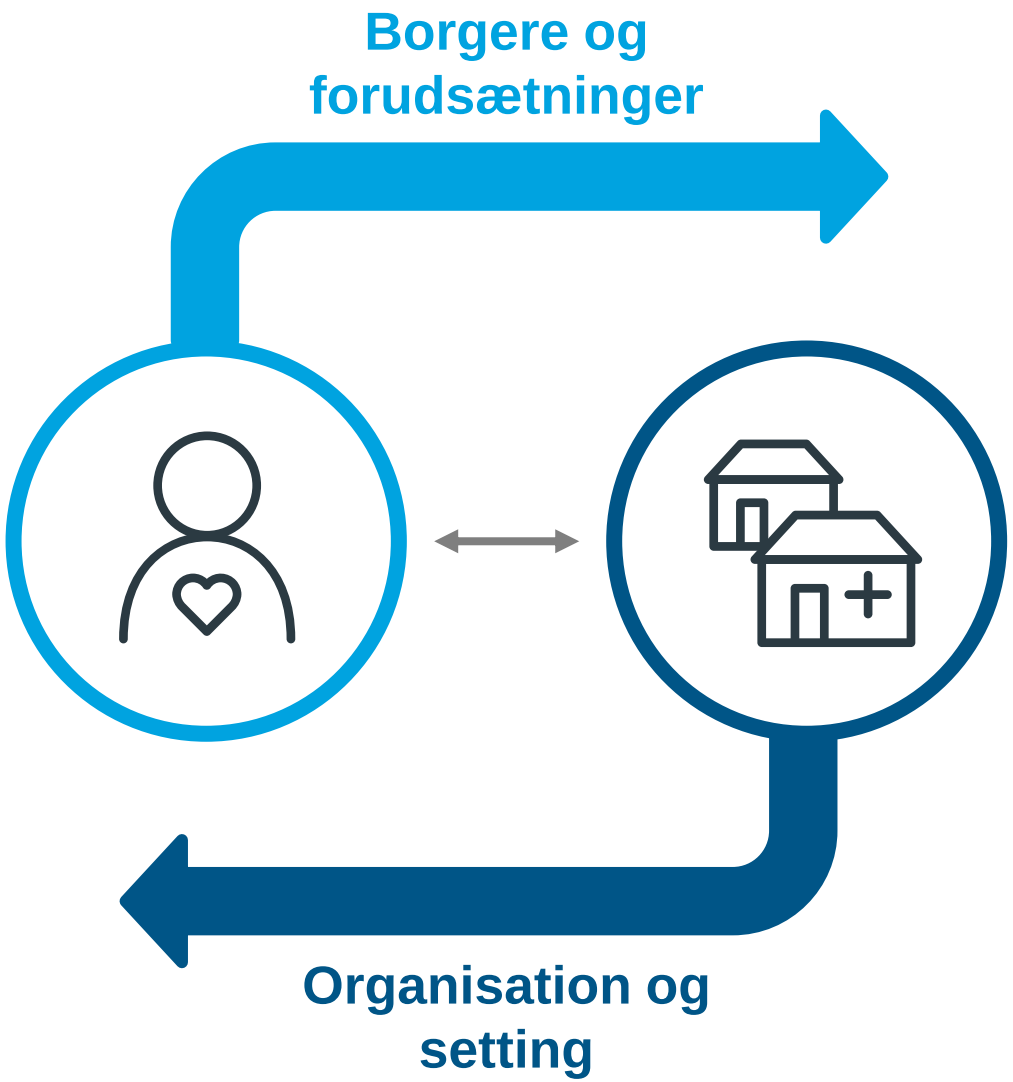
Målgruppe
Specifikt område, generel implementering, frivillig eller del af tilbud?

Pårørende
Eventuel strategi for inklusion.

Uddannelse
Strategi for uddannelse af borgere og især personale.

Opfølgning
Skal det være passiv eller aktiv tilgang til anvendelsen?

Dataindsamling
Datasikkerhed, logs, elektronisk overvågning, formål med data, type af device.



Type af borger
Ældre, kronikere, social udsatte, unge med fx sportsskader m.fl.

Ressourcer
Økonomi, pårørende, tilgang til aktivitet generelt.

Teknologisk parathed

Naturlig skepsis
Datasikkerhed, overvågning m.fl.

Langtidseffekt

Spørgsmål eller interesse?

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