Effects of the Resident Assessment Instrument in Home Care Settings by Degree of Implementation – Results of a Cluster-Randomized Controlled Trial in Germany

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I. Background: Situation in Germany

- Formal long-term home care in Germany is characterized by
  - Deficits in quality of care
  - Lack of evidence-based care
  - High burdens for documentation but
  - Care processes that don‘t make use of documentation
- The need for improvements in the process of care-giving through evidence-based instruments
- Residence Assessment Instrument – Homecare (RAI HC) could be such an instrument
- Cluster-randomized controlled trial to evaluate the effects of RAI HC in Germany
  - funded by the Federal Ministry of Education and Research (BMBF)

I. Background: The Resident Assessment Instrument (RAI)

- RAI
  - has been developed by in the US in the early 1990s
  - RAI was developed for nursing home care and was later modified to cover home care → RAI HC
  - is continuously improved by the InterRAI
  - is applied in 30 countries today

- RAI consists of
  - Minimum Data Set (MDS)
  - Trigger system
  - Client Assessment Protocols (CAPs)
  - Reassessment every 3 and 6 months respectively
  - Quality indicators developed from the MDS data

I. Background: The intervention

- Cluster-randomized controlled trial with ADL as major outcome measure along with
  - IADL
  - Cognitive skills (MMST) and
  - quality of life (EQ-5D)
  - Hospitalization and change to nursing home care

- Basic Idea of the intervention
  - Systematic assessment generates data
  - Trigger system and client assessment protocols guide nurses
  - Critical situations are systematically identified, countermeasures are taken
  - The quality of care and thus outcomes improve

II. International experiences

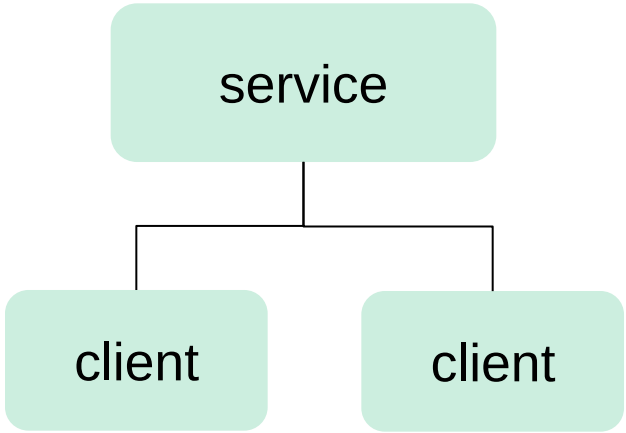
- Focusing on nursing home care
  - various international studies have shown positive effects of RAI,
  - but there are also negative results in studies e.g. from Hongkong (Chi et al.) and the Netherlands (Hansebo et al.)

- There are only very few studies on the effects of RAI in a home care setting.
  - An Italian team (Landi et al.) found improvements in ADL and cognitive skills and a reduced hospitalization rate and
  - a Korean team (June et al.) found positive effects on ADL and IADL

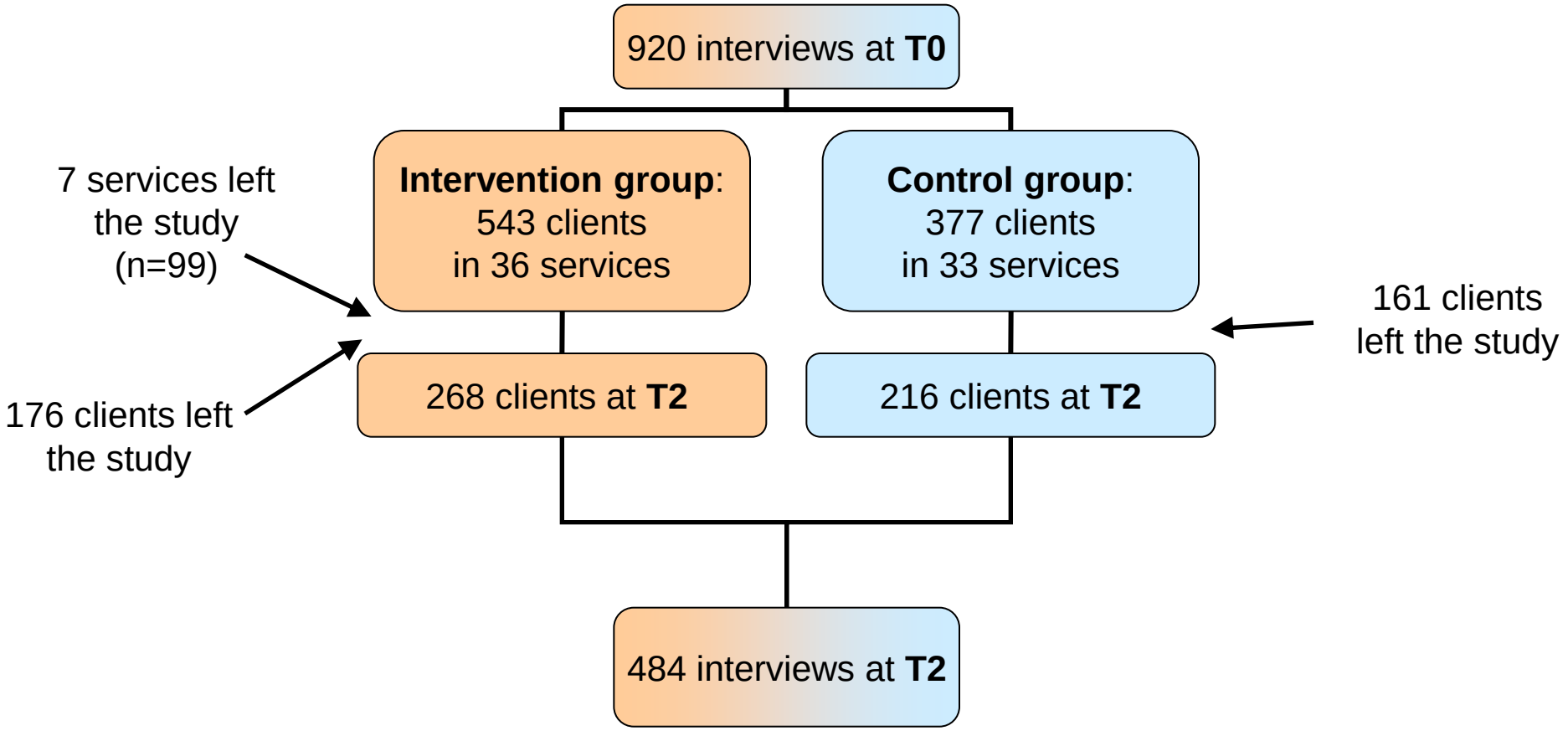
→ Research question: What are the effects of RAI HC in Germany?

Cluster-randomised controlled study

- Randomization of services, not of clients
- Cluster (services) are basic unit for planning, execution of the study and data analysis



III. Data and methods: Clients flow



Following results relate to the 482 clients

III. Data and methods: Characterization of the intervention

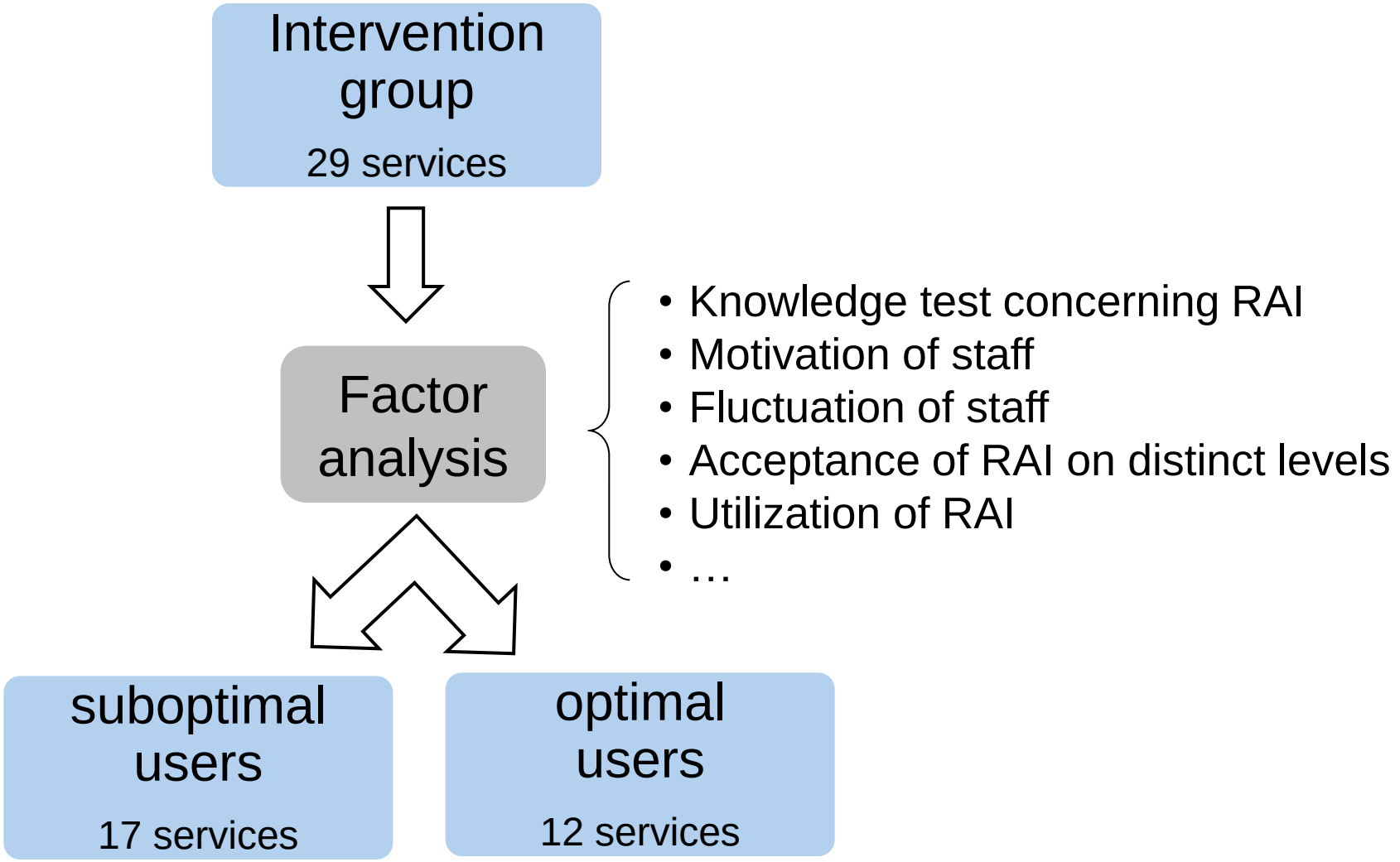
Training of nurses

- initial training → 2 x 4 hours
- advanced training → 2 x 4 hours
- IT training → about 2 hours
- training of change agents → about 2 hours

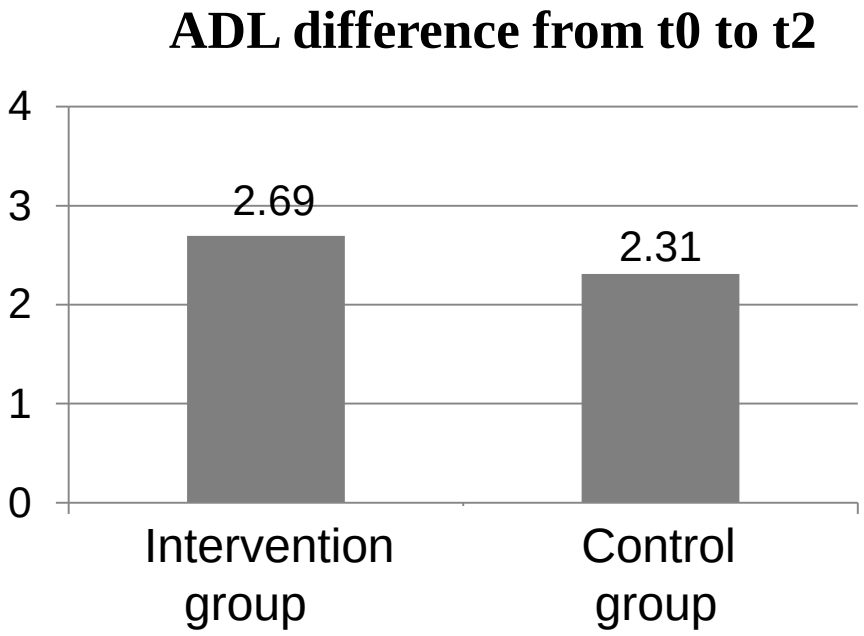
During implementation

- on average 2-3 visits per service
- on average 13 consulting phone calls per service
- 3 meetings of all RAI users in Bremen to foster exchange between services

III. Data and methods: Subgroup analysis

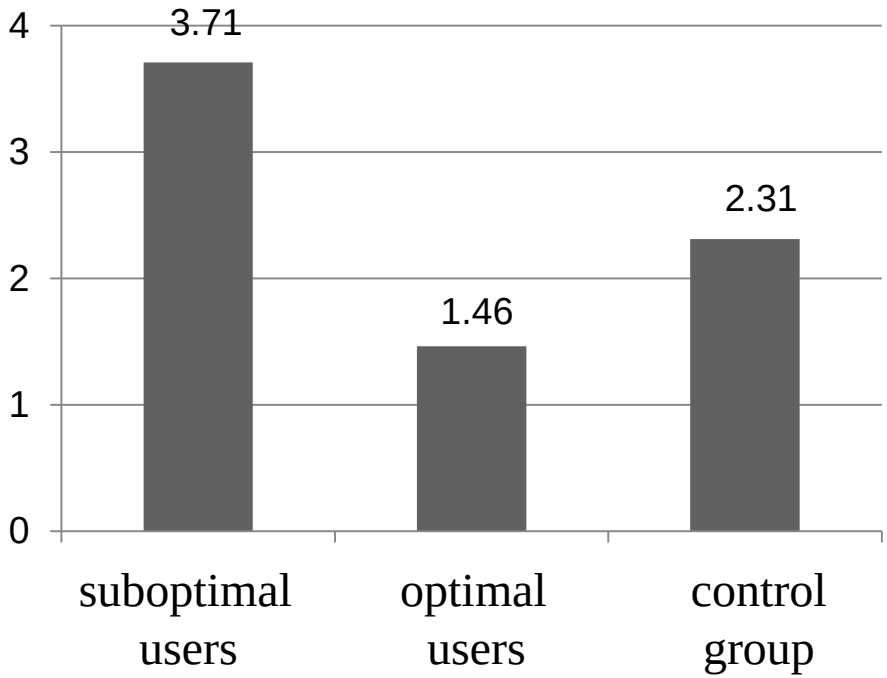


IV. Results: Activities of daily living (ADL)



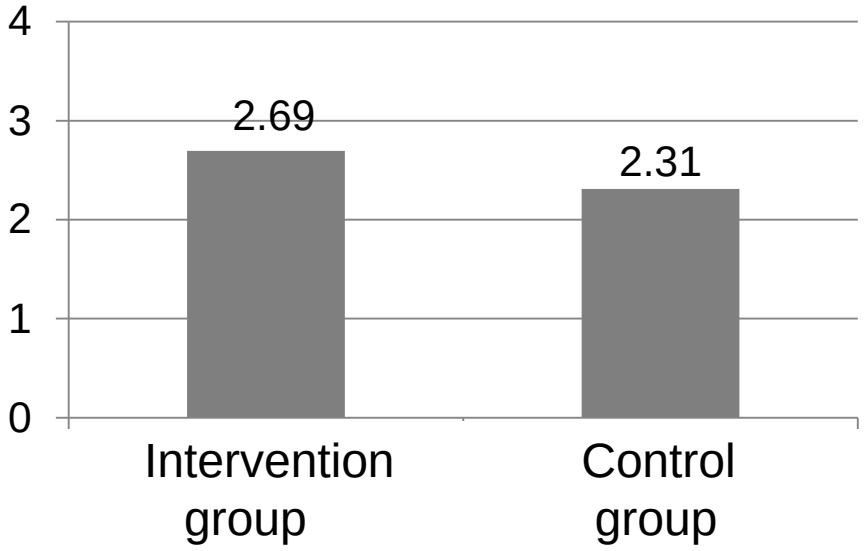
IG: n=268, CG: n=216

The higher the difference, the worse the development



sU: n=147, oU: n= 121,
CG: n=216

IV. Results: Activities of daily living (ADL)

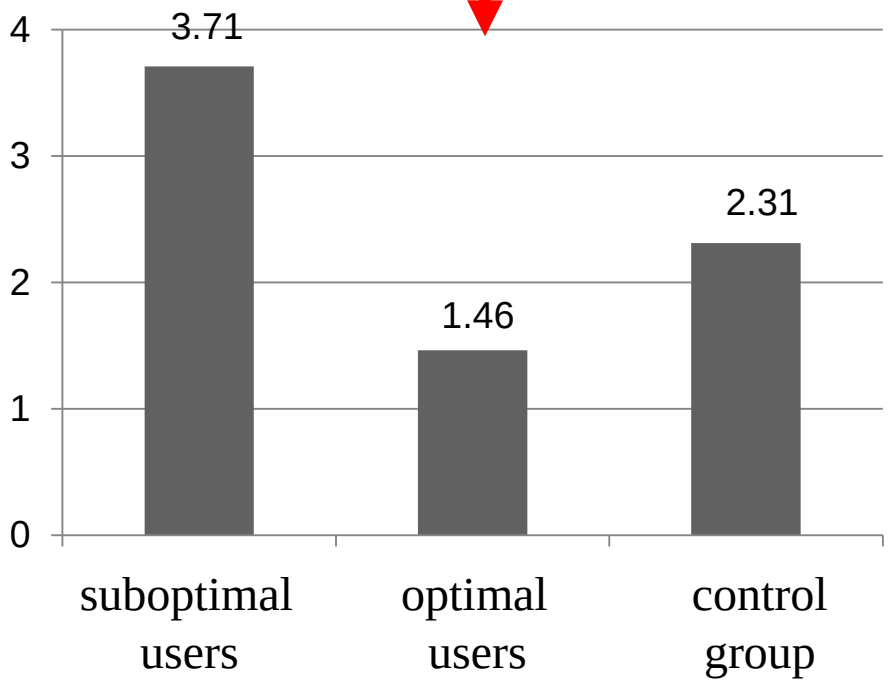


IG: n=268, CG: n=216

The higher the difference, the worse the development

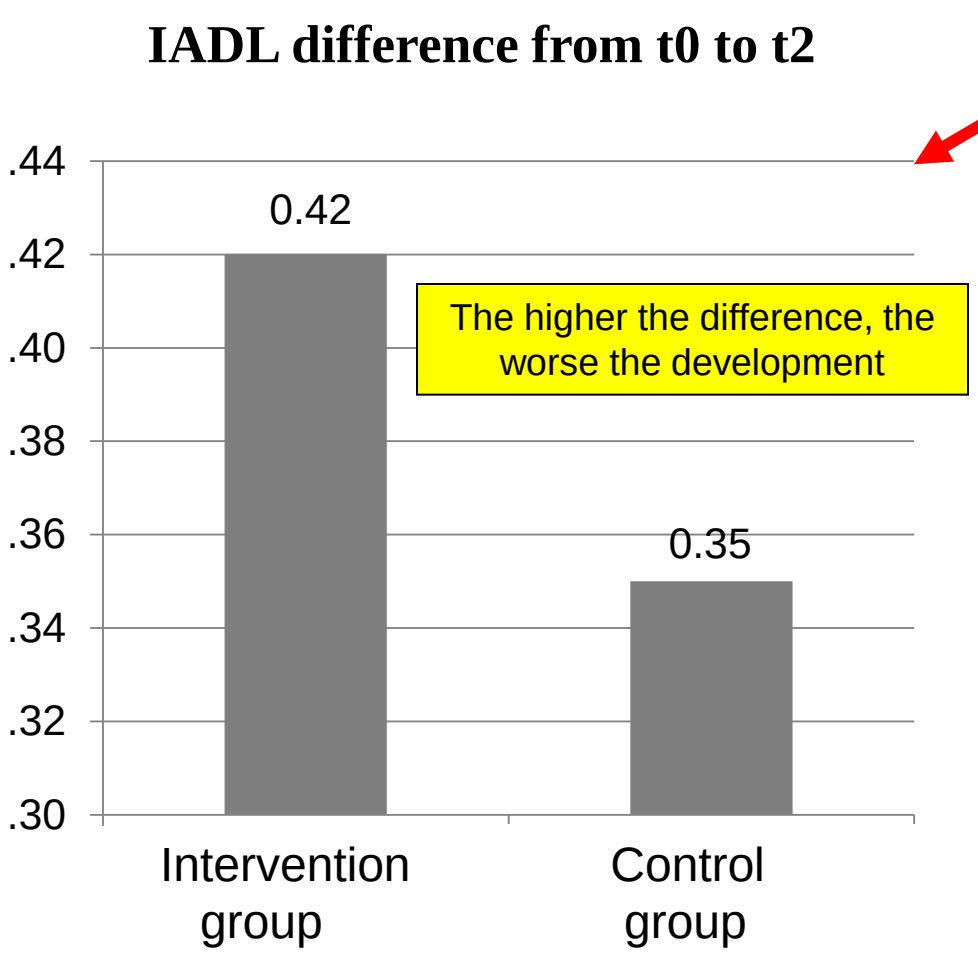
"Wrong" direction

"right" direction, but no significant effect



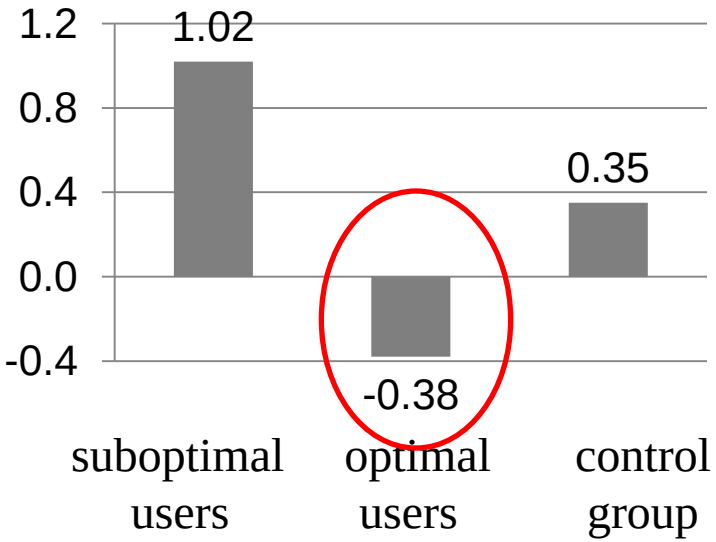
sU: n=147, oU: n= 121, CG: n=216

IV. Results: Instrumental activities of daily living (IADL)



"Wrong" direction

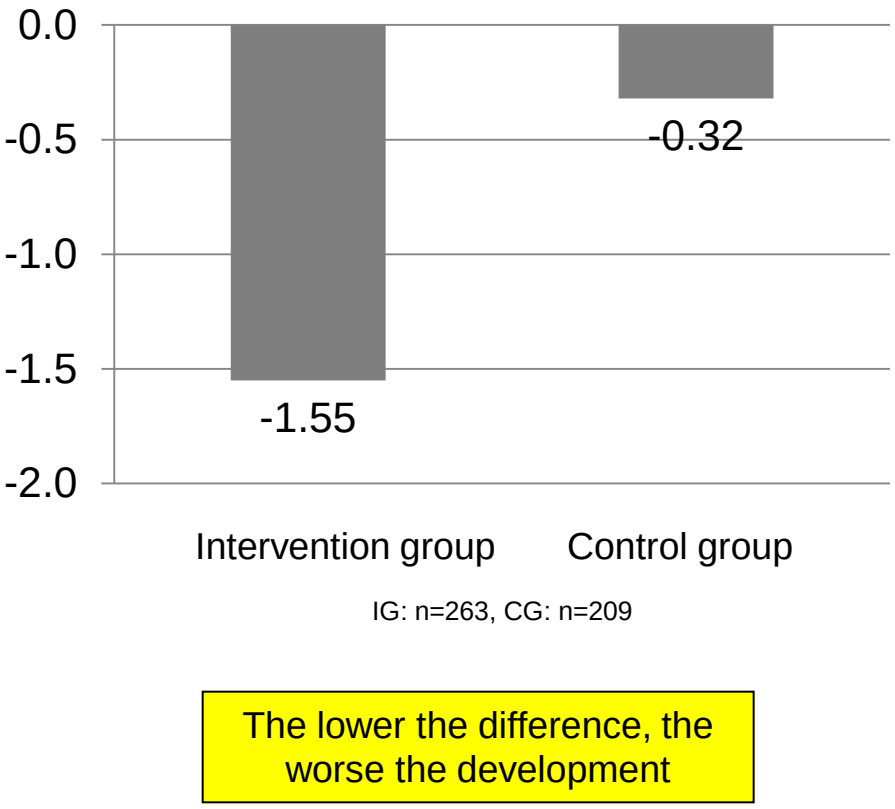
"right" direction, but no significant effect



IG: n=258, CG: n=215

sU: n=144, oU: n=115, CG: n=215

IV. Results: cognitive abilities

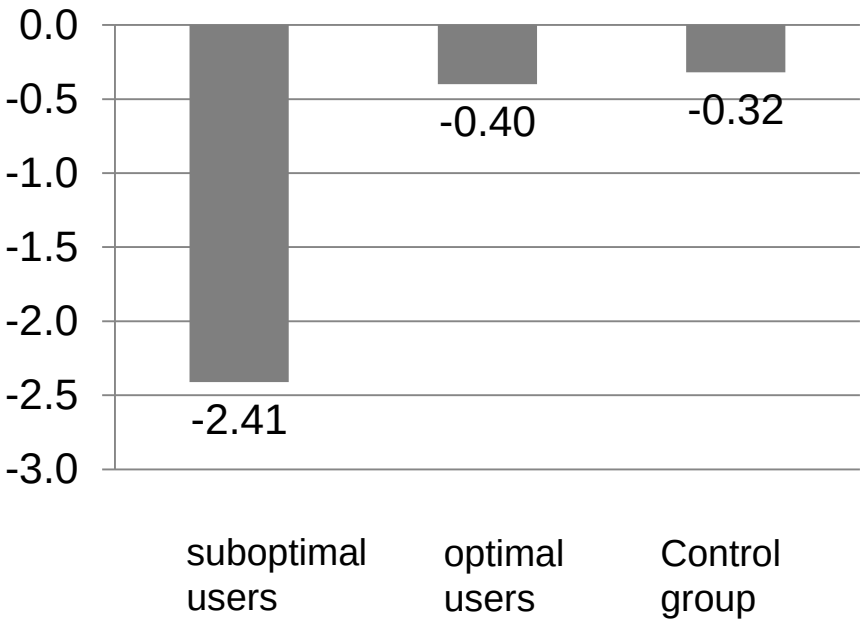


IG: n=263, CG: n=209

The lower the difference, the worse the development

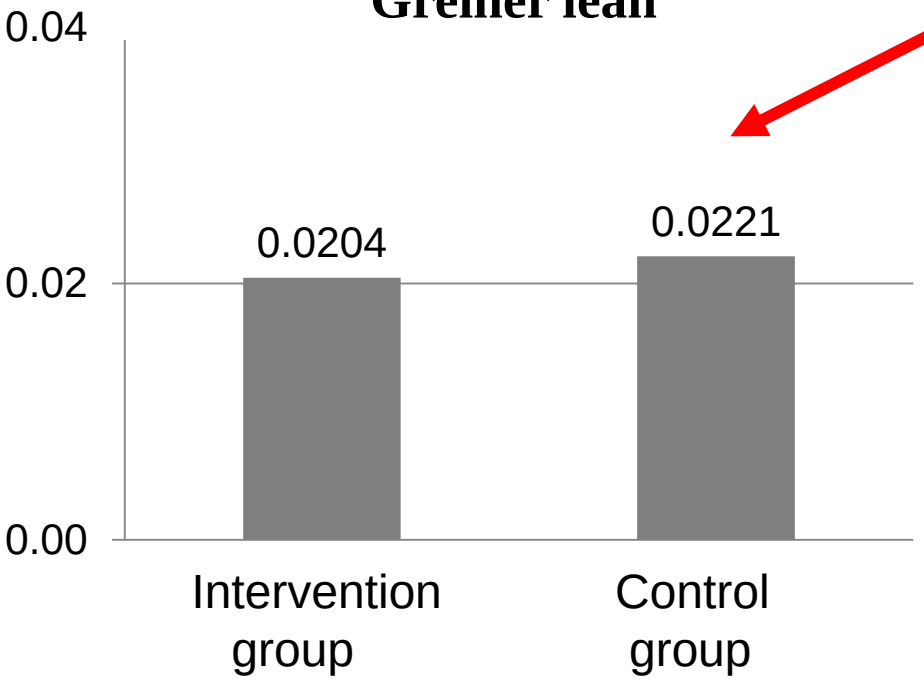
"Wrong" direction

no significant effect



sU: n=143, oU: n=120, CG: n=209

IV. Results: quality of life

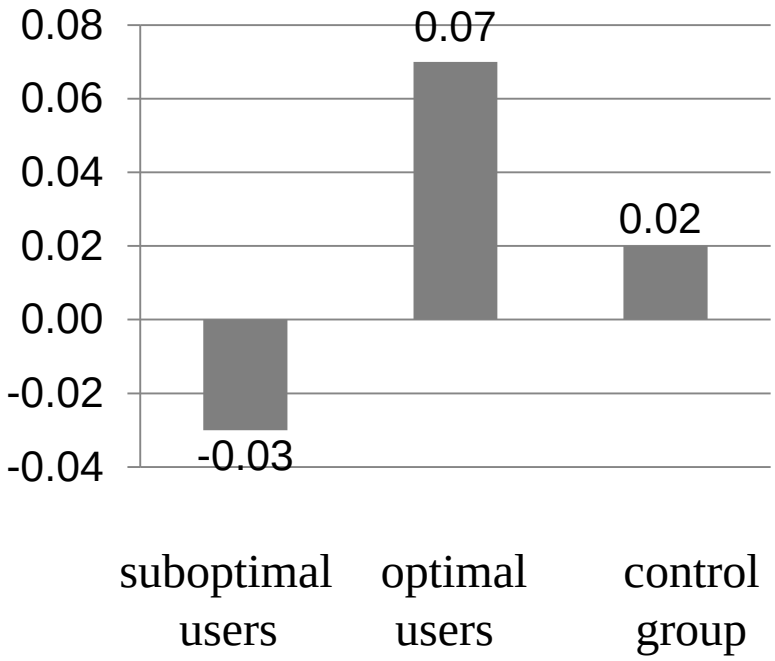


IG: n=251; CG: n=210

The lower the difference, the worse the development

"Wrong" direction

"right" direction, but no significant effect



sU: n=134, oU: n=117, KG: n=210

IV. Results: Regression analysis

linear multilevel regression	ADL diff.[a]	IADL diff.[a]	MMST diff.[b]	EQ-5D diff.[b]
intercept	-2.2081	-0.8569	3.5166	0.1427
group				
control group	1.0625	0.1842	0.5588	0.0053
sex				
female	-1.8644**	-0.2006	1.0374*	0.0145
age	0.0977***	0.0260**	-0.0476**	-0.0031***
education				
high	-		0.3221	-0.0367
living alone				
yes			-0.0972	0.0197
ADL at t_0			0.0076	-0.0014
IADL at t_0	-0.0068	--	-0.0777	0.0094**
MMST at t_0		-0.0254		
	-0.1604***		--	-0.0016
EQ-5D at t_0				
(change of +0.1 points)	0.4223**	0.1494**	-0.1681	--
care provision at t_0	0.0544	0.0030	-0.0538***	-0.0011
proportion of registered nurses	-0.4300*	-0.1432	0.1321	0.0020
size of home care service	-0.0011	0.0029	-0.0023	0.0003*
non-profit providers				
yes	2.2086**	-0.0576	-0.6211	0.0241
distance driven (km per nurse per month)				
(change of +100 km)	-0.0505	-0.0117	0.0041	0.0007

Now the sign is „right“, but effects are still insignificant

IV. Results: Hospital admissions

Number and duration of hospital stays during observation period

	Intervention group	Control group
duration	6,15	7,71
number	0,50	0,67
Hospital at all	30,6%	41,7%

IG: n=268, KG: n=216

"right" direction, but no significant effect

	Suboptimal users	Optimal users	Control group
duration	6,75	5,18	7,71
Number of stays	0,53	0,46	0,67
Hospital at all	33,3%	26,2%	41,7%

sU: n=165 oU: n=103,
KG: n=216

effects are not significant
(cluster-adjusted Wilcoxon-test)

IV. Results: Hospital admissions

logistic multilevel regression	admission to hospital (no vs. yes)
group	
optimal user	1.59**
suboptimal user	1.08
sex	
female	1.20
age	1.00
education	
high	1.18
living alone	
yes	0.98
ADL at t_0	1.01
IADL at t_0	1.00
MMST at t_0	0.99
EQ-5D at t_0	
(change of +0.1 points)	1.00
number of admissions to hospital	--
care effort at t_0	1.00
proportion of registered nurses	
(change of +10%)	0.97
size of home care service provider	1.00***
nonprofit providers	
yes	0.93
driving performance (km per nurse	
per month) (change of +100 km)	0.99

Only significant effect
(p = 0.0237)

V. Discussion: Results of cRCT

- RAI does not improve outcomes with respect to ADL, IADL, cognitive skills, quality of life

- Reason for this:
  - RAI only produces positive outcomes if all instruments (trigger system, client assessment protocol, quality indicators) are used
  - Some services only use MDS (suboptimal users): effects are negative as RAI only causes extra work

V. Discussion: Results of subgroup analysis

- When implemented properly, RAI might improve outcomes
  - Optimal users show better results for ADL, IADL, quality of life, and hospital admission, but
  - effects are only significant for hospital admission (yes/no)

- Reason for lack of significance
  - Under-powering of study for subgroup analysis
  - J-curve effect → (too) short period of observation

VI. Policy Implementation

- Implementation of RAI proves difficult due to general situation of home care in Germany
- RAI has the potential to improve outcomes but success is dependent on proper implementation which is not automatically given
- RAI might harm clients when implemented improperly
- Voluntary introduction is only successful if
  - Services really want it and use it as only planning instrument
  - Intensive consulting is guaranteed
- Mandatory introduction (as in the US and Switzerland) is only recommendable when accompanied by intensive consulting and supervison.

The end

Thank you for your attention!

Contact: rothgang@zes.uni-bremen.de

See also:

Stolle C, Wolter A, Roth G, Rothgang H (2012): Effects of the Resident Assessment Instrument in Home Care Settings – Results of a Cluster Randomized Controlled Trial, in: Zeitschrift für Geriatrie und Gerontologie, Vol. 45, No. 4: 315-322

Implementierungsbarrieren – Multilevel-Regression

lineare Multilevel-Regression	Grad der RAI-Umsetzung	p-Wert
Konstante	-101,34	<0,0001***
ADL t0 Veränderung um +1 Punkt	0,11	0,3476
MMST t0 Veränderung um +1 Punkt	0,22	0,2537
Alter t0 Veränderung um +1 Jahr	0,08	0,4743
Fachkraftquote t0 Veränderung um +10 %	-62,41	<0,0001***
Größe des Pflegedienstes t0 Veränderung Anzahl der Klienten um +1	0,03	0,1893
Trägerschaft t0 Nonprofit	-10,90	0,01**
MDK Prüfung t0 ja	-0,33	0,9311
Rendite t0 Veränderung der Rendite um +10 %	24,64	0,021**
Quantitative Anforderungen der Pflegenden Veränderung der Skala um -10 Punkte	1,93	0,0001***
Lernkurve der Study Nurse Zeitpunkt des Studieneintritts um +1 Tag	-0,036	0,0828*

3. Wirkungsweise des RAI – Veränderung der Versorgung

	Interventions-gruppe	Kontroll-gruppe	Signifikanz
Höherstufung der Pflegestufe	15,4%	8,3%	p=0,0328 (Clusteradjustierter Chi²-Test)

	Interventions-gruppe	Kontroll-gruppe	Signifikanz
Zunahme SGB-V Leistungen	10,1%	5,5%	n.s.

PS: IG n=215, KG n=157
SGB-V: IG: n=144/171
KG: 93/105