



MULTIDISCIPLINARY PREVENTION OF FALLS AND EFFECTS OF PREVENTION IN THE AGED



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OBJECTIVES

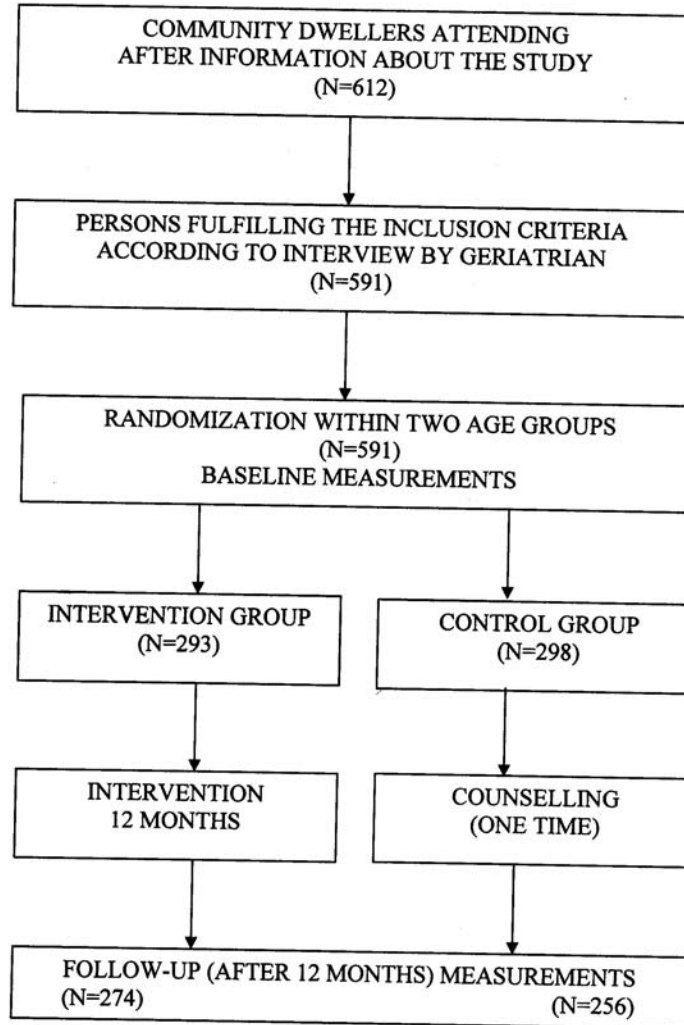
TO DESCRIBE

- The design of the study and the success of randomization
- The key activities of the prevention programme
- The adherence rates and the predictors of adherence



4. The effects of the prevention programme on risk factors of falls

- use of fall risk increasing drugs (FRID's)
- muscle strenghts
- postural balance
- depressive symptoms





INCLUSION CRITERIA

- Home-dwellers living in the town of Pori
- 65 years or older
- Having fallen during the previous 12 months
- Moderate or high cognitive abilities (MMSE ≥ 17)
- Moderate or high physical abilities (10 metres walk independently)



SUCCESS OF RANDOMIZATION

- n=293 for prevention programme
- n=298 for control programme
- mean age 73.5 yrs for both groups
- 84% in both groups were females
- groups well balanced in relation to risk factors of falls; only one significant difference: mean of regular medications

IG 4.2 ± 3.1

CG 3.7 ± 3.0



PREVENTION PROGRAMME

- Individual geriatric assessment, guidance and treatment
- Minimizing fall risk increasing drugs
- Individual counselling and guidance of fall prevention
- Physical exercise twice a month in small groups
- Home exercises individually
- Lectures in groups on various themes once a month
- Psychosocial group activities once a month
- Home hazards assessment and modification



ADHERENCE RATE IN PHYSICAL EXERCISE GROUPS

Adherence (% of offered activities)	Physical exercise groups	
	n	(%)
0	22	(7)
0.1-33.3	48	(16)
33.4-66.6	84	(29)
66.7-100	139	(47)



ADHRENCE RATE IN PSYCHOSOCIAL GROUPS

Adherence (% of offered activities)	Psychosocial groups n	(%)
0	79	(27)
0.1-33.3	120	(41)
33.4-66.6	72	(25)
66.7-100	22	(8)



ADHRENCE RATE IN LECTURES

Adherence (% of offered activities)	n	Lectures (%)
0	73	(25)
0.1-33.3	85	(29)
33.4-66.6	94	(32)
66.7-100	41	(14)



WEEKLY PERFORMANCE OF HOME EXERCISES

<u>Sessions per week</u>	<u>n</u>	<u>(%)</u>
0-0.99	80	(31)
1-2.99	88	(34)
<u>≥ 3</u>	<u>94</u>	<u>(36)</u>



PREDICTORS OF HIGH ADHERENCE IN MULTIVARIATE MODELS

Physical exercise groups

- low self-perceived risk of falling
- good physical functional abilities

Psychosocial groups

- good physical functional abilities
- good cognitive abilities

Lectures

- female gender
- good physical functional abilities
- good cognitive abilities



ADHERENCE RATES - CONCLUSIONS

- moderate rates were attainable
- those with the poorest physical or cognitive functional abilities, and probably with the highest risk to fall, had the lowest adherence rates



EFFECTS ON FALL RISK INCREASING DRUGS (FRID's) - DEFINITION OF FRID's

- benzodiazepines and related drugs (BDZ's); antidepressants (AD's);
antipsychotic drugs (AP's);
opioids (Op's)
without an appropriate indication
- inappropriate drugs for symptoms (metoklopramide, prochlorperazine, meprobamate)
- drugs with orthostatism as a side effect (OD's), when orthostatism detected
- antihypertensive drugs (AH's), when low blood pressure detected
- strong anticholinergic drugs (ACh's)



Use of FRID's at baseline

Variable		IG (n=259)		CG (n=269)		p-value
		n	(%)	n	(%)	
FRID	R	54	(21)	68	(25)	0.256
	N	95	(37)	95	(35)	0.786
PsTr	R	50	(19)	62	(23)	0.338
	N	84	(32)	81	(30)	0.575
BDZ	R	34	(13)	46	(17)	0.226
	N	78	(30)	76	(28)	0.702
AD	R	24	(9)	29	(11)	0.664
	N	3	(1)	6	(2)	0.505
Op	R	7	(3)	5	(2)	0.570
	N	24	(9)	18	(7)	0.335
Ach	R	13	(5)	15	(6)	0.847
	N	18	(7)	10	(4)	0.120



Users of ≥ 4 drugs at baseline and after 12 mo

	IG (n=259)			CG (n=269)		
	n	(%)	p-value (change)	n	(%)	p-value (change)
REG						
Baseline	127	(49)	0.384	119	(44)	0.369
12 mo	122	(47)		124	(46)	
IRREG						
Baseline	34	(13)	<0.001	32	(12)	0.020
12 mo	11	(4)		18	(7)	



Use of FRID's at baseline and after 12 mo in IG

Variable		Baseline		12 mo		OR	(95% CI)	P-value
		n	(%)	n	(%)			
FRID	R	54	(21)	46	(18)	0.82	(0.65-1.03)	0.087
	N	95	(37)	77	(30)	0.73	(0.54-0.98)	0.036
PsTr	R	50	(19)	39	(15)	0.74	(0.58-0.94)	0.016
	N	84	(32)	59	(23)	0.61	(0.46-0.82)	<.001
BDZ	R	34	(13)	22	(8)	0.61	(0.44-0.86)	0.004
	N	78	(30)	56	(22)	0.64	(0.48-0.86)	0.003
AD	R	24	(9)	25	(10)	1.05	(0.76-1.44)	0.782
	N	3	(1)	1	(1)	0.33	(0.07-1.65)	0.177
Op	R	7	(3)	7	(3)	1.00	(0.40-2.38)	1.000
	N	24	(9)	20	(8)	0.82	(0.46-1.45)	0.493
Ach	R	13	(5)	15	(6)	1.16	(0.73-1.86)	0.527
	N	18	(7)	11	(4)	0.59	(0.29-1.20)	0.147



Use of FRID's at baseline and after 12 mo in CG

Variable		Baseline		12 mo		OR	(95% CI)	P-value
		n	(%)	n	(%)			
FRID	R	68	(25)	72	(27)	1.08	(0.86-1.36)	0.505
	N	95	(35)	63	(23)	0.56	(0.42-0.75)	<.001
PsTr	R	64	(24)	64	(24)	1.04	(0.84-1.29)	0.705
	N	81	(30)	56	(21)	0.61	(0.45-0.83)	0.002
BDZ	R	46	(17)	48	(18)	1.05	(0.81-1.36)	0.695
	N	76	(28)	53	(20)	0.62	(0.46-0.85)	0.003
AD	R	29	(11)	29	(11)	1.00	(0.70-1.43)	1.000
	N	6	(2)	3	(1)	0.49	(0.12-2.02)	0.326
Op	R	15	(6)	17	(6)	1.20	(0.46-3.17)	0.706
	N	10	(4)	4	(1)	0.43	(0.23-0.81)	0.009
Ach	R	15	(6)	17	(6)	1.14	(0.70-1.86)	0.593
	N	10	(4)	4	(1)	0.39	(0.13-1.17)	0.093



Significant changes in use of FRID's between IG and CG

	IG				CG				p-value between change
	B		12 mo		B		12 mo		
	N	(%)	N	(%)	N	(%)	N	(%)	
PsTr									
Reg	50	(19)	39	(15)	64	(24)	66	(24)	0.039
BDZ									
Reg	34	(13)	22	(8)	46	(17)	48	(18)	0.012
FRID									
Reg	54	(21)	46	(18)	68	(25)	72	(27)	0.093

By sex and age, differences in changes significant in women and in those aged 65 to 74 yrs.



FRID's - CONCLUSIONS

- positive effects on use of PsTr's and BZD's
- only one counselling by the geriatrician at the beginning
- one lecture about drugs and falls during the 12 months



EFFECTS ON MUSCLE STRENGTHS

- maximal isometric muscle strength
- adjustable dynamometer chair
- handgrip strength (dominant side)
- knee extension and flexion strengths
- extension strength of left knee increased more and that of right knee tended to increase more in IG than in CG in women
- extension and flexion strengths of right and left knees increased more in IG than in CG in women aged 65-74 years



EFFECTS ON MUSCLE STRENGTHS - CONCLUSIONS

- maximal isometric muscle strength increased only in women, and especially among women aged 65-74 years
- mean muscle strengths of participants were quite good at the beginning of the programme
- more intensive exercises, including the use of extra weight of resistance, are needed



EFFECTS ON POSTURAL BALANCE - MEASURES

1. Standing balance tests

- normal standing for 30s with eyes open
- normal standing for 30s with eyes closed
- semi-tandem standing for 20s with eyes open

Using the Good Balance® system

2. Dynamic balance tests

Using the Good Balance® system

3. Functional balance measurement

Using the Berg Balance Scale



POSTURAL BALANCE

Results

- semi-tandem standing balance with eyes open: an improvement in IG compared to the change in CG in women

Conclusions

- favourable effects on postural control only in women and only in the most demanding standing balance test measured



EFFECTS ON DEPRESSIVE SYMPTOMS

- measure
Geriatric Depression Scale (GDS)
- results
a significant decrease in IG and CG
the decrease was greater in IG than in CG in
men and in older subjects



CONCLUSIONS

- moderate rates of adherence
- positive effects on use of PsTR's and BZD's
- positive effects on muscle strenghts, postural balance and depressive symptoms in some subgroups



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