Groningen Active Living Model

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GALM

- Stimulating PA in sedentary older adults 55-65 yrs
- Based on behavioral change
- Active recruitment door-to-door
- Versatile PA program based
- Started in 1995 and still going on
- Over 1,100,000, over 110,000 participated GFE, over 70,000 PA in GALM program

De Jong e.a., *JPAH* 2005
 AIM

Implementation environment

Treatment
- Recruitment phase
- Introduction phase
- Follow-up phase

Intervening mechanism
- Perceived fitness
- Social support
- Self-efficacy
- Enjoyment

Outcome
- Program adherence
- Leisure-time Physical activity

GALM effect study
- Physical activity
- Health
- Fitness

Action domain
Conceptual domain

Stevens et al., 1999

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METHODS

• Group randomized controlled design

• 3 Municipalities
  – Degree of urbanization
  – Geographically spread

• 12 Neighborhoods
  – Number of older adults aged 55-65
  – SES
  – 6 Intervention/6 Control
METHODS

Recruitment

Test

Program

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## METHODS

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<th>Characteristics</th>
<th>Measurements</th>
<th>References</th>
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<tr>
<td>Energy expenditure</td>
<td>- Voorrips questionnaire</td>
<td>Voorrips et al., 1991</td>
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<tr>
<td>Perceived health</td>
<td>- Vitality Plus Scale</td>
<td>Myers et al., 1999</td>
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<td></td>
<td>- TAAQOL</td>
<td>Fekkes et al., 2001</td>
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<td>Health indicators</td>
<td>- Bloodpressures</td>
<td>Yarows et al., 2000</td>
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<td></td>
<td>- Body mass index</td>
<td></td>
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<tr>
<td></td>
<td>- Percentage body fat</td>
<td>Núñez et al., 1997</td>
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<tr>
<td>Perceived fitness</td>
<td>- Fitness score</td>
<td>Lemmink, 1996</td>
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<td></td>
<td>- Comparative fitness rating</td>
<td>Questionnaire</td>
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<tr>
<td></td>
<td>- Reaction time</td>
<td>Lemmink 1996, 2001 &amp; 2003</td>
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<td></td>
<td>- Functional reach</td>
<td>Duncan at al., 1990</td>
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<tr>
<td></td>
<td>- Leg strength</td>
<td>Csuka &amp; McCarty 1985</td>
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<tr>
<td></td>
<td>- Flexibility shoulder</td>
<td>Lemmink 1996, 2001 &amp; 2003</td>
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GFE, Groningen Fitness for the Elderly
IG = intervention group; CG = control group; T0-T4 = baseline measurement to 4th follow-up measurement
A = program part A (15 sessions); B = program part B (15 sessions); C = intervention part C (15 sessions)
PARTICIPANTS FLOW

Potential participants
(N = 8,504)

Baseline measurement
(n = 315)

Intervention group
(n = 163)

Control group
(n = 152)

Complete data at baseline and follow-up used for analyses
(n = 79)

Complete data at baseline and follow-up used for analyses
(n = 102)

Lack of time/motivation (-63)
Illness/injuries (-7)
Other reasons (-14)

Lack of time/motivation (-44)
Illness/injuries (-1)
Died (-1)
GALM PROGRAM

• Based on:
  – Biological-evolutionary play theory
  – Social-cognitive theory (self-efficacy, social support, perceived fitness → enjoyment recreational sports activities)

• 15 sessions (e.g., ball games, dance, self-defense, swimming, athletics etc.)

• Physiological characteristics
  – 1x p/w.;
  – 60 min.;
  – Intensity:
    • 73.7% HRmax predicted;
    • 6% light, 33% moderate; 61% heavy.

De Jong e.a., JPAH 2005
## RESULTS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Intervention group</th>
<th>Control group</th>
<th>$F/\chi^2$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n = 79$</td>
<td>$n = 102$</td>
<td></td>
<td></td>
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<tr>
<td>Age (y)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>59.6 (2.4)</td>
<td>58.8 (2.7)</td>
<td>4.02</td>
<td>0.05</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mean (SD)</td>
<td>78.8 (11.1)</td>
<td>78.4 (12.8)</td>
<td>0.05</td>
<td>0.82</td>
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<tr>
<td>Length (cm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>171 (7.9)</td>
<td>171 (8.5)</td>
<td>0.02</td>
<td>0.88</td>
</tr>
<tr>
<td>Women (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54.4</td>
<td>56.9</td>
<td>0.11</td>
<td>0.74</td>
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<tr>
<td>Living alone (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>17.7</td>
<td>19.8</td>
<td>0.13</td>
<td>0.72</td>
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<tr>
<td>Educational level (%)</td>
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<tr>
<td>Elementary</td>
<td>43.6</td>
<td>33.7</td>
<td>5.02</td>
<td>0.08</td>
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<tr>
<td>Secondary</td>
<td>28.2</td>
<td>44.5</td>
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<tr>
<td>Higher education</td>
<td>28.2</td>
<td>21.8</td>
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</table>
RESULTS 0-6 MONTHS

Significant between-group differences favouring IG

- Sleep ($P = 0.04$)
- Fitness score ($P < 0.01$)
- RDBP ($P = 0.02$)
- Grip strength ($P < 0.01$)

Significant within-group differences

- $EE_{RECSPORT}$ (IG, $P < 0.01$)
- $EE_{LTPA}$ (IG, $P < 0.01$; CG, $P < 0.05$)
- Gross motor functioning (VPS) (IG, $P < 0.05$)
- BMI (IG, $P < 0.01$)
- Body fat (IG, $P < 0.01$; CG, $P < 0.01$)
- Manual dexterity (IG, $P < 0.01$; CG, $P < 0.01$)
- Reaction time (IG, $P < 0.01$; CG, $P < 0.01$)
- Functional reach (IG, $P < 0.05$; CG, $P < 0.01$)
- Leg strength (IG, $P < 0.01$; CG, $P < 0.01$)
- Sit-and-reach (IG, $P < 0.01$; CG, $P < 0.01$)
- Walking (IG, $P < 0.01$; CG, $P < 0.01$)

Summary
- Few between-group differences
- Many within group-differences
  - IG & CG
- CG did not behave as controls

De Jong et al., 2006
RESULTS 0-12 MONTHS: EE\textsubscript{RECSPORT}

Significant main effect for time \((F = 20.51; P < 0.01)\)

\textit{De Jong et al., 2006 & 2007}
RESULTS: 0-12 MONTS: EE<sub>LTPA</sub>

De Jong et al., 2006 & 2007

Significant main effect for time \( (F = 9.17; P < 0.01) \); Significant time x group effect \( (F = 9.70; P < 0.01) \)
RESULTS 0-12 MONTHS: $EE_{\text{TOTAL}}$

Significant main effect for time ($F = 24.79; P < 0.01$)

De Jong et al., 2006 & 2007
RESULTS 0-12 MONTHS: HEALTH & FITNESS

Main effects for time
• Fitness score ($F = 23.10; P < 0.01$)  
  ▲

• BMI ($F = 9.90; P < 0.01$)  
  ▼

• Reaction time ($F = 12.21; P < 0.01$)  
  ▼

• Leg strength ($F = 88.67; P < 0.01$)  
  ▲

• Sit-and-reach (+/CG) ($F = 14.00; P < 0.01$)  
  ▲

• Walking ($F = 16.19; P < 0.01$)  
  ▲

Significant time x group
• Sit-and-reach ($F = 29.55; P < 0.01$)  
  CG + / IG =

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RESULTS 0-18 MONTHS: AEROBIC ENDURANCE

a) Mean heart rate over time for walking speed 4 km.h⁻¹

b) Mean heart rate over time for walking speed 5 km.h⁻¹

c) Mean heart rate over time for walking speed 6 km.h⁻¹

d) Mean heart rate over time for walking speed 7 km.h⁻¹
CONCLUSIONS

- Short-term effects $EE_{LTPA}$ & indicators of health
- Long-term effects $EE_{RECSPORT}$ & performance-based fitness
- Increase aerobic endurance over 18 months
DISCUSSION

- No “real” control group

- Recruitment & measurements stimulate PA (Increase EE_{RECSPORT}, EE_{LTPA} in CG!)

- Compensatory mechanism?
  + EE_{RECSPORT} \rightarrow - EE_{LTPA}

- Positive effects health 0-6 months; decrease from 6-12 months.

- Positive effects performance-based fitness 0-18 months