Evidence Summary Title:
Home versus center based physical activity programs in older adults: Evidence and implications for public health

Review Quality Rating: 10 (strong)

Review on which this evidence summary is based:

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This is an evidence summary written to condense the work of the authors of this systematic review, referenced above. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Review content summary
This a systematic review of 6 randomized controlled trials (224 home-based and 148 centre-based participants) aimed to determine the effectiveness of of ‘home based’ versus ‘center based’ physical activity programs on the health of older people who have one or more of the following: 1) existing cardiovascular disease; 2) one or more risk factors for cardiovascular disease; 3) chronic obstructive pulmonary disease; and 4) degenerative arthritis. Participants studied were: 50 years or older. To be included, studies were: randomised or quasi-randomised controlled trials. Studies that included recent cardiac events, post-operative programs, and chronic pain populations were excluded. Interventions described in this review included: both home-based and centre-based physical activity programs. Outcomes measured include: functional activity, long-term maintenance of physical activity, quality of life, cost health service utilization, mortality, rates of cardiovascular diseases, exercise capacity, CV risk factor reduction, lung function tests, pain reduction, joint range of motion, radiographic deterioration. Authors report that both exercising at home or at a centre improves the health and physical function of older adults; centre based programs are superior to home base programs in patients with peripheral vascular disease and that home based programs were superior to centre based in terms of adherence to exercise (especially in the long term). Further research is required in this area especially related to programmes for people with osteoarthritis and the costs associated with physical activity promotion programs in the elderly. The reviewers also revealed methodological flaws in current research design in evaluating the effectiveness of physical activity programs, particularly in the area of blinding.

Comments on this review’s methodology
This is a methodologically strong systematic review. A focused clinical question was clearly identified. Appropriate inclusion criteria were used to guide the search. A comprehensive search was employed using several health and sport electronic databases over 10 years; screening reference lists; handsearching; contacting key experts; and retrieving unpublished papers. The search was not limited by language. Primary studies were assessed for methodological quality using a generic quality assessment tool. This assessment was transparent in that methods were described in sufficient detail so as to allow replication and two reviewers were involved in quality appraisal. Any discrepancies in appraisal results were rectified by discussion. Results were clearly presented in narrative form so as to allow for comparisons across studies. Heterogeneity was assessed. Appropriate analytical methods (fixed effects, random effects) were employed to enable the synthesis of study results. The reviewers rated five of the studies as moderate quality and one as poor.

Why this issue is of interest to public health
The Canadian Community Health Survey revealed an alarming rise of obesity in persons over the age of 75, climbing from 11% in 1978/79 to almost 24% in 2004.1 This rise in obesity in the elderly is a public health concern because overweight and physical inactivity are recognized risk factors for most chronic diseases and contribute significantly to mortality and morbidity.2-3 Meta-analyses evaluating the effects of physical activity or fitness on cardiovascular diseases (CVDs) reveal that active or fit groups reduce their CVD risk by approximately one-third to a half compared with their sedentary/unfit counterparts.4-6 Furthermore, regular physical activity has been shown to enhance health, reduce the risk for all-cause mortality, prolong life, improve quality of life particularly among the elderly, and result in less functional decline in old age.7-13

In 2005, Federal, Provincial, and Territorial Ministers of Health, in recognition of the shared concern over the rise of deaths from chronic diseases, launched the integrated Pan-Canadian Healthy Living Strategy, aimed at improving overall health outcomes and to reduce health disparities through the promotion of healthy eating, physical activity, and their relationship to healthy
Evidence and implications

Evidence points are not in order of the strength of evidence

<table>
<thead>
<tr>
<th>What's the evidence?</th>
<th>Implications for practice and policy:</th>
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<tbody>
<tr>
<td><strong>1. Patients with Cardiovascular Disease (4 studies)</strong></td>
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<tr>
<td>1.1. Functional activity (1 study)</td>
<td>1.1. In patients with cardiovascular disease home-based programs may have better adherence rates than centre-based programs, however more high quality research is required as this data resulted from only one study</td>
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<td>1.1.1. After 3 months, both centre-based and home-based interventions resulted in significant improvements in functional activity (e.g., ADLs, walking ability). However, no comparison was made regarding the relative effectiveness of one intervention versus the other.</td>
<td>1.2. In patients with cardiovascular disease center based programs appears to be more effective than home based programs at improving distance walked and time to claudication pain for up to 6 months. However, the long-term impact is unknown as no studies evaluated impact beyond 6 months. Therefore it is unknown if these differences are sustained over time.</td>
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<tr>
<td>1.2. Long-term maintenance of PA program (1 study)</td>
<td>1.3. Future research needs to address issues concerning:</td>
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<tr>
<td>1.2.1. At 1 year post intervention, home based participants were more likely than centre based participants to have maintained their exercise program (p&lt;0.0005).</td>
<td>1.3.1. dose (intensity, frequency, and duration)</td>
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<td>1.2.2. At 2 years post-intervention, high intensity home based participants were more likely than high intensity centre based participants to have maintained their exercise program</td>
<td>1.3.2. requirements of resources and other supports in order to maintain long term exercise programs</td>
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<td>1.2.3. Just after one-year post-intervention, participants in the high intensity home based program were more likely than those in the low intensity home based program to have maintained their exercise program (p=&lt;0.0029)</td>
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<td>1.3. Quality of Life (3 studies)</td>
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<td>1.3.1. There was no significant difference between groups in various measures of quality of life (e.g., physical function and pain)</td>
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<td>1.3.2. One study reported significant improvements in physical function, pain, and physical measures at 3 and 6 months post intervention for both home and centre based groups</td>
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<td>1.4. Secondary CV related measures (4 studies)</td>
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<td>1.4.1. No significant change was noted in blood pressure among participants in three different exercise groups (higher and lower intensity home based and a center based group) at one and two years follow-up (1 study)</td>
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<td>1.4.2. No significant change in lipid levels for any of the intervention groups at one year follow-up (1 study)</td>
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<td>1.4.3. Both home based (high and low intensity) groups had a significant increase in HDL cholesterol levels (4.3% and 8.5% for the higher and lower intensity programs respectively) compared with baseline at two years but no significant difference in HDL was noted between home and centre based groups. A sub-group analysis by frequency of exercise within exercise groups showed a convincing association between increased exercise levels and increased HDL levels. (1 study)</td>
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<td>1.4.4. No significant difference was noted in Body Mass Index or smoking rates between intervention groups (1 study)</td>
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<td>1.4.5. A statistically significant improvement in the peak walking time for participants in the home-based compared to the centre-based groups (p=&lt;0.05) (1 study)</td>
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<td>1.4.6. No significant difference was noted in peak oxygen consumption (1 study)</td>
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<td>1.4.7. While within group changes were noted, there was no significant difference between groups on absolute claudication distance (1 study)</td>
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<td>1.4.8. Both the home and center based groups experienced significant improvements in the maximum walking time and claudication pain time at 3 and 6 months. There was a significant difference in both these measures,</td>
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favouring the center based group over home based, at 3 and 6 months (p<0.004).

1.4.9. All three exercise treatment groups (higher and lower intensity home based groups and a 'center based' group) showed significantly greater improvements in VO2 max and treadmill duration compared with controls

1.5. Methodological concerns with primary studies related to allocation concealment and attrition rates.(see section 4)

2. Patients with COPD (2 studies)

2.1. Functional activity (1 study)

2.1.1. No significant differences were observed in walking distance between the home and centre based groups

2.2. Quality of Life

2.2.1. No significant differences were observed between home and centre based groups of COPD patients on measures of quality of life (2 studies)

2.2.2. Compared with controls, significantly more participants in the exercise groups experienced 'better' general well-being at 3 months and 18 months (1 study)

2.2.3. Quality of life scores improved significantly for both home and centre based groups up the 13 months follow-up but no significant difference was noted between the groups However, none of the quality of life measures were sustained after the 13 month follow up. (1 study)

2.3. Secondary COPD related outcomes (2 studies)

2.3.1. One study reported significant reductions in diastolic blood pressure post exercise compared with pre for both exercise groups. This was not sustained at 13 month follow-up. No significant difference was noted in BP between groups.

2.3.2. Maximal work levels on a cycle ergometer were significantly improved after the center based exercise program (from baseline). However these changes were not sustained post intervention and there was no statistically significant differences in these levels between treatment groups. (1 study)

2.3.3. No statistically significant changes were noted for arterial blood gas analysis and basic spirometry values pre/post intervention or at follow-up

2.3.4. Statistically significant improvements in forced expiratory volume in 1 sec (FEV1) and maximal inspiratory pressure at residual volume (MIP) in both the home and center based programs. These improvements were not sustained at follow-up and there was no significant difference noted between exercise types. (1 study)

2.4. Methodological concerns with primary studies related to allocation concealment and attrition rates

3. Patients with Osteoarthritis (no studies)

3.1. Research is needed to determine the effectiveness of physical activity programs for reducing osteoarthritis among older adults

4. Methodological Issues with the Primary Studies in the Review

4.1. failure to clearly describe allocation concealment

4.2. high attrition rates

4.3. lack of longer term studies

4.4. lack of valid outcome measures for function, cost, and health care utilization

4.5. failure to include populations with other risk factors

5. Cost Benefit or Cost-effectiveness Information

5.1. No cost related information was included in the review

4. Implications for Future Research

4.1. High quality program evaluations and rigorous research studies should be conducted
**General Implications**

- Given that patients were not harmed when participating in either home-based or centre-based activity programs, their recommendation is warranted. While much more research is needed, at this time, home-based activity programs should be recommended given the positive association with long-term adherence.

**Legend:** CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk

**For definitions see the healthevidence.org glossary** [http://www.healthevidence.org/glossary.aspx](http://www.healthevidence.org/glossary.aspx)

### References used to outline issue


### Other quality reviews on this topic


### Related links


Suggested citation

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