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## Peer coaching as a population approach to increase physical activity in older adults

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# CHAPTER 1

## General introduction

Paul van de Vijver

Based on:

Van de Vijver PL, Van Bodegom D

De rol van de sociale omgeving bij veroudering.

*Geron* 2016;18:37-40.

Van de Vijver PL, Schalkwijk FH, Van Bodegom D

Peer coaching om ouderen gezond te houden.

*Huisarts en wetenschap* 2017;60:444-446.



## INTRODUCTION

The world population is ageing. In the past 160 years, average life expectancy increased from 40 to 80 years.<sup>1</sup> This success is the result of advances in sanitation, income, medicine and nutrition.<sup>1,2</sup> In the same period, presumed boundaries in the increasing life-expectancy have always been broken.<sup>1</sup> Several countries that experienced a stagnation of the increasing trend in life expectancy, have caught up in the last years.<sup>3</sup> Current projections also predict with high probability that female life expectancy at birth will break the 90 year barrier by 2030 in South Korea.<sup>4</sup> In addition, in the first decades after the Second World War life expectancy increased rapidly in the Western World.<sup>5</sup> So, regardless of the exact trends and limits in future life expectancy, the number and proportion of adults aged over 65 will increase in almost all countries of the world.<sup>6,7</sup>

As a consequence, many countries nowadays face a high prevalence of age-related diseases. Increasing prevalence of diabetes, cardiovascular disease and risk factors for these diseases has been seen in the past decades almost everywhere.<sup>8-10</sup> In 2019, the global cardiovascular disease prevalence was estimated to be 523 million people. Global diabetes prevalence was estimated to 463 million in 2019.<sup>10</sup> Additionally, the risk factors hypertension, hypercholesterolemia and obesity have a high prevalence, especially in the high income regions of the world.<sup>11-13</sup>

Many of the age-related diseases are modifiable by lifestyle. Healthy lifestyle is associated with a 66% reduced risk on cardiovascular disease.<sup>14</sup> An unhealthy lifestyle increases diabetes risk with 75% compared to a healthy lifestyle.<sup>15</sup> Major components of lifestyle are physical activity, diet, alcohol consumption, smoking behaviour, stress, sleeping pattern and personal hygiene.

Physical activity is consistently identified as one of the best means to impact healthy ageing.<sup>16-21</sup> Daily physical activity has been found effective at preventing and treating many age-related diseases and risk factors such as cardiovascular disease, diabetes, hypertension, obesity, osteoporosis, and sarcopenia.<sup>16-18</sup> In older adults it also reduces depression, anxiety, the risk of falls and increases mobility, quality of life and longevity.<sup>18-20</sup> According to the World Health Organisation (WHO), the recommended level of physical activity is 150 minutes of moderate-intensity aerobic physical activity or 75 minutes of vigorous-intensity aerobic physical activity a week for older adults (>64 years).

However, an estimated 31% of the global population does not reach the recommended level of physical activity.<sup>22</sup> Physical inactivity is a driving force behind the high prevalence and incidence in age-related diseases and mortality.<sup>23,24</sup> It is estimated that physical inactivity causes 5.3 million deaths worldwide annually.<sup>25</sup> Physical activity is negatively associated with age. The estimated number of older adults not reaching the recommended level of physical activity ranges between 17 – 97.6% and increasing age is associated with a higher risk of physical inactivity.<sup>26–28</sup> Perceived barriers for the adoption or maintenance of physical activity in older adults are age, poor health, unsafe environment, distance from recreational facility, lack of knowledge and understanding of physical activity, lack of company, lack of interest, lack of opportunities and lack of transport.<sup>29,30</sup> Facilitators for physical activity included the motivation to maintain physical and mental health, increased self-efficacy, social support, group cohesiveness, and access to affordable, convenient, and stimulating physical activity options.<sup>30–32</sup>

Interventions are effective in increasing physical activity behaviour in older adults during the intervention period.<sup>20,33,34</sup> This increase in physical activity subsequently also has effect on clinical meaningful outcomes.<sup>33,35</sup> However, long term effects of interventions are scarce, when the intervention period ends physical activity behaviour often declines.<sup>20,36–38</sup> Long term effects on physical activity behaviour after an intervention depend on intervention technique, intervention duration, physical activity intensity during intervention and self-efficacy.<sup>39,40</sup> Behaviour, or social-cognitive change techniques focusing on increasing self-efficacy and physical activity do increase the long term effect of interventions, but not indefinitely.<sup>41,42</sup> To obtain sustainable effect, physical activity interventions must be permanent. However, there are not enough professionals and financial resources to deliver physical activity interventions permanently to all inactive older adults.

New intervention strategies are needed to promote and support physical activity. These interventions need to successfully promote physical activity, be able to reach large numbers of older adults and have a sustainable effect on physical activity behaviour. Expensive interventions using scarce professionals are inherently unfitted to meet these three requirements.

One alternative solution that has been suggested to solve this problem are eHealth interventions. Online physical activity promotion is a method that could be suitable to sustainably increase physical activity in large numbers of older adults. However, results of these studies do not show long term effectivity yet and fail to engage large numbers of older adults.<sup>43–46</sup> New studies need to focus on how to increase effectiveness and adherence of these interventions, especially in older adults.

Furthermore, most of these studies are not specially designed for older adults.<sup>47,48</sup> Phone-based interventions show promising effects.<sup>49</sup> However, phone-based interventions with professionals are unable to reach large numbers of older adults because they are conducted one on one. Phone-based interventions without the use of professionals could be a promising solution.

Studies show that the preference of face-to-face contact during intervention is especially present in older adults.<sup>50-53</sup> Classic face-to-face group interventions with a professional are too expensive to be sustainable and are limited by the scarcity of professionals. Similar to phone-based interventions, classic face-to-face group interventions could be a promising solution without the dependency on professionals. Removing professionals from physical activity interventions is a new and emerging philosophy. Replacements of these professionals are, in the case of eHealth, webpages, apps or algorithms. In phone-based or face-to-face interventions, professionals can be replaced by volunteers or peers.

Peer coaching is a particular promising solution to avoid the use of costly and scarce professionals.<sup>54-57</sup> Peer coaching is a face-to-face intervention to reach a common goal given by a non-professional, who has a common background with the recipient, either through a similar life experience or other shared characteristics.<sup>58</sup> The strength of peer-coaching lies in empathy and using the experiential knowledge of the peer coach, to understand the other peers wishes, motivations, possibilities and limitations. The most successful and widely-known peer coaching initiative is Alcoholics Anonymous, with more than two million members spread over 150 countries.<sup>59-61</sup>

In physical activity interventions, empathy from peer coaches could help improving long term maintenance of physical activity.<sup>62</sup> Also, unsupervised peer coaches showed similar effects regarding physical activity promotion compared to professionals, students and supervised peer coaches.<sup>57,63</sup> Additionally, the handful of studies that do report on adverse events show no difference in the number of adverse events between peers and professionals.<sup>64</sup> These insights make peer coaching a suitable delivery method for physical activity interventions for older adults.

Thus far, no study has investigated peer coached physical activity interventions where peer coaches are also responsible for the organization of the intervention. A completely sustainable intervention must be able to operate independently of expensive and scarce professionals. Also, the intervention must be able to be self-supporting and not dependent on financial resources from the public or private sector.

## AIM OF THIS THESIS

In this thesis we investigate the possibility of a face-to-face group intervention exercising outside to sustainably increase physical activity in older adults. By replacing the professional with a peer coach, there are in theory no limitations in terms of reach and sustainability due to scarcity of professionals and high structural costs. By using the public space there is no need for expensive and scarce venues. In principle, each neighbourhood or community could start a peer coach physical activity intervention. However, there was no study regarding the effect, reach and sustainability of such an intervention. Moreover, implementation strategies of this intervention were also unknown. All these aspects are studied and described in this thesis. Additionally, possible referral schemes in primary care and ways to structure future umbrella organization are explored.

The goal is to show first proofs of effect and feasibility of a peer coach physical activity intervention for community dwelling older adults. In this thesis we first study the effectivity of such an intervention. Secondary, we study the feasibility of implementation of this intervention. Thirdly, we study a possible referral scheme from primary care to this intervention. Finally, we describe a possible structure of a nationwide implementation of this intervention.

The intervention studied in this thesis is unique as it is not depending on a specific sector. This is important because many means to population change are in different sectors than healthcare. For example the sectors urban planning, transportation, education, employment and politics.<sup>65</sup> Secondly, the implementation of this intervention does not need many resources and high executive power and implementation of intervention often happens at levels with poorer resources and lower executive power.<sup>65</sup>



## TERMINOLOGY

Using peers in physical activity promotion comes with a variety of terms and ideas. It is important to note that in this thesis we follow the typology of Matz-Costa et al.<sup>58</sup> A peer coach is strategy-planner and motivator. Similar to a professional gym teacher during gym class at school. The primary objective of a peer coach is to plan exercise sessions and encourage participants to complete these exercises. This is how the role of a peer coach was implemented in the intervention. A peer coach can also fulfil the roles of a peer mentor or peer support where he or she acts as an experienced other or a moral support-provider. These are secondary roles that can happen when peers are grouped together, but this was not implemented in the intervention.

Matz-Costa et al. also make a distinction between peer-delivered interventions, where the peer directly delivers the physical activity program content or a portion of the content, and peer-assisted interventions, where the peer assists in the delivery of the program content or a portion of the content.<sup>58</sup> Matz-Costa et al. do mention that an intervention can be a hybrid form of these two and that this distinction has not been explicitly made in the literature. The physical activity intervention in this thesis is peer-delivered, as the peer coaches deliver the program content directly to the participants.

## OUTLINE OF THIS THESIS

This chapter, **chapter one**, provides a general introduction to the thesis

**Chapter two** investigates the relationship between the timing and magnitude of physical peak performance and life expectancy. This relation is based on life-history theory. A theoretical framework that seeks to explain how natural selection shapes key life events of an organism's life. These key life events, including growth, sexual maturation, behaviour and lifespan, are intertwined and the timing of one event influences the other. Physical activity is an important factor that influences health, but this study also shows there is a biological predisposition for timing and magnitude of physical peak performance and lifespan regardless of an individual's efforts.

**Chapter three** describes a proof-of-principle of a peer coach physical activity intervention of community dwelling older adults. This self-organising intervention, created and organised by older adults themselves, is a successful example of long-term physical activity promotion. In this chapter we describe the components of the intervention and the effects on health and well-being. This chapter is the basis when implementing new physical activity interventions for a feasibility study.

After chapter three, the question arises if healthcare professionals could create a self-organizing peer coach physical activity intervention. **Chapter four** describes a feasibility study. It studies the process of implementing a new peer coach physical activity intervention and making them self-organizing after a short period of time. This part gives insight if the self-organizing physical activity intervention, that was previously created by older adults themselves, can be actively implemented by healthcare professionals in different settings.

Although chapter four showed that healthcare professionals can implement a self-organizing physical activity intervention, there was no active recruitment strategy to reach older adults. The peer coach physical activity intervention is successful by itself it was largely based on healthy older adults in the neighbourhood. Linking the intervention to primary care could increase the recruitment of older adults that benefit from daily physical activity the most. **Chapter five** describes the experiment that tested the effect of a primary care referral scheme. Prevention is becoming an increasingly important objective in primary care. A successful physical activity intervention at the disposal of primary care physicians could increase prevention efforts.

The future of peer coach physical activity interventions as a population approach is described in **chapter six**. Here, we describe the *Círculos de Abuelos*, a Cuban example of a population approach to increase physical activity in older adults. The organizational structure and success of the *Círculos de Abuelos* can act as inspiration for policy makers and healthcare professionals to implement physical activity promotion on a population level.

**Chapter seven** summarises the main conclusion and discusses possible considerations of this thesis. Additionally, several implications of the results of the study are stated. Finally, several recommendations for future studies are discussed.

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