



## Motivators and Barriers for Physical Activity in Older Adults With Osteoporosis

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### ABSTRACT

**Background and Purpose:** Although physical activity (PA) is an important tool to counter osteoporosis, too few older patients with osteoporosis (OPWO) engage in PA. Little is known about specific motivators for and barriers to PA in OPWO, hindering the development of targeted PA promotion campaigns for these persons. Therefore, the main objective of this study was to identify motivators for and barriers to PA specifically in OPWO.

**Methods:** This qualitative study identified specific motivators for and barriers to PA in OPWO through 2 different methods: focus groups with professionals and in-depth interviews with OPWO.

**Results:** The OPWO tended to give a broad interpretation of what they considered as PA (practicing sports, physical work, and performing household activities), whereas the professionals seemed to mainly focus on (therapeutic) exercise as PA. Fifteen different motivators and 18 barriers have been identified. Among others, health improvement, social contact, habit, feeling good, and receiving medical advice from a medical doctor were motivators. Pain, fear of falling, bad weather, lack of interest, and caring for an ill partner were barriers to PA. For some older respondents, osteoporosis acted as a trigger for PA, and for others it was a barrier.

**Conclusions:** This study emphasizes the importance for health care professionals to give personalized PA advice regarding the nature and frequency of PA that is safe and beneficial for osteoporosis. It stands to reason that the information about PA needs to be clear and consistent. Furthermore, it is quintessential to mention that it can take some time to adapt to physical exercise and to experience the beneficial effects, because pain sensations during the first PA sessions can be perceived as barriers to OPWO. Misconceptions or barriers to PA should be countered by assessing motivators for and barriers to PA by the health care professional together with the older client so that barriers can be eliminated and motivators can be strengthened. Physical activity education

should involve not only the OPWO but also their relatives, friends, and important peers. Different social aspects of PA and the encouragements from peers are stimulating for older adults to initiate and to continue PA. The results of our study can constitute a starting point for further research to identify the motivators for and barriers to PA with the highest impact on PA behavior in OPWO, thus enabling evidence-based PA promotion campaigns for this patient group.

**Key Words:** barrier, motivator, older adults, osteoporosis, physical activity

(*J Geriatr Phys Ther* 2015;38:105-114.)

### INTRODUCTION

Physical activity (PA) is one of the most effective tools to counter age-related health conditions. Regular PA has preventive effects on cardiovascular conditions, type 2 diabetes, and degenerative diseases such as osteoporosis and osteoarthritis.<sup>1,2</sup> Moreover, PA increases bone density, reduces the risk for falls, and can counter thoracic hyperkyphosis in older patients with osteoporosis (OPWO).<sup>3,4</sup> In this context, a strong dose-response relationship seems to exist between PA and its preventive and/or therapeutic effects on osteoporosis.<sup>3</sup>

Caspersen et al defined PA as “any movement of the body produced by skeletal muscles that results in energy expenditure.”<sup>5(p126)</sup> For persons aged 65 years and older, the World Health Organization (WHO) states that PA includes leisure time PA (eg, dancing, gardening), transportation (eg, walking or cycling), professional occupation (if the person is still professionally active), household activities (eg, cleaning), games, sports or planned exercise, in the context of daily, family, and community activities.

In general, the WHO recommends adults aged 65 years and older to engage in at least 150 minutes aerobic PA at moderate intensity or 75 minutes aerobic PA at vigorous intensity per week, or an equivalent combination of aerobic PA at moderate and vigorous intensity. To obtain additional health benefits, aerobic PA has to be increased up to 300 minutes at moderate intensity or 150 minutes at vigorous intensity per week. In addition to aerobic PA, muscle-strengthening of major muscle groups should be performed on 2 or more days per week. Older adults with poor mobility should perform exercises specific for improved balance on 3 or more days per week.<sup>6</sup> The most optimal

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The authors declare no conflict of interest.

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Bernadette Williams-York was the Decision Editor.

DOI: 10.1519/JPT.0000000000000035

exercise program to prevent and/or treat osteoporosis in postmenopausal women remains unclear.<sup>3</sup> However, the Institute for Clinical Systems Improvement recommends a lifetime exercise program containing 3 major components: exercise with high impact (eg, jumping), muscle strengthening exercise using weights, and balance training.<sup>7</sup>

Only a small number of older persons attain the recommended levels of weekly PA. While 58% of the younger adults (aged 18-29 years) in the United States reach the recommended amount of PA, this proportion decreases to 38% for persons aged 75 years or older.<sup>8</sup> Similar numbers were found for Western European countries such as Belgium, where only 1 in 5 older adults (age ≥ 75 years) attains a minimum of 2.5 hours of moderate PA per week.<sup>9</sup> Gender differences also exist; for instance, in Germany, only 27% of older women and 35% of older men (age ≥ 65 years) reach the recommended amount of PA.<sup>10</sup> At higher ages, the age-related decline in PA is more pronounced. The Osteoporotic Fractures in Men Study found that the decline in PA over a mean of 5 years follow-up period for men older than 80 years [PASE scores -29 (61)] is more substantial than that for men aged 70 to 74 years [PASE scores -16 (67)]. Poor health seemed to be a primary factor in the decline of PA in the oldest group.<sup>11</sup> On the contrary, many older people, including those with a very high age (>85 years) and multiple comorbidities, are able to attain and maintain higher amounts of PA.<sup>12</sup> Therefore, factors other than disease and age have a strong influence on PA behavior in older persons.

Participation in PA is a dynamic and complex process influenced by various factors. Motivators for and barriers to PA in older persons have been intensively investigated during the last decade.<sup>10,13-17</sup> Intrapersonal factors such as poor health, fear of falling, or lack of interest are considered as major barriers to PA for older adults.<sup>10,13,14</sup> On the contrary, improving physical and psychological health status appeared to be substantial motivators for participation in PA.<sup>15,16</sup> Fear of falling, fear of pain, and fear of fractures are typical obstacles to engage in PA in older persons, including those aged 80 years and older.<sup>15</sup> Interpersonal factors such as the lack of company are found to be a barrier to PA in older adults.<sup>10,14,17,18</sup> Also, community factors such as lack of transport or experiencing difficulties to get to exercise facilities were mentioned as barriers,<sup>10,18,19</sup> while neighborhood safety<sup>20,21</sup> and personal safety<sup>19</sup> were reported as motivators for PA in older adults. Therefore, PA behavior should be investigated through a combination of psychosocial and environmental variables.<sup>22</sup> Several intrapersonal factors (such as fear of falling or lack of interest) but also social elements (support from peers or professionals) and environmental factors (such as neighborhood safety, presence of sidewalks) are important determinants for being physically active. Since ecological models postulate that health behavior is influenced by multiple factors, including interpersonal, intrapersonal, and environmental

**Table 1. Levels of Influence Within the Social Ecological Model<sup>a</sup>**

Level of Influence	Explanation Definition
Intrapersonal level	Individual characteristics that influence behavior, such as knowledge, attitudes, beliefs, and personality traits
Interpersonal level	Interpersonal processes and primary groups, including family, friends, and peers, that provide social identity, support, and role definition
Community level	
Institutional factors	Rules, regulations, policies, and informal structures, which may constrain or promote recommended behaviors
Community factors	Social networks and norms, or standards, which exist as formal or informal among individuals, groups, and organizations
Public policy	Local, state, and federal policies and laws that regulate or support healthy actions and practices for disease prevention, early detection, control, and management

<sup>a</sup>Adapted from Mcleroy et al.<sup>37</sup>

factors, the Social Ecological Model (SEM) was used in this study as a theoretical framework (see Table 1).

Osteoporosis is one of the major chronic musculoskeletal conditions in older persons, with a potential influence on PA behavior, given its impact on physical and psychological well-being.<sup>23</sup> Unfortunately, little is known about specific motivators for and barriers to PA in OPWO, hindering the development of targeted PA promotion campaigns for these persons. Therefore, the main objective of this qualitative study was to identify motivators for and barriers to PA specifically in OPWO.

## METHODS

### Design

A qualitative study design was used to identify specific motivators for and barriers to PA in OPWO. A multi-methods approach was chosen because it is well suited to identify undocumented and new factors in the decision-making processes, which are relevant for clinicians and patients.<sup>24</sup> The decision to be (or not to be) physically active is a complex process in which different elements have a role to play. To understand the multiple facets of health, qualitative methods were preferred in this study.<sup>25</sup>

Methodological triangulation was used. This refers to the use of more than 1 method in the same study.<sup>26,27</sup> In this study, within-method triangulation was obtained by using 2 different qualitative methods of data collection: focus groups and in-depth interviews. Data triangulation was attained by questioning (1) professionals in the field of coaching and/or managing PA in OPWO (by means of focus

groups) and (2) OPWO (by means of in-depth interviews). This combination of triangulation methods was used to provide a more comprehensive description of the motivators and barriers by gathering multiple perspectives.<sup>27-29</sup>

### Focus Groups

Focus groups were preferred as a method to explore the knowledge and experiences of health care professionals.<sup>30</sup> The main advantage of focus groups is the use of interaction of the participants to gain data.<sup>31</sup> The purpose of this approach was to obtain motivators for and barriers to PA in OPWO from the viewpoint of professionals who are in daily contact with OPWO within the medical or PA sector. The panel, composed of a wide range of expertise, consisted of a rheumatologist ( $N = 1$ ), a master in physical education ( $N = 1$ ), a master in physical therapy ( $N = 1$ ), and representatives of sport/PA federations for the older adults ( $N = 3$ ). To allow for interdisciplinary exchange of ideas (to enrich the data) and taking into account that the topic they had to discuss was not sensitive, the use of a focus group was preferred here as a method.<sup>31</sup>

The focus group discussion was semistructured and recorded. In preparation for the focus group discussion, the group was split in half (ad random) after which the subgroups received 6 questions to answer. Within each subgroup, an independent researcher ensured that each professional contributed to the discussion. For the focus group discussion, the 2 groups were merged and the answers to each question were read out loud by a representative of each subgroup, followed by additional input from the other professionals to obtain maximum data saturation. One researcher led the discussion, while another researcher made notes. Finally, the synthesis of the focus group discussion was sent 1 week after the group discussion to each of the professionals, allowing them to verify, correct, and/or add supplementary answers when necessary. The questions for the focus group are presented in Table 2.

The answers to these questions were used to extract motivators for and barriers to PA for OPWO.

### Semistructured Interviews

In-depth interviews were preferred as a data collection method for OPWO as this method is appropriate to identify

and describe the essence of the experience as it is perceived by those who have the experience.<sup>32</sup> This method has been effectively used in research on motivators for and barriers to PA in older adults.<sup>33-35</sup> Moreover, to avoid bias due to a selective recruitment of more physically mobile and active respondents, the interviews with OPWO were conducted at their own homes. Inclusion criteria for participation in the interviews were as follows: age 65 years or older, being able to express themselves, community-dwelling, being able to walk independently (walking aides such as a cane were allowed), and being (previously) diagnosed with osteoporosis (documented by dual-energy x-ray absorptiometry bone densitometry T-score  $< -2.5$  at the spine and/or hip/femur). To ensure that the population consisted of respondents with different levels of PA, participants were recruited through publicity folders that were distributed in medical cabinets of osteoporosis specialists and at senior recreational exercise classes. After explaining the goal and procedures of the study, oral informed consent was obtained from the participants. The transcriptions were anonymized by removing any identifying information.

Fifteen Caucasian community-dwelling patients with osteoporosis (age range, 68-82 years), 10 women (age  $74 \pm 6$  years) and 5 men (age  $76 \pm 4$  years), were interviewed. Eleven participants were married, and 4 were widowed. The interviews were performed by 1 independent researcher, who had neither a professional nor personal link with the respondents.

First, the respondents' primary characteristics were recorded including marital status, date of birth, weight, height, fractures, and history of falls (see Table 3). Second, to focus the interview on PA, they were asked to formulate their own definition of PA. The main interview contained questions about their self-reported levels of PA, how their PA was influenced by osteoporosis, and perceived motivators for and barriers to PA. The levels of PA were not measured and therefore not identified here. All questions were nonsuggestive. The interviews were performed at the participants' homes and recorded. Each interview took approximately 35 minutes and was entirely transcribed. The questions for the OPWO are presented in Table 4.

The institute's Medical Ethics Committee (IRB 016) confirmed that this study is exempt from approval and from written informed consent.

### Data Analysis

A thematic analysis was chosen in which all data were deconstructed and reorganized, by clustering them on the basis of similar content. This first part of the analysis clustered the items based on the revealing data (inductive analysis), followed by categorizing these items within the framework of the SEM (deductive analysis).<sup>31,36</sup> Meaningful text fragments that were revealing motivators for or barriers to PA were independently identified, coded, and clustered by 2 senior researchers (E.G. and V.B.). The main

**Table 2. Questions for the Focus Group**

What is your opinion about PA for older patients with osteoporosis?
What kind of PA advice do you give to older patients with osteoporosis?
What kind of PA are older patients with osteoporosis able to perform?
How do older patients with osteoporosis think about PA?
What are the barriers to PA in older patients with osteoporosis?
What are motivators for PA in older patients with osteoporosis?
Abbreviation: PA, physical activity.

**Table 3. Characteristics of Respondents With Older Patients Age 65 Years and Older**

Age (years)	Gender	Marital Status	Weight (kg)	Height (cm)	Low Impact Fracture(s)	History of Falls <sup>a</sup>
79	Female	Widowed	53	140	No	Yes
82	Male	Married	68	172	Yes	Yes
77	Female	Married	61	151	No	Yes
72	Male	Married	92	175	Yes	Yes
72	Female	Married	58	164	No	No
81	Female	Married	66	161	Yes	Yes
80	Male	Married	72	164	No	No
68	Male	Married	67	160	Yes	No
81	Male	Widowed	55	160	Yes	Yes
70	Female	Married	63	158	Yes	No
68	Female	Married	63	157	No	Yes
79	Female	Married	70	163	No	Yes
70	Female	Widowed	80	165	No	No
68	Female	Married	45	156	No	No
72	Female	Widowed	68	148	Yes	Yes

<sup>a</sup>FALL in the previous 5 years.

analysis consisted in first dividing the interview transcription in meaningful units, that is, segments of the text that contained motivators for or barriers to PA. Then the text segments were labeled. These labels were combined into larger categories on the basis of the similarity of the content. This inductive process continued until all meaningful text fragments were categorized into 15 different motivators and 18 different barriers. The deductive part of the data-analysis consisted of assigning the motivators and barriers to the different levels of the SEM by 2 independent reviewers.<sup>37</sup> The SEM was chosen because in other models (such as Stages of Change Model or the Self-Efficacy Model) the

environmental factors of behavior are less integrated. Social ecology integrates the individual, social, and environmental aspects that have an influence on human behavior. Conflicts were discussed and resolved by consensus.

**RESULTS**

**Conceptualization of PA According to the OPWO and the Professionals**

Different concepts for PA were reported by all interviewed OPWO. Besides defining PA as practicing sports (such as walking, running, cycling, and swimming), also other activities involving movement of the body were mentioned as PA. For example, working (such as doing administrative work as a 70-year-old female respondent claimed, “I am still working full time doing paperwork”) and performing household tasks in and around the house were mentioned as PA.

As for the group of professionals, they primarily defined PA as the equivalent of physical exercise to improve or maintain physical fitness. Daily activities involving physical movement were seen as a secondary form of PA “OPWO need to take fitness classes and perform aerobic exercises. Swimming is also beneficial or training on a power plate. Perhaps we have to convince them to continue their activities at home.” Professionals emphasized the importance of the type and intensity of PA: “It is not like they can do any kind of activity. Just waving their hands is not sufficient. The intensity of the exercises has to be high enough.” They agreed that there are different kinds of activities that patients with osteoporosis can perform: fitness programs focusing on gaining power, exercising through activities at home, joining

**Table 4. Questions for the Older Patients With Osteoporosis**

What do you understand by PA?
What kind of PA are you doing now?
By what kind of factors are you motivated/hindered to perform PA?
What kind of PA would you like to do? What is hindering you to do so? What kind of factors would facilitate this?
What is the relation between health and PA? Does PA influence your health?
Did the diagnosis of osteoporosis change your level of PA? Why or why not?
What kind of recommendations did you receive from your doctor concerning PA and osteoporosis? Did someone else give you information about PA and osteoporosis? If yes, who and which information?
Does osteoporosis act as a motivator for or a barrier to PA for you? Why or why not?
Abbreviation: PA, physical activity.

walking clubs, or joining sports clubs for older adults. They discouraged martial arts or contact sports because they believed that these represent a higher risk of injuries.

**Motivators for and Barriers to PA**

Motivators for and barriers to PA were ordered according to the SEM (see Tables 1 and 5), which is based on 3 different levels of influence: the intrapersonal, interpersonal, and community levels. This last level, which contains public policy, institutional and community factors, was considered here as 1 single category.

**Intrapersonal factors**

For the older respondents, osteoporosis was sometimes considered as a motivator for PA. In fact, PA was perceived by them as a facilitator for daily activities: “For me osteoporosis is a motivator. I feel that certain things become much easier when I’m doing physical exercises” (male, age 72 years). On the contrary, osteoporosis was also perceived as a reason for adapting PA and thus acting as a barrier. The older respondents mentioned to be more careful in PA:

“I have to be careful. Osteoporosis works like a refrainment for me” (male, age 68 years). “I adjust my position when I’m gardening or doing household tasks” (female, age 70 years). Other respondents said that they reduced the intensity and/or volume of PA: “I do everything more at ease and at my own pace” (female, age 77 years). Some of the older respondents needed assistance in activities of daily life: “I ask other persons to help me with household activities, transportation and maintenance” (female, age 79 years). “My partner and I divide the household tasks” (female, age 68 years). Fear of falling by being physically active was also mentioned as a barrier related to osteoporosis: “I’m scared that I will fall during exercise. It hinders me to move. I had a spontaneous fracture of the hip” (female, age 70 years). For others, osteoporosis did not influence PA at all: “Being diagnosed with osteoporosis didn’t influence my PA behavior” (male, age 72 years). Others said that they did not want to learn a new type of PA: “I don’t want to learn something new. I’m too old” (female, age 72 years). Others regret that they have never learned to ride a bike or to swim: “I think swimming would be good for me,

**Table 5. Overview of the Motivators and Barriers for Physical Activity (PA) Given by the Interviewed Older Participants With Osteoporosis (OP; 1) and by the Professionals (2)**

Motivators	Barriers
<b>Intrapersonal factors</b>	
Health benefits/feeling better through PA (1,2)	Pain hindering PA and/or pain induced by PA (1,2)
Positive influence of PA on OP (1,2)	Physical complaints related to OP as hindering factor for PA (1,2)
Having more time for PA since retirement (1,2)	Not feeling well enough to perform PA (1)
Mandatory PA through household activity (eg, cleaning, gardening, ...) (1)	No interest in PA (1,2)
PA creates a feeling of having control over daily life and/or physical independency (1)	Less financial resources for participating in PA (1,2)
PA is a way of passing time (1)	No time for PA (1,2)
Positive past experience with PA (1)	Fear of falling during PA (1,2)
PA prevents and/or reduces pain (1)	Fear of medical complications due to PA (1)
	Feeling too old to learn or to engage in (new) PA (1)
	Lack of knowledge regarding PA modalities and their benefits (2)
	Lack of exercise skills (1)
<b>Interpersonal factors</b>	
Advice from family (children or partner) to perform PA (1,2)	Being alone (1)
Performing PA with others (1,2)	Depending on others to reach PA activities (1)
Help/advice from a professional (1,2)	Partner doesn’t feel well (1)
PA encouragement from peers (1,2)	Lack of (proper) PA advice from physician (1,2)
Having a PA partner (1)	
<b>Community factors</b>	
Availability of transportation (1)	Lack of transportation facilities to reach PA activities (1)
Good weather (dry and comfortable temperature) (1,2)	Bad weather (precipitation or wind) (1,2)
	Negative image building through the media about older people practicing PA (2)
Abbreviations: OP, osteoporosis; PA, physical activity.	

unfortunately I've never learned how to swim and now it's too late" (female, age 70 years).

Most of the interviewed patients with osteoporosis were convinced that being physically active was beneficial for their physical health and mentioned a large variety of benefits: "It is good for the heart, our lungs, muscles and blood circulation" (female, age 77 years). Conversely, lack of PA was considered as detrimental to their health and level of functioning: "You are getting stiff from sitting still" (male, age 82 years). Patients with osteoporosis reported being hindered in PA by pain or not feeling well. On the contrary, some older participants reported a positive influence from PA on their physical health: "I feel good and satisfied when I've been exercising" (male, age 72 years). "I have to keep moving, otherwise my back hurts" (male, age 82 years). Others mentioned negative experiences of PA: "The exercises from the physiotherapist aren't doing any good for me" (female, age 79 years). "I'm exercising less because of the pain" (female, age 72 years). "Every move I make, I'm experiencing pain" (female, age 72 years).

The professionals agreed on the health benefits of PA and on osteoporosis in particular. They were all convinced that osteoporosis, just like any other disease or medical condition, can act as a motivator or barrier. They also mentioned that generally, OPWO are poorly informed about suitable modalities of PA: "The older persons think that PA is not suitable for patients with osteoporosis and that it is not good for their health." They stated that OPWO are insufficiently aware of how much PA and what kind of PA is needed to obtain positive effects on health. The professionals also mentioned that OPWO are convinced that PA is necessary, but are ignorant about the details, thus hindering them to start exercising. This was confirmed by statements from the older patients with osteoporosis, who also mentioned that specific instructions on performing PA in the context of osteoporosis were not given by physicians: "The doctor told me I had to exercise for my legs and my osteoporosis, but he didn't tell me how or what to do" (male, age 68 years).

Some OPWO reported not being interested in PA. Several reasons for their disinterest in PA were provided, among which were a lack of experience with PA in the past or a general indifference for activities in daily life. The professionals mentioned that older people who used to be physically active when they were young are easier to motivate toward being active. The professionals stated that OPWO have misbeliefs about PA, which prevent them to make the first step toward exercise. "OPWO have fear of falling and are reluctant to adapt their current lifestyle" (professional participant X). "Patients with osteoporosis should be warned that feeling better after being physically active doesn't occur immediately, but only becomes apparent after a longer period of time" (professional participant Y).

Some of the older respondents mentioned lack of financial resources as a barrier for being physically active. "I don't have enough money for all my osteoporosis treatments. Where would I get the money to spend on PA?" (female, age 79 years). The professionals confirmed that some older people do not have enough financial resources to perform PA and that this is a potential barrier for them. Finally, some of the older adults stated that they have either more or no time to perform PA since retirement. This statement was also confirmed by the professionals.

### **Interpersonal factors**

The interviewed patients with osteoporosis said that they might be encouraged to be physically active by a health care professional, their partner, family, or close peers. However, we noticed that the patients received heterogeneous advice from their respective physicians regarding PA: "The doctor told me to move more: walking, biking, swimming, fitness..." (female, age 68 years). While other respondents were advised being less physically active or were restricted in the type of PA. "I was told not to exercise too much and I have to take a rest now and then" (female, age 70 years). "The doctor advised me not to ride a bike" (female, age 72 years). "My general practitioner said I didn't have to sit still and that every type of exercise is good for me. The specialist gave me the same advice and added that I have to travel to sunny places" (female, age 72 years) "I need to pay attention to what I'm eating: a lot of calcium and I have to sit in the sun" (female, age 81 years). Others reported that their doctor was limited with information concerning PA: "The doctor gave me medication, that's it" (female, age 79 years). "He didn't say anything in particular" (male, age 81 years). Interestingly, the older respondents said that they were willing to modify their PA behavior: "I would like to walk longer and faster" (male, age 72 years) "I would like to travel more" (male, age 80 years, and male, age 68 years). "I would like to have an exercise bike so I could train inside the house" (female, age 79 years). In addition, they mentioned the need for professional advice to become more confident in their capacity to achieve this: "I would be stimulated if someone who is specialised in my medical condition would give me a good follow-up and proper advice. What I have to do to get rid of my pain without feeling pain in the mean while" (female, age 79 years). The professionals said that physicians experience difficulties in providing appropriate PA advice to OPWO: "I can't inform every older patient with osteoporosis about the benefits of PA due to a lack of time during my consultations." "Prevention is in fact one of the last things I think about." "Most of my time goes to the prescription of medication, the instruction of medication intake and the accompanying paperwork." "Medical doctors spend most of the time talking about medical treatments. There is less time to talk about PA."

According to the older respondents, social support from family or friends can help them initiate and continue doing

PA. On the contrary, some of the older respondents actually found that their spouses were more a barrier to PA instead of a motivator, especially when they provided care for a physically dependent partner: “My wife’s walking abilities are worse than mine. I always have to take into account that she is disabled” (male, age 72 years). Professionals agreed that social support from family and friends can be helpful, but they also mentioned that other aspects of being physically active can be important, such as meeting and socializing with other persons. Also, when older people live alone and have no PA partner, this will be a barrier to be physically active. Being dependent on others (eg, for transportation) was also mentioned by the older respondents as a barrier to PA. Finally, professionals stated that OPWO don’t like to exercise on their own or among people who are much younger.

### **Factors situated within the community level**

The OPWO reported bad weather as a barrier to being physically active; while good weather facilitates PA: “I’m not averse to being physically active, except when there is a bad storm outside” (female, age 70 years); a factor that was confirmed by the professionals. The presence or lack of good transportation was mentioned both as a motivator or as a barrier to attend to PA in the OPWO. As an example, lack of public transport stimulates some of the respondents, for example, to go shopping by foot, but hinders others to reach their PA sessions. The professionals were convinced that media could play an important role in shaping society’s perception of older patients practicing sports. The OPWO feel that this is not accepted by younger generations and/or feel ashamed.

## **DISCUSSION**

To our knowledge, this is the first study to describe motivators for and barriers to PA in OPWO. In this qualitative study, semistructured interviews in patients with osteoporosis aged 65 years and older were complemented with a focus group session containing professionals in the field of coaching and/or managing PA in OPWO.

### **Conceptualization of PA According to OPWO and Professionals**

While the OPWO showed a broad interpretation regarding the concept of PA (ie, practicing sports, physical work, performing household activities), the professionals considered PA mainly as (therapeutic) exercise. This might be because the professionals were physicians and representatives of sport organizations for older people. Remarkably, contrary to the definition of PA provided by the professionals, the one formulated by the OPWO came close to the definition of PA according to the WHO. Health care workers might consider promoting the nontraditional forms of PA (activity, transportation/mobility, occupational, household

activities) that are consistent with the WHO in the context of daily, family, and community activities. On the contrary, we found some misconceptions of PA among the patients with osteoporosis, since some of them considered doing administrative work (accountancy, archiving documents) as PA. Therefore, it is important to verify the interpretation of PA by older osteoporosis patients and to provide them accurate information.

### **Motivators for and Barriers to PA**

Fifteen motivators and 18 barriers were found. The intrapersonal factors within the SEM were well described by the OPWO (10 barriers and 8 motivators) and the professionals (7 barriers and 3 motivators). At the interpersonal (5 motivators and 4 barriers by the older patients and 4 motivators and 4 barriers by the professionals) and community level (2 motivators and 2 barriers by the older patients and 1 motivator and 2 barriers by the professionals) fewer factors were identified.

Health improvement was mentioned as a motivator for PA by the OPWO as a way to counter the disease and/or its functional consequences. However, not all respondents were motivated for PA by health concerns. For some of them, osteoporosis was considered as a refrainment to PA, while others mentioned that osteoporosis had no influence at all on their level of PA. Health-enhancing effects of PA are, in general, a motivator for older persons to perform PA, but morbidity is also a prominent barrier to PA in the older.<sup>19</sup> The role of osteoporosis for engaging in PA remains unclear. The professionals stated that OPWO are not well informed about suitable modalities of PA according to their condition. In this way, physicians should better inform OPWO about PA guidelines and how to put these into practice. The OPWO mentioned that they lacked information from their physicians about the positive effects of PA on osteoporosis. The finding that older patients did not receive sufficient advice from their physicians is also described for older patients diagnosed with knee osteoarthritis.<sup>38</sup> In a systematic review, agreement was found about the central role of the general practitioner in the promotion of PA to older patients, but conflicting evidence is available for the effectiveness of counseling programs.<sup>39</sup>

The older respondents did not have a clear idea about the beneficial effects of PA on osteoporosis. The impact of giving systematic information by health care workers to OPWO warrants further investigation.

Some OPWO said to be physically hindered by pain, but they acknowledged the positive influence of PA on their pain levels. In several studies, pain is mentioned as a barrier to PA in older women without osteoporosis.<sup>35,40</sup> Long-term exercises (>12 months) lead to significant pain relief in older postmenopausal patients with osteoporosis.<sup>41</sup> Therefore, it would probably be useful that health care professionals use the health-enhancing effects of PA as an argument to convince their OPWO to continue physical

exercise. In this study, fear of falling was mentioned as a barrier to PA both by the professionals and by several OPWO. In fact, in another focus group study, fear of falling was also found as a significant barrier to PA in persons aged 65 years and older.<sup>42</sup> However, it remains unclear whether this barrier is reinforced by osteoporosis due to fear of falling or fear of fractures.

All professionals working with OPWO should emphasize that osteoporosis is not a reason to avoid PA but, on the contrary, is an indication to be more physically active. The physician's advice can be an important motivator for OPWO to initiate and to become more confident in performing these activities. This was also confirmed in community-dwelling adults aged 60 to 70 years.<sup>43</sup> Although general practitioners play a central role in the promotion of PA according to the older respondents in our interviews,<sup>39</sup> the professionals reported that they have insufficient time to give advice. Behavioral interventions, face-to-face delivery of information on PA, and targeting individuals with a chronic illness such as diabetes or osteoporosis make older patients more active.<sup>44</sup> Although a personal conversation with the physician is preferred, health care workers could consider using supporting tools, such as a DVD with simple instructions on how to perform exercises in a correct and safe way. This can also accommodate the fact that what patients remember of the advice that they received can be quite different from what the doctor actually told them. However, research on health promotion in the oldest old (age 80 years and older) revealed that this group preferred receiving information from a medical doctor about reading or watching a television program.<sup>44</sup> Obviously, the information about PA should be clear and consistent, because in our interviews some of the older participants reported that they received different advice from 2 different practitioners. Also, the social support these older patients received influenced their motivation. In other research, their motivation was identified as being of greater importance to maintain exercise and PA in the long term, while advice from a primary health care worker was more effective as an initiator to exercise.<sup>43</sup>

Older patients do not always have enough financial resources for PA. However, activities such as walking, gardening, or household activities do not demand an extra financial effort.<sup>45</sup> But guidelines should be provided on how to perform these activities to obtain the required amount of PA. From our results, it remains unclear whether the treatment for osteoporosis puts an extra burden on the budget of the OPWO or not.

The number of motivators and barriers given on the community level was limited but is similar to those reported in other research.<sup>15</sup> Lack of transportation is extensively reported for older adults in general.<sup>10,19,46</sup> According to our interviews, access to public transport was also mentioned as a facilitator to be more physically active. This is in

agreement with other studies in adults aged 65 years and older.<sup>10,19,46</sup>

### Strengths and Limitations

In this study, the main goal was to identify motivators for and barriers to PA in OPWO. This approach might generate some restrictions in analytical terms and that more subtle aspects of older adults' experience of PA were missed. A weakness of this study is that a false dichotomy could have occurred—since factors that facilitate may be the reverse of those that are acting as a barrier and vice versa. Some of the participants admitted that they should be physically active because of health benefits, but they also stated to be hindered by health problems. In this study, the importance of the different motivators and barriers in OPWO was not weighed, and no data were collected on the actual decision-making process. As older persons are all unique, convincing them to increase older patients' level of PA will probably need an individual approach<sup>12</sup> where it could be useful that health care workers or health coaches make an inventory of the motivators for and barriers to PA together with the older client so that barriers can be eliminated and motivators can be strengthened.

The SEM was used as a framework to organize the different factors brought up by the participants. It is a weakness that the questions asked were not formulated according to the different levels of the SEM.

Although the focus group reflected different disciplines, it was limited in scope: only 1 medical doctor took part in the focus group. This, in combination with the relatively small sample size, may limit the generalizability of the findings of this study.

### Implications for Daily Clinical Practice

Based on the results of this study, we suggest the following recommendations for clinical practice. To foster optimal and successful ageing, health care workers may benefit from the use of an individual approach. A meta-analysis showed that face-to-face delivery of health-enhancing recommendations is much more effective than collective programs.<sup>47</sup> Health care workers should take time to clearly explain the benefits and modalities of being physically active with their older patients, especially the ones who are diagnosed with osteoporosis. They also should give clear and personalized advice regarding the nature and frequency of PA that is safe and beneficial for osteoporosis because fear of falling is a significant barrier for these patients.<sup>48</sup> As the body of knowledge regarding the feasibility and safety of PA for persons with osteoporosis grows; the message from the providers should be more consistent. Furthermore, it is quintessential to educate older patients regarding the fact that it can take some time to adapt to physical exercise and to experience the beneficial effects, because pain sensations during the first PA sessions can be perceived as a barrier to

continue PA in OPWO. Misconceptions or barriers to PA should be countered by the health care professional during individual consultations.

Health care workers should involve not only the OPWO but also their relatives, friends, and important peers. The social aspects of PA and encouragement from peers are stimulating for older adults to initiate and to continue PA.<sup>49,50</sup>

Because participants in this study reported conflicting and negative advice regarding PA, health care professionals should regularly check whether the older patient with osteoporosis really understands what was said during the conversation.

## CONCLUSIONS

Older adults with osteoporosis quote several motivators for and barriers to PA. Overall, these motivators and barriers are not very different from the motivators for and barriers to PA quoted by older persons in general. On the one hand, health improvement, social contact, habit, feeling good, and receiving medical advice from a medical doctor are motivators for PA in older adults with osteoporosis. On the other hand, pain, fear of falling, bad weather, lack of interest in PA, and providing care to an ill partner were reported as barriers to PA. However, future research is warranted to verify whether some of these factors are playing a more important role in OPWO compared with older adults without osteoporosis. Interestingly, being diagnosed with osteoporosis is for some persons aged 65 years and older an incentive for being more physically active, as for others it works more as a barrier.

The results of our study can constitute a starting point for further research to identify the motivators for and barriers to PA with the highest impact on PA behavior in OPWO, thus enabling evidence-based PA promotion campaigns for this patient group.

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