Appealing fitness centres for adults over the age of 55

Translating the wishes of older adults into practical applications for fitness centres

Masterthesis

Communication, Health and Life Sciences

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Preface

Dear reader,

This document presents the final version of my master thesis. After focussing my bachelor thesis on the locational choice of fitness centres, my curiosity was drawn to how fitness centres can aid in the challenge of an ageing population. The thesis was written for the master's program of Communication, Health and Life Sciences at Wageningen University and Research from January until September of 2018.

Special thanks are due to those who have supported this research in various ways. First of all, I would like to thank my thesis supervisor dr. KT (Kirsten) Verkooijen for the regular feedback and guidance. Furthermore, I would like to thank NL Actief for their enthusiastic response and recommendations for fitness centres to interview. Finally, I would like to thank all the interviewees who have found time to give an interview. I greatly enjoyed the open conversations we had, the inside view of the fitness centres and the training sessions that often followed the interviews!

The document is rather elaborate. Those who are in lack of time I would advise to read the summary, discussion and conclusion and pay special attention to Figures 9 and 10. The table of contents can then be used to find more information about the topics on which a further elaboration is wanted.

Enjoy reading!

Kind regards,

Martin Chaigneau

Executive summary

The Netherlands is facing a rapidly ageing population. Unfortunately, ageing is often paired with health problems. It is in the interest of both the older adults as well as society to promote healthy ageing. An excellent tool to do this is through sufficient physical activity and resistance training. The Health Council of the Netherlands has therefore incorporated resistance training in their overall physical activity guidelines for adults over the age of 55.

Older adults need a place to engage in these activities. Commercial fitness centres are widely available, have plenty of equipment and can offer the guidance for older adults to exercise in a safe and suitable manner. Whereas some fitness centres manage to attract a lot of older adults, they are almost absent in others. This research identifies the characteristics fitness centres can apply to serve the needs of older adults. This is done by a literature review, interviews with representatives of five fitness centres with a lot of older adults and five interviews with other relevant experts.

The results of this research show that older adults are highly motivated by the physical and mental health benefits of resistance training. Equally important is the social aspect of resistance training. Older adults like to engage in group activities and accompany their training with social interactions. For a fitness centre to be appealing to older adults, the characteristics of the centre have to match the needs of the age group. Before contemplating the decision to focus on older adults, it is important to thoroughly research if there are enough older adults in close proximity of the fitness centre to reach the needed membership threshold.

When one decides to focus on older adults, the centre has to be accessible to less mobile individuals and equipment should be suitable for older adults. Also, the focus on older adults should be clearly communicated to the outside world. Both the physical structure as well as the created environment should facilitate social interactions. Good personnel is key. They should have an affinity with older adults and sufficient knowledge to properly guide them. In training guidance, it is important to emphasize the importance of strength training. Housing all age groups in one fitness centre is challenging, making it worth considering splitting different age or user groups. Older adults value the opinion of health professionals. Housing a physiotherapist is advised. Establishing relationships with general practitioners and municipalities can be fruitful but requires a pro-active approach and often takes time.

There is still a lot to learn about older adults, resistance training and suitable environments to do so. Future research can focus on the adherence behaviour, how to best create social interactions among members, clarifying current guidelines and investigating the potential for collaborations between fitness centres, general practitioners and municipalities.

Nederlandse samenvatting

Nederland heeft te maken met een sterk vergrijzende bevolking. Helaas gaat het ouder worden vaak gepaard met gezondheidsproblemen. Op zowel persoonlijk als maatschappelijk vlak is het van belang om mensen gezond oud te laten worden. Een excellente methode die hieraan bij kan dragen is het verhogen van de fysieke activiteit en het deelnemen aan krachttraining. Om deze reden heeft de Gezondheidsraad in augustus van 2017 dan ook een minimum van tweemaal krachttraining per week aan haar beweegrichtlijnen toegevoegd voor mensen ouder dan 55 jaar.

Ouderen hebben een plek nodig om aan deze activiteit deel te nemen. Commerciële fitnesscentra zijn wijd verspreid, hebben de benodigde apparatuur en kunnen ouderen begeleiden in het bewegen op een veilige en geschikte manier. Waar sommige fitnesscentra erin slagen veel ouderen aan te trekken, zijn ze nauwelijks aanwezig in andere centra. Dit onderzoek identificeert de karakteristieken die fitnesscentra kunnen toepassen om goed aan te sluiten bij de behoeften van ouderen. Dit wordt gedaan aan de hand van een literatuurstudie en interviews. Vijf interviews zijn gehouden met woordvoerders van fitnesscentra met veel oudere leden en vijf interviews met relevante andere experts.

De resultaten van dit onderzoek laten zien dat ouderen sterk worden gemotiveerd door de fysieke en mentale gezondheidsvoordelen van krachttraining. Minstens zo belangrijk is het sociale aspect van fitness. Ouderen vinden het fijn om deel te nemen aan groepsactiviteiten en hechten veel waarde aan sociale interactie omtrent training. Wanneer een fitnesscentrum aantrekkelijk wil zijn voor de oudere doelgroep moeten de karakteristieken die zij bieden overeenstemmen met de behoeften van de leeftijdsgroep. Om zich succesvol te focussen op de oudere doelgroep moet aan de voorwaarde worden voldaan dat in de directe omgeving van het centrum voldoende ouderen woonachtig zijn om de drempelwaarde van de onderneming te kunnen behalen.

Wanneer gefocust wordt op ouderen is het belangrijk om het centrum goed toegankelijk te maken voor minder mobiele doelgroepen en materiaal aan te schaffen dat geschikt is voor ouderen. Verder dient de focus op ouderen en kwaliteit duidelijk naar de buitenwereld te worden gecommuniceerd. De fysieke structuur als ook de sfeer in het centrum dienen sociale interacties te faciliteren. Het personeel dient affiniteit te hebben met ouderen en voldoende kennis om hen juist te begeleiden. In de begeleiding is het van belang de voordelen van krachttraining te benadrukken. Alle doelgroepen bedienen in hetzelfde fitnesscentrum wordt gezien als uitdaging. Het kiezen van een duidelijke doelgroep is daarom het overwegen waard.

Er valt nog veel te leren omtrent ouderen, krachttraining en geschikte omgevingen om dit te doen. Toekomstig onderzoek kan zich richten op het bewegingsgedrag van ouderen, onderzoeken hoe sociale interacties in een fitnesscentrum zijn te faciliteren en hoe samenwerkingen tussen fitness centra, gemeenten en huisartsen kunnen worden gecreëerd.

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Abbreviations

	English	*Dutch*
BVO	Movement friendly environment	*Beweegvriendelijke omgeving*
CBS	Central Agency for Statistics	*Centraal Bureau Voor de Statistiek*
CPB	Netherlands Bureau for Economic Policy Analysis	*Centraal Planbureau*
MET	Metabolic equivalent	*Metabool equivalent*
RCT	Randomised controlled trial	*Gerandomiseerd onderzoek met controlegroep*
RIVM	National Institute for Public Health and the Environment	*Rijksinstituut voor Volksgezondheid en Milieu*
SCP	The Netherlands Institute for Social Research	*Sociaal en Cultureel Planbureau*
VWS	Ministry of Health, Welfare, and Sport	*(Ministerie van) Volksgezondheid, Welzijn en Sport*
WHO	World Health Organisation	*Wereldgezondheisdorganisatie*

Figures

Tables

1. Introduction

In august of 2017, the Dutch physical activity guidelines were updated. The Health Council of the Netherlands [Gezondheidsraad] now advises adults to exercise with moderate intensity for at least 150 minutes per week, spread among several days. Additionally, adults over the age of 55 are advised to do muscle and bone strengthening exercises at least twice a week (Gezondheidsraad, 2017a). A place to potentially reach these movement norms are commercial fitness centres. While some fitness centres already manage to have a large number of older members, they are almost absent in others. This research investigated the aspects that make fitness centres appealing to adults over the age of 55. This has been done by interviewing representatives of fitness centres with a large number of older members and other relevant experts. Furthermore, a literature research has been conducted to identify aspects that older adults find important to participate in resistance training. The remaining of this chapter will elaborate on the rational of studying this topic.

Ageing of the population

As many other countries, the Netherlands face a rapid ageing of the population. In 2017, 18.5 per cent of Dutch residents were 65 years or older, amounting to a total of over 3.1 million people (Central Agency for Statistics [CBS], 2017). This percentage is expected to rise to 24 per cent in 2030 (National Institute for Public Health and Environment [RIVM], 2014). Increased age often comes along with decreased health, which is both negative for the person whose health is being affected as well as for society. Figure 1 (van der Horst et al., 2010, p. 43) shows a clear increase in healthcare costs with increased age. A rapidly ageing population will result in a large increase of national healthcare costs. Therefore, it is of great importance on both the personal as well as the societal level to keep adults healthy for as long as possible. By focussing on preventive elderly care, the use of healthcare amongst older adults will decrease, which results in lower healthcare costs within the Netherlands (Middelkoop & Richardus, 2012).

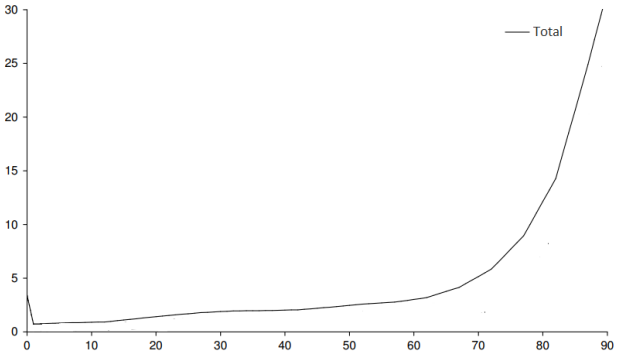

Figure 1: Annual healthcare costs by age in 2008 (x1000 euro). Adapted from: *Vergrijzing verdeeld. Toekomst van de Nederlandse Overheidsfinanciën* (p. 43), by A. van der Horst, L. Bettendorf, N. Draper, C. van Ewijk, R. de Mooij & H. ter Rele (2010)

Health benefits of physical activity

One of the best, non-pharmaceutical ways of promoting healthy ageing is regular physical activity (Vogel et al., 2009). Regular physical activity is associated with improved cardiovascular, muscle and bone health, leading to a better overall health-related quality of life (Taylor et al., 2004; Vogel et al., 2009). Resistance training encompasses all the health benefits of regular physical activity but has the added benefit of reducing the loss of muscle mass, loss of bone density and loss of strength that is associated with older age (Pollock et al., 1998; Gezondheidsraad, 2017a). Increasing physical activity and participation in strength training would therefore greatly benefit older adults on their path to healthy ageing.

Besides physical health benefits, regular physical activity has also been associated with improvements in mental health (Battaglia et al., 2016). These positive effects are believed to be reached through three main mechanisms. Physical activity 1) offers a form of distraction from

everyday life and its coincided problems, 2) increases the feeling of self-efficacy and 3) provides an opportunity for social interactions (Battaglia et al., 2016). Randomised controlled trials [RCT's] have shown repeated improvements of mental health in a variety of older adult groups when physical activity was increased (a.o. Lincoln, Shepherd, Johnson & Casteneda-Sceppa, 2011). Besides overall increases in mental health, physical activity has also been shown to have a positive effect on severe mental and neurological health problems. Over 20 per cent of people older than 60 suffer from mental or neurological health problems. The most common ones being dementia (five per cent of population) and depression (seven per cent of population) (World Health Organisation [WHO], 2017). Physical activity may reduce the severity and delay the onset of dementia (Benedetti, Borges, Petroski & Gonçalves, 2008) and may even prevent depression (Mammen & Faulkner, 2013). The positive health effects of exercising are displayed in Figure 2 (Gezondheidsraad, 2017a, p. 17 & 18).

Compliance to activity guidelines

The physical activity of older adults has increased over the past years. The previous Dutch activity guidelines (see Figure 3) were met by 58 per cent of the total population in 2014, compared to 42 per cent in 2000 (Hildebrandt, Bernaards & Stubbe, 2013). In the age group of adults over the age of 55, 71 per cent of people complied to the guidelines (de Zeeuw, 2017). It should be noted that all adults had to move for 30 minutes at least five days a week, but that adults above the age of 55 required a lower level of intensity. This lower intensity partially explains the 71 per cent adherence of older adults. Figure 3 provides an overview of the different guidelines for older adults. Since the new guidelines are relatively new, compliance is not known at the time of writing this report. Compliance rates are expected to be lower since the new guidelines include resistance training and increased intensity of exercise. The RIVM (2017) has made an estimation that 44 per cent of the total Dutch population will meet the guidelines. Compliance among adults over the age of 55 is estimated to be 33 per cent.

The guidelines entail a minimum level of physical activity and state that increased levels of physical activity (either duration or intensity) lead to additional benefits (Gezondheidsraad, 2017a). All age groups are also advised to 'minimise sedentary behaviour', since sedentary behaviour has been linked to increased risks of heart and coronary diseases and overall increased mortality (Gezondheidsraad 2017c).

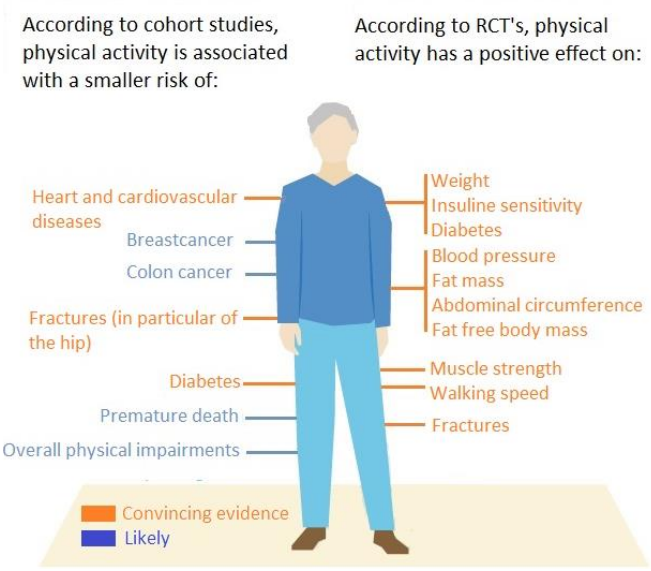

Figure 2: Health benefits of physical activity in adults over the age of 55. Adapted from *Movement norms 2017 [beweegrichtlijnen 2017].* By: Gezondheidraad 2017a, p. 17 & p. 19.

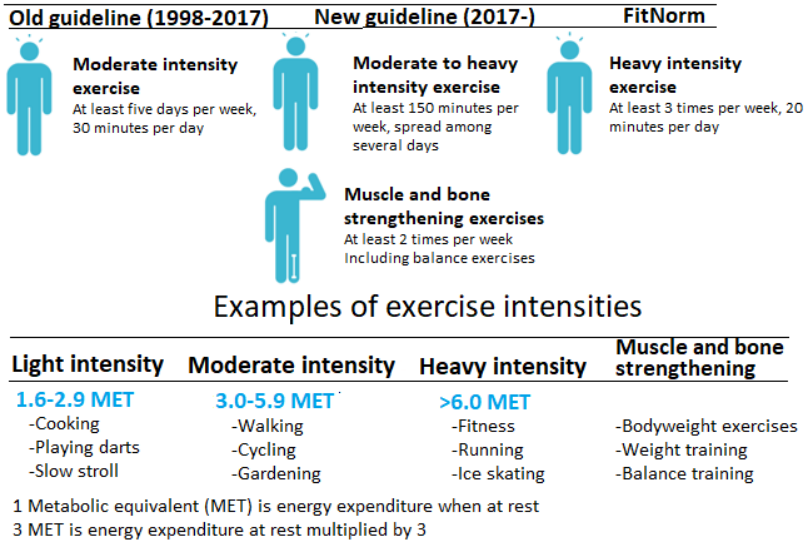

Figure 3: Physical activity guidelines for adults over the age of 55. Data from *Physical activity guidelines, 2017 [beweegrichtlijnen, 2017].* By: Gezondheidraad 2017a,

Although the old general activity guidelines were met by most older adults, they engage much less in physical exercise. Caspersen, Powell & Christenson (1985) define physical activity as any bodily movement that results in energy expenditure. Physical exercise is the engagement in physical activity that is planned with the actual goal of improving or maintaining physical fitness. A guideline that can be used as an indication of participation in physical exercise is the Fitnorm (see Figure 3). Compliance to the Fitnorm is much lower than compliance to the physical activity guidelines. Only 16 per cent of people in the age group of 65-74 comply to the Fitnorm, whereas 58 per cent of this age group complies to the (old) general movement guideline (de Zeeuw, 2017). Compliance to the norms also varies between summer and winter. Adults over the age of 65 tend to be less active during wintertime, compared to summer. In 2011 for example, 73 per cent of people over the age of 65 adhered to the old movement norms in summer versus 52 per cent in winter. The same trend is observed in adults aged 18-64, but to a lesser degree (17 per cent difference between summer and winter) (Hildebrandt, Bernaards & Stubbe, 2013). For compliance it is also important that the facilities to participate in exercises are close to home. Living near exercise facilities reduces the effort needed to get to the facility and thereby increases the chance that older adults will keep on participating (Schutzer & Graves, 2004).

Altogether we face a situation in which older adults would greatly benefit from achieving more physical activity and physical exercise in all seasons of the year. Furthermore, the new guideline entails older adults to do muscle and bone strengthening exercises. A great place to achieve these goals is in fitness centres. Fitness centres have equipment to do the required bone and muscle strengthening exercises while also offering plenty of opportunities to engage in physical exercises of higher intensities. Furthermore, they have personnel that can guide the elderly during their physical exercises and the centres can be visited year-round. With over 1900 commercial fitness centres, they can be found in virtually any residential area in the Netherlands. Therefore, most older adults will be able to find a commercial fitness centre in their proximity. To match the new activity guidelines, this research also focuses on adults over the age of 55.

Scientific relevance

A vast amount of literature has looked at older adults and their wishes regarding physical exercise (e.g. Chao, Foy & Farmer, 2000). Other studies have studied the benefits of physical activity and exercise in specific populations, for example older adults with type 2 Diabetes (Lincoln, Shepherd, Johnson & Castaneda-Sceppa, 2011). Studies specifically looking at the wishes of older adults regarding resistance training have recently also been conducted (e.g. Burton et al., 2017a; Burton et al., 2017b). Furthermore, a large number of interventions to promote physical activity and strength training among older adults have been designed and applied. Although these interventions often are effective, they prove incredibly hard to incorporate in real life practice and the results are often temporary (Atun, 2012). Therefore, it might be better to approach the situation the other way around. By looking at successful real-life settings, a theory can be inducted which has already proven itself in the real-life setting. A way to do this is by conducting a best practice study. A best practice study was not yet done regarding fitness centres that manage to attract a large amount of older adult members. Practice based experiences of fitness centres can potentially teach us a lot about suitable movement environments for older adults. This study fills this gap by studying the successful fitness centres and identifying their common characteristics. Furthermore, the views of relevant experts within the fitness world and experts who have experience with physical exercise promotion of older adults are brought forward in this research.

Societal relevance

Looking at older adults who already have physical complaints is incredibly important, but it would be even better to prevent them from getting complaints in the first place. This can potentially be reached by getting them to participate in physical exercise. Gaining insights into the important factors for older adults to engage in physical exercise and how these have been applied by successful fitness centres, can lead to an increase of fitness centres that are suitable for and appealing to older adults. By doing this, older adults will be enabled to participate in more physical exercises, with numerous benefits for both physical and mental health. Society will also potentially benefit by reductions in disease-related costs.

Research questions

The aim of this research is to identify important characteristics of fitness centres that make them appealing for adults over the age of 55. The following research question is answered:

'What are characteristics of commercial fitness centres that make them appealing for Dutch adults over the age of 55?'

To answer this research question, two sub questions are answered first.

1. According to the literature, which aspects are important for older adults to participate in resistance training?
2. According to experts, which aspects are important for older adults to participate in resistance training?

2. Background

This research focusses on Dutch fitness centres. To provide a better understanding of the market and the societal sport environment in which these centres operate, some background information will be provided in this chapter. Most of the information is derived from two detailed reports describing the Dutch fitness market. These are a report by Hover, Hakkers & Breedveld, written in 2012 and a more recent report by Middelkamp & Wolfhagen (2016). Although the report of Middelkamp & Wolfhagen was published in 2016, they often extrapolate data to estimate statistics in 2018. They do this with confidence since they state that the market has stabilised during the past years. Therefore, all data of 2018 are extrapolations and not measured data.

Fitness participants

Fitness is an increasingly popular type of exercise. In 2008 there were 106 million members of fitness centres worldwide. This has grown to 151 million members in 2016. As can be seen in Figure 4 (P. Hover & J. Middelkamp, 2017), Europe was the leading market in terms of member numbers, amount of fitness centres and revenue in 2016. Within Europe, the Dutch market ranks seventh in terms of revenue (Hover & Middelkamp, 2017).

Just like the global market, the Dutch fitness market has known a large growth during the past decades. The largest growth occurred between 1991 and 2007, fitness participation (at least once a year) grew from 9 to 22 per cent during this period. After 2007, participation rates have stabilised (Hover, Hakkers & Breedveld, 2012). A total of 16.7 per cent of the Dutch population participated in fitness at least once a month in 2014 (Middelkamp & Wolfhagen, 2016). Not every form of fitness takes place within a fitness centre but can also be done for example at home or outdoors. About two thirds of fitness participants do this within a fitness centre (Hover & Middelkamp, 2017). Middelkamp & Wolhagen (2016) and Rabobank (2017) both state that there is a total of 2.7 million Dutch inhabitants with a membership to a fitness centre. These numbers make fitness the form of exercise with the highest number of participants in the Netherlands (Hover, Hakkers & Breedveld, 2012).

The participation of the age group above 55 has known a large growth between 2006 and 2010 which is displayed in Figure 5 (P. Hover, S. Hakkers & P. Breedveld, 2012). Whereas in 2006 only 16 per cent of fitness participants was older than 55, this increased to 26 per cent in 2010. It should be noted that the age group above 55 also increased by two per cent in the entire population during this

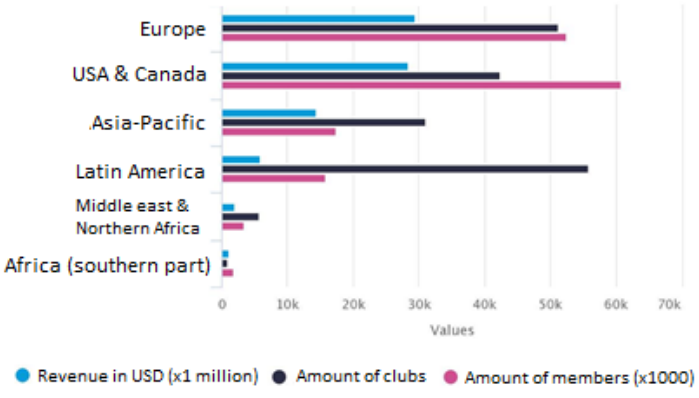

Figure 4: Revenue, amount of clubs and member amount of the worldwide fitness market in 2016. Reprinted from *Allesoversport.nl* by P. Hover & J. Middelkamp, 2017. Retrieved from: https://www.allesoversport.nl/artikel/fitnessbranche-kan-groeien-door-innovaties/.

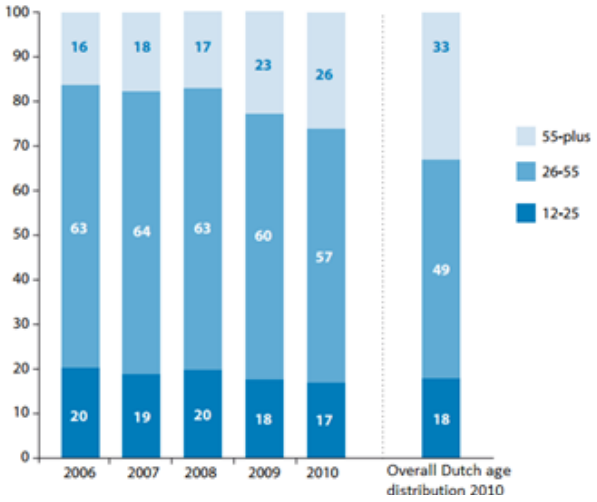

Figure 5: Age distribution of fitness participants (>12 years old) in percentages. Reprinted from *Trendrapport Fitnessbranche 2012* by P. Hover, S. Hakkers & P. Breedveld, 2012. Utrecht: WJH Mulier

period, which has contributed to this effect (CBS, 2016). Even though the participation increased, the age group was still underrepresented when taking the overall age distribution of the Dutch population into account (Hover, Hakkers, Breedveld, 2012). More recent data by Middelkamp & Wolfhagen (2016) report that the participation of adults aged 50-64 grew from 16 to 19 per cent between 2010 and 2014. The participation rates of adults aged 65-79 remained at 14 per cent during these years. In the following period from 2014 till 2016 there were no noticeable changes in distribution of fitness participation among age groups (Middelkamp & Wolfhagen, 2016).

The sex distribution of members is in favour of women. In 2014, 20 per cent of women participated in fitness versus 13 per cent of men (Hover, Hakkers & Breedveld, 2012). These higher participation rates among women can be seen as remarkable, since fitness is often seen as a typical male sport (Hover & de Jong, 2011) and was also primarily a male domain in the earlier days. Though, women soon found their way into fitness centres with reports as early as 1977 observing a majority of female fitness users in the United States (Stern, 2008). This change was partly brought about by an increased offering of cardio equipment, group lessons and aerobics (Hover, Hakkers & Breedveld, 2012). Women participation rates have remained stable between 2006 and 2014 but the male participation rate has grown from 13 to 16 per cent (Middelkamp & Wolfhagen, 2016).

Fitness providers

The supply of fitness has grown with the increased demand. The Dutch fitness market currently has over 1850 fitness centres (Hover & Middelkamp, 2017; Rabobank. 2017). The market has a lot of competition, which is partially due to an increased number of centres that are part of one of the large fitness chains. These chains offer regular fitness for a cheap price. About a third of the Dutch fitness centres is part of these big chains (Rabobank, 2017). Fitness clients tend to easily switch from one centre to another, resulting in a fierce competition for clients between nearby centres (Hover, Hakkers, Breedveld, 2012). Competing on price is often hard for individual centres. They are therefore encouraged to focus on customer retention by offering high quality services and by distinguishing themselves from the larger chains (Rabobank, 2017; Hover, Hakkers & Breedveld, 2012). The Dutch market seems less mature than for example the United States where this process of large fitness chains, heavy competition and specialisation took place during the late 1990's and early 2000's. Stern (2008) offers a great, historic overview of this market transition.

Providers deal with many uncertainties. A survey among fitness centre owners and managers asked them about their biggest perceived threats for their own fitness centre on a scale of one (not an important threat) to five (an important threat for the company). On top of the list was a possible increase of taxation rates (score of 3.39). This was followed by the opening of new competitors in the direct surroundings (3.14), lower membership fees by direct competitors (2.5), budgetclubs (2.42) and personal training studios (2.34) (Middelkamp & Wolfhagen, 2016). The same survey also asked the owners and managers about the opportunities they saw for the future. The four highest rated opportunities were the retention of current customers (4.13), introduction of new programs (4.05), personal training (4.03) and members above the age of 50 (4.03) (Middelkamp & Wolfhagen, 2016).

Altogether fitness has known a tremendous growth during the past decades with increased participation and membership rates making it the form of exercise with the most participants in the Netherlands. Memberships distributions are moving towards a more even distribution between men and women, but women are still the majority. Participation among older adults has grown relatively, but they are still underrepresented when looking at the overall age distribution in the Netherlands. The market faces a lot of competition, resulting in both uncertainty as well as inventiveness among centre owners.

3. Theoretical framework

The decision of older adults to start exercising or to keep on exercising at a fitness centre is subject to a broad range of influences. It is not just composed of physical aspects such as the equipment available in a fitness centre but is also influenced by psychological aspects like the perceived atmosphere that is present in a fitness centre. These different aspects are not separate parts but are interconnected and influence each other. How these aspects will be analysed in this research is elaborated in this chapter.

Integral model

A framework is needed to analyse the different aspects that influence the appeal of fitness centres for older adults. A way to do this is by using the integral model, which is displayed in Figure 6. The model was designed by Ken Wilber (2000), in his book 'A theory of everything'. Different fields, such as healthcare, education, economics and spatial planning have adopted this integral approach. It offers a way to analyse a complex field, without overlooking important aspects. By doing so, a complete overview is generated which can fuel discussion on where improvements are needed (Wilber, 2000). The model is praised for its capacity to address the full complexity of human experience in complex contexts (Lundy, 2010).

The Integral model uses two axes, interior versus exterior and individual versus collective. The *exterior* side of the model focusses on external, physical factors. The *interior* side focusses on the consciousness of people. The other axis distinguishes between observing these interior and exterior factors on the *individual* or on the *collective* (group) level. When combined, these two axes form the four quadrants displayed in Figure 6.

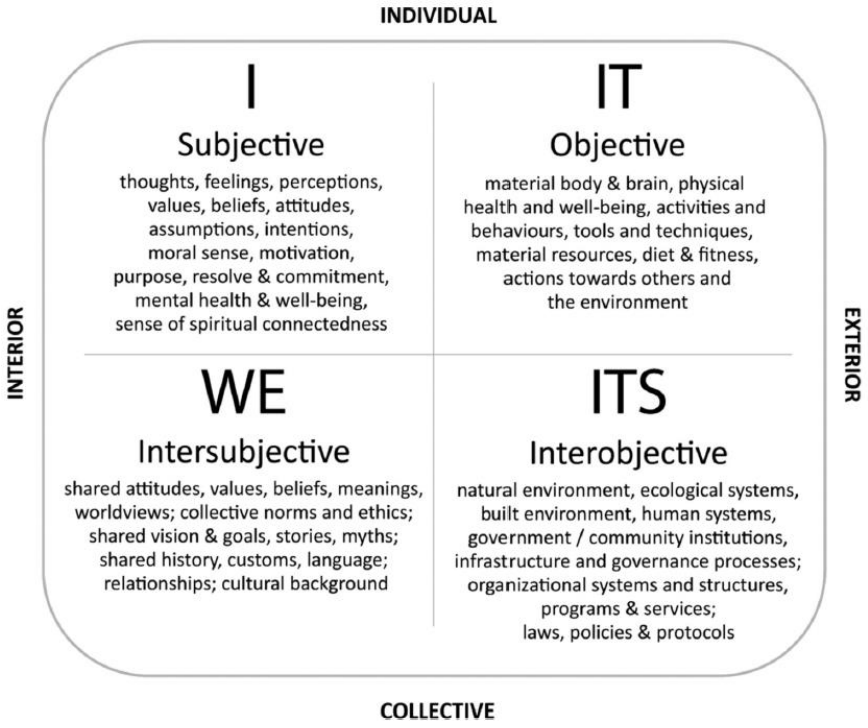

Figure 6: The Integral Model. Reprinted from 'A paradigm to guide health promotion into the 21st century: the integral idea whose time has come' by T. Lundy, 2010, *Global Health Promotion, 17,* p. 47.

The objective (IT) quadrant looks at the exterior of individuals. The organic state of the body forms the central theme within this quadrant. All aspects belonging to the objective quadrant are observable with the human senses (or their extensions such as a stethoscope). The observed aspects are described in an empirical and objective way. Many of the 'classical sciences' such as nutrition and movement sciences study phenomena in this quadrant. When applying this to fitness centres, one can think of the strength and endurance of an individual.

The subjective (I) quadrant focusses on the consciousness of individuals. It looks at how a person interprets and values himself and his environment. Subjects as motivation, self-worth and mental-health belong to this quadrant. Lots of these aspects are studied within the field of psychology. Examples related to fitness centres would be if a person has the self-confidence to go to a fitness centre, the motivation to keep going there and whether they feel at ease within a fitness centre.

The intersubjective (WE) quadrant looks at shared patterns of consciousness on the group level. These consciousnesses are shared by people that belong to a certain group. These consists of elements such as the spoken language, shared perceptions, presumptions, morals and ethics. An example would be if a group of older adults has the shared perception that fitness centres are just for the younger generation and that their age group does 'not belong there'. The differentiation between the subjective and intersubjective quadrant is in the collectiveness of the belief. If there is a certain belief in a group of people, it will often also be the belief of the individuals in a group. Though, the belief of the group can also differentiate from the personal belief and influence an individual. It might be a common norm to not drink alcohol during lunch. Even if an individual does not share this belief, the group norm might nevertheless make the person think twice about opening his beer at lunch.

The interobjective (ITS) quadrant looks at observable aspects on the group level. It consists of structures and of physical aspects that are accessible to more than one person. These are for example the physical characteristics of the built environment, governmental institutions, offered programs and available facilities. In fitness centres, one can think of the offered exercise classes, the fitness equipment and governmental funds that enable people in lower social economic classes to pay for a membership.

Application to fitness centres

Fitness centres have to take all quadrants into account when creating and maintaining an appealing and suitable environment for older adults. Centres operate in the interobjective (ITS) quadrant. Their actions consist for example of offering equipment, services and trying to create a suitable atmosphere for older adults. Offering a suitable environment in the interobjective quadrant will hypothetically influence the other three quadrants. By for example offering older adults specific training programs (ITS) and marketing towards them (ITS), the attitude of an individual older adult (I) as well as the group as a whole (WE) towards fitness as a form of exercise might change. It also works the other way around, if an older adult complains that the music is too loud (I), one can ask around and see if this is a shared belief among other members (WE). If so, the fitness centre can consider adjusting the volume (ITS). It is important to first provide an overview of the subjective, objective and intersubjective quadrants for older adults, regarding fitness centres and exercise participation. By doing so, an overview will be created of aspects that are important for older adults. By comparing this to the interobjective aspects that are offered by successful fitness centres, theory can be inducted of which aspects are important for fitness centres to apply in the interobjective quadrant to be in line with the needs of older adults in the subjective, intersubjective and objective quadrant.

Hardware, software and orgware

Since this research focusses on fitness centres, the interobjective quadrant will receive much attention. Therefore, the interobjective quadrant will be further structured by differentiating between hardware, software and orgware. Resulting in Figure 7.

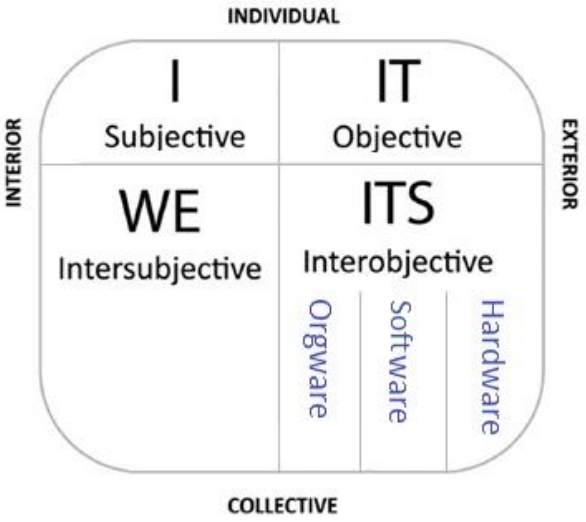

Figure 7: Combination of the integral model, hardware, software and orgware.

Just like the integral model, the hardware, software and orgware differentiation has been used in a range of fields to analyse subjects that are influenced by a variety of interrelated aspects. Examples of these can be found in urban planning (Cho, Heng & Trivic, 2015) and technology decision-making (Dobrov, 1978). Often it is applied when an innovation is strived for, which can only succeed if all relevant aspects are taken into account. On initiation of the Ministry of Health, Welfare, and Sport [VWS], the hardware, software and orgware framework is increasingly used to design movement friendly environments [beweegvriendelijke omgeving [BVO]]. BVOs are defined as an environment that facilitates, stimulates and challenges people to move and do sports (Hoyng, 2017a). The model is currently being applied to schoolyards and on the neighbourhood level (Ketwich, 2013).

Hardware is defined as the physical environment. It consists of the design of places but also the available physical resources within these environments (Cammelbeeck, Engbers, Kunen, L'abée, 2014). Examples for outdoor environments are infrastructure, parks and benches (Hoyng, 2017b). Hoyng (2017b) also brings forward that it is important to keep the physical environment clean, safe and that it has to be aligned with the wishes of the users (in other words, in line with the subjective, intersubjective and objective quadrants). *Software* refers to uses of the physical environment in the form of activities (Cho et al., 2015; Hoyng, 2017b). It also encompasses all aspects related to communication and guidance. Examples are offered sport activities, personnel to guide the sport activities, promotional activities and written instructions on how to exercise (Hoyng, 2017b; Cammelbeeck et al., 2014). *Orgware* refers to the policy and management aspects. These can include cooperations with other organisations such as the municipality or existing exercise programs (Hoyng, 2017b; Cammelbeeck et al., 2014).

Application to fitness centres

When operating within a complex system such as a fitness centre, hardware, software and orgware have to be aligned to reach the best results. Offering equipment within a fitness centre (hardware), does not guaranty that the equipment will be used in the right and safe way. To reach this, proper instructions have to be present on the machine or the use has to be explained by personnel (software). Hardware and software also have to operate within the current orgware.

Synergy of the two models

The separate models can be combined to work in a synergetic way. Within the integral model, most of the actions for fitness centres will take place within the interobjective quadrant. Posing all these without further differentiation will result in a large, unstructured list of important aspects. The hardware, software, orgware differentiation focusses on objectively, observable aspects, while disregarding subjective aspects. By taking the overall framework of the integral model, all aspects will

be taken into account during the analysis. By applying the hardware, software, orgware model within the integral model, extra structure will be offered to the dominant interobjective quadrant for fitness centres. Furthermore, by applying the hardware, software, orgware model, the report will be in line with the current research regarding BVO.

4. Methods

To answer the research questions of this thesis, a literature study as well as interviews have been conducted. Important aspects for fitness centres to be appealing to older adults were not previously studied. Therefore, this research has an explorative character. According to Boeije, 't Hart & Hox (2009), qualitative research is the suitable method when a field has to be explored and important aspects have to be identified. Qualitative research offers a way to gain a deeper understanding of the mechanics underlying such processes (Bowling & Ebrahim, 2005) which is essential for theory induction. This chapter will elaborate on the decisions made in the design and execution of the chosen methods.

Literature study

The literature study focusses on aspects of importance for older adults to engage in resistance training. If possible, studies specifically looking at older adults in relation to training in a fitness centre have been used. Findings of studies looking at physical exercise in general are discussed if they concern aspects that are most likely also relevant to training in a fitness centre (e.g. time constraint of exercising). Schutzer & Graves (2004) emphasize that older adults experience specific (age related) barriers and motivators regarding physical exercise participation. As a result, one should be cautious when extrapolating data of other age groups to older adults.

Table 2:Search terms used in the literature study

Population	'Older adults' OR Elderly
Intervention	'Strength training' OR 'resistance training' OR Fitness OR sport* OR 'physical activity' OR 'physical exercise'
Outcome	Motiv* OR barrier* OR participation OR 'healthy age*' OR 'mental health'
Setting	'fitness centre' OR gym

The search engine of Scopus was used to find relevant literature. Different search strings including the population, the intervention, the outcome (and if needed the setting) were entered in Scopus. The most commonly used search terms can be found in table 1. In some instances, specific search terms were used to find additional information. If more information was for example needed about the time constraint of exercise a search term such as time was added to find additional information on the topic.

The amount of search results varied. Some resulted in a few articles whereas others had over a hundred results. In some cases, the majority of results revolved around medicinal or physical effects of resistance training in older age group. When excluding these results, a manageable number of articles remained. Remaining articles were first screened on title and later on abstract. Articles not focussing on older adults, focusing on a very specific group (e.g. type 2 diabetics woman or cancer patients) or not focussing on types of exercise conducted in a regular commercial fitness centre were excluded. Articles on a specific topic were reviewed until there were either no articles left, or data saturation was reached. Data saturation on the topic was reached when further reviewing of articles did not result in additional information.

The literature search for the It quadrant differed from the other quadrants. The amount of literature regarding the physical consequences of resistance training was too large to review for the scope of this research. Therefore, a widely cited literature review was sought to identify the main overall physical consequences of exercising for older adults (Hunter, McCarthy & Bamman, 2004). Additional information regarding the topics discussed was added by using specific search terms such as sarcopenia or 'training volume'.

Interviews

To gain greater insights in the aspects that are important for fitness centres to be suitable for older adults, in-depth interviews were conducted with experts. These experts can be sub-divided in two groups. The first group are representatives of fitness centres that already have a large number of members over the age of 55. The second group consists of experts that do not own a fitness centre but have extensive experience in either the fitness industry or physical activity promotion of older adults. An overview with a brief description of all interviewees is given in table 2. Interviews were conducted until data saturation was reached. With the fitness centre representatives, five interviews provided enough information on the relevant topics. The last two interviews were mainly confirming points that had already been brought forward in previous interviews. Furthermore, most of the interviewed other experts also had owned or managed several fitness centres and therefore also provided lots of information from their hands-on experience of working in fitness centres. For the other experts, no more than five were found that would add relevant new insights to the data. A total of ten interviews was also estimated as a realistic number for the scope of this research.

Recruitment of participants

Inclusion criteria were applied to the selection of fitness centres. Fitness centres approached for interviews had to be accessible to everyone. This measure excluded for example physiotherapists with a room of fitness equipment for patients, fitness centres that are only available to employees and centres purely focussed on one group (e.g. women). Excluding specialised centres increases the comparability of the interviewees and thereby the internal validity. The interviewed representatives were either the owner, manager or an influential employee that is involved in decision making.

The fitness centres were chosen based on their ability to attract a relatively large amount of older adult members, making this a form of purposive sampling. Purposive sampling is a sampling method in which respondents are deliberately chosen because they reflect certain features or characteristics that are of interest for the research (Bowling & Ebrahim, 2005, *P. 226*). The branch organisation of Dutch fitness centres (NL Actief), was contacted to suggest fitness centres to interview. NL Actief has four regional advisors who advise fitness centres and therefore visit a large amount of fitness centres. These regional advisors were asked if they knew fitness centres that are particularly good in attracting members above the age of 55. The selection process is displayed in Figure 8. The centres in a range of 100 kilometres of the University of Wageningen were initially approached due to time and economic constraints. Two of these centres were contacted in person during a regional meeting of NL Actief. Both agreed to be interviewed. The other two were contacted by email. It should be noted that contacting NL Actief excluded centres that are not connected to this branch organisation. This might result in a selection bias if unconnected fitness centres differ greatly from the ones that are part of the branch organisation. To lessen the selection bias, two other fitness centres were contacted without being suggested by NL Actief. These were reached through the researcher's personal network and an online news item regarding older adults and fitness centres (Allesoversport, 2017).

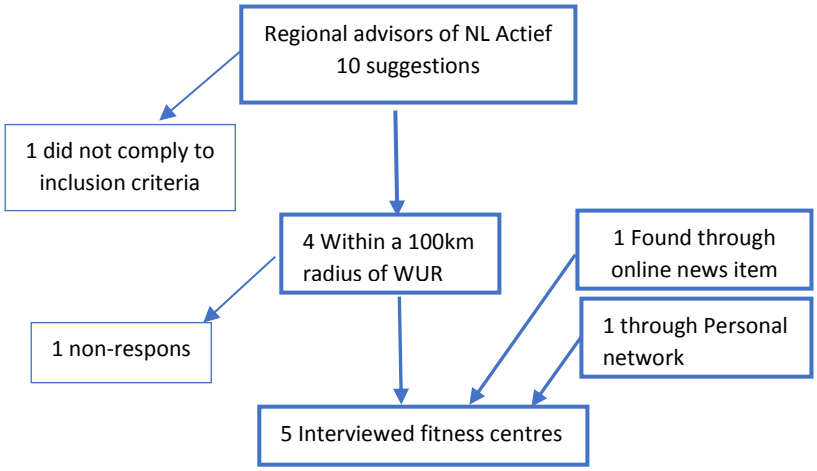

Figure 8: Selection of fitness centre respondents

The relevant other experts were chosen by theoretical sampling. Professionals from whom it was expected that they would have great contributions to the findings of this research were contacted to conduct an interview.

Interview execution

The interviews were conducted in a semi-structured way. Applying a semi-structured interview offers the opportunity for the interviewer to add additional questions if needed. Furthermore, it gives the interviewee the opportunity to bring up topics of their own and elaborate on topics they find important (Bowling & Ebrahim, 2005). Thereby, possible topics which were not previously encountered in the literature study or previous interviews can also be discussed, resulting in more complete data. The interviewer used a topic list and steered the interview in a direction that was relevant to the research. The topic list was based on the theoretical framework and literature study. Aspects that came forward in the literature study were brought forward to discuss in the interviews. The used topic list can be found in annex 1.

The other experts were asked about overall aspects older adults find important to engage in resistance training and how to apply these to fitness centres. Their topic lists were similar to the ones used in the interviews with representatives of fitness centres. Additionally, specific questions related to their area of expertise were added. These specific questions differed between interviews. For example, in the interview with the sales manager of Matrix, more emphasize was put on suitable equipment for older adults. In the interview with Dr. Middelkamp, more emphasize was put on the research he has done regarding self-efficacy and attendance behaviour.

All interviews with fitness centres took place within the fitness centre and in all cases a tour of the fitness centre was given. The interviews with other experts took place at a location of choice of the respondent. Three were interviewed at their work location, one interview took place in a coffee bar and one interview took place in the showroom/fitness centre of Matrix. All interviews were started with a brief explanation of the research and the interviewee had the opportunity to ask any question they had regarding the research. Permission was asked to record the interview. The interviewees were informed that at all stages they could stop the interview, decline to answer a question or decide at a later stage to withdraw things they had said. Most interviews took between 60 and 75 minutes. After the interview, the interviewees were asked if they wished to stay anonymous within the research and how they would like to be named in the final report. Of the respondents one interviewee wished to remain anonymous. The others gave permission to use their full name or the name of the fitness centres.

Interview analysis

The transcribed interviews were transported to Atlas.ti. Atlas.ti is a qualitative data analysis tool, used to analyse large sets of textual data. In Atlas.ti the interviews were coded by using open, axial and selective coding. The following elaboration of the coding process is based on the book *'Analysis in Qualitative Research'* by Boeije (2010, pp. 93-121). *Open coding* is a first selection process of the raw data. Relevant parts of the interview are coded according to their general topic. Parts of different interviews, covering the same topic thus receive the same code. During *axial coding*, parts of interviews with the same topic are compared to one another. Main and subcategories are identified and coded accordingly. Also, similarities and differences between views of respondents are indicated in this stage. *Selective coding* is the final step in the coding process. Connections are sought between categories to identify main and sub themes. Also, the previously indicated differences and similarities between respondents are further compared and interpreted. By looking at main and subthemes and their interconnections, selective coding forms the start of theory induction.

Table 2: Overview of interviewed experts.

Fitness centres

Name and location	Interviewee and way contacted	Percentage of older adult members	Description
LaVita Lifestyleclub Fitness & Spa Veenendaal	Owner Advised by NL Actief	32 per cent (>50)	LaVita is a fitness centre with approximately 3100 members. They aim to offer the complete package for all who wish to improve their fitness, wellbeing and appearance. Their facilities include a 1200 m2 fitness area, several rooms for group lessons, a large ball room for dancing/conferences and several sauna's. They furthermore rent out spaces to several medical professionals within the building. LaVita offers special membership arrangements for adults over the age of 60 and organises 60+ Fit lessons eight times per week.
Body Language Hardinxveld-Giessendam	Owner Personal contacts	Average age is 42. Owner estimates that half of the members must be over the age of fifty.	Body Language is the fitness centre where the idea for this thesis topic originated. The centre was started 25 years ago due to the growth of the physiotherapist practice of the owner and has a lot of older members. Body Language offers a fifty fit group lesson once a week and has an Egym circuit training which is highly popular among their older members.
Fitness centre in the province of Gelderland (wishes to remain anonymous)	Two owners Advised by NL Actief	Average age is almost 50 years old. They estimate that over half of the members is older than 55 years old.	The centre has between 1000 and 1500 members.
Derks4sport lifestyle and preventioncentre Wijchen	Manager Found through a video of Kenniscentrum Sport	Of the members, about 150 are children who participate in Judo, the remainder of the 1700 members is aged over 35.	Derkssport has four fitness centres from which the first one was established in 1966. All fitness centres are accessible to all age groups, but they all have their own focus group. The centre Derks4sport primarily focusses on older members. This location has 1700 members and mainly uses Egym equipment. Members over the age of 80 get a free membership.
Van Hellemond Sport Hilversum	Manager Advised by NL Actief	Estimation of 25 per cent (if fighting sports and swimming lessons are excluded).	Van Hellemond Sport has two fitness centres in Hilversum and one in Naarden. They offer fitness, swimming lessons and several fighting sports. The first centre opened its doors back in 1932.

Other experts

Name	Function	Description
Dr. J. Middelkamp	Development Director at HDD Group CEO of BlackBoxPublishers	Dr. MIddelkamp has over 30 years of experience in the fitness industry, fulfilling all kinds of functions. He has a PhD in health exercise behaviour change and published over 20 books focussing on the fitness sector, several of which are used in this research. Currently Middelkamp is the development director at HDD Group. HDD Group helps fitness centres to be successful by providing insights and solutions for group fitness, personal training and club management. Middelkamp has previously been the franchise manager of fitness franchise chain Fit-Care (22 clubs), the Chief Operating Officer [COO] of Fitness first and the COO and business development director of HealthCity/BasicFit International (European chain with 265 clubs). Up until recently he has also been a board member of EuropeActive. EuropeActive represents the European health and fitness sector in Brussels. He is also the CEO of BlackBoxPublishers, a publisher of books in the fields of sports, fitness and health.
J. de Zeeuw	Advisor of Kenniscentrum Sport, specialised in older adults	The career of Ms. de Zeeuw revolves around the stimulation of physical activity among older adults. She has designed and implemented several projects that revolve around older adults and physical activity. She aims to use physical activity as a tool to enable older adults to keep living independently, make them less vulnerable and maintain their social relationships.
A. Kuipers	Regional advisor NL Actief Project worker NL Actief	As regional advisor of NL Actief, Ms. Kuipers advises fitness centres in the provinces of North-Holland, Utrecht and Flevoland regarding all aspects associated with running a successful fitness centre. She also organises regional meetings to discuss relevant information, new developments within the fitness world etc. Furthermore, she works on several projects of NL Actief. These include representing NL Actief at events or researching topics that concern the associated fitness centres of NL Actief. Kuipers has also worked in a fitness centre in Alkmaar for over 18 years.
J. van Beek	Owner of 'Genna Well-Being Concepts' Advisor to fitness centres Master-trainer Teca, Nautulus and Schwin	Joop van Beek has been working in the fitness industry since 1995. His main areas of expertise are marketing, public relations and communication. Van Beek has worked as an advisor for fitness centres and is a master trainer for the brands of Teca, Nautulus and Schwin and was a main contributor to the introduction of spinning in the Benelux. He also has his own company of Genna Well-Being Concepts in which he guides clients to a better overall physical and mental wellbeing.
J. van de Graaf	Benelux sales manager Matrix	Johan van de Graaf is the Benelux sales manager of Matrix. Matrix is the largest supplier of fitness equipment in the Netherlands. Besides selling equipment, Matrix advises and aids their clients in their overall business operations. As a Benelux sales manager, van de Graaf visits numerous fitness centres and has extensive knowledge of the important aspects to be successful as a fitness centre.

5. Results literature study

This chapter briefly presents the results of the literature study, subdivided by the quadrants of the integral model. For sake of the overall length of this thesis, the results of the literature study have been shortened. For further details, the referenced articles can be consulted. To which quadrant aspects belong is sometimes debatable. Therefore, some quadrants will be preceded with a brief explanation as to why certain aspects are discussed in that quadrant.

5.1 It quadrant: objective elements on the individual level

The It quadrant revolves around objectively observable elements on the individual level. These include all aspects related to the physical state of the body, but also include for example the amount of money and time available to a person. The general health benefits of physical exercise and resistance training have been discussed in the introduction. The degree to which these aspects influence one's exercise behaviour is dependent on the interpretation and relative importance one attaches to these aspects. This interpretation of the aspects is subjective and therefore takes place in the I quadrant. Money and time needed to participate in physical exercise are also objectively observable aspects but they again depend on the subjective interpretation of an individual and their willingness to invest time and money in physical exercise. The effect physical health, time and money have on exercise behaviour will therefore be discussed in the I-quadrant.

Types, intensity and frequency of exercising

Within a fitness centre, older adults can engage in different types of exercise. Often a distinction is made between cardiovascular training and resistance training which are both advised within the current guidelines of the Gezondheidsraad (2017a). Wood et al., (2001) found in their RCT that a combination of cardiovascular training and resistance training led to the most beneficial health results in adults over the age of 60. The literature review by Hunter, McCarthy & Bamman (2004), suggests that if only one type of training is chosen, strength training is the most beneficial. This is because most day-to-day tasks are of relatively short duration and are therefore more dependent on the strength level of an individual than on the aerobic condition. Also, aerobic training is suspected to have more joint impact, whereas strength training offers more joint stability (Picorelli et al., 2014). The added benefit of strength training is the reducing effect it has on the gradual loss of muscle size and strength associated with ageing (sarcopenia). A RCT by Tieland et al., (2012) found that resistance training prevented the muscle decline that would be expected in a group of frail elderly over a period of 24 weeks. The study also included a group that followed the same resistance training program but also received 15 grams of protein supplementation twice a day. This group significantly increased their lean body mass with 1.3 kg on average.

RCT's use intensities, durations, frequencies and types of training that differ too much to come up with a clear dose-response scheme for overall physical activity in older adults (Gezondheidsraad, 2017a). Though, some interesting results have been shown. Woodcock, Franco, Orsini & Roberts (2011) found that 2.5 hours of physical activity per week was associated with a reduction of 19 per cent of all-cause mortality risk. Physical activity of 7 hours per week reduced the mortality risk by 24 per cent. This indicates that more physical activity seems to be better but that relatively the most benefits can be reached by changing from a lifestyle lacking physical activity to incorporating moderate levels of physical activity.

Data is even more limited on the dose-response of resistance training. Some authors do give general advice regarding the intensity and frequency of resistance training. Overall, higher intensities seem

more effective in reaching desired health outcomes. Hunter, Mcarthy & Bamman (2004) advice older adults to train between 60 and 80 per cent of the maximum weight they can perform for one repetition for 2-4 sets of 8-15 repetitions per muscle group and that each muscle group should be exercised 2-3 times per week. Resistance training should form the core of training activities. Added endurance training should not exceed 3 days a week. The Gezondheidsraad (2017a) matches the 2-3 times per week frequency of resistance training. While they do encourage that higher levels of physical activity lead to additional health benefits, they do not mention a maximum.

The positive effects of exercising are extensively researched and brought forward in the literature but, possible negative effects are rarely highlighted. The Gezondheidsraad (2017a) mentions that weak indications have been found that a small portion of people who start exercising more will develop minor injuries. Though, increased exercise behaviour is unlikely to increase the chance of major injuries.

5.2 I quadrant: subjective aspects on the individual level

Motivation

An overreaching concept is that of motivation. Sufficient motivation is needed to put in the effort of participating in exercise and resistance training (Chao, Foy & Farmer, 2000). This is true for both the initial participation as well as the exercise adherence on the longer term (Molanorouzi, Khoo & Morris, 2015).

Enjoyment

In the study of Burton et al., (2017a), 50 per cent of those who participated in strength training indicated enjoyment as a motivating factor. It stood out that only 17 per cent of non-participants indicated that they would see enjoyment as a potential motivating factor. Even though those who enjoy the activity are more likely to participate in resistance training, the large difference could indicate that older adults do not expect resistance training to be fun, before commencing in the activities. In a recent survey, NL Actief (2018) asked 524 visitors of a convention for adults over the age of 50 what motivated or prevented them from participating in resistance training. Nine per cent of respondents who did not participate in fitness indicated that they see resistance training as an obligation rather than an activity to derive joy from. Also, the most mentioned barrier to participate in resistance training was that older adults prefer to be outside (14 %). In a study looking at sport participation of adults in general, Molanorouzi, Khoo & Morris (2015) found that learning something new can also add to the enjoyment of exercise.

Self-efficacy

Many studies bring forward the importance of self-efficacy (a.o. MCAuley et al., 2011; Bandura, 2004; Conn, 1996; Middelkamp, van Rooijen, Wofhagen & Steenbergen, 2017). Self-efficacy is the belief that a person has in his or her capabilities to successfully carry out a course of action (MCAuley et al., 2011). People with a low self-efficacy will soon believe that their actions are futile and tend to give up when faced with too many barriers. People with a high self-efficacy will set more demanding goals, believe that they can conquer barriers and tend to have a firmer commitment to their goals (Bandura, 2004). Research among older adults has found strong correlations of self-efficacy to exercise program adherence (McAuley et al., 2011), exercise behaviour after participating in an exercise program (McAuley, 1993) and lifelong exercise behaviour (Conn, 1996). Therefore, it seems to be an important influencing factor on exercise behaviour. Interesting to note is that studies often report a large standard deviation in self-efficacy among older adults, indicating a high degree of variety in self-efficacy from person to person (a.o. McAuley, 1993; Conn, 1996). Dalle Grave, Calugi,

Centis, El Ghoch & Marchesini (2011) emphasize the importance of setting realistic expectations to protect both people with high as well as low self-efficacy. Too high expectations might result in disappointment or feel overwhelming and low expectations can be demotivating.

Physical health as motivator and barrier

Physical health is seen as a major motivator for older adults to participate in resistance training and seems to become more important with increased age (Trujillo, Brougham and Walsh, 2004). To feel good physically (mentioned by 81%), to feel fit (74%) and to feel strong (51%) were some major motivators mentioned by older adults who participated in resistance training in the study of Burton et al., (2017a). These were also the most commonly mentioned potential motivators by those who did not participate in resistance training (Burton et al., 2017a).

Besides these overall physical health benefits, the prevention or lessening of (age associated) aches, pains and problems also motivates older adults (burton et al., 2017b; Lübcke, Martin & Hellstrom, 2012). Commonly mentioned motivators are overall improved strength, balance, physical function (Burton et al., 2017b) and reduction of stiffness (Lübcke, Martin & Hellstrom, 2012). These motivating factors are often tied with goals regarding day-to-day activities. Older adults for example wish to reduce their chance of falling (Burton et al., 2017a), wish to remain living independently (Burton et al., 2017b), increase their walking pace or wish to be able to walk without a cane (Lübcke et al., 2012).

Henwood, Tuckett, Edelstein & Bartlett (2011) add an interesting note on the knowledge of older adults regarding the physical benefits of resistance training. They mention that older adults do have a general awareness that resistance training is beneficial for their health. Though, this knowledge is very broad and not in line with the clinical understanding of the benefits of resistance training. As a result, they argue that further educating older adults might attract a larger range of older adults to start engaging in resistance training.

On the flipside, physical health also forms a major barrier to participate in resistance training. Pain (32%) and ongoing injury/illness (31%) were by far the two most commonly mentioned barriers to participate in resistance training in the study of Burton et al. (2017a). Short term physical effects also form a barrier. Exercise results in sweating, costs physical effort and (especially the first couple of times) often results in delayed onset muscle soreness (Schutzer & Graves, 2004; Chao, Foy & Farmer 2000). The benefits of exercising often take longer to present themselves. Also, the negative effects of not exercising are often not observed in the short term. As a result, the short-term negative effects might outweigh the long term potential benefits for an individual (Chao, Foy & Farmer, 2000).

Mental health as motivator and barrier

Older adults also seem aware of and motivated by the mental health benefits of physical activity. In the study of Burton et al., (2017a), overall mental health benefits (44%) were almost as frequently mentioned as overall physical health benefits (46 %). Among other effects, older adults feel resistance training improves their alertness, concentration, mood and confidence. Furthermore, it is an important stress reliever and makes older adults ‘feel good’ in general (Burton et al., 2017b).

Mental health can also form a barrier to participate in physical exercise. Current psychological well-being might influence the ability of individuals to adhere to certain behavioural changes. Poor psychological health possibly has a negative effect on other factors such as self-efficacy and confidence (Schutzer & Graves, 2004). Lack of willpower, negative attitude, emotional problems, nervousness and depression also came forward in the study of Burton et al., (2017b) as barriers.

Time investment

A literature review by Chao, Foy & Farmer (2000) looks at the specific challenges and strategies of exercise adherence in older adults. They state that the adoption of moderate physical exercise is viewed as time consuming. The time commitment needed to participate in physical exercise composes of the time spent exercising as well as the time spent travelling to the facility and the hygiene following the physical exercise. Furthermore, they bring forward that it is often more difficult for older adults to plan the time of exercise themselves instead of just showing up at a particular, pre-set time.

A lack of time was indicated by 12 per cent of older adults in the study by Burton et al., (2017a). In the survey of NL Actief (2018), lack of time was only brought forward by 9 per cent of older adults. It can be imagined that time forms more of a constraint to older adults that still work than to those in retirement, though data comparing these groups is not available.

Costs

Costs are sometimes mentioned as a barrier for older adults to participate in resistance training (a.o. Bopp, Wilcox, Oberrecht, Kammermann & McElmurry., 2004; Keogh, Rice, Taylor, & Kilding, 2014). In the study of Burton et al., (2017a) costs were mentioned by 12 per cent of respondents. Surprisingly, the frequency of costs being mentioned was almost double among females than among males. In the study of Burton et al., (2017a), Costs were the ninth most mentioned barrier to participate in resistance training.

5.3 WE quadrant; subjective aspects on the group level

The distinction between the I and WE quadrant is often subtle because collective beliefs also operate on the individual level. In this literature review, aspects were added to the WE quadrant if they are described in the literature as being shared by more than one person or if they revolve around social contacts.

Social contacts

Social contacts are a major motivator for older adults to engage in physical exercise. Ooms, Hiemstra & Kalkman (2016) wrote a report advising sport clubs how to make themselves suitable for adults over the age of 50. They urge that although many adults are aware of the physical benefits of exercising; enjoyment and social contacts are the major reasons to participate. Social contacts are frequently mentioned in studies (a.o. Burton et al., 2017a; Burton et al., 2017b; Lübcke, Martin & Hellstrom, 2014) and was the most commonly mentioned motivator in the survey of NL actief (2018). Older adults indicate that the fitness facility becomes a place to meet friends and gives them the sense that they belong to a group (Lübcke, Martin & Hellstrom, 2014).

Image of fitness among older adults

Some sources state that the fitness industry has a negative image. In 2004 fitness was seen as a sexy yet vulgar sport (Fit!Magazine, 2004). In 2008 the sport was still seen as a typical male sport (Hover & de Jong, 2011), even though the percentage of female members in fitness centres had already surpassed the percentage of male members. Hover & de Jong (2011) have written an extensive report about the images of different sports in the Netherlands. They have done this by surveying people who do and who do not participate in said sport. Fitness is seen as beneficial for one's health and easy to learn by outsiders. When the views of participants and non-participants were compared, most parameters showed similar percentages, except for the parameter whether fitness is a fun

social engagement (58 versus 39 per cent). The image of fitness might therefore be suggestive of the health benefits, but not of the social benefits.

Studies on older adults mention that the fitness centre is often perceived as a forbidden area for older, untrained persons (Rydeskog, Frändin, and Hansson Sherman,2005; Lübcke, Martin & Hellstrom, 2012). In the study of Burton et al. (2017a), 21 per cent of respondents mentioned being 'too old' to participate in fitness. Chao et al. (2000, p. 214), mention that: '*Older women in particular may have to fight the negative impression that prevailed until the last decade that exercise is 'unladylike' and 'unfeminine'.* During the recent survey of NL Actief (2018) the negative image of fitness centres was not directly mentioned by the respondents. However, the respondents were aware that they were talking to representatives of the branch organisation for fitness centres, so they might have been reluctant in providing stigmatising answers.

Opinions and support of others

The opinion of relevant others can play an important role in the decision to start engaging or prolong participation in resistance training. Expected approval can play an encouraging role, whereas disapproval might have a discouraging effect (Ajzen & Fishbein, 1980; Middelkamp et al., 2017). Norms regarding physical activity can also be established on the group level (McNeill, Kreuter & Subramanian, 2006). A healthy lifestyle and a coherent amount of physical exercise can be viewed as important within a group and thereby motivate individuals within that group to start exercising. Observing the physical activity behaviour of others can also have a positive effect (McNeill, Kreuter & Subramanian., 2006; Ooms, Hiemstra & Kalkman, 2016; Lübcke, Martin & Hellstrom, 2012) other older adults can become true role models regarding physical exercise (Lübcke, Martin & Helsstrom, 2012). Social support or the lack thereof can also influence exercise behaviour. Interesting to note is that social support and encouragement from peers or staff is more often mentioned as a motivational factor than social support of spouse, family or friends

5.4 ITS quadrant: objective aspects on the group level

The interobjective quadrant revolves around physical elements that can be used by more than one person. As explained in the theoretical framework, a further subdivision has been made between hardware, software and orgware.

Hardware

Environment inside the fitness centre

Within the fitness centre several elements are important to take into account to provide an inviting and suitable physical environment for older adults. Scientific research into these physical elements has not been conducted, but elements are occasionally mentioned in articles. Important aspects include accessible machines (Lübcke, Martin & Hellstrom, 2012), the fitness centre not being too crowded (Lübcke, Martin & Hellstrom, 2012) and appropriate music (Schutzer & Graves, 2004). Since the social aspect is a major reason for older adults to participate it is advised to have a designated area to have a drink before and after training (Ooms, Hiemstra & Kalkman., 2016).

Environment outside of the facility

Apart from the physical elements within a fitness centre, the physical elements outside of a fitness centre can also be of influence. Several studies looked at the importance of neighbourhood safety on exercise participation. Higher crime rates have been related to lower exercise participation rates (Centers for Disease Control and Prevention, 1999; Beenackers, Kamphuis, Burdorf, Mackenbach & van Lenthe, 2011). Especially older adults who prefer walking as their mode of transport tend to have increased physical activity when crime rates are lower (Schutzer & Graves, 2004). Although these

studies looked at barriers to go outside in general, it can be imagined that older adults do not like to walk to fitness centres in unsafe neighbourhoods and during evening-hours.

Westerbeek & shilbury (1999) investigated the effect the appearance of a sport venue has on the image of customers. They bring forward that the appearance of a venue is the foremost selling point of the offered product. The overall appearance of the venue can influence the experienced or suspected quality of the offered activities. A luxurious appearance can increase the willingness to pay of customers (Westerbeek & Shilbury, 1999). It is also important to have proper street lightning and make the fitness centre easily and safely accessible (Ooms, Hiemstra & Kalkman, 2016).

Location

Most people exercise at a location close to home in terms of travelling time needed to get there. Therefore, the proximity of potential members and reachability are important to consider (Lübcke, Martin & Hellstrom, 2012). Mulier Institute (2017) mentions that 58 per cent of people exercise in their own neighbourhood. Marchant (2014) did a non-scientific research, asking over 800 US respondents how long they were willing to travel (by car) to certain local businesses. Traveling to a gym scored the lowest with an average of 12 minutes of travelling time. In comparison, people were willing to travel 16 minutes to a grocery store and 20 minutes to a clothing store. Therefore, it is important for a fitness centre to be easily accessible for older adults in terms of time investment needed to get to the facility. Finding a location with demographics supporting the strived for target group, was identified as the most important aspect when choosing a location (Chaigneau, 2016). Ooms, Hiemstra & Kalkman (2016) add that it might be worthwhile to investigate where many older adults can be found. By temporarily offering an activity close to the older adults, they get familiarised with the form of training and the instructors. This might increase their willingness to travel a little longer to the fitness centre. Having public transport close to a physical exercise site does increase its reachability for groups that are not able to get there by other means of transportation (Chao, Capri & Foy, 2000).

Software

Offered activities

In order to attract and retain older adults, suitable activities are needed within the fitness centre. This can be done by creating specialised programmes for this age group or adjusting intensity and duration in yet available forms of resistance training (Ooms, Hiemstra, Kalkman, 2016. Ooms, Hiemstra & Kalkman (2016) advise flexible training times, to serve both the working and retired older adults. These activities do not have to be limited to resistance training, but can also encompass educational activities (Burton et al., 2017a; Henwood, Tuckett, Edelstein & Bartlett, 2011).

Training guidance

The guidance and support from staff directly influences the enjoyment, increases the safety, feeling of safety and overall exercise experience. Older adults attach much value to individual guidance and knowledgeable personnel. Personnel needs to have an affinity with the age group and an enthusiastic approach (Ooms, Hiemstra & Kalkman, 2016). Furthermore, it is important that personnel is aware of the specific training needs of older age groups (Lübcke, Martin & Hellstrom, 2012; Burton et al., 2017b)

Chao et al., (2000) bring forward that the needs of the participants in physical exercise have to be acknowledged for every individual. These can vary between races, social economic status, gender, ethnicity and spiritual belief, but also change over time. There is not a one size fits all approach for programming, but proven strategies include goal setting, self-monitoring, implementing decision

making models, modifying cognitive thoughts during training and increasing social support (Chao et al., 2000).

Older adults can get motivated by seeing role models. This is also mentioned by Ooms, Hiemstra & Kalkman (2016) as an important tool to attract older adults to the exercise facility. It is therefore recommended to use pictures of older adults on for example the website and flyers.

Orgware

Health professional advice

The advice of a health professional is often weighed heavily by older adults. In the study of Burton et al., (2017) 31 per cent of older adults that are not currently participating in resistance training indicate that the advice of a health professional to do so, would motivate them to start. Chao et al., (2000) mention that health professionals often see the declines in physical activity as something inherent to the process of ageing. Furthermore, they are often unaware that some older adults think that exercise does more harm than good. Therefore, it is important that health professionals encourage older adults to engage in physical exercise and or resistance training.

Governments

Due to the related healthcare costs, it is of great interest to governmental organisations to keep older adults as healthy as possible for as long as possible. One of the tools used by the Dutch government are the physical activity guidelines. One will only change their behaviour if they perceive a threat in their current behaviour and see a potential benefit in changing their behaviour. Awareness is an important first step to bring about a potential change in behaviour (Middelkamp et al., 2017). Governmental guidelines can increase the knowledge and awareness of potential health risks and therefore form an important first step to changing health behaviour. Chao et al., (2000) bring forward that it is of great importance to keep the recommendations clear and easy to understand for older adults.

6. Interview results

6.1 IT quadrant: objective aspects on the individual level

Types of activities for older adults

The interviewees often made the distinction between aerobic types of training and strength training. Older adults tend to focus more on aerobic types of training when they exercise on their own initiative in a fitness centre. Getting them to participate in strength training often requires effort from the personnel in the fitness centre. Emphasizing the added benefits of strength training and explaining the equipment were mentioned as tools to get older adults to also participate in strength training. All interviewed fitness centres made sure that when older adults visit the fitness centre for the first time, they are guided by an employee. This is done on the individual level or in small groups. After these first sessions, older adults are still monitored closely.

Functional exercises revolving around joint health, flexibility and balance were commonly mentioned to be important. Often these types of exercises are incorporated in the specific group lessons focussed on older adults. Two interviewees brought forward that they see heart rate as an important measure of safety and as a method to guide the intensity of exercise. Older adults often start having heart problems. Monitoring heart rate can prevent them from putting too much strain on the cardiovascular system. One of the fitness centres mentioned that he used to equip everyone above the age of forty with a heart rate monitor. Each year he managed to identify several cases of heart arrhythmia.

Four interviewees brought forward their concern about the effectiveness of the activities some older adults undertake in a fitness centre. Finding the balance between having a fun time exercising and still moving at the right intensities to stimulate a physical response is viewed as challenging. This is nicely illustrated by the following quote:

'When you see some of them [older adults] *move, you wonder if it will have any effect. But you also can't put too much pressure on them, because then they will quit. You have to find the right middle ground between keeping them here and making them exercise in a way that leads to health benefits. That is hard to do.'* -Owner fitness centre

One of the interviewees brought forward that even though some of the older adults do not exercise in the most effective way, they still cycle to the centre and have a fun time while being there. Since these also bring about health benefits, he is not too concerned with constantly pushing them to high intensities during their workouts.

6.2 I quadrant: subjective aspects on the individual level

Health as motivator and barrier

Health was by far mentioned the most as motivator for older adults to exercise in a fitness centre. One of the interviewees cited Arthur Schopenhauer's (German philosopher, 1788-1860) phrase *'Health is not everything, but without health, everything is nothing'*. This realisation often comes about when older adults are faced with health problems. These health problems make them realise that they should undertake some actions if they wish to grow old in a pleasant way. The interviewees mentioned inducements such as having undergone an operation, having visited a physiotherapist and not having the balance to get dressed. There is also a group that has always led an active lifestyle and is maintaining their exercise behaviour. For both groups, health is a major motivator, but the ones

who have not been active in the past often need a physical health trigger to start changing their exercise behaviour.

When people feel that their health has increased due to exercising, this is a major stimulus to maintain their exercise behaviour. One of the fitness centres gave an example of diabetic patients losing weight and even getting rid of their medication. Older adults often measure progress in a very practical way, such as having less problems walking up the stair.

The respondents voiced that degradations of health are a barrier for older adults to engage in physical exercise. A portion of older adults believe that when they have aches or pains, it is best to steer clear of physical exercise. Some interviewees saw this as an inheritance of the old healthcare approach in which rest was often seen as the remedy instead of exercising in a suitable way. Whereas exercise nowadays is more often prescribed, the overall idea of the importance of rest still prevails in the mind of a portion of older adults. Health is also mentioned as a major reason to stop exercising at a fitness centre. Mentioned health problems were death, dizziness due to blood pressure problems and having undergone a major operation.

Health knowledge

Overall, the interviewees believed that older adults have a general idea that exercising leads to both physical and mental health benefits. Though, this knowledge is rather superficial. They for example do not know the effects it has on specific health parameters or on day to day activities. The knowledge regarding the added benefits of strength training is even more limited. Several interviewees voiced that increasing this knowledge might lead to more older adults being motivated to start and keep on exercising. Respondents do bring forward that this lack of knowledge applies to the entire population, not just older adults.

The interviewees thought that the old guideline of thirty minutes of physical activity per day is well known among the older adult population. The new guidelines, especially the inclusion of resistance training, are not yet known. One fitness centre representative told that not a single older adult had mentioned or informed about the new guidelines since the introduction (introduction was 9 months prior to the interview).

The older adult advisor of Kenniscentrum Sport (Knowledge Centre for Sport Netherlands) brought forward an interesting note regarding the effect health knowledge has on the actions taken when older adults are presented with health problems. When faced with knee pains, person A might stop exercising, whereas person B might start doing specific exercises to try and strengthen their knee joint. Health knowledge influences which approach is chosen. This knowledge can either be present within the older adults or be derived from other parties such as a general practitioner or physiotherapist.

Costs

All respondents were asked about the role costs play in the decision to exercise at a fitness centre. The overall consensus was that costs are not an important motivator or barrier for most older adults. Respondents mentioned that most older adults are easily able to pay for a membership and often have more monetary funds than younger age groups. One of the fitness centres recently raised his monthly membership fee by almost 15 per cent. He mentioned he did lose some younger members, but not a single older adult. One respondent mentioned that theoretically two older adults can exercise on the same membership in a budgetclub for around 20 euros per month. Therefore, if they want to, there is a fitness membership for every budget. There was also a call that people should not complain about investing some money in their health. One of the respondents illustrated this with

the following quote: *'People spend such ridiculous amounts of money on all kinds of things they do not need. Then why would it be a problem to invest 40 euros in your health each month.'*

6.3 WE quadrant: subjective aspects on the group level

Social aspect

The social aspect was viewed as either equally important to the physical health aspect or was viewed as the second most important aspect for older adults to exercise in a fitness centre. The regional advisor of NL Actief said the following:

"Older adults derive much joy from meeting others in a group setting and exercising together. Whether that is by means of walk and talk or some form of exercise, it doesn't really matter. As long as they are doing something. So, the combination of exercising and being together."

Older adults tend to stick to the same times at which they exercise. As a result, the same older adults often run into each other. Respondents brought forward that with increased age, loneliness is a prevalent problem. Older adults often lose people in their environment and are able to do less activities. Therefore, their world becomes smaller with increased age. The fitness centres said that the older adults became good friends over time. They would start undertaking activities together and support each other in rough times. Fitness centres mentioned that members would visit each other when they were sick, go to funerals together and motivate each other to keep on exercising.

The older adults advisor of Kenniscentrum sport said that a portion of older adults is just not too concerned with their health and will also not engage in physical exercise for that reason. They have a completely different view regarding physical exercise and will only engage in it if they enjoy it. For that particular group, the social aspect is a much more powerful trigger to start exercising than the health benefits.

Way of communication

Respondents brought forward that older adults attach a lot of value to the way they are approached in comparison to other age groups. They like to get personal attention, be addressed in a formal way and appreciate little gestures. Being attentive by remembering their names, how they like their coffee and stories they have told is highly appreciated. Also, simply talking to them about topics that are not related to fitness is valued by older adults.

Attitude of older adults towards fitness

Respondents shared the view that the image of fitness has greatly improved during the last years. This is mainly attributed to a higher focus on health and movement instead of just cosmetic goals. Also, fitness has been around for a long time and became really regular during the past years. Therefore, many older adults have already visited a fitness centre in the past or at least know people who regularly visit a fitness centre. They also see fitness in magazines, newspapers and on TV. As a result, older adults start regarding fitness as a normal activity to undertake.

One of the experts stated that he has always found it peculiar that fitness was supposed to be surrounded by such a bad stigma. If the stigma was really that bad, how could fitness still reach such staggering membership rates. He said that the negative image is mostly portrayed by the media, but that people value the reference of someone close to them far more. If a friend recommends a centre, they will still go, regardless of what the media says. Another expert called fitness *'the laughing stock with the highest rates of participation'*. Even if fitness is said to have a bad image by some, apparently it does not scare away the overall population.

However, respondents mentioned some concerns that specifically apply to older adults. Older adults often think that they will be the only old or unfit person in a fitness centre. The only solution respondents saw to overcome these beliefs is for older adults to simply visit the centre. Once they visit the centre these prejudices are taken away. Furthermore, a point regarding older adults of old age (e.g. over 70) was mentioned. They led a life in which exercising was not a regular activity. Life was spent working and taking care of the children. They might have to overcome a barrier in which they start to see physical exercise as an 'okay thing to do' and also of great benefit.

Other user groups

A fitness centre houses different groups of users in terms of age and interest (e.g. bodybuilding, powerlifting, fight sports, recreational fitness). A slight majority of respondents preferably saw a separation between different groups of users, due to their different needs and attitudes. Two of the fitness centres experienced that different groups of users in their fitness centre didn't match and therefore separated them. One of the fitness centres used to have a combined boxing gym and fitness centre. He now split up the two, within the same building. Both have their own entrance, dressing rooms and equipment. He mentioned that having a twenty-year-old who had just finished sparring in the same canteen as a 70-year-old who was about to start his group lesson just didn't match.

Another centre used to be in one location but opened several new locations under the same name. Within each of the centres they deliberately chose a focus groups and redirect potential members to the centre that best suits their needs. The regional advisor of NL Actief mentioned a fitness centre which had all fighting activities on the second floor and during evening hours, whereas the rest of the centre was more focused towards regular members.

The sales manager of Matrix said that he always advises fitness centres to choose a certain group of clients instead of trying to house them all. Housing all groups only works in locations where there is little competition. As soon as there are more centres, groups will often start visiting the centre that best suits their needs. An overall centre does not particularly suit the needs of any group and might therefore start seeing a decline in memberships. He nicely summarised this with the phrase: *'Choose to be chosen'.*

Two other centres did not see any major problems with housing different groups. One of the owners said that he simply kicked out those who posed a problem. The other centre mentioned that the times at which different groups visited the centre made for a natural spread. Also, they had different rooms within the centre aimed at different groups. One of the other experts mentioned that some older adults also like to exercise together with younger participants. It motivates them, reminds them of their children and of when they were young. On the contrary, another expert brought forward that it can be highly frustrating for older adults to constantly see younger members running around and doing things that they are no longer able to do.

6.4 ITS: objective aspects on the group level

Hardware

Equipment

When discussing equipment, several key features came up, for example the user-friendliness and safety of the equipment. When entering a fitness centre, members are faced with tons of equipment. If every piece of equipment is also accompanied with multiple procedures needed before it can be operated, this can feel very overwhelming. Some older adults have a hard time or little interest in understanding how to adjust the equipment to their needs. This can partially be undermined by properly explaining the machines and having written instructions. Still, it is important to keep the amount of procedures required to use a machine to a minimum. One of the fitness centres explained his choice of equipment with the following quote:

"That's why I have this brand of machines. I did that for the older members. You don't have to adjust anything. Often, they are just blabbing away and sometimes even forget to change the weights. With these machines, they can't really do anything wrong."

Attention was also paid to the allure of the equipment. Older adults are less interested in free weights and more in machines and cardio equipment. Also, several respondents pointed out to choose subtle colours. These bore less quickly and the clothing of people in the fitness centre already provides plenty of colour.

The sales manager of Matrix mentioned that the weights of machines have to be incrementally adjustable (e.g. weight increases of 1.25kg instead of 5kg). Cardio equipment should start at a very low pace, have a low point of access and preferably is equipped with a heart rate monitor. For people with visual impairments, it is important to highlight adjustable parts by bright colours and have treadmills with bright stripes at the side of the belt. One of the fitness centres also mentioned he positioned the machines in a way that others could not see how much weight a person is using.

Several interviewees saw a big potential for high-tech circuit training (e.g. Milon and eGym). These types of equipment only have to be set the first time an older adult uses them. The settings will be saved for the individual and the machine automatically adjusts to the right settings, the next time the member inserts his or her key. Furthermore, they systematically analyse data and adjust training programs and intensity accordingly. These machines are therefore always set to the individual and make everyone train at the right intensity, rest intervals etc.

Aspects inside of the fitness centre

Respondents brought forward several physical aspects in the interior, which influence the atmosphere and perceived quality of the centre and its services. The entrance should be easily identifiable and preferably have see-through glass with a clear view of the front desk. The interior of the centre should be clean and well taken care of. Eliminating doorsteps, installing grab and evading long hallways between the dressing rooms and exercise areas were also mentioned as important physical aspects for older adults. The sales manager of Matrix brought forward that when he visits a fitness centre, he always pays attention to what he sees, smells, hears and feels and uses these to evaluate the interior of the centre.

Due to the major importance of the social aspect, proper facilities for older adults to engage with each other around training are needed. An inviting coffee corner seems to be key. The regional advisor of NL Actief said that the coffee corner has to *'feel like an extension of their living room. A place where they can read the newspaper, drink coffee and meet their friends'.* Mentioned aspects to

achieve this were having a bar, several tables with comfortable chairs and most importantly good coffee and tea.

Music

The volume and type of music was mentioned by all respondents as very important. Taste in music differs and you can't please all members. The most important thing is to find a type and volume of music that is acceptable to all who are present in the fitness centre at that time. Noticing who is present and estimating what music they like takes a certain feeling. Most interviewees believed that older adults have an overall preference for music from the 70's and 80's and do not like more aggressive and house types of music. Therefore, at times when mostly older adults are present it is probably best to play less aggressive music at a reduced volume, especially since most older adults do not bring headphones with their own music to the fitness centre. One fitness centre also mentioned having free earplugs for those who find the music in group lessons too loud.

Aspects outside of the fitness centre

Location was seen as the most important aspect for a fitness centre to be successful by some of the respondents. One of the other experts portrayed this with the following quote:

"I think that factor number one, for all fitness centres is location. Did you position your club at the right location? You can design your club in the best way imaginable, but if your location is wrong, older adults won't come to you."

The gross part of members, especially less mobile older adults, will live in close proximity to the fitness centre. Therefore, it is incredibly important to take demographics into account when choosing a location or considering a change in focus group. All interviewed fitness centres were located in neighbourhoods with a relatively high amount of older adults or had limited direct competition in close proximity.

Having parking facilities was also mentioned as important for the reachability of the venue. Outside of the fitness centre one should take care of the basics, such as an attractive appearance and making sure the pathways are ice and snow free in winter. Positioning yourself in an industrial area might form a barrier, specifically for women, to visit the centre during evening hours.

Software

Offered activities

The offered activities in a fitness centre should match the population it is trying to serve. Respondents brought forward that older adults like to exercise in a group setting. Within groups the social aspect often becomes a major motivator, resulting in high adherence rates. Women tend to have more preference for group lessons than men. Respondents attributed this to the feminine image of group lessons. Lots of lessons revolve around some form of movement to music, which is associated with dancing. Respondents mentioned that men are a little more susceptible to the competitive aspect, though, no particular successful ways to attract men for certain group lessons were mentioned.

Since the social aspect of physical exercise is viewed as very important by older adults, community building can be a powerful tool to retain current members and also to attract new members. These activities do not have to be related to fitness or exercising. Respondents named organising card game evenings, high-tea's and walking groups.

Personnel

Having the right personnel was viewed as very important by all respondents. They are the ones ensuring a safe environment, guiding the older adults and are great contributors to the atmosphere and social environment of the fitness centre. Being open, easy to talk to, well-mannered and joyful were mentioned as the main aspects that were looked for in potential employees. These qualities were more valued than the level of knowledge regarding fitness. Respondents mentioned that they can learn them 'the trick of being a fitness instructor' but that it is much harder to mould them into social employees.

Having employees of older age was also preferred when they work with older adults. Older adults have specific topics they like to talk about (e.g. grand children, vacations, pension, illness and death), have a specific type of humour and like to be approached in a certain way. The difference between a twenty-year-old and an older adult was seen as too big in most cases. Several of the fitness centres had group instructors or front desk employees above the age of 55. One of the centres mentioned that he always tells his instructors to scout for new employees among their members. If they notice a member that is always enthusiastic and very social they will ask them if they would be interested to work for the centre. If they are interested they will be sent to all kinds of classes to learn more about being a fitness instructor.

There was also an overall belief that the Dutch educations delivering most fitness instructors do not really suit the needs of a market for older adults. Specific knowledge regarding the physical state and proper guidance of older adults is almost absent in students from these educations. Also, the ability to be a good host is often lacking, whereas this is viewed as very important by the experts. It even goes thus far that several interviewees said they preferably hire someone from for example hotel management than someone coming from a more sport-oriented education.

Using members as a resource

Interviewees brought forward that members themselves can also be used as a resource. If older adults are satisfied with the fitness centre they are willing to help in all sorts of ways. They can be asked to invite others to try out the fitness centre. A fitness centre also mentioned that one of their members organises walking groups starting and ending in the fitness centre. In return he receives a free membership. Another expert mentioned that it is important to always stimulate conversations with and among members. Members have knowledge in all kinds of fields, which can prove incredibly resourceful. They might for example have good connections with the municipality, have knowledge on how to install a new floor etc. Respondents also brought forward that the wishes of older adults should be monitored among the members. Just ask them frequently what they like and what they dislike.

Communication

Several respondents brought forward that apart from implementing important aspects to make your fitness centre suitable for older adults, it is also important to explicitly communicate this to the outside world. Communication can be used to reduce barriers by for example using images of older adults in your advertisements or posting about the new air refreshers that have just been installed. A problem occurs when finding a term to address older adults. In the experience of respondents, they do not wish to be called elderly and are not particularly attracted to for example group lessons labelled as 55+. No true suitable term was found by the respondents, but they did mention that using terms as health and vitality were more successful when addressing older adults than terms such as fitness and strength.

Individualising between older adults

Different people prefer a different approach and have different physical capabilities, it is important to keep these differences in mind. Two experts mentioned they used analytical tools to determine what 'kind of person' a member is and how they most likely prefer to be approached and guided. One used the personality types of Carl Jung, whereas the other used the DISC personality system. One member might prefer to be left alone during his or her workout, whereas another might wish to constantly receive advise and help.

Volume, intensity and types of movements also have to be individualised. Within for example a group lesson, there should always be some variances available. Whereas one adult might do full push-ups, another person can do them while resting on the knees and a third person can do push-ups against the wall. The same goes for weight selection if equipment is used.

Two fitness centres described how the personnel each had their own group of older adults. The personnel was expected to be aware of all physical capabilities of the adults in their groups, establish good relationships with them and give them a call if they didn't show up. This enabled the centres to work in a very individualised way where there was plenty of opportunity to give all adults the attention they needed.

Health knowledge education

Health knowledge, especially regarding resistance training, is limited among older adults. Having increased knowledge of the physical and mental health benefits of resistance training can be a major motivator and also lead to better results. Therefore, educating older adults might be a useful tool to increase adherence. The interviewed fitness centres mentioned they mainly did this in an informal setting, through little chats with older adults before, during or after their workouts. Two interviewees also mentioned the possibility of organising lecture-like events, in which older adults would be informed about a specific topic.

Interviewees urge that the information provision should not limit itself to just exercising but should also include information about proper nutrition and sleep. Combining the three is what leads to great results, just focussing on one will lead to limited results. Furthermore, one respondent mentioned that older adults are often also interested in mindfulness and stress-relief.

Orgware

Collaboration with other parties

The collaboration with other parties is viewed as challenging but potentially fruitful by all experts. Successful collaborations can enable fitness centres to provide better services to their members and lead to potential increases in revenue. Furthermore, general practitioners [GPs], physiotherapists and insurance companies are viewed as health experts by older adults. If one of these parties collaborates with a fitness centre, this gives a certain trust among older adults that a fitness centre is a legitimate place to work on one's health with quality guidance. Thereby, health experts can give legitimacy to the product of fitness.

The most discussed parties were physiotherapists, municipalities and GPs. These will be discussed separately.

Physiotherapists

Physiotherapists seem to be the group with which collaborations form rather organically. All successful fitness centres had at least one physiotherapist within their centre. In most cases the physiotherapists rent a space within the fitness centre and use the facilities of the fitness centres

when treating clients. The collaboration is fruitful for both parties. The physiotherapist has equipment to train his clients and the centre has someone who can treat their clients when physical problems occur. A physiotherapist often also treats patients that are not a member of the fitness centre. These will be familiarised with the fitness centre and the physiotherapist can advise them to keep on exercising in the fitness centre after the treatments are finished. Furthermore, having a physiotherapist within the fitness centre offers a feeling of safety for older adults. In case something goes wrong, they seem to have more trust in a physiotherapist to help them than in an employee of a fitness centre.

Municipalities

The collaboration with municipalities is seen as wishful but hard to establish by most experts. Three major reasons were mentioned for this rough path to successful collaborations. First, municipalities and fitness centres operate at a different pace. Fitness centres often have an idea and want to execute this as soon as possible, whereas municipal decision-making often takes a long time. This difference in pace can create tensions and frustrations. Secondly, municipalities do not have full confidence in the quality of guidance that is provided by fitness centres and therefore do not contact them when creating plans to increase the physical activity of older adults. Thirdly, municipalities often see fitness centres as a commercial party with sufficient resources. As a result, they often expect services to be provided for free and receiving funds is hard.

From the view of fitness centres, it is key to have a pro-active approach. The municipality will not come to the fitness centre looking for help but has to be actively convinced that the fitness centre is offering quality services. Fitness centres who established successful collaborations with municipalities emphasize that it is important to not just think about the immediate commercial benefits of collaboration. Building this relationship is a long-term project which takes a lot of time and effort. One of the fitness centres had lots of collaborations with the municipality. The owner mentioned that he worked on establishing a personal relationship with the alderman of sports in his municipality. Furthermore, the centre is contributing to everything sport related within the municipality. When swimming lessons for elderly are organised, they send one of their instructors to give an aquarobics class, they offer sporting lessons for schools, are present at conferences for older adults etc. Contributing to all these projects does not immediately result in extra income, but it does send a message that the centre is willing to collaborate. Furthermore, it ingrains your fitness centre as a potential partner to contact in future projects or collaborations. Lastly, older adults participating in these external events are familiarised with the centre and personnel which might result in them visiting the centre and getting a membership. Respondents mentioned that over time they were increasingly invited for meetings by the municipality and contacted to explore options for collaboration.

Respondents also mentioned changes that can be made in the attitude of municipalities. Experts voiced their annoyance that fitness centres are often expected to provide services for free, while non-commercial sporting clubs receive funding. Also, they often get the feeling that municipalities view them as a purely commercial organisation that is just trying to maximise profit. This is sometimes viewed as offensive, since some fitness centres truly want to help the older adult population and are not just concerned with profits.

General practitioners

Collaborations with GPs varied between centres. There is a great potential for GPs to advise older adults to start exercising at a fitness centre. Though, according to the respondents this barely occurs. The explanation for this can be sought in both parties. GPs are not schooled in having extensive knowledge of the effects exercise has on health. They have a general idea but increasing this

knowledge might lead to them increasingly promoting physical activity. Furthermore, they might have a limited idea of what a fitness centre has to offer and how they can help older adults.

The role of fitness centres is to offer quality guidance to older adults and convincing the GPs that they do so. If a general practitioner does not have the feeling that his patients can safely train in a fitness centre, he will surely not advise them to go there. Convincing them, again, takes a pro-active approach. It is important to familiarise the GP's with the fitness centres. This can be done by simply inviting them to visit the centre or ask them if you can place a flyer in their waiting room. One of the fitness centres told that the GP's always have their meetings in his fitness centre. He simply provides them with coffee and a meeting room. Due to this, they are familiarised with the centre and some of them even started exercising in the centre themselves. As a result, they send many of their patients to the fitness centre.

Other parties

Health insurances were mentioned by some respondents as potentially interesting allies. Promoting physical activity by for example reducing fees for those who regularly visit a fitness centre could be a powerful tool. If health insurances actively promote fitness, this further contributes to the legitimacy of fitness as a tool towards better health. One of the respondents brought forward that in Germany, health insurers are connected to fitness centres and provide for example lessons focusing on back pain. During the early 2000's a Dutch insurance company even had their own fitness centres. After a couple of years, they stopped and currently there are hardly any collaborations between fitness centres and insurance companies.

The overall view of respondents regarding higher governmental organisations is that they are too far away from the everyday practice of fitness centres. The governmental organisations voice an interest in increasing the overall health of the Dutch population, but the experts do not see a practical way to directly connect this to fitness centres at this stage.

One of the fitness centres brought forward that they purposely joined a local social club to increase their contacts within the local community of their fitness centre. They themselves do not live where their fitness centre is located and saw this local club as a way to get acquainted with local older adults and other organisations.

The older adult advisor of Kenniscentrum Sport brought forward an interesting case of a local pharmacy in The Hague. The pharmacy actively informed clients about the importance of physical exercise and available exercise programs. She also drew the comparison with regular sporting clubs. In The Netherlands these are encouraged to have an 'open-club'; meaning that clubs allow for example walking groups to meet each other at their football field and also drink some coffee afterwards. Fitness centres can also apply a more open approach to other parties. This will ingrain the centre in the minds of people, which possibly results in more memberships and collaborations.

Summary of the results

The most important aspects for older adults to participate in resistance training are displayed in Figure 9, subdivided among the I, It and We quadrant. The It's quadrant is discussed in Figure 10. Orange aspects came forward in the interviews, light blue aspects in the literature and green aspects in both. Physical health, costs and time investment are objectively measurable criteria, but their importance and effect depends on the subjective interpretation of the individual. Therefore, these aspects have been placed in between the subjective and objective quadrant. Physical health, mental health and the social aspect were identified as the three most important aspects and are therefore displayed in a larger font.

The I, It and We quadrant focus on aspects that are important for older adults and thereby answer the sub research questions. To answer the main research question, these wishes have to be translated in clear characteristics that can be applied by fitness centres. This is done in the It's quadrant, which is displayed in Figure 10. The Figure summarises the results of both the literature and interviews. One big prerequisite was identified. The location of a fitness centre should have a sufficient amount of older adults in its close proximity. If this prerequisite is fulfilled, there are several characteristics in the hardware, software and orgware that are important to apply.

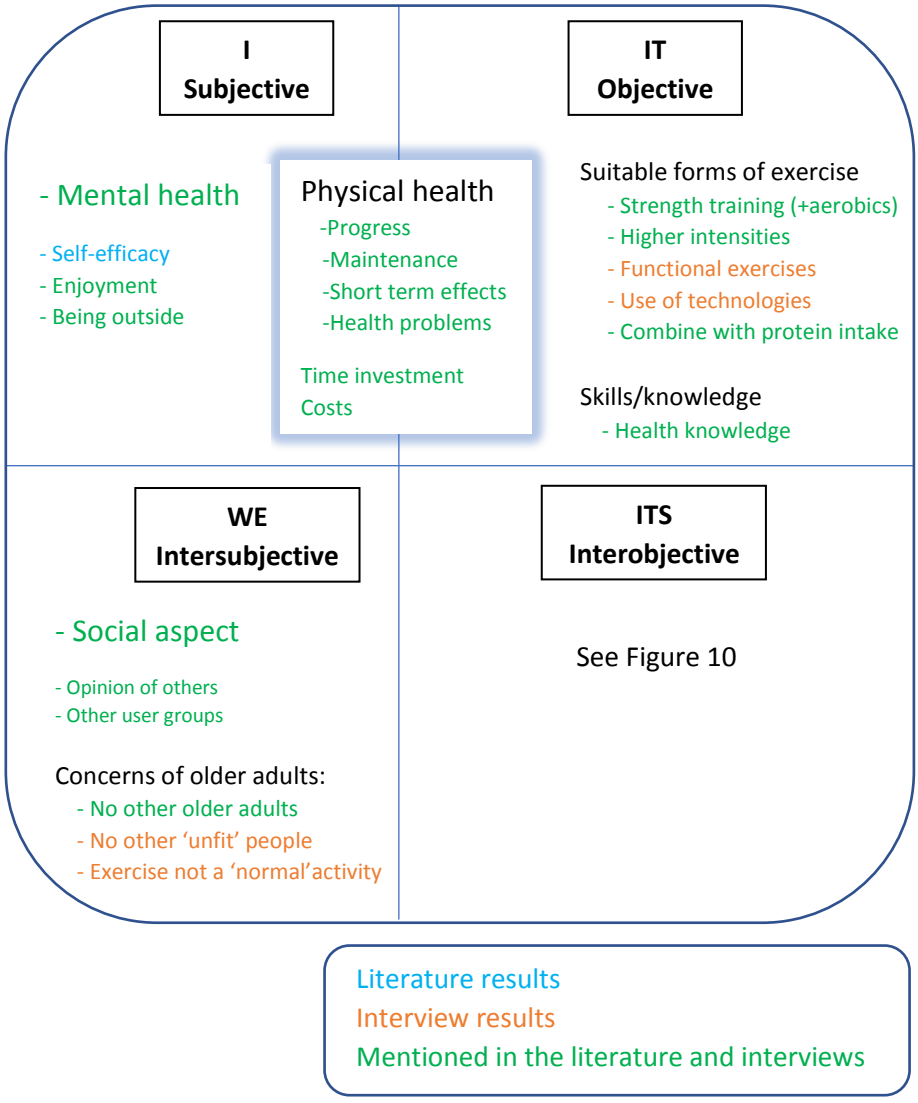

Figure 9: Important aspects for older adults to participate in resistance training

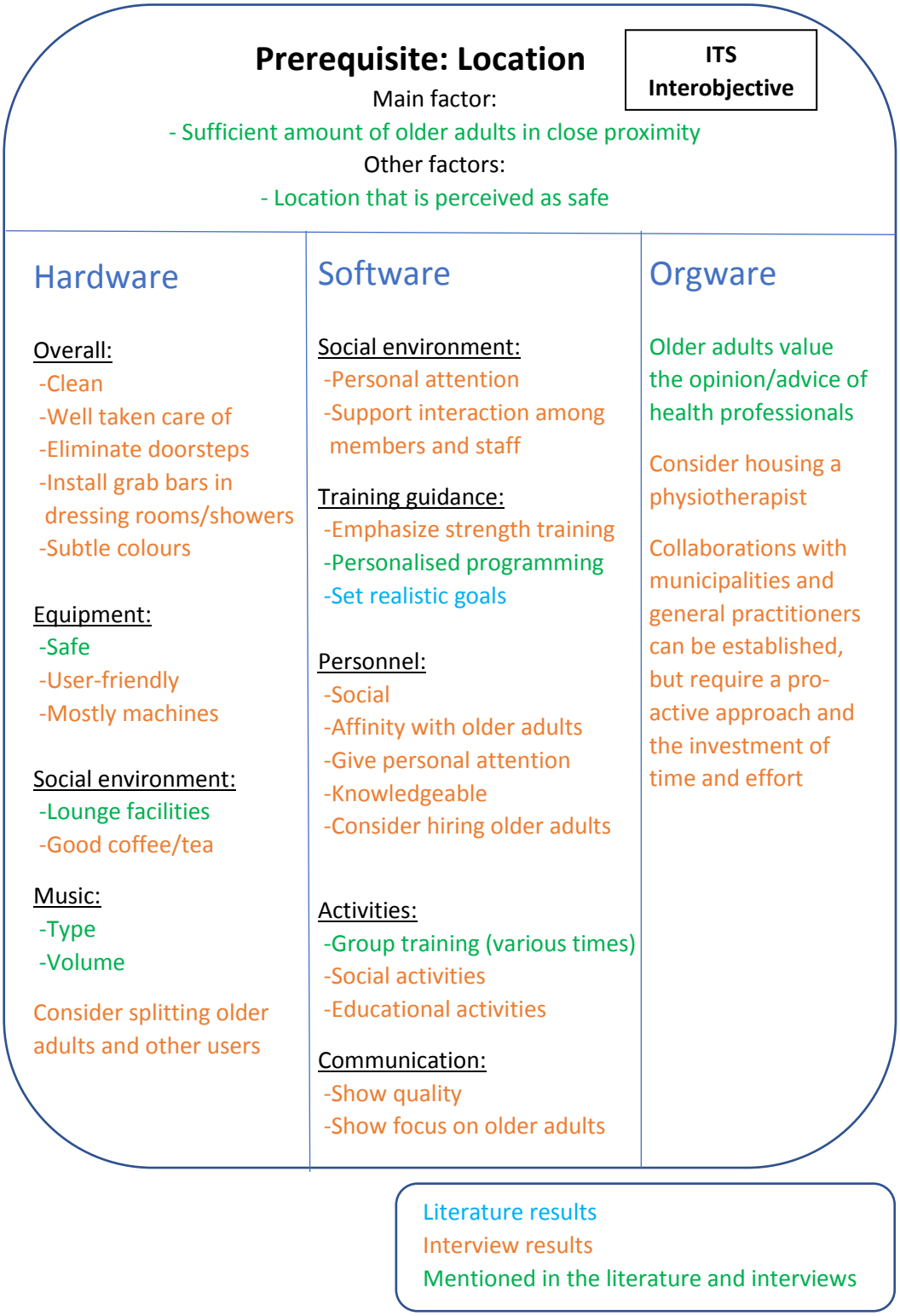

Figure 10: Important characteristics to apply for fitness centres looking to serve the adult population over the age of 55.

7. Discussion

After presenting the results of this study, these will now be discussed. Also, strengths and weaknesses will be highlighted and recommendations for future research will be given.

The aim of this research was to identify important aspects for older adults to participate in resistance training and translate these into recommendations for fitness centres that wish to serve the adult population over the age of 55. The results show that to truly serve older adults, the hardware, software and orgware of the centre has to be aligned with the aspects older adults find important to engage in resistance training. This is in accordance with the aim of the Dutch ministry of Health, Welfare and Sports (VWS) to create movement friendly environments by applying the hardware, software and orgware model (Hoyng, 2017b).

The most important aspects for older adults to engage in resistance training are summarised in Figure 9. Findings from the interviews mostly confirmed findings from the literature. The physical health benefits, mental health benefits and social aspect of exercising are the major reasons for older adults to engage in resistance training (Burton et al., 2017a; Burton et al., 2017b; Lübcke, Martin & Hellstrom, 2014). Physical health goals of older adults are often related to day-to-day activities (Lübcke, Martin & Hellstrom, 2012; Burton et al., 2017a). Barriers are found in physical health problems (Burton et al., 2017a) and short term physical effects of exercising such as sweating (Schutzer & Graves, 2004; Chao, Foy & Farmer, 2000). Furthermore, some older adults feel reluctant to visit a centre due to the belief that they will be the only old or unfit person there (Rydeskog, Frändin & Hansson Sherman, 2005; Lübcke, Martin & Hellstrom, 2012).

Still, some differences can be noted between the literature and interviews. Increased mental health was strongly emphasized in the literature as an important reason and motivator to engage in resistance training (Battaglia et al., 2016; Burton et al., 2017a, Burton et al., 2017b), but was sparingly mentioned in the interviews. Though, the importance of battling loneliness and importance of giving older adults something to do was more often emphasized in the interviews. Self-efficacy was only mentioned once in the interviews, but this is likely a consequence of self-efficacy being a rather abstract, scientific term. Collaborations with other parties such as physiotherapists, municipalities and general practitioners are hardly mentioned in the literature, whereas the interviewees had lots of input regarding this topic.

Figure 10 presents the most important characteristics for fitness centres to apply if they wish to focus on older adults. Most of the aspects were absent in the literature and were only mentioned during the interviews. Choosing a location with a sufficient amount of older adults in the direct proximity was found to be a pre-requisite to be successful. This is in accordance with the research of Chaigneau (2016) in which demographics were also the most important locational aspect to consider for fitness centres in their choice of location. The physical environment and equipment should be suitable for older adults and facilitate social interactions. A clear common approach of the successful fitness centres was that they all put major emphasize on creating a social environment. Although there is no comparison with fitness centres that do not have many older adults, emphasizing the social environment might be key to the success of these fitness centres. Collaborations with physiotherapists are advised. Collaborations with other parties are sparingly established, but seen as potentially fruitful.

Interesting is the view of several interviewees that having different user groups within the same fitness centre is not ideal and that focussing on one group instead of all is the preferred approach. Although some studies mention that older adults may feel discomfort when exercising in the same

room as other user groups (e.g. Lübcke, Martin & Hellstrom, 2012), none explicitly said to physically split the groups. Also, the need to strongly emphasize the importance of weight training due to the tendency of older adults to mainly engage in aerobic exercises of moderate intensities is not explicitly mentioned in the existing literature. Lastly, the interviewees mentioned that the new national physical activity guidelines are hardly known among older adults and require active promotion.

Whereas there was much overlap between the literature and interviews regarding the aspects that older adults find important to participate in resistance training (Figure 9), there was little overlap in the characteristics for fitness centres to apply to be suitable for older adults (Figure 10). Apart from music (Schutzer & Graves, 2004), accessible machines (Martin & Hellstrom, 2012), a preference for group training (McNeill, Kreuter & Subramanian., 2006; Ooms, Hiemstra & Kalkman, 2016; Lübcke, Martin & Hellstrom, 2012), individualised programming (Ooms, Hiemstra & Kalkman, 2016) and a designated area to have a drink (Ooms, Hiemstra & Kalkman 2016), the identified characteristics of this study were not mentioned in the literature. This seems to indicate that the scientific literature has managed to map the aspects older adults find important but fails to make the practical translation to characteristics of fitness centres that can be applied to serve these needs.

Strengths and weaknesses

Several strengths of this research can be identified. All interviewed fitness centres were truly successful in attracting the older age group and thereby provided excellent inputs of best practice; making this the first best practice research focussed on older adults and fitness centres. The interviewed 'other' experts all had excessive experience in either the fitness market or exercise behaviour of older adults. Their experiences gave extensive inputs, derived from their specific backgrounds. Combining interviews with representatives of fitness centres and 'other' experts therefore resulted in more complete data and insights.

Another strength can be found in the use of the integral model (Wilber, 2000). The integral model is an excellent tool to explore a new field of study and was not previously applied to the topic of fitness centres. A good overview has been obtained by mapping the important aspects for older adults to engage in resistance training in the integral map. Translating these aspects into clear characteristics of fitness centres, gives this research a strong practical application which is missing in the existing literature. Using the hardware, software and orgware model provided a clear structure to the recommendations. The characteristics presented in Figure 10 can be used by fitness centres who wish to serve the older adult population. If these characteristics are applied, centres will become more appealing for older adults and thereby more older adults might start to exercise in a fitness centre.

The use of the integral model also had negative consequences. Trying to map all important aspects inevitably leads to a broad overview in which individual aspects are not investigated to great depths. Furthermore, it is often debatable to which quadrant of the integral model certain aspects belong. Deciding how to differentiate between quadrants proved hard. Explaining these choices within the text proved challenging and reduced the overall readability of the document.

Another weak point can be found in the literature review. Due to the multiple methods applied in this research, the literature review was not conducted in a systematic way. Therefore, it is possible that some aspects were overlooked.

It should be realised that all interviewed fitness centres had existed for more than fifteen years, were located in medium sized municipalities and lacked big competitors in their close proximity. Although

not mentioned in the literature or by the interviewees, other aspects might become important when located in bigger cities, in places with an increased level of competition or when starting a completely new centre.

Recommendations for future research

Overall, there is not a lot of research regarding older adults and exercising in a fitness centre, especially in the domain of social sciences. As Schutzer & Graves (2004) mentioned, older adults experience specific (age related) barriers and motivators regarding physical exercise participation. Some studies have been done regarding these motivators and barriers (e.g. Burton et al., Baert et al., 2011), but information is for example missing about the reasons why older adults stop exercising in fitness centres. Mapping attendance behaviour of older adults could be a first step. At this stage we do not have detailed data on how often older members visit a fitness centre and how long they maintain their exercise behaviour. After mapping these behaviours, further studies could investigate the reasons older adults stopped participating.

Follow-up studies of older adults exercising in fitness centres are also absent. The literature and interviews have brought forward that wishes of older adults change due to increased age and that cohort effects might be of influence (Brougham and Walsh, 2014). Current research often studies the entire range of adults over the age of 65 or 55. Further differentiating within this group would provide better insights in the wishes differently aged older adults have regarding exercising. Also, the physical state and life events of older adults influence their wishes regarding exercise. Following older adults for a longer period of time could learn us a lot about the effect certain life events have on their exercise behaviour and wishes. These insights could enable us to better suit the needs of older adults regarding exercise participation.

Collaborations between fitness centres and for example municipalities, general practitioners and insurance companies can be fruitful, but have not been investigated. During the interviews, several fitness centres were mentioned that had succeeded in establishing these collaborations. Though, these are incidental cases. A best practice research could be designed, focussing on the approach and processes these fitness centres have applied to establish these relationships.

In physical sciences, some general guidelines are identified regarding the most suitable frequencies and intensities of aerobic exercises and strength training for older adults (e.g. Hunter, McCarthy & Bamman, 2004; Picorelli et al., 2014; Gezondheidsraad, 2017a). Though, the recommendations are broad and not taking the heterogeneity of the age group into account. As Chao et al., (2000) urge, it is important to have clear and easily understandable guidelines for older adults. Future research could focus on the most beneficial exercises, intensities, volume and durations of exercise for older adults, preferably further differentiating on age between for example 55 and 70 year olds. With these insights, clear guidelines should be established, which are more easily communicable to older adults.

8. Conclusion

Older adults are encouraged by the Health Council of the Netherlands [Gezondheidsraad] to engage in resistance training because of the numerous health benefits resistance training entails for this age group. To do so, suitable environments have to be available to them, specifically adapted to their needs. Older adults are highly motivated by the physical health benefits, mental health benefits and the social aspect of engaging in resistance training. The time investment to engage in training should, however, be limited. Some feel reluctant to enter a centre for the first time because of the concern that they will be the only older adults or only unfit person. The opinion of relevant others and seeing other older adults exercise can play an encouraging role.

For a fitness centre to successfully focus on older adults, the location has to have a sufficient number of older adults in its close proximity. The characteristics of the fitness centre have to be in line with the wishes of older adults. Of major importance is the creation of a social environment. Also, the equipment, music, activities and personnel has to suit the age group. The knowledge of resistance training and its health benefits is often limited among older age groups, which calls for active education and encouragement from the staff in the fitness centre. Housing all different age groups in one fitness centre is challenging. If the opportunity arises, it is worth considering to specifically focus on one group instead of all. Older adults value the opinion of health professionals. Housing a physiotherapist gives them a feeling of safety. Collaborations with municipalities and general practitioners can be established in the long run but require a pro-active approach.

This study has provided the first insights regarding suitable fitness centres for adults over the age of 55. Suitable fitness centres can be created and offer potential for being the structural solution to getting older adults to engage in resistance training. Though, more insights are needed about the social side of fitness centres, attendance behaviour of older adults, how wishes regarding exercise change due to life events and increased age. Furthermore, the current movement norms are unknown among older adults, should be made more concrete and should be actively promoted. Strengths of this research are found in the interviewed experts and provision of a clear, applicable overview of important aspects for fitness centres to apply if they wish to serve the older adult population. Weaknesses are found in the broadness of the research and limited literature review.

The age group over 55 years old and their accompanied burden of disease is growing. Resistance training is an excellent tool to assist healthy ageing. Let’s continue investigating how to apply this tool in the best way possible.

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Annex 1: Interview topic list representatives of fitness centres

General information:
Year of establishment
Amount of members >55
Absolute Relative
Conscious decision to focus on older adults?

I/IT Major reasons for older adults to start exercising in a fitness centres
Major motivators to start
-Health
-Knowledge of health effects among older adults
Motivators to prolong exercise participation
Barriers to start
Reasons to stop
Differences in motivators/barriers men-women
Differences in motivators/barriers with increased age

We Image of fitness among older adults
-Changed over the years?
-Future perspective
-Ways to influence
Importance of groups

Its Major aspects to get older adults into the centre
Important aspects to retain older adults
Special approach towards older adults?

Hardware
Important elements within the fitness centre
Music
Equipment
Other
Important elements outside the fitness centre
Surroundings
Location

Software
Special offerings for older adults
Personnel
Knowledge of older adults
How to select
How to individualise between older adults
How to have older adults and other user groups in the same fitness centres

Orgware
Collaboration with other parties
Municipalities
General practitioners
Higher governmental organisations
RIVM, Gezondheidsraad, movement norms