

ANALYSIS OF PHYSICAL ACTIVITY AS AN INTEGRAL ELEMENT OF ACTIVE AGING

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ABSTRACT

Lifestyle can accelerate or slowdown the involution and deterioration of the different abilities. This research shows that if people over sixty five years old (EA 65+) practice physical activity on a regular basis, the progressive and generalised deterioration of bodily functions, the onset of dementia and degenerative diseases can slow down, while extending autonomy and reducing limitations in daily life. Objectives: 1. Study and analyse experts' opinion regarding physical activity (PA) practice so that aging remains active. 2. Analyse the PA characteristics in terms of volume, intensity, density, frequency and duration for it to become part of an active aging. 3. Design a basic PA programme. Method: Evaluation and synthesis review of the sources considered most relevant at international level. Study the research work of doctors Gerard D. Cohen and Robert M. Kaiser. Results: All the sources consulted affirm that EA 65+ practising PA (at least two or three days per week) improve their mood, stay active, foster interpersonal relationships and enjoy a greater autonomy. Conclusion: The sources studied show that practicing PA on a regular basis guarantees the quality of life and autonomy, as well as the delay in the onset of dementia for EA 65+.

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INTRODUCTION

Individuals turning grey do not find it easy to accept the aging process due to the multiple and complex factors associated with it (Cohen, 1979). World Health Organization (WHO) states that anxiety, depression, insomnia and cardiovascular problems (CVD) typical of this stage, are signs indicating that something is not right (WHO, 2015). Brown, Kaiser and Gellis, (2007) point out an imperative need to detect depression at an early stage due to the disastrous consequences it causes in the elderly individual, such as increased morbidity, suicidal risk and mortality due to other causes. Sedentary or inactivity lifestyle could also cause dementia (British Heart Foundation (BHF, 2012; Cadar, Hackett, Mischie *et al.*, 2017; School of Sport, Exercise and Health Sciences, SSEHS, 2011). The rise in life expectancy and the evident fertility decline registered in the population since 2015, increase the number of older adults (WHO, 2015). Kingston, Wohland, Wittenberg *et al.* (2017) report that, as life expectancy increases, the disease levels will rise and, in general terms, they will restrict elderly people's abilities and independence. Consequently, the demand for healthcare, social assistance, and specialised care

services will increase. The aging process is a complex situation involving individuals in all their dimensions. Its progress limits their independence, conditions their quality of life and, therefore, that of those around them (Cohen, 1979; Spanish Society of Geriatric and Gerontology (SEGG, 2014; Kingston *et al.*, 2017). Several experts agree when stating that aging is a multifactorial complex, which involves more than one process, acting together to contribute to aging, leading to different degrees depending on the individual (Craig and Baum, 2009; Delgado, 2015; Lipsky and King, 2015; Ozbolt, Paniagua and Kaiser, 2008; Stassen, 2009). Indeed, it is a complex process that forces doctors to acquire an excellent training in order to act optimally. At the University of Miami Miller School of Medicine (UMMSM), for students to meet specific performance standards in the practice routine skills, van Zuilen, Kaiser and Mintzer, (2012) explain how this university's medical education, based on competencies, had to be developed and extended with the aim of addressing three geriatric syndromes: dementia, falls and deliriums from 61 learning objectives. Considering the unanimous testimony of the sources consulted, it is necessary that physical activity becomes part of active aging due to its capacity to extend the EAs autonomy and reduce their daily life limitations.

The individual growing old: Aging encompasses the last stage of a person's life cycle. It is a biological regression

process also known as senescence or "involutive stage of the life cycle" (Delgado, 2009). It is a "universal phenomenon" (Craig and Baucum, 2009). It includes underlying change trends whose functioning impact is difficult to predict (WHO, 2015). Biological changes result from different molecular and cellular damage that promote the decrease of physiological reserves, favouring the risk of diseases and predisposing individuals to a reduction of their abilities (Cilerdzic *et al.*, 2013; Cohen, 1999). Although an important section of authors states that aging starts at 45 years old, others confirm that symptoms start to be more noticeable after 60 years old (BHF, 2012; Craig and Baucum, 2009). Evidence of this are osteoarthritis and sight and hearing impairments (SEGG, 2015). It should be taken into account that this process does not take place equally in all living beings, as its pace varies from one person to another, even between organs in the same living being, as each one does so at a different rate (Delgado, 2015; Lipsky and King, 2015; Stassen, 2009). Authors of degenerative diseases specialised literature state that the longer the lifetime, the higher is the possibility of suffering degenerative diseases such as Alzheimer (Benlloch, 2016; Craig and Baucum, 2009; Hokkanen, 2015; ILC, 2011; Lipsky and King, 2015), causing elderly individuals to be the ones taking the most prescription drugs. SEGG (2015) states that 93% of people over seventy five years old take some sort of drug. And Kaiser (2007) publishes: "The majority of our patients are over sixty five years of age. All are veterans of the US armed forces. Most have a long list of medical problems, with a list of medications to match". Sensory organs are less effective, visual and auditory acuity are also affected. Sleep/wakefulness cycle slows down their activity due to neuronal aging (Cilerdzic *et al.*, 2013) and telomeres (Rizvi, Tasleem and Mahdi, 2014). Voluntary movements require more processing time, as well as: head and neck turns, ability to react, reflexes, position and direction changes, and driving, which becomes slower (Delgado, 2015, p. 291; Hughes, Ueda and Casey, 2015). After sixty five, short-term and fluid memory start failing significantly; individuals find it difficult to maintain or divide their attention in a conversation or to get across the message that has just been heard (Delgado, 2015, p. 291). Even verbal and thinking fluency deteriorates (Benlloch, 2016; Cohen, 1999). Lee, Chi and Palinkas, (2018) manifest that leisure activities can help individuals better adjust to life after significant life transitions as a the retirement.

In aging, cardiac stress problems and consequences leading to deficiency in different vital organs such as the kidneys, liver, pancreas or lungs, are frequent. Likewise, cardiovascular diseases (CVD), diabetes (El Assar *et al.*, 2016), asthma or disorders that have their origin in infectious diseases (Carlson, 2014) are frequent while aging. Muscle fibres scarcely regenerate or do not regenerate at all and muscle mass is lost (sarcopenia), (López, 2017; Stassen, 2009). Consequently, falls become more likely. In this regard, Marking (2018) states that the main causes of hospitalisation or admission to nursing homes are falls due to muscle weakness. Physic frailty is an important medical manifestation in which several causes and factors intervene, all of them involved in the physiological and muscular function wear, such as loss of strength, resistance, stability, orientation, etc. (Morley *et al.*, 2013) predicting falls, disability and mortality; a common condition characterised by the deterioration of the skeletal and cognitive system, and the insufficiency to cope with stress elements (Watts, Webb and Netuveli, 2017). Morley *et al.*, (2013) define it as a medical manifestation in which several causes and factors intervene, all

of them involved in the physiological and muscular function wear, such as loss of strength, resistance, stability, orientation, etc., that make the individual more likely to depend on others or more prone to death. In this sense, Alexandre, Corona, Nunes *et al.* (2014) suggest that, encouraging physical activity must be one of the strategies "to avoid, delay, or even remedy frailty".

Active Aging: WHO (2015) defines active aging as "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age". Aiming "to optimize opportunities for health, participation and security in order to enhance quality of life as people age" (WHO, 2002). In this sense, the literature reviewed agrees in that, people aging actively take less medication, promote changes in their immune system, in terms of control and find greater social support (Cohen, 2009; BHF, 2012; SSEHS, 2011; Sumic, Michael, Carlson *et al.*, 2007). On the other hand, a full *active aging* requires that people growing old have a positive attitude, accept the limitations related to their age and, based on those limitations, enjoy a healthy and involved life (SEGG, 2014). Marking (2012) explains that, from the first Aging Survey that the insurance company General conducted in Germany to approximately 2,000 people between 65 and 85 years old, the findings revealed that the average number of respondents said they felt ten years younger because they were living active, satisfying and varied lives. Marking states that health for EA 65+ is interpreted as the most relevant condition for an independent life. Yamashita, Bardo and Liu, (2018) reveal the results of a study among active and non-active people over 65, which allow matching physically active leisure with general subjective well-being due to its correlation with higher levels of experienced happiness, and lower levels of sadness. Adam and Carlson, (2018) confirm that "the vast majority of older adults in the United States (80 percent) suffer from at least one chronic condition (e.g., diabetes, hypertension, heart disease). Many of these health conditions are associated with physical inactivity".

Physical Activity as an integral element of active aging: The American College of Sports Medicine (ACSM, 2011) confirms the scientific evidence proving that the positive effects of PA are unquestionable and its benefits exceed the risks for most adults. In order to improve and maintain an optimal state of fitness and health, ACSM recommends most adults, beyond the activities they perform on a daily basis, to regularly practice PA, including cardio respiratory work, resistance training, flexibility and neuromotor exercises. In this regard, BHF states that regularly practicing PA improves physical and psychological health and it is associated with the maintenance of functional activity and independence of life (2012). Indeed, practicing PA throughout life increases healthy life expectancy while also providing a positive mental health, reducing the total time spent in sedentary activities as well as the disability stage. It also reduces blood pressure, improves insulin sensitivity, preserves bone mass and reduces the risk of developing breast and colon cancers. Elderly people practicing PA regularly improve their positive energy, well-being, quality of life and cognitive function (ACSM, 2011; Bento-Torres *et al.*, 2017; BHF, 2012; Herrera, 2005; WHO, 2015), they are exposed to a lower risk of cognitive impairment and dementia (ACSM, 2011; BHF, 2012; Cadar *et al.*, 2017; Olanrewaju, Kelly, Cowan and Brayne, 2016; SEGG, 2014; SSEHS, 2011). Guillem del Castillo and Linares, state that being physically fit is positive in order to undertake daily life activities, and it is a

sign of good health (2002). Fragility, that can be due to several reasons, is one of the main medical symptoms of lack of fitness and health (ACSM, 2011). Sarcopenia or loss of muscle fibre is one of its main causes and, even though it is debilitating, it can be treated. Strength training with weights promotes muscle fibre regeneration, which wears out with age (Marking, 2018). Physical weakness also involves fragility, however, Morley *et al.* (2013) state that it can be successfully prevented or treated with specific actions. They recommend practicing physical activity, eating a diet rich in protein, calories and vitamin D, and reducing drug intake. Watts *et al.* (2017) highlight the importance of sports clubs in promoting and helping to live an active life based on PA reducing fragility levels in elderly adults and promoting social relationships (SSEHS, 2012; WHO, 2015). Staying active improves balance, helps to improve strength, state of mind and depression. Cohen (2009) states that at the end of life, more than at any other stage of the life cycle, the death of beloved ones may lead to major depressions. PA, such as walking fast, bicycle riding, dancing, undertaking house maintenance works, gardening, walking up and down stairs, bowling, playing non-aggressive team games and swimming should be part of the daily life of the elderly adult. National Institute on Aging and Health (NIA and NIH) in Go4Life program defends that elderly adults should look for activities they like to do and include them in their daily life as something natural (BHF, 2012; Go4Life, 2017; SSEHS, 2011). Among the PA benefits, Richards (2015) emphasises that it improves joint movement, facilitates pain control, increases strength, promotes body stability, prevents against the risk of suffering chronic diseases and controls them, facilitates coping with incontinence and maintaining weight. Rodrigues, Vrinceanu, Berryman *et al.* (2017) manifest that strength, aerobic, muscular endurance and skill exercises improve the executive functions of EA, and the interruption of training can offer results of loss of physiological benefits.

WHO (2015) in a recent analysis states that moderate PA reduces mortality by 31% vs. individuals who are less active, and that the benefit is greater for those over 60 years old (p.70). Cohen (2009) ratifies that PA optimises physical and mental abilities of EAs because it maintains muscle strength and the cognitive function. Other literature states that it reduces anxiety, stress, improves self-esteem, prevents and delays CVD (by 11-22%), acts on diabetes, osteoporosis and cardiovascular accidents (WHO, 2015, p. 70; Go4Life, 2017). It also improves intergenerational and social relationships of the elderly. Conversely, older inactive people are exposed to the risk of suffering dementia by 20%, and it is estimated that 10 million new cases could be avoided if the elderly population practiced the PA suggestions (WHO, 2015). To this end, it is suggested to work on aerobic activity, strength and balance (neuromotor apparatus), which must be prior to the aerobic in a progressive training. This type of training develops muscle strength, physical capacity, prevents against the risk of falling and CVD, and improves metabolic and coronary function. This will be the basis of cardio-vascular aerobic activity (WHO, 2015, p.71). The research from Fontvieille, Parent-Roberge, Langlois *et al.* (2017) suggest that aerobic and resistance training reduces cancer-related fatigue in oncogeriatric patients. And Brown, Riddell, Macpherson *et al.* (2013) show us that the active elder has a lower mortality risk compared to inactive adult. On the one hand, ACSM recommends that EAs 65+ years old inform their doctor about their intention to perform PA. The exercise programme must

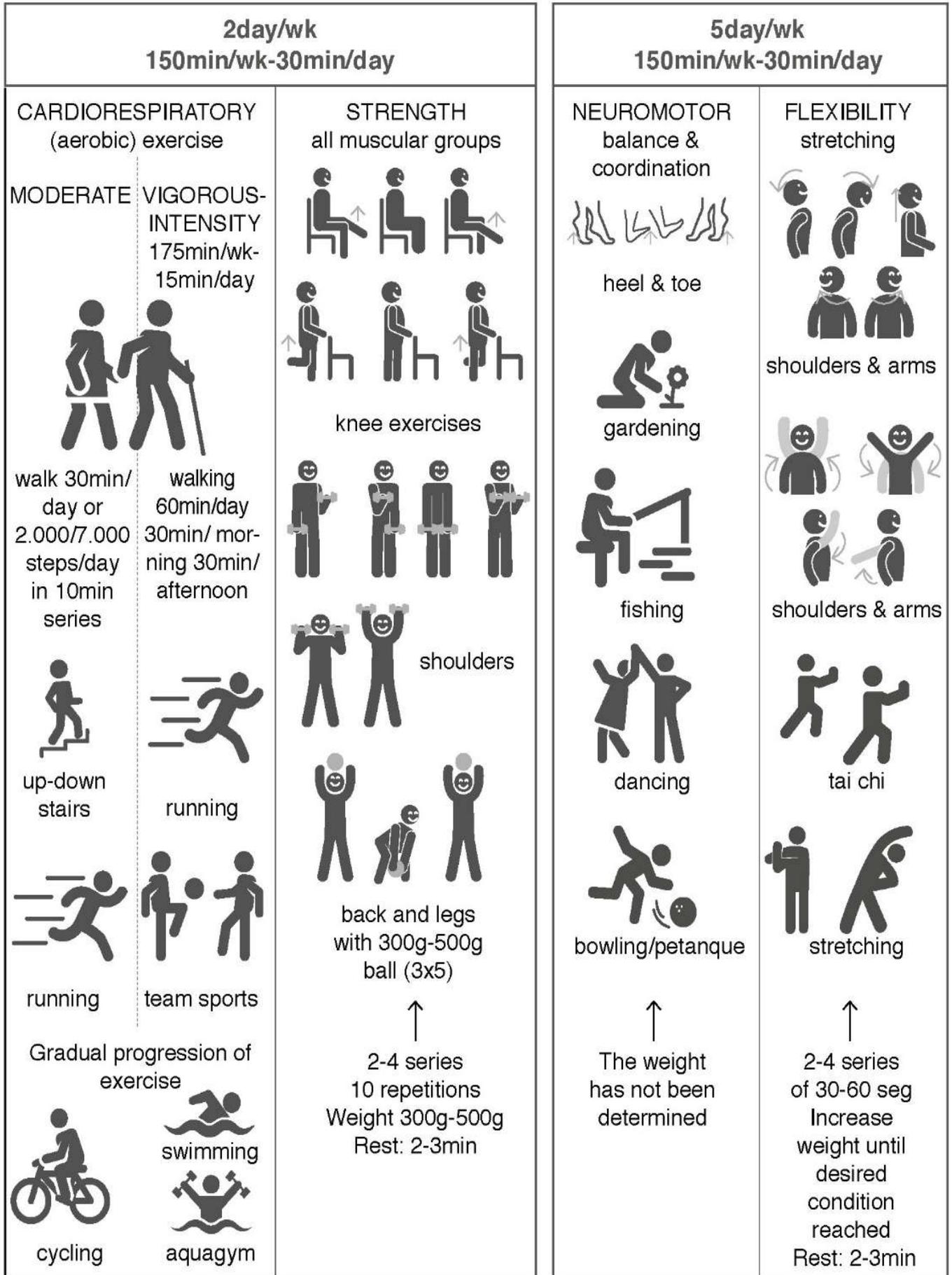
be adapted to the individual according to his/her state of health and physical condition and in order meet the established objectives. ACSM recommends finishing the exercises stretching and relaxing in order to avoid musculoskeletal injuries, and advises that a pleasant PA can improve the affective response of the individual to exercise and improve their participation in the long term (2011). All consulted sources agree that 1. PA should be practiced on a daily basis and include cardio-respiratory and resistance exercises for each of the main muscle groups, flexibility for each of the major muscle groups and tendons, and neuromotor exercises (balance, agility and coordination); 2. The intensity should be moderate in general, although cardio respiratory work should be combined with vigorous intensity exercises, 3. Each session should be progressive from less to more effort, being the intensity activity stronger in the central part. 4. It is important to stay active beyond 65 years old as well as to foster social relationships. It should be noted that Go4Life or BHF have created outreach campaigns in order to promote interest for an active life regularly practicing PA. They suggest that the plan must be creative, with varied activities that motivate a regular participation (BHF, 2012), wear comfortable clothes and recommend drinking lots of water even if not thirsty (Go Life, 2018). Harada, Sugisawa, Sugihara *et al.* (2017) suggest that a social environment of the neighborhood where young and old practice PA outdoor correlates with the active participation of elder adults in the PA (Laforest *et al.*, 2009).

DISCUSSION

After analysing all the bibliography, and in order to suggest a daily PA programme for elder adults 65+, the following sources have been selected ACSM, NIA and NIH, SSEHS and WHO since they have more content related to PA for elder adults 65+ and because they are the most prestigious in the international arena (NIA and NIH and WHO), the United States of America (ACSM) and the United Kingdom (SSEHS).

Conclusion

All selected sources unanimously agree when affirming that PA for elder adults 65+ should be practiced 150 minutes per week (150min./wk.); i.e. 30 minutes per day (30min./day) of moderate activity and 75min./wk.); i.e. 15min./day of strenuous work. It should include cardiovascular or aerobic work, balance, coordination, flexibility and strength. Except for the aerobic and strength work that will be practiced 2day/wk., the rest must be practiced daily. They state that stretching is highly advisable to improve flexibility and that aerobic and strength exercise should be preceded by a previous preparation or warming up (ACSM, 2011, p. 1342). All sources insist on the need to avoid a sedentary lifestyle and to walk at least 30min/day. Only SSEHS advises to walk 30min/morning and another 30min./evening. All sources also promote dancing and tai chi as better activities for balance and coordination and that interventions at personal and environmental level are necessary. Only ACSM breaks down the volume, intensity, resting time, and energy consumption of the exercises of a PA programme for EA 65+ and states that PA must be intended for adults of all ages. It recommends that, where possible, it should be personalised for EA 65+. Elder adults 65+ with certain chronic disabilities should also be able to participate, provided they are evaluated by a healthcare professional and with the pertinent modifications.



(a x b) = (number of series and number of repetitions for each serie).

Figure 1. Physical activity plan suggested a basic program for people over 65, by Author

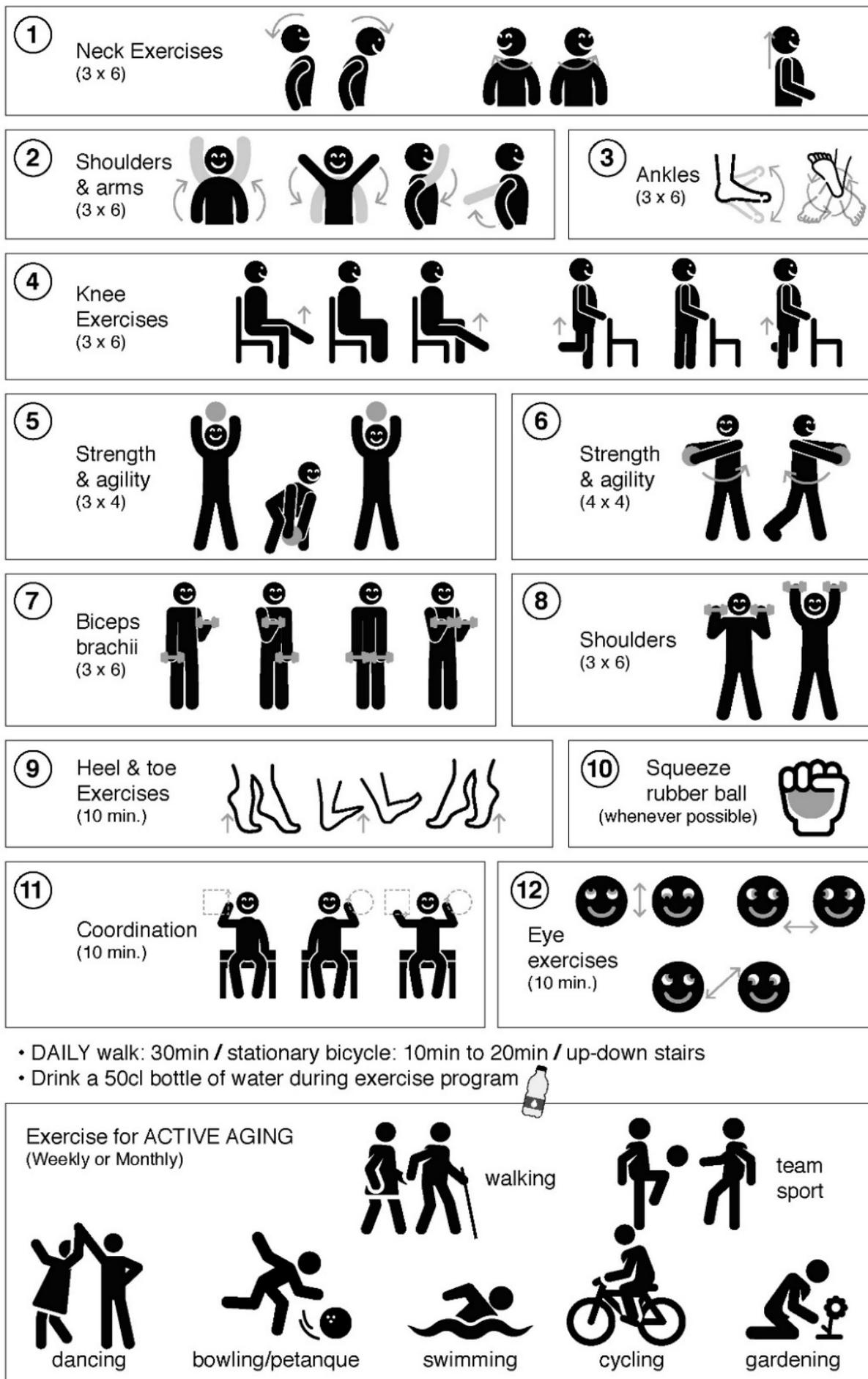


Figure 2. Proposal for a daily exercise program (exercises 1-12) and weekly and monthly recommendations for people over 65, by Author

Suggestion of a basic and general PA plan for elder adults

65+: Taking into consideration the urgent need for aging to be active, the regular practice of PA as an integral element of active aging, the lack of motivation of EA 65+ to follow healthy habits in general and the regular practice of PA in particular, and of the time that can elapse since the moment in which the healthcare professional suggests these recommendations until the EA 65+ implements them, in case he/she does, and also noting that PA at home is more frequent when a medical referral is not required (WHO, 2015, p.106). A basic and general PA programme for elder adults 65+ is suggested below and is presented in infographic format (Figure 1). In addition, a proposal is presented for a daily exercise program with weekly and monthly recommendations (Figure 2).

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