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Original Research

Unlocking the Power of Self-Regulation: How It Boosts Physical Activity in Older Adults

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ABSTRACT

Older adults undergo various physical changes that necessitate consistent efforts to sustain their health, which includes engaging in regular physical activity. Participation in these activities is influenced by multiple factors, one of which is self-regulation. This study aims to investigate the relationship between self-regulation and physical activity among older adults at the Ciptomulyo Health Center. The research employs an analytical method utilizing a cross-sectional design. A total of 374 respondents who met the study's selection criteria were recruited. The Physical Activity Self-Regulation Scale (PASR) and the Physical Activity Scale for the Elderly (PASE) were utilized to evaluate the levels of self-regulation and physical activity, respectively. The collected data were analyzed using the chi-square test. The majority of respondents were female (58.6%), with a significant proportion demonstrating high levels of self-regulation (74.6%) and satisfactory physical activity levels (61.5%). The results established a substantial correlation between self-regulation and physical activity ($p = 0.000$), suggesting that enhanced self-regulation is associated with increased physical activity. These findings underscore the importance of interventions designed to enhance self-regulation among older adults. By strengthening self-regulation, it is possible to mitigate inactivity and promote a healthier lifestyle. This insight provides a foundational basis for developing strategies that support older adults in maintaining an active and healthy lifestyle by enhancing their self-management skills.

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Introduction

Older people are at the final stage of the phase of human life, which is characterized by the age of over 60. Ageing in the biological aspect occurs due to cell damage that occasionally affects the body's physiology (WHO, 2022a). The changes experienced by older people are a natural degenerative process of the body that can reduce the ability of older people to engage in physical activity (Hagger, 2019). The limitations of older people in physical activity, if not treated immediately, will affect the decrease in quality of life, where their living needs will not be met optimally (Tabrizi, Shaykhi & Najafi, 2020).

The population of older people is increasing from year to year. In 2020, the population of older people was around 1 billion, increasing to 1.4 billion in 2022. In 2030, the number of older people will continue to increase because 1 in 6 residents will be 60 years old and above (WHO, 2023). In Indonesia, the number of older people has increased from 2022 to 2023 by 10.48%. The percentage of older people in East Java is the second highest (15.57%) after Yogyakarta (Ministry of Health Republic of Indonesia, 2023). The number of older people in Malang in 2022 is 110,746, but only 1,970 older people have obtained health screening. This figure also underscores the potential impact of the increasing older population on health programs, particularly those involving physical activity (Muarif, 2023).

Physical activity results from skeletal muscle movements that trigger metabolism and are beneficial in improving health. The benefits of physical activity include lowering the risk of cardiovascular disorders, maintaining cognitive health, maintaining body balance, and improving sleep quality (WHO, 2020). Lack of physical activity is a risk factor for disease and death (Cruz-Jentoft & Sayer, 2019). Most of the causes of death in Indonesia due to non-communicable diseases are lack of physical activity (76%), 42% of the older people in Indonesia are known to have light physical activity. This impacts the onset of chronic conditions, including hypertension, gout, diabetes mellitus, and cardiovascular (Kanejima *et al*., 2019; WHO, 2022b). Most complaints experienced by older people come from decreased cell regeneration due to a lack of physical activity in older people.

Self-regulation is the body's ability to regulate emotional, cognitive, and behavioural, then interact with each other and form complex self-regulation (Vasilopoulos & Ellefson, 2021). Self-regulation determines whether someone will commit to set goals or vice versa (D'Cruz *et al*. , 2024). Self-regulation of older people has the potential to determine plans and manage facilities that will be used as a goal, one of which is an effort to raise living standards. An increase in self-regulation of older people will be followed by an increase in high motivation (defined as a strong desire or drive to achieve a goal) to maintain physical activity to maintain health. Physical and psychological changes in older people will affect the participation of older people in physical activities and are difficult to change (Lavrova and Kharitonova, 2023).

An initial study at the Ciptomulyo Health Center found that there were 4,695 older people, but only about 20-30 older people actively participated in physical activity activities for older people (called Prolanis). This stark contrast highlights the urgency of the issue. Very few articles address the connection between older adults' self-regulation and physical exercise. The older participants's poor program attendance suggests a lack of self-awareness of the significance of preserving health. Older people with poor involvement also tend to have low levels of physical exercise, which can lead to several health issues. In order to increase the number of older people engaging in physical exercise, it is vital to understand factors associated with their inclination to do so. Therefore, in this study, we analyse the relationship between self-regulation and physical activity of older people in the Ciptomulyo Health Center Work Area is to be carried out.

Method

In this cross-sectional study, older people within the Ciptomulyo Health Center's working region were involved. The study's population was 4,695 older individuals in the Ciptomulyo Health Center work area. From this population, 374 respondents were recruited, meeting the inclusion criteria of being 60 years and above, able to communicate verbally, and understanding Bahasa Indonesia. Notably, older people with

total dependence, undergoing intensive care, dementia, deafness, blindness, and experiencing a decrease in consciousness were excluded from this study, ensuring the quality and reliability of the data.

Data were collected using a three-part questionnaire (demographic data, self-regulation, and physical activity). Self-regulation was measured with the Physical Activity Self-Regulation Scale (PASR) questionnaire, which was translated into Indonesian by Atikah (2023). The PASR consists of six items: self-monitoring, goal setting, social support, support, time management, and prevention. The scores of each item were then added up to create a cutoff score of 30. A score below 30 was categorized as low SR, whereas a score above and equal to 30 was categorized as high SR. Physical activity was measured using the Indonesian version of the Physical Activity Scale for the Elderly (PASE) adapted from Indrawati *et al*. (2023). This questionnaire consists of 3 parameters: self-reported work, household, and leisure activity over 7 days. A total PASE score below 15 was categorized as bad PA, and a PASE score above and equal to 15 was categorized as good PA. The data obtained were then scientifically analyzed using the Chi-Square test to determine the correlation between SR and PA. All statistical analyses were performed using the reliable and widely-accepted SPSS software.

This study obtained ethical permission from the Faculty of Health Sciences, Brawijaya University, with the number 10771/UN10.F17.10.4/TU/2024.

Results and Discussion

Among 374 respondents, the majority were female (58.6%), showed a high SR (74.6%), and good PA (61.5%), as shown in Table 1. The generic term "self-regulation" (SR) encompasses three domains; behavioral, cognitive, and emotional self-regulation. The emotional domain consists of affective regulation, emotional awareness, and expression, which is the basis for high-level cognitive processes in behavioral regulation (Rojo-Ramos *et al*., 2023). Executive processes (working memory, cognitive flexibility, and control) and attention are components of the cognitive domain that support planning, goal orientation, problem-solving, and reasoning. Complete control over delaying gratification, effort, goal-oriented conduct, and independence—all essential for a person to select their attitudes—are all included in the behavioral domain (McClelland *et al*., 2018).

Table 1. Respondents' Characteristic

Characteristic	Frequency (n)	Percentage (%)
Gender		
Female	219	58.6
Male	155	41.4
Self-Regulation (SR)		
Low	95	25.4
High	279	74.6
Physical Activity (PA)		
Poor	144	38.5
Good	230	61.5

Our research has revealed a significant relationship (p=0.000) between SR and PA (Table 2). This finding has important implications for healthcare professionals, as older individuals with low SR tend to have poor activity (37.5%), while those with high SR exhibit good physical activity (82.2%). Understanding this relationship could help professionals better support their older patients, as SR is closely linked to a person's ability and willingness to pursue specific goals, such as engaging in physical activity or abstaining from choices that are not in their best interests, even if they feel an aversion to them.

Table 2. Relationship between Self-Regulation (SR) and Physical Activity (PA)

Variable	Physical Activity (PA)		Total	p-value
	Poor	Good		
Self-Regulation (SR)				
Low	54 (37.5%)	41 (17.8%)	95 (25.4%)	0.000
High	90 (62.5%)	189 (82.2%)	230 (61.5%)	

This study, in alignment with Strachan *et al* (2017), illustrate that individuals with high SR are more successful in improving PA than those with low SR. The development of good self-regulation can lead to an increase in PA. SR, or self-control, is a crucial factor in channeling self-motivation towards setting and achieving long-term goals. Self-control serves as a tool to enhance physical activity and vice versa (de Vet & Verkooijen, 2017).

Self-regulation directly influences behavior. As the study's finding reveal, older adults' physical activity and self-regulation are significantly and positively linked. The primary factor that enables older adults to sustain short-term physical exercise is their ability to regulate their behavior. The capacity of older adults to self-regulate in the context of physical exercise has a profound impact on their regular engagement in a variety of physical activities, thereby enhancing their physical and mental well-being (McMullan *et al*., 2021).

These results, in line with Fuentealba-Urra *et al* (2023), demonstrate a positive correlation between physical activity habits and emotional-SR (ESR) in adolescents. ESR, the ability to manage emotions, is a key factor in maintaining healthy habits in older adults, including regular physical activity (López-Gil *et al*., 2020). Physical activity not only improves mood and reduces negative emotion such as irritability, anxiety, and stress, but also positively influences neurobiological and psychological processes, enhancing the well-being of older people (Mannino *et al*., 2019).

The body of older people is characterized by a decrease in the quality of the body's constituent cells, so the functional organs of the body are also disturbed, which results in very complex health complaints. The decline in quality of life in older people will worsen if comorbidities follow it. Degeneration in older people can be inhibited by practising a healthy lifestyle by maintaining a diet, exercise, and rest (Jumayyah, Rachmavati & Choiruna, 2020). PA carried out by older people has social, physiological, and psychological benefits. Physiologically, PA can improve body strength and metabolic balance (Juliansyah *et al*., 2021).

This result align with Herzog-Krzywoszanska *et al*. (2024), a study in adults showing that low ESR is significantly associated with low PA levels. The delay of physical activity and other delays mediates the relationship. In general, people with low emotional SR have a strong propensity to put things off, which is followed by a propensity to refrain from physically demanding activities. As a result, the individual participates passively in regular exercises (Landau, 2020).

Additionally, the findings of this study are consistent with research conducted by Vasilopoulos & Ellefson (2021) in secondary elementary school children, which shows a positive relationship between ESR and PA. PA is important for psychological and physiological health (Lawrence *et al*., 2017). Poor PA levels are linked to low quality of health, such as cardiovascular disease and death in adults or older people. Good PA intensity in childhood impacts good health in adulthood; it can maintain bone health and older people's mental health (Howie *et al*., 2020).

This aspect of SR can be developed through a person's interaction with the environment. The environment plays an important role in supporting the development of SR related to self-involvement in physical activity (D'Cruz *et al*., 2024). On the other hand, PA behavior also contributes to the development of SR skills. PA stimulates brain development in the limbic system and frontal cortex, which is important for the development of SR. In the long run, PA also increases neurotropic rates, thus stimulating neurogenesis and improving brain development (Leaked *et al*., 2020).

Physical activity (PA) offers significant benefits for enhancing the quality of life of older individuals by delaying the onset of various chronic diseases. Collaborative planning with healthcare providers to design and implement programs that enhance

individual psychosocial well-being through self-regulation strategies is crucial (Ylitalo *et al*., 2023). In line with the self-regulation (SR) concept, older individuals can improve their self-regulation abilities to help maintain the body's homeostasis by forming new, healthier habits (D'Cruz *et al*., 2024). The capacity to observe and respond to various stimuli, especially those originating from our surroundings, is crucial for developing self-regulation. This involves not just the ability to activate or inhibit behaviours and emotions as needed but also to adapt them in response to the feedback received. By effectively monitoring our actions and attentiveness, we can maintain a balanced and controlled approach to our behaviour, which is essential for personal growth and emotional intelligence (Pandey *et al*., 2018).

Cognitive decline is a prevalent issue that affects many individuals aged 50 to 65. This stage of life often brings concerns about memory, attention, and overall mental sharpness. However, embracing a routine of physical exercise can serve as a powerful and effective preventive strategy. A growing body of research has shown that engaging in regular physical activity—whether it's brisk walking, dancing, or strength training—can significantly mitigate the decline of cognitive abilities in older adults. By fostering better blood flow to the brain and promoting the release of beneficial hormones, exercise plays a crucial role in maintaining and even enhancing cognitive function as we age (Sharma *et al*., 2021). Furthermore, older individuals often require support from their immediate community to maintain physically active lifestyles that are accessible and appropriate for their ability level (Ige-Elegbede *et al*., 2019). One promising avenue for enhancing self-regulation and physical exercise behavior in older individuals is the application of behavioural support techniques. Understanding the elements associated with self-regulation is crucial for planning and implementing effective interventions.

Conclusion

There is a significant relationship between SR and PA among older people in the working area of Ciptomulyo Health Center. High Self-Regulation (SR) will be followed by good Physical Activity (PA), particularly regarding actions that enhance health quality. On the other hand, bad PA comes with low SR. Various aspects of self-regulation in older people interact with each other to foster interest in their involvement in physical activity. In contrast, low SR leads to low PA, which can be seen in withdrawal from any form of physical activity. The findings of this study underscore the pivotal role of interventions in improving SR ability. This knowledge empowers us to take action, reducing absenteeism in physical activity and fostering a prosperous, healthy lifestyle.

Limitations of the study

The findings are less representative of the larger older population because the research sample was restricted to one location. Additional studies are required to broaden the scope of the research.

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Conflict of Interest

There is no conflict of interest.

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