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DOI: [10.31965/infokes.Vol24.Iss1.1815](https://doi.org/10.31965/infokes.Vol24.Iss1.1815)Journal homepage: <https://jurnal.poltekkeskupang.ac.id/index.php/infokes>**RESEARCH****Open Access****Social Cognitive Theory Construct as a Determinant of Physical Activity in Older People****Elisabeth Gultom^{1a*}, Frans Manangsang^{1b}, Ellen R.V Purba^{1c}**¹ Department of Nursing, Health Polytechnic of Jayapura, Ministry of Health, Jayapura, Papua, Indonesia^a Email address: elisabeth.gultom2@gmail.com^b Email address: fransmanangsang@yahoo.co.id^c Email address: ellen.purba5@gmail.com

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Abstract

The aging process causes a decline in physical function that increases the risk of chronic diseases and reduces the quality of life among older people, while participation in physical activity programs remains low. Social Cognitive Theory (SCT), particularly self-efficacy, outcome expectancy, and self-regulation, is considered an important approach for understanding and improving physical activity behavior among older people. This study aims to analyze the influence of Social Cognitive Theory (SCT) constructs, including self-efficacy, outcome expectancy, and self-regulation, on the physical activity of the older people in the Ciptomulyo Community Health Center work area, Malang City. Method: This study used an observational analytical design with a cross-sectional approach among 374 older people individuals aged 60-85 years. Data were collected through online questionnaires and structured interviews. Results: The study found that 64.4% of the older people had low levels of physical activity. The results of the hypothesis analysis showed that self-efficacy had a positive and significant effect on outcome expectancy ($\beta=0.413$; $p<0.001$), self-regulation ($\beta=0.508$; $p<0.001$) and physical activity ($\beta=0.263$; $p<0.001$). Outcome expectancy also had a significant positive effect on self-regulation ($\beta=0.309$; $p<0.001$), and physical activity ($\beta=0.207$; $p<0.001$). In addition, self-regulation has a significant positive effect on physical activity ($\beta = 0.264$; $p < 0.001$). Conclusion: Self-efficacy, outcome expectations, and self-regulation are important determinants of increased physical activity among older people. SCT-based interventions can be an effective approach motivating and increasing physical activity participation among older people.

Keywords: Physical Activity, Outcome Expectancy, Self-Regulation, Self-Efficacy, Social Cognitive Theory.

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1. INTRODUCTION

Physically, the body undergoes changes and decreased function, leading to various disorders, characterized by the older people's inability to perform physical activities or engage in activities that affect health, thereby impacting the quality of life of older people. Older adults over 60 who maintain their physical fitness can slow the degenerative process. However, in reality, many older people in most communities still do not maintain their physical fitness.

One of the causes of death in Indonesia is non-communicable diseases, most of which are caused by a lack of physical activity, as much as 76% (WHO, 2022). Meanwhile, the survey results of the Indonesian Medical Gerontology Association (PERGEMI) explain that 24.6% of older people in Indonesia have chronic diseases. In 2022, the history of chronic diseases in older people was hypertension at 37.8%, followed by diabetes at 22.9%, rheumatism at 11.9%, and heart disease at 11.4%. Some of the complaints experienced by older people listed above are caused by decreased cell regeneration and lack of physical activity (Dinas Kesehatan Daerah Istimewa Yogyakarta, 2024).

The number of older people individuals in the working area of Ciptomulyo Public Health Center is 6.905. However, only 1.970 individuals (28.5%) have received health screenings in accordance with the standard. This finding means 71.5% of the older people have not undergone screening or received healthcare services. Based on the data above, there is a significant gap between the need for healthcare services and their utilization. This figure also reflects the low participation of older people in the physical activity programs implemented by the public health center. Physical activity or Physical Activity (PA) is any body movement produced by skeletal muscles that requires energy, including during leisure time, for transportation to and from places, or as part of a person's work (Chaeroni et al., 2021). To improve the effectiveness of physical activity intervention for the older people, the interventions must be grounded in a clear, predictive theoretical model. Therefore, Social Cognitive Theory (SCT) is among one of the most dominant theoretical approaches to physical activity interactions (Mz & Arovah, 2023).

Self-efficacy is a person's belief in their ability to perform behaviors needed to achieve desired goals (Attainini, 2022). Self-efficacy can also influence a person's effort expenditure, choice of activities, and persistence in the face of obstacles or failure (Chen et al., 2022).

Outcome expectations refer to the anticipated results of a behavior and can influence an individual's motivation to engage in physical activity (Attainini, 2022). Older adults sometimes perform a behavior, but they may not believe the results are beneficial. Measuring outcome expectations is particularly appropriate for understanding their impact on increasing the older people's participation in physical activities and sports.

Self-regulation is the main determinant of long-term physical activity in the elderly (Mc Mullan, 2021). Older people self-regulation has great potential in planning, organizing, and managing exercise activities to improve and maintain their health. Developing older people self-regulation skills can be a promising approach to psychoprophylaxis of various disorders and to protecting mental health in old age (Lavrova & Kharitonova, 2023). Self-regulation is very important because motivation alone is not enough to maintain regular physical activity.

Based on a preliminary study, one of the physical activity programs for older people at the Ciptomulyo Health Center is older people gymnastics, held once a week. However, the number of older people who actively participating in the activity is around 20-30. One common solution is to prioritize health education and promotion that emphasize the importance of physical activity for older people. However, this approach is still not effective enough at increasing the older people's consistent involvement in physical activity.

SCT has previously been applied in Indonesia in several literature reviews that provide general descriptions of stimuli among older people (Prahasgita & Lestari, 2023). SCT is one of the behavioral theories that has helped greatly increase physical activity. Given the

importance of physical activity for the health of older people, this study aims to analyze the relationship among self-efficacy, outcome expectations, and self-regulation, as well as between these factors and physical activity, among the older people in the Ciptomulyo Health Center Work Area.

2. RESEARCH METHOD

The research design used an observational-analytical cross-sectional approach in 2024. This study includes associative research that connects between variables, namely the independent variable (X) to the dependent variable (Y). Exogenous variables consist of self-efficacy (ED) with 9 indicators, and outcome expectation (EH) with indicators physical health (EH1), mental health (EH2), and physical health (EH3). Self-regulation (RD), with indicators self-monitoring (RD1), goal setting (RD2), gathering social support (RD3), support (RD4), time management (RD5), and relapse prevention (RD6). Endogenous variables consist of physical activity (AF), with indicators: leisure time activities (AF1), household chores activities (AF2), and work-related activities (AF3). All social cognitive measures are used in the SCT model (Figure 1).

The study participants were older people aged 60-85 years. This study uses an age threshold because older people over the age of 85 more often have more complex medical conditions or disorders, such as dementia, osteoporosis, or more advanced neurological disorders. The inclusion criteria for respondents are older people who visit older people health post according to the predetermined schedule and those who agree to participate. At the same time, the exclusion criteria are older people who are totally dependent, not present when the study was conducted, older people who are undergoing treatment in a hospital during the study and have dementia, deafness, blindness, psychological disorders, or decreased consciousness.

This study uses a purposive sampling technique on older people in the Ciptomulyo Health Center work area during data collection in August 2024. This study employs purposive sampling due to the unavailability of an adequate sampling frame. The community health center lacks valid, accurate data on older people individuals, making random sampling infeasible. Therefore, purposive sampling is used to ensure that the research subjects meet the predetermined criteria. The population in this study was 4.695 people. The sample size was calculated using the Slovin formula. The calculation results show that the sample required for this study is 374. Data were collected using an online version of the questionnaire, with structured interviews conducted directly by researchers, thereby ensuring greater data accuracy. The questionnaire was used to measure older people's physical activity levels and social cognitive constructs. Previously, they were given informed consent, which was included in the online questionnaire.

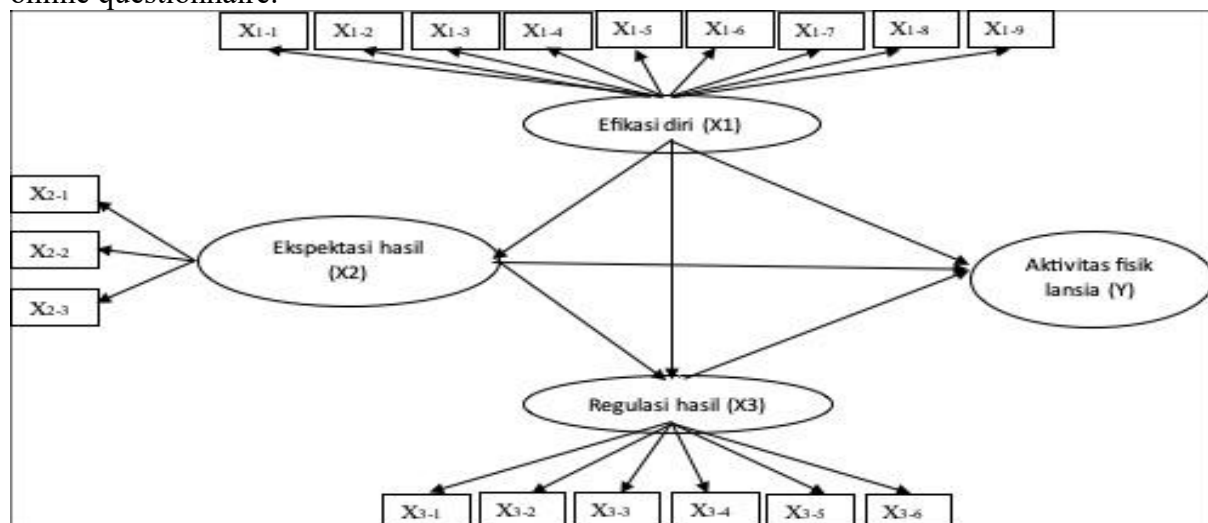


Figure 1. Concept of the Social Cognitive Model from Physical Activity.

The research instrument used to assess physical activity is the Physical Activity Scale for the Older people (PASE) questionnaire. To assess the social cognitive construct, the Self-efficacy for Exercise (SEE) questionnaire was used. The Self-efficacy for Exercise (SEE) questionnaire, consisting of 9 question items, was used to measure self-efficacy. For each item, a Likert scale is used, with scores ranging from 1 to 10, where 1 indicates "not confident" and 10 indicates "very confident". The total score is calculated by summing the answers to each question. The Outcome Expectation for Exercise (OEE) questionnaire was used to measure the outcome expectation variable. This scale is designed to evaluate the level of benefits received by older people as a consequence of their beliefs in exercise behavior. This questionnaire has been translated into Indonesian (Arovah & Heesch, 2022). The instrument used to assess self-regulation is the Physical Activity Self-Regulation Scale (PASR), adopted from Rahayu (2023).

Validity and reliability tests of the research instrument were conducted on older people in Bakalankrajan Village, the working area of Ciptomulyo Health Center, Malang City, with 3 respondents. The results of the instrument validity test indicated that all items (indicators) of self-efficacy, outcome expectations, self-regulation, and physical activity had correlation coefficient (riT) greater than the table correlation (0,361, n=30). This finding indicates that all indicators of questions from the instrument used are valid. The results of the reliability test showed that the overall Cronbach's Alpha was > 0,6, indicating that all indicators of the instrument were reliable, which made it possible to be applied as an accurate data collection tool. Data collection was carried out directly by researchers with 9 enumerators who had previously discussed common perceptions. Then the researcher conducted structured interviews. Data collection was carried out during older people posyandu activities.

3. RESULTS AND DISCUSSION

Of the 374 respondents in this study, the average was 19.5% male respondents, and 80.5% female respondents. 77.8% were aged 60-69 years, 18.7% were aged 70-79 years, and 3.5% were aged 80 or older. In addition, 59.6% of respondents admitted to having a married status, 1.1% of respondents were unmarried, and 39.3% of respondents admitted to having a widower or widow status (Table 1).

The results of the descriptive analysis showed that 38.8% of older people had low self-efficacy, and 61.2% of older people had high self-efficacy. This shows that most of older people have high self-efficacy. 15.2% of older people have low outcome expectations, and 84.8% of older people have high outcome expectations. This shows that most of older people have high outcome expectations. As many as 55.9% of older people have low self-regulation, and as many as 44.1% of older people have high self-regulation. This shows that most of older people have low self-regulation. In addition, 64.4% of older people have low physical activity, and 35.6% of older people have high physical activity. This shows that most of older people have low physical activity (Table 2).

Table 1. Demographic Characteristics of older people (n=374)

Characteristic	Age group	Frequency	Percentage
Gender	Male	73	19.5%
	Female	301	80.5%
Age	60-69 Years old	291	77.8%
	70-79 Years old	70	18.7%
	>80 Years old	13	3.5%
Marital status	Married	223	59.6%
	Unmarried	4	1.1%
	Widow or Widower	147	39.3%

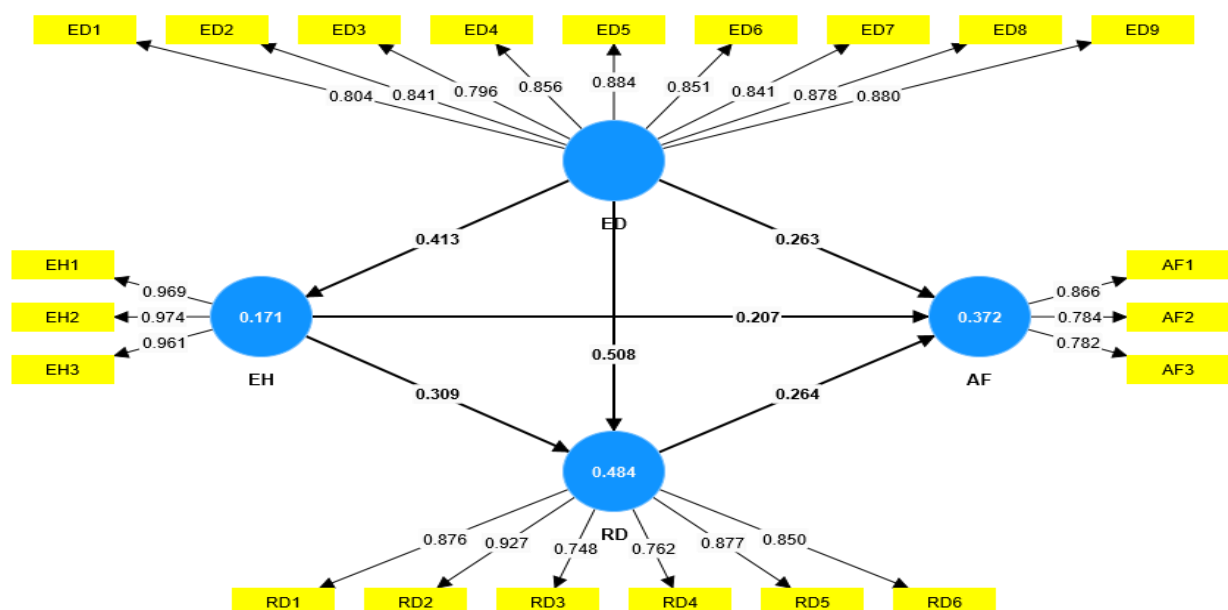
Table 2. Descriptive Analysis of Variables.

Category	Interval	Frequency	Percentage
Self-Efficacy			
Low Self-Efficacy	9 ± 49.5	145	38.8%
High Self-Efficacy	49.5 ± 90	229	61.2%
Expected Outcome			
Low expected outcome	9 ± 27	57	15.2%
High expected outcome	27 ± 45	317	84.8%
Self-Regulation			
Low Self-Regulation	12 ± 36	209	55.9%
High Self-Regulation	36 ± 60	165	44.1%
Physical Activity			
Low physical activity	10 ± 25	241	64.4%
High physical activity	25 ± 40	133	35.6%

The analysis technique used in this study is Partial Least Squares (PLS) analysis with a 1st order measurement model, where the 1st order measurement in this study is that the dimensions are used as indicators and the data used to represent the dimensions is the average of the indicators that measure each of the dimensions concerned (Hair et al., 2021).

Evaluation of Measurement and Structural Models

The physical activity measurement components based on the SCT model were evaluated to ensure the factor structure of the latent variables, where there is an arrow pointing from the elliptical latent variable to the measured variable displayed in a rectangular form. In the initial stage, Convergent Validity was measured to determine whether the variable indicators were valid or not. It is said to be valid if the loading factor is positive and greater than 0.6. The results of the convergent validity test can be seen in Figure 2. Thus, the indicator is declared valid in measuring the variables of self-efficacy, outcome expectations, self-regulation, and physical activity. The construct reliability test uses Composite Reliability and Cronbach's Alpha. If the Composite Reliability value of the latent variable is greater than 0.7, and Cronbach's Alpha is greater than 0.6. Thus, all indicators that measure the latent variables are declared reliable. GOF is 0.509, meaning that the latent variable has a major influence on physical activity.

**Figure 2.** Flow Chart.

In this study, the significance value of the p-value used is 0.05, so that the t-table value is 1.96. The provisions of this test are that if a positive path coefficient (>0) is obtained and the p-value $\leq$ significant level ($\alpha=0.05$), it will indicate influence between exogenous and endogenous variables (Hair et al., 2021). The result of this test can be explained as follows:

Table 3. Hypothesis Testing Results.

Exogenous	Endogen	Path Coefficient	T Statistics	P-Values	P-Values (One Tailed)
Self Efficacy	Outcome Expectations	0.413	8.536	0.000	0.000
Self Efficacy	Self Regulation	0.508	14.984	0.000	0.000
Self Efficacy	Physical Activity	0.263	4.706	0.000	0.000
Outcome Expectations	Self regulation	0.309	8.377	0.000	0.000
Outcome Expectations	Physical Activity	0.207	3.768	0.000	0.000
Self Regulation	Physical Activity	0.264	4.357	0.000	0.000

Based on the results of the hypothesis testing, it is known that self-education has a positive and significant effect on outcome expectations with a path coefficient value of 0.413. This means that the higher self-efficacy, the more likely it is to increase the outcome expectations of older people in carrying out physical activities in the Ciptomulyo Health Center work area.

Self-efficacy has a positive and significant effect on self-regulation with a path coefficient value of 0.508. This means that the higher the self-efficacy, the more likely it is to increase the self-regulation of older people in carrying out physical activities in the Ciptomulyo Health Center work area. Outcome expectations have a positive and significant effect on self-regulation with a path coefficient value of 0.309. This means that the higher the outcome expectations, the more likely it is to increase the self-regulation of older people in carrying out physical activities in the Ciptomulyo Health Center work area.

Self-efficacy has a positive and significant effect on outcome expectations with a path coefficient value of 0.263. This means that the higher self-efficacy, the more likely it is to increase the outcome expectations of older people in carrying out physical activity in the Ciptomulyo Health Center work area. Outcome expectations have a positive and significant effect on physical activity with a path coefficient value of 0.207. This means that the higher the outcome expectations, the more physical activity the older people tend to engage in the Ciptomulyo Health Center work area.

Self-regulation has a positive and significant effect on physical activity with a path coefficient value of 0.264. This means that the higher the self-regulation, the more likely it is to increase the physical activity of older people.

The indirect hypothesis (Indirect coefficient) has a positive value (greater than 0) and p-value $\leq$ level of significance ($\alpha = 5\%$), then it is stated that there is a positive and significant influence of the exogenous variable on the endogenous variable through the mediating variable. The results of the indirect influence hypothesis testing can be seen through the summary in the following Table 4:

Table 4. Indirect Testing Table.

Exogenous	Mediation 1	Mediation 2	Endogen	Indirect Coefficient	P-Values	P-Values (One Tailed)
Self efficacy	Outcome Expectations		Self-regulation	0.128	0.000	0.000
Self efficacy	Outcome Expectations		Physical Activity	0.086	0.001	0.001
Self efficacy	Self regulation		Physical Activity	0.134	0.000	0.000
Self efficacy	Outcome Expectations	Self regulation	Physical Activity	0.034	0.001	0.001
Outcome Expectations	Self regulation		Physical Activity	0.082	0.000	0.000

Table 5. Results of the mediation effect test.

Mediation 2	Endogen	Mediation 2	Endogen	Path Coefficient	P-Values (One-Tailed)	Indirect Coefficient	P-Values (One-Tailed)
Self efficacy	Outcome Expectations		Self regulation	0.508	0.000	0.128	0.000
Self efficacy	Outcome Expectations		Physical Activity			0.086	0.001
Self efficacy	Self regulation		Physical Activity	0.263	0.000	0.134	0.000
Self efficacy	Outcome Expectations	Self regulation	Physical Activity			0.034	0.001
Outcome Expectations	Self regulation		Physical Activity	0.207	0.000	0.082	0.000

Based on the results of the hypothesis indirect testing, Self-efficacy has a positive and significant effect on physical activity through self-regulation with a path coefficient value of 0.134. This finding shows that self-regulation is stated to partially mediate the influence of self-efficacy on physical activity (Table 5).

The indicators of physical activity in older people are determined using the developed SCT, as carried out by Moeini et al. (2024). The results of this study prove that the physical activity of older people is greatly influenced by the SCT construct, such as self-efficacy, outcome expectations, and self-regulation. The level of self-efficacy in older people was found to be high, high self-expectations, low self-regulation and physical activity in older people was low.

Self-efficacy related to the outcome expectations of older people.

The first hypothesis proves that self-efficacy is related to the outcome expectations of older people in carrying out physical activities in the Ciptomulyo health center work area. The results of this study are consistent with this theory and confirm that self-efficacy is related to the outcome expectations of physical activities and sports carried out by older people (Bandura, 1997). This study is also in line with Moeini's research, where self-efficacy and self-expectation

are interrelated and are predictors of intention to do physical activity. Currently, self-efficacy theory has been widely used to measure physical activity in older adults. (Moeini et al., 2024).

Self-efficacy plays an equally important role with outcome expectations in influencing activity behavior in older adults (Bandura, 1998; Feist et al., 2021). Therefore, we suggest that it is necessary to consider the application of self-efficacy and outcome expectations through physical activity interventions in the form of scheduled exercise or sports programs in older people. In the management of hypertension, the American Heart Association (AHA) recommends a healthy lifestyle and physical activity (Salami, 2021). However, to encourage the independence of older people in dealing with physical obstacles and achieving the physical and psychological goals they set for themselves in a physical activity program, special attention must be given (Garland et al., 2021).

Older people who have high self-efficacy in their ability to perform high levels of physical activity are more likely to see long-term benefits from physical activity, such as improved balance, flexibility, and mental health.

Self-efficacy related to the self-regulation of older people.

The second hypothesis is that self-efficacy is related to older people's self-regulation in carrying out physical activities in the Ciptomulyo health center work area. Self-efficacy is a person's belief in their own ability to complete tasks or face challenges, influencing how older people themselves regulate emotions and daily activities in managing their health, including chronic conditions that are often experienced by older people (Castillo-Mayén et al., 2020; Goldoust et al., 2022). The results of this study indicate the importance of self-efficacy in improving self-regulation and physical activity in older people, which, of course, will have an impact on a better quality of life for older people. This is in line with research conducted by Toros et al. (2023); Wang et al. (2024). The research results also confirmed that seniors who exercise regularly show increased life satisfaction, self-esteem, and self-efficacy compared to those who are inactive. This study highlights the importance of consistency in exercise to significantly improve the psychological well-being of seniors.

What is interesting is that among the SCT constructs above, there is a stronger relationship for physical activity, namely the relationship between self-efficacy and self-regulation. This means that the higher self-efficacy, the more likely it is to increase the self-regulation of older people in carrying out physical activity in older people. Research conducted by (Ageez, 2024; Frazier et al., 2021; Luszczynska, 2020), explains that in the context of older people health, a high Path Coefficient value for the relationship between self-efficacy and self-regulation confirms that self-efficacy is a strong predictor of long-term involvement in physical activity, great motivation, and even being able to maintain a physical activity routine in the long term. This supports the statement that self-efficacy helps improve self-regulation skills that include skills such as planning, self-monitoring, and re-evaluation, which are all important for maintaining physical activity levels.

Self-efficacy related to the physical activity of older people.

The third hypothesis proves that self-efficacy is related to physical activity in older people in the Ciptomulyo health center work area. This finding shows that self-efficacy plays a positive and significant role in older people's participation in physical activity. This is in line with Bandura's SCT (Bandura, 1989; Bandura, 2004), which explains that when someone tries to maintain a behavior in the long term (continue to exercise, maintain a healthy diet, and maintain mental ability), believing that they are sure they can do it (self-efficacy), will be very helpful. This belief or self-efficacy will make older people more consistent in carrying out these actions, even when facing challenges or difficulties. The higher the level of self-efficacy of older people in believing in the benefits of physical activity, the more likely they are to be

actively involved in this activity, in accordance with the research of Ige-Elegbede et al., who found a correlation between self-efficacy and the level of physical activity of older people (Ige-Elegbede et al., 2019). Other research findings also support this research, showing that successful exercise experiences increase feelings of self-efficacy, which in turn encourages satisfaction and further engagement in physical activity, improve management of their health conditions (Rosdina et al., 2024).

Outcome expectations related to the self-regulation of older people.

The fourth hypothesis proves that outcome expectations are related to self-regulation of older people in the Ciptomulyo health center work area. Outcome expectations, such as the belief that exercise can improve health and quality of life, often encourage older people to be more physically active. This finding is in line with research conducted by Moeini et al. (2024), which found that older adults who have high outcome expectations are more likely to monitor their physical activity progress, such as recording their exercise or using fitness tracking devices. Older people are also more likely to consistently allocate time for physical activity, compared to older people who do not have clear outcome expectations. Older people who believe that physical activity will improve their health are more likely to set goals and use self-regulatory strategies to stay active.

Outcome expectations related to the physical activity of older people.

The fifth hypothesis is proven to be true; there is a significant positive relationship between outcome expectations and physical activity of older people in the Ciptomulyo health center work area. Outcome expectations can help someone in making decisions regarding actions to be taken based on their personal beliefs and hopes that the action will produce the desired results (Bandura, 1997; Lynch et al., 2023), which proves that the better the expectations of the results or understanding of older people regarding the benefits of physical activity and exercise, the better the level of physical activity of older people. The result of the study showed that when older people have positive expectations, such as better health, they are more motivated to participate in physical activity. However, when older people do not have good self-regulation, the sustainability of physical activity will decrease.

Self-regulation related to physical activity in older people.

The sixth hypothesis is proven to be true; there is a significant positive relationship between self-regulation, and physical activity of older people in the Ciptomulyo health center work area. Bandura's SCT theory (Bandura, 1989, Bandura, 1998) states that behavior is directly influenced by self-regulation. Likewise, the results of this study found that self-regulation has a significant positive relationship with physical activity in older people. Self-regulation is the main determinant of physical activity in older people in maintaining physical activity in the short term (McMullan, 2021). Older people who have the ability to self-regulate themselves (self-regulation) regarding physical activity have a significant influence on the routine participation of older people in various physical activities, which contributes to better physical and mental health of older people.

Self-efficacy related to physical activity through self-regulation of older people.

Based on the research results, in accordance with the proposed model, it was found that there is a positive and significant indirect relationship between self-efficacy and physical activity in older people through the mediation of self-regulation. Self-efficacy significantly improves self-regulation, which in turn increases physical activity. This pathway is the strongest indirect pathway, so interventions that focus on improving self-efficacy and self-regulation may be an effective strategy to increase older adults' engagement in physical activity.

Self-regulation plays an important role in linking self-efficacy to physical activity. The relationship between self-efficacy, self-regulation and physical activity shows that self-efficacy has a significant indirect effect on physical activity through self-regulation (Moeini et al., 2024), explains that high self-efficacy tends have better self-regulation abilities, which allows older adults to set goals, overcome obstacles, and maintain consistent physical activity routines.

4. CONCLUSION

The results of the study indicate that there is a significant positive relationship between the self-efficacy of older people and the outcome expectation of older people's, there is a significant positive relationship between the self-efficacy of older people and the self-regulation of older people, there is a significant positive relationship between the self-efficacy of older people and the physical activity of older people, there is a significant positive relationship between the expectation of older people's results and the self-regulation of older people, there is a significant positive relationship between the outcome expectation of older people's results and the physical activity. There is a significant positive relationship between the self-regulation of older people and the physical activity of older people. There is a positive and significant indirect relationship between self-efficacy and physical activity in older people through the mediation of self-regulation.

The results of this study strengthen the social cognitive theory in the context of older people physical activity by showing that self-efficacy, outcome expectations, and self-regulation have a significant positive effect on older people's involvement in physical activity. Health centers can prepare SOP with integration of self-regulation interventions that include goal identification and setting, self-monitoring, coping strategies, provision of social support, and feedback. In addition, health centers can provide training for nurses related to improving older people's self-regulation.

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