



The Relationship between Social Cognitive Theory in Enhancing Physical Activity in The Elderly: A Systematic Review

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Abstract. The high number of elderly people has led to various health problems that must be faced. However, there are still elderly people who are reluctant to carry out regular physical activity, so the health status and quality of life of the elderly also decline. Aims: This systematic review aims to identify the relationship between social cognitive theory (SCT) on physical activity in the elderly. Methods: This systematic review method approach is based on PRISMA. This systematic review examines several research articles from journal databases, namely PubMed and ScienceDirect, and obtained 13 articles in 2019-2024. The keywords used in the search are “Social Cognitive Theory”, “SCT”, “Physical Activity”, “PA”, and “Elderly”. The articles reviewed met the inclusion criteria, namely relevant article topics, original research articles in English, and publications in the last five years. The eligibility criteria were then assessed separately using the JBI Critical Appraisal Checklist tool. Results: From a total of 13 articles reviewed, it can be concluded that the majority of articles explain how important the social cognitive patterns that elderly people must have in relation to the physical activity of the elderly, such as predicting the physical activity of the elderly, increasing the exercise behavior of the elderly, influencing the level of physical activity for people with chronic diseases, and adjusting physical activity with the abilities of the elderly. The higher an elderly person's social cognition, self-efficacy, encouragement, and social support to be able and willing to carry out physical activities in accordance with the elderly's abilities and physical condition. Conclusion: The social cognition of the elderly places more emphasis on the ability of the elderly to learn things around them, so that the elderly have self-efficacy, encouragement, and social support to do things in according to their goals and beliefs. Health workers in provide health services to the community, social cognitive theory can be used for alternative to increase the physical activity of the elderly. A personalized smartphone-based intervention based on SCT is highly effective for promoting physical activity in older adults.

Keywords: Social Cognitive Theory, Elderly, Physical Activity

1. INTRODUCTION

The aging process is a phase of life that everyone will experience. The aging population has increased rapidly over the past few decades due to two significant factors: a decline in mortality and fertility rates and an improvement in the quality of life, leading to an increase in life expectancy worldwide (Zenebe et al., 2021). Globally, the number and proportion of people aged 60 and older in the population are steadily increasing. In 2022, the number of people aged 60 and above reached 1 billion. This number is expected to rise to 1.4 billion by 2030 and 2.1 billion by 2050. In 2050, 80% of all older adults will live in low- and middle-income countries (WHO, 2020; Zenebe et al., 2021).

The significant increase in the elderly population presents complex health challenges the need to be addressed. The decline in physiological functions, along with deterioration in psychological and cognitive health, as well as social issues, are some of the realities faced by older adults. Elderly individuals with cognitive decline often exhibit difficulties with orientation, attention, concentration, thinking, memory, and language. Surveys show that

around 75% of elderly people suffering from degenerative diseases will experience difficulty performing physical activities by 2050 (Cahyaningrum, 2022).

Elderly individuals who are unable to fully engage in physical activity will experience an impact on their quality of life and even their overall health status. Physical activities that are performed regularly and in accordance with their abilities can positively affect both the physical and psychological health of older adults. This, in turn, can also improve their cognitive and social functions, helping them adapt to the phase of life they must go through (INDAYANI, 2020). Certain types of physical activity can influence cognitive function, making it important to understand which activities are appropriate for each individual's health status and quality of life (Mz & Arovah, 2023).

The social cognitive theory (SCT) is a theory that examines individual change within a social environment (bandura, 1986), in (Qodir, 2021). SCT indicates that elderly individual engagement in physical activity is influenced by a key factor: self-efficacy, or an individual's belief in their ability to perform behaviors aligned with their desires. Elderly individuals with high levels of self-efficacy will exhibit better adherence to physical activity compared to those with low levels of self-efficacy (Setyowati, 2023). This statement can be interpreted to mean that the more elderly individuals believe that physical activity is very important for themselves, the more consciously and voluntarily they will engage in physical activities that align with their capabilities and limits.

Based on the statements above, the researcher is very interested in reviewing several research articles relevant to the topic discussed, namely the impact of social cognitive theory on the level of physical activity among the elderly.

2. RESEARCH METHOD

This article uses the PRISMA (preferred reporting items for systematic reviews and meta-analyses). This method consists of 9 steps, and during the initial screening of articles, findings from articles published more than 5 years ago and those that are not relevant to the topic will be excluded from the group of identified articles. Bibliographic information (title, author name, journal name, publication year, volume, and issue number) is entered in EndNote software, and duplicates are removed using the find duplicate feature. The next step is to examine the titles and abstracts to identify documents that meet the eligibility criteria for inclusion in the study and to remove unrelated documents. The research titles are independently reviewed by the authors to eliminate studies that do not meet our inclusion criteria before a thorough review of the abstracts and full text of the selected studies. In this systematic review, the articles examined were selected based on several relevant inclusion criteria: the article's topic (addressing SCT,

PA, and the elderly), original research articles, publishes in English, and released within the last five years.

Research articles that do not meet these inclusion criteria will be excluded and not considered for review. The search for research articles as literature in this systematic review was conducted through several journal databases, namely Pubmed, and ScienceDirect, and obtained 13 articles in 2019-2024 using the keywords specified by the researchers “Social Cognitive Theory,” “SCT,” “Physical Activity,” “PA,” and “Elderly”. Out of a total of 295 articles were excluded due to duplication. An additional 103 articles were removed for not having sufficient relevance to the topic on interest, leaving only 13 articles that were synthesized and included in this study. An explanation of the article search strategy can be found in Figure 1.

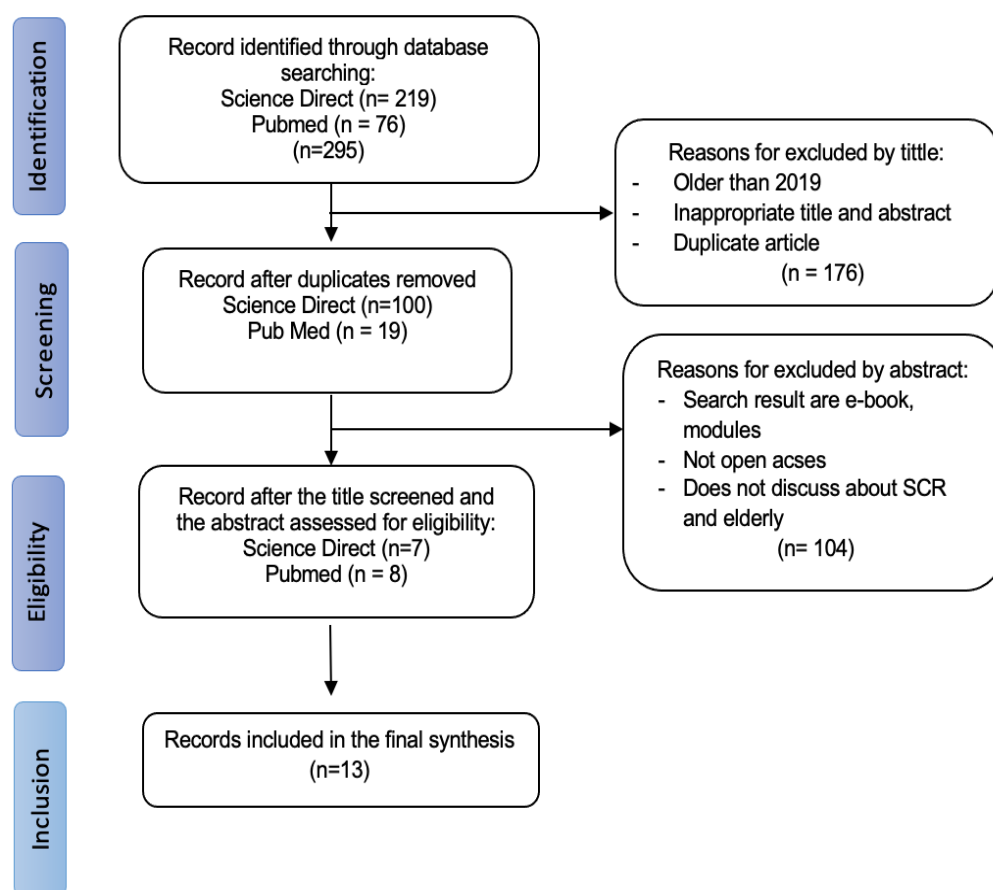


Fig. 1. Flow diagram of the selection process for the review

a. Quality Assessment

The 13 articles that were assessed as falling within the eligibility criteria were then assessed separately using the JBI Critical Appraisal Checklist tool. This instrument assesses the quality of the methodological quality of the studies and determines the extent to which the studies have addressed potential biases in their design, conduct, and analysis. The assessment

is subsequently used to inform the synthesis and interpretation of the findings. The overall quality score we used were as follows good (+), and not (-). As for the quality assessment of the article findings is presented in table 1.

Table 1. Quality-Approved Checklist For Analytical Cross Sectional Studies

Evaluated criteria	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Total score	Quality
Baird <i>et al.</i> , 2021	+	+	+	+	-	-	+	+	6/8	Good
Jeng <i>et al.</i> , 2022	+	+	+	+	+	-	+	+	7/8	Good
Silveira & Motl, 2024	+	+	+	+	+	+	-	+	7/8	Good
Neal <i>et al.</i> , 2024	+	+	+	+	-	+	+	+	5/8	Good
Zainuddin, 2023	+	+	+	+	-	+	+	+	7/8	Good
Arovah & Heesch, 2022	+	+	+	+	-	+	+	-	7/8	Good
Motl, 2019	+	+	+	+	+	+	-	+	7/8	Good
Sze <i>et al.</i> , 2023	+	+	+	+	+	+	+	+	8/8	Good
Ingold <i>et al.</i> , 2020	+	+	+	+	+	+	+	-	7/8	Good
Chen <i>et al.</i> , 2022	+	+	+	+	+	+	+	+	8/8	Good
Smith <i>et al.</i> , 2019	+	+	+	+	+	+	+	+	8/8	Good
Moeini <i>et al.</i> , 2024	+	+	+	+	+	+	+	+	8/8	Good

Note: Item 1: Criteria inclusion; item 2: study subject and the setting describe; item 3: exposure; item 4: Standard criteria; item 5: confounding factors identified; item 6: strategies to deal with confounding factors state; item 7: measured in a valid and reliable; item 8: appropriate statistical.

Table 2. Quality-Approved Checklist For Analytical Randomized Controlled Trials

Evaluated criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	Total score	Quality
Harada, 2022	+	+	+	-	-	-	+	+	+	+	+	+	+	10/13	Good

Note. Item 1: assignment of participants; item 2: group concealed; item 3: treatment groups similar; item 4: participants blind; item 5: treatment blind; item 6: intervention of interest; item 7: treatment assignment; item 8: treatment groups; item 9: outcomes measured; item 10: follow up complete or not; item 11: participants analysed in the groups; item 12: appropriate statistical analysis; item 13: trial design.

3. RESULT AND DISCUSSION

a. Result

The findings from the 13 reviewed articles show that the majority indicate a strong connection between social cognitive theory and physical activity in the elderly. The 13 articles that have been reviewed can be seen in Table 3.

Table 3. The Review Article

Author	Country	Sample size	Desaign	Result
Baird <i>et al.</i> , 2021	United States	180	<i>Cross sectional study</i>	A behavior intervention focused on self-efficacy and goal-setting for exercise as targets of social cognitive theory (SCT) may be appropriate for improving physical activity (PA) in older adults with multiple sclerosis (MS).
Jeng <i>et al.</i> , 2022	Germany	210	<i>Descriptive correlation</i>	Self-efficacy ($p=0,31$), social support, and barriers, except for goal-setting ($p=0.25$), are associated with self-reported physical activity. These SCT variables are key targets of SCT-based behavioral interventions. These SCT variables are key targets of SCT-based behavioral interventions aimed at improving physical activity among people with MS who experience fatigue.
Silveira & Motl, 2029	USA	22	<i>Cross sectional study</i>	Change in physical activity (PA) experienced by 9 out of participants showed an increase in moderate-to-vigorous physical activity (MVPA) of less that 0.5 standard deviations (SD), while 8 out of 22 participants experienced an increase in goal-setting, planning, and self-efficacy in overcoming barriers, were

				associated with the increase in physical activity.
Neal <i>et al.</i> , 2024	Birmingham	30	<i>Cross sectional study</i>	Overall, participants who reported higher levels of exercise goal-setting had higher level of physical activity (Rs = 0,34; P <0,05). This indicates that social cognitive theory (SCT) is closely related to an individual's physical activity.
Zainuddin, 2023	Takalar District	90	<i>Mixed method sequential explanatory design</i>	The development of an SCT-based mHealth application model has proven to be highly beneficial in assisting nurses in designing morning physical activity programs for patients with type 2 diabetes mellitus.
Arovah & Heesch, 2022	Indonesia	126	<i>Cross sectional study</i>	This measurements instrument has proven to be valid and easy to use in assessing the level of physical activity among respondents.
Motl, 2019	USA	275	<i>Cross sectional study</i>	Social cognitive theory (SCT) has been shown to be associated with sedentary behavior in patients with multiple sclerosis (MS).
Sze <i>et al.</i> , 2023	Japan	36	<i>Cross sectional study</i>	A personalized smartphone-based mHealth intervention grounded in social cognitive theory (SCT) is feasible and effective for promoting physical activity among patients with type 2 diabetes.
Ingold <i>et al.</i> , 2020	Western Sydney, Australia	61	<i>Cross sectional study</i>	Certain types of physical activity can influence cognitive function, making it important to understand the physical activities that are appropriate for each

				person's health status and quality of life.
Chen <i>et al.</i> , 2022	Tiongkok	285	<i>Cross sectional study</i>	Exercise anticipation and healthy behavioral habit can effectively the ability of elderly individuals to engage in physical activity.
Smith <i>et al.</i> , 2019	Skotlandia	6	<i>Studi Cross-correlation n-of-1</i>	The SCT constructs (self-efficacy regarding barriers, goal setting, planning, social support, outcome expectations, perceived barriers, enjoyment) can predict physical activity. However, SCT and physical activity have a bidirectional relationship, meaning that SCT constructs can predict engagement in physical activity and vice versa. Therefore, further research is needed.
Moeini <i>et al.</i> , 2024	Kermanshah, Iran	610	<i>Cross sectional study</i>	The expanded SCT, which includes HLP, intention, and efficient SCT constructs, is a reliable model for predicting physical activity behavior in older adults. This theory is used to enhance physical activity in older adults.
Harada, 2022	Jepang	393	<i>Randomized, non-blinded, RCT</i>	Self-regulation can enhance exercise behavior among older adults, alongside health literacy, habit strength, and socio-demographic characteristics.

b. Discussion

1) Key findings

Social Cognitive Theory (SCT) is a theory related to behavioral change that focuses on the reciprocal relationship between behavior, cognitive or personal factors, and the environment (Setyowati, 2023). From this definition, it can be interpreted that this theory

studies how older adults observe the thing in their surrounding environment, leading to the emergence of a belief or willingness to engage in physical activity.

Based on the 13 articles reviewed, a consensus was found that social cognitive theory (SCT) in the elderly is related to their physical activity. SCT is closely linked to increasing physical activity in order adults, as evidenced by:

2) Predicting physical activity in the elderly

In this review, the statement can be illustrated by the idea that an elderly person will be willing and motivated to engage in regular physical activity that suits their abilities if they have a good understanding, self-efficacy, and adequate knowledge. The opposite condition if the elderly not understand and have not good knowledge related to social cognitive, then the elderly are reluctant and feel no need to do physical activity, such as sports or other activities, for various reason. The same opinion was conveyed by Smith et al, SCT and PA have a two-way relationship, namely that the SCT construct can predict PA involvement, but at the other times, involvement, physical activity cause change in the SCT construct (Smith et al., 2019). There are certain times when SCT is interrelated with PA at the same time. Like sometimes, individuals are more likely to be physical active on days when someone has a positive attitude (Duarte et al., 2022). In the research of Kwasnicka et al, it also explains that someone with osteoporosis of the lower limb is more likely to have high physical activity (such as walking) when they have stronger conditions (attitudes, behavioral control which is felt and intention) (Kwasnicka et al., 2017).

In anticipation of exercise and lifestyle habits, have a close relationship with the elderly. Anticipation of exercise and lifestyle habits effectively predict the ability of the elderly to perform physical activities (Chen et al., 2022). Additionally, Jeng et al., who said that the need for self-efficacy, goal setting, social support, and overcoming barriers for older adults with multiple sclerosis to have targets in behavioral interventions aligned with SCT to enhance physical activity (Jeng et al., 2022). In addition, SCT can also be used as a measuring tool in assessing and predicting the behavior of elderly physical activity, SCT is very accurate and suitable for use as a measuring tool in determining physical activity (Arovah & Heesch, 2022; Ghobadi et al., 2023).

3) Improving sports behavior in the elderly

By implementing self-regulation of time in daily exercise, behavioral changes in physical activity among the elderly can be enhanced. Self-regulation provides control in achieving the desired result or goals. This can be observed through the involvement of a

series of skills and processes, including emotion regulation, impulse control, and goal setting (Harada, 2022). The research of other studies also explains that interventions focused on self-efficacy and self-regulation are effective in increasing physical activity among the elderly (Baird et al., 2021; Duan et al., 2021; Spring et al., 2021). The SCT was also developed to be able to increase physical activity among the elderly (Moeini et al., 2024). With the findings, it will be easier for healthcare providers to establish suitable and regular interventions to increase physical activity among the elderly.

4) Influence on physical activity levels in people with chronic diseases

Other opinions are also explained by Neal et al., who concluded that SCT is closely related to an individual's physical activity patterns, enabling them to set goals and develop the ability to exercise (Neal et al., 2024). Another article also explains that consistent interventions based on SCT can maximize the effectiveness of treatment for patients with multiple sclerosis (MS) (Motl et al., 2019; Silveira & Motl, 2019). With better exercise goal setting, this SCT intervention is highly effective when applied to populations with chronic diseases to enhance behavioral changes in physical activity.

5) Physical activity according to physical ability

The higher a person's understanding of SCT, the greater their goals for engaging in physical activity will be. In carrying out physical activities, an elderly person must also pay attention to their physical ability level. Inconsistency in choosing the type of physical activity to be carried out can affect the cognitive patterns of the elderly themselves (Ingold et al., 2020). Participating in physical activity has been shown to provide protection against age-related cognition loss (Palta et al., 2019). The physical activity behaviors chosen and carried out by the elderly will have an impact on the quality of life and overall health status of the elderly. Physical activity, provides for older adults' cognitive function ability when compared with no physical activity participation,

6) Information technology innovation

With the advancement of technology, efforts to enhance an individual's social cognition can leverage the progress in information technology in various forms, such as social media, the internet, mobile applications, smartphones, and more. This is similar to the findings of Sze et al., who concluded in their research that the use of smartphones has proven to be effective and efficient in promoting the importance of engaging in physical activity for individuals with type 2 diabetes mellitus. Besides being more practical and engaging, smartphone-based applications provide more targeted messages and information (Sze et al., 2023). In addition to the benefits of M-Health applications for

individuals with non-communicable diseases (Sari & Besral, 2020), diabetes (Zainuddin et al., 2023), increase physical activity (Sohaib Aslam et al., 2020), these applications also significantly assist healthcare providers in designing daily physical activity programs for diabetes patients.

Freco, et al, also explained that by using digital technology, can be increased physical activity and a more active and healthy aging process can occur (Greco et al., 2023). Currently, information and communication technologies (ICTs), and more generally new digital technologies, show great potential in increasing PA levels and reducing sedentary levels, at last in the short term. Technology that can offer virtual physical games is an effective strategy to promote PA by overcoming certain barriers that may limit its practice in apparently health older adults.

4. CONCLUSSION AND RECOMMENDATIONS

The pattern of physical activity behavior carried out by the elderly is significantly influenced by the level of their social cognitive patterns. The social cognitive factors that the elderly should possess in relation to their physical activity include pretending their physical activity, increasing exercise behavior, influencing physical activity levels in individuals with chronic illnesses, and adjusting physical activity to match their abilities. The higher the social cognitive patterns of the elderly, the greater their self-efficacy, motivation, and social support in engaging in physical activity. Therefore, healthcare providers, in delivering health services to the community, social cognitive theory can be considered as an alternative to increase physical activity among the elderly. Smartphone-based interventions personalized according to SCT are highly effective in promoting physical activity among the elderly. The development of SCT is used to enhance physical activity in older adults. In this systematic review, the authors have not yet explored in-depth what types of physical activities are undertaken by the elderly and how to measure the social cognitive patterns they possess.

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