The Multivariants of Physical Activity for Cognitive Impairment
Among Elderly: A Systematic Review

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Abstract: Background: Dementia is a syndrome characterized as a decline in cognitive function, decreased memory capacity, orientation, language, decision making, judgment, emotional control changes, social behavior, motivation and physical abilities. The purpose of this study was to determine the effect of various physical activities on the elderly with decreased cognitive function. Method: The method used is Systematic Review using 17 articles Randomized Control Trial Study and 1 Systematics Review, 2 article Systematic Review and Meta-Analysis by using PICOT approach. Results: Simple physical activities, natural and followed by social activities can improve the condition of cognitive function decline and physical function of the elderly with decreased cognitive function. Conclusion: Physical activity programs are highly varied, simple and easy to implement by nurses to reduce physical and cognitive dysfunction, decrease fall risk factors and overcome sleep disorders of patients with decreased cognitive function, through various ways both formal and informal in health and community facilities with combing physical and social activities for the elderly.

1 BACKGROUND

Today, many interventions that support psychosocial cases are developed and believed to be more effective than pharmacological interventions for people with dementia, which include interventions of physical activity that have been a promising alternative to interventions, physical activity includes movement of the body to move muscles and burn calories from body [1]. Physical activity is closely related to some of the health benefits and cognitive function of the human adult phase and high levels of physical activity may decrease the risk of mild cognitive impairment or future dementia [2]. Physical activity can stimulate elderly cognitive function with decreased cognitive function and healthy elderly and may relieve neuropsychiatric symptoms. However, implementing and maintaining a program of physical activity in everyday life is a challenge in itself [3]. Physical activity is one of the external factors associated with the rhythm of rest and activity in the elderly. Physical activity and balanced rest are essential to restore sleep function as it is vital in maintaining the physical and mental health of the elderly [4]. Low physical activity and sleep disturbances can disrupt the health of the elderly so it is important for nurses to plan for interventions and develop appropriate treatments for people with dementia [5]. Good physical activity can be seen from the physical appearance of the physical ability of the elderly. The concept of physical ability of the elderly is closely related to the ability to implement ADL. Physical activity is low and physical dependence is common in the elderly. Good physical ability greatly contributes to the physical ability of the elderly with decreased cognitive function and dementia [6]. A study suggests that elderly people with mild cognitive impairment noted a positive effect between physical activity on global cognition, executive function, attention and memory, a meta-analysis also noted that aerobic exercise may improve global cognitive abilities and provide fewer positive effects on memory impairment cognitive [1]. Aerobic and cognitive activity have moderate effects on cognitive decline in elderly people with or without cognitive function decline [7].

Dementia is a syndrome caused by a disease of the brain that causes a progressive decrease in cognitive function, including memory loss, learning, orientation, language, decisions and judgments commonly found in elderly people over 65 years [8], cognitive decline beyond normal-age expectations,
followed with changes in emotional control, social behavior, motivation and / or physical ability. [9] The number of elderly with dementia is estimated to be 5 - 8.5% of the elderly (≥ 65 years) in 2030. Prior to diagnosis dementia begins with a decrease in cognitive function lighter in elderly [3], the main cause of disability and dependence on the elderly, and the need for care in elderly dementia is expected to increase sharply as the number of elderly people in the world also increases [10]. The increased prevalence of dementia leads to an increase in maintenance and financial burdens, causing frustration and causing family agitation behaviors, due to the fact that dementia sufferers have difficulty in balance, mobilization, and fine motor skills, which affects the ability to maintain independence in implementing ADLs [9]. In the world, there are 35.6 billion families with dementia, 7.7 billion diagnoses each year, and will double 2 every 20 years [11]. 47.5 million people live with dementia worldwide and the number is expected to rise to 131 million by 2050 [12], in developing countries 2-3 people live with people with dementia and care for them at home, and over 90% care for them with informal caregivers such as partners, other family members and friends.

[1]. Alzheimer's Disease International notes that in 2010 in the United States it took $ 604 million for the care and treatment of people with dementia [13]. Therefore, dementia is referred to as the second ranking cause of the high burden of disease and the causes of poverty [13]. Decreased cognitive function is a transitional condition between healthy elderly conditions and dementia [6]. Elderly with a decline in cognitive function the majority live in the community and treated by his family at home [3], where dementia disease including Alzheimer's disease is the latest issue because it requires high maintenance costs, morbidity and death in the community [2]. But when the condition of people with dementia can not be handled alone then moved or put in health facilities or elderly parlors. Patients with dementia after 6 months without good treatment will show symptoms of functional decline of the body such as personal hygiene, dressing, and toileting and in severe dementia showed symptoms of eating disorders [14]. So that the fulfillment of body needs will be greatly disturbed, on the way the disorder is not uncommon cause symptoms neuropsychiatri. Neuropsychiatric symptoms that appear can be physical and verbal aggression, sleep disorders, wandering and refused treatment. Neuropsychiatric symptoms are present in 90% of people with dementia along with illness [14]. It is strongly influenced by many factors in elderly life with dementia, one of which is physical activity. Low physical activity is one of 7 factors that contribute to 13% of Alzheimer's disease in the world [3]. Decreased mobilization is a risk factor for the risk of falling, incontinence, decubitus and pneumonia, which ultimately decreases the quality of life of the elderly [15].

The onset of cognitive decline in dementia causes a decrease in complex physical ability more rapidly. At an advanced stage the patient needs help with self-care, so interventions to alleviate cognitive impairment and support of the caregiver are urgently needed [1]. Some studies say that someone who is physically active can prevent dementia and have a positive effect on cognitive health [8]. Interventions of physical activity aimed at improving the components of physical ability are closely related to the ability to perform physical activities because the higher the level of physical activity the higher the physical ability and other functions, the components include muscle strength, aerobic resistance, flexibility, body composition, dynamic balance, and dexterity of the body, recommended activities for the elderly include carrying out aerobic activities in daily life, activities to maintain or improve flexibility, and balance exercises for the elderly who have the risk of falling, can be supplemented with muscle strength activities, reduce the habit of sitting still, and manage the risk of injury and / or [6] in order to benefit health, as well as impact on cognitive function and to delay or prevent mild cognitive decline and dementia in the elderly. Thus, physical activity can have a positive impact on cases of cognitive impairment in the early stages of cognitive impairment and may slowly decrease physical disability and dependence in administering ADL to elderly people with dementia [6]. Physical activity can have a positive effect on cardiovascular health, gait and balance, cognitive function and general elderly health, but in the elderly the dementia of physical activity and motor function decreases and is recommended as one that can prevent the risk of falling, although physical activity also may increase the risk of falls and the risk of injury to the elderly [16]. With the increased prevalence of dementia, the lack of appropriate and effective treatment and lowering the cost of care and reducing neuropsychiatric symptoms, is a vital intervention to minimize undesirable behavior and improve or maintain quality of life, the benefits of appropriate physical activity can provide a more useful alternative to specific activities and easily implemented by people with dementia [17]. Patients
with dementia generally suffer from decreased physical function, severe cognitive impairment, and sleep distress. Many of the factors that cause it include changes in age, health and medical conditions, psychotropic side effects, the risk of falling illness, physical dependence, noise, brightness and the surrounding environment [5].

Therefore, living together with the elderly with decreased cognitive function or dementia will experience many changes in life and must be able to make changes in stimulating the environment and physical activity of the elderly [2]. Physical exercise can be used as a strategy of managing and inhibiting the progress of dementia [9]. But still needed a qualified program to achieve the goal of giving strategy of physical activity. So optimal parameters such as exercise type, frequency, time required and intensity of physical activity for dementia patients [9] are required. Progressive motor exercises that are easy and securely intensive are very effective for body strength and physical appearance [16]. Physical and cognitive exercise has a more effective effect on the treatment of symptoms of dependence of people with dementia. The Long Lasting Memories (LLM) The European Project has been validated as an alternative to technology-based interventions that combine cognitive exercise with physical exercise [7]. Innovative approaches are needed to overcome neuropsychiatric symptoms. Function-Focused Care (FFC) is intended to transform a nursing care philosophy that focuses on optimizing physical activity rather than other maintenance tasks. The objective of the FFC is to focus on the appropriate cognitive and physical abilities of the patient, including walking in the dining room, participating in eating in the orphanage or feeding themselves, preparing cutlery, filling drinking and helping others to drink, or facilitating ROM (Range of Movement) is active during treatment [14]. Although physical exercise has a major impact on people with dementia including physical functioning, ease of movement, hospitalization, caregiver death and burden, short and precise interventions that not only involve the patient but also the caregiver is urgently needed [18].

A systematic review in 2011 that reviewed 10 articles with qualitative methodologies gave results that regular physical activity carried out involving walking and implementing ADLs could positively impact some physical functional indicators [8]. While many people think that physical activity means doing sports and parents should avoid sports that are considered quite heavy. Phenomena that exist in health facilities are often difficult to find alternative physical activity for the elderly. Based on the above explanation, the hypothesis of this systematic review is to test whether various kinds of physical activity affect the elderly with decreased cognitive function using quantitative method. While the purpose of this systematic review is to determine the effect of various physical activities on the elderly with decreased cognitive function.

2 METHODS

The development of this article using Systematic Review designed PICOT approach.

Participants

The inclusion criteria in the preparation of this article are 1). Articles with participants diagnosed with dementia and aged over 60 years 2). Articles with participants are still able to carry out physical activities 3). There are clear interventions and instruments and data retrieval procedures in the articles obtained 4). There are at least 2 groups of participants 5). Participants can be obtained from orphanages or in the community. While the exclusion criterion are 1). Articles with participants suffering from terminal pain 2). Articles with participants in treatment programs that do not permit physical activity 3). Articles with participants receiving palliative therapy 4). The article does not contain clearly the participants and the intervention provided.

Search Strategy

The search strategy of an article in the preparation begins with topic selection, then the keyword is specified. Keywords used are physical activity and cognitive and elderly and experiment. The article searches are done on the SCOPUS and Science Direct databases, the result restrictions are journal, publication year 2012 - 2018, nursing journal area and gerontology, and English speaking. When the search was obtained 2317 journals, after selection was obtained 39 journals from SCOPUS and 22 journals from related Science Direct, and decided 7 journals from SCOPUS and 13 journals from the appropriate Science Direct. Journals that were determined using Randomized Control Trial Study, Systematic Review, Systematic Review and Meta Analysis designs were all quantitative studies. After the journal is determined, then the preparation of PICOT of the entire journal.

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Comparison

The benchmarking stage uses the participation of the control group and the intervention group, or the group with the most minimal intervention with the group receiving the planned interventions. In the arrest there are also participants divided into more than 2 groups.

Result

Based on the articles obtained, the results are summarized based on an assessment of the articles using objective methods, subjective methods and a combination of objective and subjective methods. The objective method when physical activity is performed directly and observed directly, the subjective method when the observation is performed using a particular instrument. Results do not include data of physical activity outside the criteria.

3 RESULT

Article Identify

In the search in the database, obtained 2317 articles displayed. After reviewing the title and abstract then full textnya, it was decided 20 articles included in this systematic review.

Article Quality

Overall the bias risk of the articles is moderate [19] [13] [20] [21] [22] [23] [24] [25] [15] [8] [9] [16] [26] [14] [7] [2], high bias [17] [1], and low bias [27] [28]. Participants were taken randomly for intervention and control groups in almost all articles except on [7] [2] [17] there were no control groups and in the article [20] [23] [24] [25] there was no clear control group because it is a systematic review and meta-analysis. The method of intervention is objectively performed on [15] [19] [22] [28] and the method of intervention of combinations that is objectively and subjectively performed on [27] [8] [9] [16] [26] [14] [7] [2] [13] [1] [21].

Article Characteristic

Of the 20 articles that constitute RCTs articles are [27] [19] [13] [17] [11] [21] [22] [28] [15] [8] [9] [16] [26] [14] [7] and systematic review and meta-analysis articles [20] [23] [24] [25]. Three articles are from the United States [17] [14] [8] and Spanish [28] [7] [26], two articles are from Australia [13] [9] and Netherland [1] [16] as well as one article derived from Korea [27] and Portugal [2] while other articles do not clearly mention the location of his research. The total number of participants in this article is 9104 participants and 56 families. Participant age between 55 years to 96 years, which includes both women and men, elderly participants themselves and caregivers. In those articles there is a control group and an intervention group in which there is a control group that is not assigned an activity that is on [27] [19] [13] [28] [21] [22] [9] is on the other RCTs article of the fixed control group get treatment. All RCTs articles provide clear intervention protocols.

Affectivity of the Intervention

Overall, the results of the intervention indicated that the intervention provided a positive effect on the physical condition, especially the physical appearance of participants and able to reduce the risk of decline in cognitive function and functional funnya. Although there are articles that show the results of significant low analysis but still provide positive results between physical activity with decreased cognitive function in the elderly.

Overall Results

Studies of the effects of physical activity on cognitive impairment have significant results on improvements in cognitive function, neuropsychiatric symptoms, physical appearance and ADL implementation in the elderly. Some of the physical activity programs provided include flexibility, stretching, balance and resilience [1] & [14] fun activities and TUG (Time up and Go) 3 meters [18] aerobic exercise [7] & [18] in the form of hiking and biking [7] arts and crafts activities, physical exercises, cognitive stimulation, music / entertainment, sensory stimulation, social / reminiscence and daily routine activities [17]. Walking, marching, moving weights, and upper and lower body strength activities [13], standing up straight from sitting or squatting [15], social activities [8], sitting and standing exercises [9], and balance while standing, up stairs, stepping over objects [16]. Participants included in the study were from several elderly (wreda) institutions [13] [15] [8] [9], and from the rehabilitation section of a hospital [16], physical activity for spare time with lots of lounges [3], physical activity associated with simple sleeping activities [4], physical activity using modern fitness equipment [2], physical activity involving ADL activities selected by participants [5]. The results of these studies were safe physical
exercise given to people with dementia and did not cause an increased risk of falling [16], physical activity had an effect on the agitation and physical appearance of dementia residents [9].

The physical activity program influences the physical and cognitive functions of dementia [8], physical activity is able to maintain its mobility and slow the functional and cognitive impairment [15] and physical activity significantly affects the severity of dementia [13], physical activity increases the fulfillment of elderly sleep needs with dementia [5], elderly people with decreased cognitive function have low levels of physical activity as well as their physical fitness level [2], newly diagnosed dementia elders possess lower levels of fitness than those long diagnosed [6], weak physical activity is affected to the appearance of neuropsychiatric symptoms in the elderly with decreased cognitive function and causing distress in the caregiver [3], new dementia patients tend to have lower resting activity levels with lower activity, more time-consuming patients in bed, and insomnia [4] and people with dementia exhibit lower levels of physical fitness than the elderly without dementia, suggesting that dementia sufferers have less physical activity and increased physical dependence annually [6], physical exercise has an effect on concentration power [1], physical activity has an effect on improving the variables of cognitive functioning except in the symptoms of depression [18], the program of physical activity affects the improvement of cognitive function [14] [7] and physical function [17]. When viewed from the results of these studies can be concluded that the physical activity has a positive effect on the power of concentration, decreased cognitive function except symptoms of depression and physical function, elderly with decreased cognit function.

4 DISCUSSION

Although the overall results of the above studies show a positive relationship to cognitive function decline, physical activity is a simple activity, light and in accordance with the wishes of participants. From the article there are still studies that use the number of participants less than 100 people and the largest number of 415 people. The study area was conducted in care facilities for the elderly and from the community population. While the design used has been in accordance with the research dilaksanakakan. Measurements, data retrieval procedures, interventions provided and intervention procedures have been clearly stated.

A Systematic Review notes that a combination of physical and cognitive exercise effectively improves cognitive function and functional status of the elderly with decreased cognitive function [29]. A study noted that the ability of physical activity in people with mild cognitive impairment may affect brain structure changes, and increased physical activity may have a positive impact on neuropathologic substrates that may decrease brain function and medial temporal lobe atrophy [18]. But many people still think that medical therapy is the only therapy for people with dementia regardless of side effects of drugs given. Physical activity and exercise can be a non-pharmacological strategy to help people with neurocognitive disorders [2]. People also consider that people who are sick should not perform physical activity because it will be difficult to recover from illness, and elderly who experience decreased cognitive function is considered as a sick person who is expected to recover. People also still think that the so-called physical activity is an activity that involves the physical function of bodybuilding to sweat like sports. Various kinds of physical activities to fill leisure time include walks, qigong, gardening, and based on notes from a community-based study, walking is a popular activity for the elderly with or without cognitive function decline [3]. Elderly people who are able to perform their ADLs are still not considered as performing physical activity and those with ADL dependency should be assisted in total. Physical activity has a positive impact on cognitive function decline in the early stages of cognitive function decline and can slowly restore physical ability and ADL skills, ADLs include bathing, dressing, and mobilization [6]. People assume that people who have trouble sleeping is prohibited for physical activity because it can cause fatigue so that more difficult to sleep, or vice versa that doing physical activity can cause a strong drowsiness so that after doing physical activity will immediately fall asleep. Given similar research can change the minds of people and health workers in this case medical and nurses that physical activity can be an alternative for elderly care takers either in care facilities, hospitals and in the community. Physical activity is meant not ahanya in the form of heavy activities that must sweat when carrying out. The "time up and go" exercise may affect executive and periventricular leukoaraiosis in patients with mild cognitive impairment [18]. The combination of the ability of the sport to slow down and / or withstand cognitive decline in patients with dementia [30], the movement of bodies that support
physical exercise can reduce unstable behavior and agitation, and improve sleep patterns, and potentially decrease the need for psychotropic treatment [31]. Physical activity tailored to the abilities and interests of patients and caregivers also proven to improve the decline in cognitive function and physical function of the elderly. Such activities include arts and crafts, physical training, cognitive stimulation exercise activities, music / entertainment, sensory stimulation, social / reminiscence and daily routine activities [17].

Physical activity program is quite a lot and can be given easily and cheaply, only needed continuity in the implementation. Nurses as spearheads in the provision of nursing services in health care facilities ahrs able to implement the program effectively and efficiently. Progressive motor exercises that are easy and securely intensive are very effective for body strength and physical appearance [16]. Simple mobilization interventions in the elderly should be integrated into routine care routines by nurses, thereby helping to slow the decline in mobility impairment and ADL function impairment [15].

Based on the above studies found that a variety of physical activities are simple, natural and followed by social activities can improve the condition of decline in cognitive function and physical function of the elderly with decreased cognitive function. Although it is believed that physical activity may increase the risk of falling in the elderly, but based on the results of the study found that relevant physical activity in elderly conditions with dementia can actually reduce the risk factors of falls and injury sufferers of dementia.

Implication

The implications for the nursing practice of this systematic review are that simple and easy physical activity programs are useful interventions in care facilities for the elderly with both short-term and long-term dementia. The recommendation for further research is to develop research topics of physical activity with populations in community areas.

5 CONCLUSION

In general, the results of this study is that the physical activity program is very varied, simple and easy to implement by nurses in order to reduce the disruption of physical and cognitive function, reduce the risk factors fall and overcome sleep disorders of patients with decreased cognitive function, through various ways both formal and informal diarea health facilities and communities by combining physical activities and social activities for the elderly. Current studies have only examined the association and / or the effect of physical activity on the physical ability of the elderly with dementia without broadening targets for the community and interventions involving social activities and linking to risk factors for falls and injuries.

REFERENCES


