

PHYSICAL ACTIVITY AND COGNITIVE FUNCTION: A SYSTEMATIC LITERATURE REVIEW

Deden Herdoles¹, Bambang Abduljabar²

¹Department of Sport Education, ¹Postgraduated School, ¹Indonesia University of
Education, ¹Indonesia

²Postgraduated School, ²Indonesia University of Education, ²Indonesia

Abstract

Age is part of the process of growth and development, this is a process that continues (continues) naturally. The decline in cognitive abilities such as forgetfulness, a decline in orientation to time, space, place, and not easy to accept new things/ideas. The purpose of this study was to determine the effect of physical activity on cognitive function. In this study using a systematic literature review method. To generate data, the researcher used a systematic literature review funnel. the results of the application of search strings on 4 databases, namely Pubmed, Scencedirect, and Taylor and Francis, and Emerald, the results of filtering based on the criteria produced 21 journals to be used as final papers and analyzed. After that, the researcher added data using template analysis as a thematic way of analyzing qualitative data. The researcher used Mendeley-Dekstop-1.19.8-win32 as the analysis tool. Of the 20 journals that have gone through full text screening, there is an impact of bodily interest on cognitive characteristic at all ages. Regular physical activity also increases the number of synapses, thereby increasing the effectiveness of the brain in carrying out all its functions, especially cognitive function. Based on the description above, researchers are interested in researching the effect of physical activity on cognitive function.

Keywords:

Physical Activity, Cognitive Function

*Corresponding address: Bandung, Indonesia

* Corresponding e-Mail:

Introduction

Cognitive function is the largest part of the brain. The decline in cognitive abilities such as forgetfulness, a decline in orientation to time, space, place, and not easy to accept new things/ideas (Maryam, 2008). Along with the aging process, all systems in the body will experience changes or decline in function gradually, one of which is a decrease in physical activity. Decreased physical activity in the elderly is one of the causes of cognitive impairment. The decline in cognitive function in the elderly is the biggest cause of the inability to carry out normal daily physical activities. Physical activity was identified as one of the factors thought to have something to do with cognitive function. Several studies report that elderly people who have difficulty carrying out physical movements or are inactive, there will be differences in the number of cognitive function scores (Santoso, 2011). Physical

activity has a beneficial effect on cognitive function in old age and is also a preventive against cognitive impairment and dementia (Singh-Manoux et al, 2015). When entering pre-elderly age, low levels of physical activity can affect cognitive function. This statement is also reinforced in the study of Cumming (2012) which states that physical activity can also protect brain health in old age.

According to the Central Statistics Agency (2013), the projected quantity of aged human beings (>60 years) in Indonesia in 2014 is anticipated to attain 207,930,000 humans, and in 2035 it's far predicted that it's going to attain 481,987,000 million human beings. The good sized boom inside the range of aged humans in Indonesia makes Indonesia one of the pinnacle 5 nations with the largest aged populace within the world (international fitness company, 2014). based at the 2011 United international locations record, in 2000–2005 lifestyles expectancy reached sixty six.4 years (with the percentage of elderly human beings in 2000 became 7.74%). This determine will growth in 2045-2050 with an predicted life expectancy of seventy seven.6 years (with the proportion of the aged population in 2045 being 28.68%). The significant facts organization (BPS).said that there was an increase in life expectancy, from 64.5 years (with a percentage of the elderly population of 7.18%) in 2000 to 69.43 in 2010 (with a percentage of the elderly

population of 7.56). %), and in 2011 to 69.65 years (with a percentage of the elderly population of 7.58%) (Data and Information Centre of the Ministry of Health of the Republic of Indonesia, 2013).

According to the Central Statistics Agency (2013), the projected number of elderly people (>60 years) in Indonesia in 2014 is estimated to reach 207,930,000 people, and in 2035 it is estimated that it will reach 481,987,000 million people. The significant increase in the number of elderly people in Indonesia makes Indonesia one of the top 5 countries with the largest elderly population in the world (World Health Organization, 2014). Based on the 2011 United Nations report, in 2000–2005 life expectancy reached 66.4 years (with the percentage of elderly people in 2000 was 7.74%). This figure will increase in 2045-2050 with an estimated life expectancy of 77.6 years (with the percentage of the elderly population in 2045 being 28.68%). The Central Statistics Agency (BPS) said that there was an increase in life expectancy, from 64.5 years (with a percentage of the elderly population of 7.18%) in 2000 to 69.43 in 2010 (with a percentage of the elderly population of 7.56). %), and in 2011 to 69.65 years (with a percentage of the elderly population of 7.58%) (Data and Information Centre of the Ministry of Health of the Republic of Indonesia, 2013).

Increasing physical activity in general, especially through high-intensity exercise, is often difficult and sometimes comes with a risk of injury and damage from physical complications, whereas increasing light- intensity activity may be easier and safer for older adults. Therefore, it is necessary to determine which intensity of physical activity is associated with cognitive function (Umegaki et al., 2018). Meanwhile, according to (Hu et al., 2019) Given the considerable health consequences of depression and cognitive impairment and the consistent relationship between the two factors. As we know that cognitive function is very important in a person's life because with normal cognitive function we can focus attention, remember, have initiative, solve a problem, and have a good planning function. Cognitive function itself is influenced by several factors, including age, genetics, education level, and the patient's occupation (Pramudita & Pudjonarko, 2016). Cognitive function is

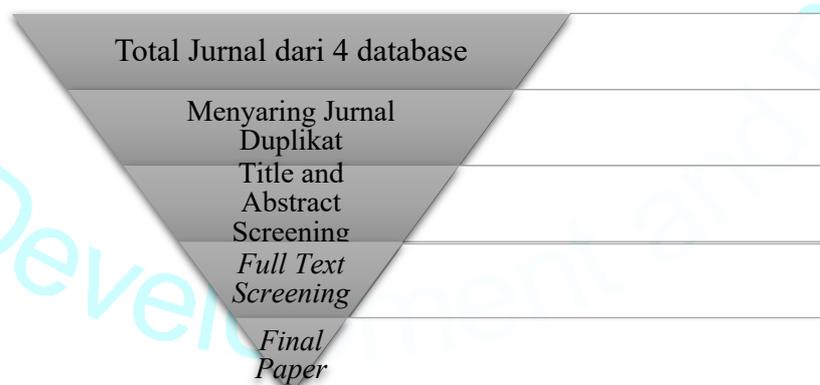
generally caused by disorders of the central nervous system which include impaired oxygen supply to the brain, degeneration or aging, Alzheimer's disease and malnutrition. From these factors, the problems that are often faced by the elderly who experience mental changes (cognitive disorders) include disturbances in time, space, place orientation and are not easy to accept new things or ideas. The wrong or inappropriate exercise will pose a more dangerous risk, but with the right exercise, the benefits of exercise for the elderly will also be very significant (Ramli & Fadhillah, 2020).

Methods

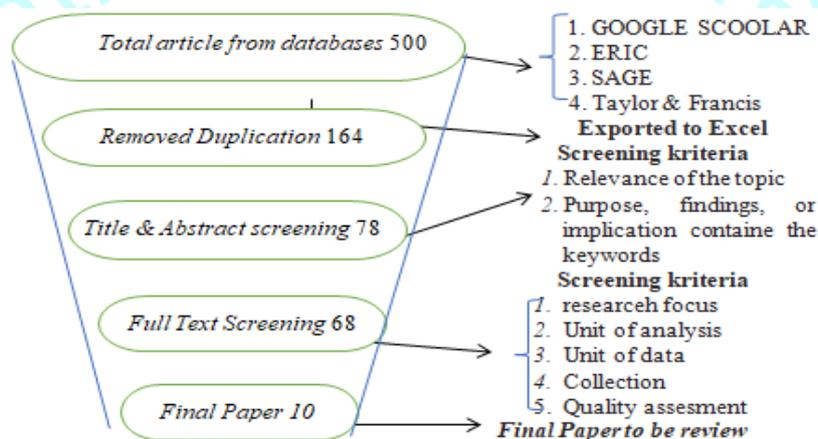
This study uses a systematic literature review which is a literature review method that identifies, assesses, and interprets all findings on a research topic, to answer research questions that have been determined previously (Kitchenham et al., 2007), and interpret with a systematic literature review, it is possible to answer specific questions in a transparent and repeatable manner while trying to collect all published evidence on a particular topic and assess the quality of that evidence (Lame, 2019). Systematic literature reviews aim to increase transparency in any review process by relying on an explicit process. Systematic methods can reduce bias in the selection and inclusion of studies, assess the quality of the studies and summarize them objectively (Thomé, Scavarda, & Scavarda, 2016).

The Research Question (RQ) is the first part of the systematic literature review process. Research questions are used to guide the process of searching and extracting literature. The results obtained from the Research question are data analysis and synthesis. A good research question is one that is useful, measurable, and understands the State-Of-The-Art Research of a research topic.

After determining the research question that will be used in the study, the next step in the systematic literature review research method is data collection. In collecting data, it is necessary to approach the search for data sources. Please note that every academic library or database is different from one another so it takes time to learn how that library or database operates. In addition, we need a way to get the data we want through the library or database. The following is the flow of data collection that the author did along with the stage



Journal search based on search results on Google Scholar, Elsevier, Science Direct, Pubmed, Taylor&Francis, Eric and Atlantis Press with the keywords , Physical Activity, Cognitive Function, and researchers found 500 journals that matched these keywords. A total of 500 journals found according to the search keywords were then screened, 164 journals were excluded because there were the same titles and no full text articles were available and 78 journals were generated for Abstract screening and the results were obtained as many as 66 journals. A feasibility assessment of 66 full text journals was carried out, 68 duplicated journals that did not meet the inclusion criteria were excluded, so that 20 full text journals were reviewed.



Problem identification is the process of identifying or investing in problems. The research problem is something that is important among other processes, because it determines the quality of a research. In this study, researchers examine the problem through international and national research journals derived from reports on research results. The research problem is the effect of activity on cognitive function.

Screening is filtering or selecting data that aims to select research problems that are in accordance with the topic under study. The title examined in this study is the effect of activity on cognitive function.

Data extraction can be done if all the data that has met the requirements have been classified for all existing data. After the screening process is carried out, the results of data extraction can be known for sure from the initial amount of data owned to how many meet the requirements for further analysis.

The type of data used is in the form of secondary data obtained from various sources such as books, magazines, newspapers, journals, and other literature relevant to the object of research. In this study, researchers used secondary data collected and then analyzed to answer problems based on the facts and data that the authors obtained.

Data Analysis

The data analyzed is data from library research from journals taken from available databases, namely Google Scholar, Elsevier, Science Direct, Pubmed, Taylor & Francis and Atlantis Press, then researchers conduct an analysis to draw conclusions.

Result

It is a stage for identifying, evaluating and interpreting the results of similar research to answer research questions, certain topics or phenomena that are of concern (Kitchenham in Siswanto, 2013). From the similar data will be identified, analyzed and interpreted so as to produce conclusions. Meanwhile, by definition, synthesis is defined as a technique for combining existing data to obtain new concepts or deeper understanding. The results of the synthesis obtained when analyzing several primary studies, are expected to bring new understanding and better understanding of a problem raised.

