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The Impact Of Physical Activity In The Health And Economic Sector On Formal Sector Workers: *Literature Review*

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ABSTRACT	ARTICLE INFO
<p>Non-Communicable Diseases (NCDs) account for 74% of all significant deaths worldwide. Formal sector workers experience the work characteristics with the highest prevalence of NCDs. The risk factor for NCD, with the highest number in the formal worker's group, is low physical activity. This study aimed to compare the impact arising from the intensity of physical activity on formal sector workers in the health and economic sectors based on previous studies. This study employed the method of literature review. The research population includes all articles published in accredited national and international journals between 2018 and 2023 on the impact of physical activity on formal sector workers or office workers in the health and economic sectors. The research sample comprises 11 articles chosen based on inclusion criteria determined by searching the Google Scholar, Pubmed, and Garuda databases. Articles were selected for their suitability of title, full text, and discussion of the impact of physical activity on formal workers. Physical activity has been shown to reduce the risk of metabolic syndrome, hypertension, and lower back pain. Physical activity can also help workers' mental health. Several studies have found that physical activity does not affect body fitness, risk of coronary heart disease, or worker productivity in the economy. Increasing physical activity in the formal sector, particularly at moderate to severe intensity, positively impacts workers' health. There was no significant impact of physical activity on economic improvements.</p>	<p>Article History: <i>Submitted/Received 1 Jan 2023</i> <i>First Revised 2 Mar 2023</i> <i>Accepted 17 May 2023</i> <i>First Available online 20 Jul 2023</i> <i>Publication Date 30 Jul 2023</i></p> <hr/> <p>Keyword: <i>Physical Education Health</i> <i>Formal Workers</i> <i>Sedentary Behavior</i></p>
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1. INTRODUCTION

Indonesia is predicted to experience a demographic bonus between 2020–2035, indicating an explosion in the number of productive age population (15 – 64 years) in a country significantly higher than the proportion of the non-productive age group (less than 15 years and more than 65 years) (Sutikno, 2020). The 2020 Population Census results show that the productive age population accounts for 70.72% of the total population in 2020 (Badan Pusat Statistik, 2021). This condition will partly benefit Indonesia in the socioeconomic field because the population's dependency ratio (dependency ratio) ranges between 40-50. According to this figure, every 100 people of productive age have only 40-50 dependents of non-productive age (Setiawan, 2018).

One tool to measure the success of human development in a region is the Human Development Index (HDI) which emphasizes improving health, education, economic welfare, and morality (Parwodiwiyono & Witono, 2022). A healthy and productive society undoubtedly impacts a country's economy, social life, and politics. The health problem that is still a priority today is Non-communicable Diseases (NCDs). Non-communicable diseases account for 74% of the world's leading causes of death, and NCDs account for 86% of the 17 million deaths among people aged 70 and under (World Health Organization, 2023). According to the World Health Organization (WHO), most NCD deaths occur in low and middle-income countries, including Indonesia (World Health Organization, 2023). Management of NCDs is complex because it is difficult to detect early symptoms of NCDs, the effects of PTM can only be seen in the long term, and determining the cause of PTM is problematic because it results from an unhealthy lifestyle.

The Ministry of Health of the Republic of Indonesia states several risk factors for NCDs, including smoking habits, alcohol consumption, lack of physical activity, and indiscriminate eating patterns (Tim Promkes RSST - RSUP dr. Soeradji Tirtonegoro Klaten, 2022). NCD risk factors that are not controlled can impact a person's physical condition and the welfare of the family. Reduced working days due to work-related illnesses and low productivity for sick workers will lower the quality of the goods/services produced. It is feared that an increase in unproductive workers during the demographic bonus period will burden the state more than the benefits obtained. As a result, it is critical to manage these NCD risk factors.

According to the findings of the 2018 Basic Health Research, formal sector workers such as the State Civil Apparatus (ASN), Indonesian National Armed Forces (TNI), Indonesian National Police (Polri), State-Owned Enterprises (BUMN), and Regional-Owned Enterprises (BUMD) have the highest prevalence of NCDs (for cancer, diabetes mellitus, and coronary heart disease). Low physical activity is a risk factor contributing to the highest rates of NCDs in the group of formal workers (Badan Penelitian dan Pengembangan Kesehatan, 2019). A study of office workers in DKI Jakarta Province revealed that most of these workers were inactive, with some respondents not engaging in any physical activity, with sedentary behavior at work reaching 8 hours per day (Abadini & Wuryaningsih, 2018).

Sedentary behavior is defined as any unconscious activity with an energy expenditure of 1.5 MET (metabolic equivalent) when sitting or lying down, which can be practically defined as staying in the same position (sitting or lying down) for an extended period (Tremblay et al., 2017). If this behavior continues without interruption by physical activity, it will reduce a person's level of physical fitness. Data from the 2022 SIPGAR (Physical Fitness Measurement Information System) application show that 50% of ASNs out of 3,158 survey participants need to improve their physical fitness. A person's lack of physical fitness due to sedentary behavior can be caused by a lack of knowledge about the benefits of physical activity and the risks of sedentary behavior (Shibata et al., 2009). This piques the interest of researchers

in studying the impact of physical activity on formal sector workers in the health and economic sectors so that they can compare the effects of increased physical activity on formal sector workers based on studies from previous studies.

2. METHODS

This study employed the literature review method, with secondary data from previous research as data sources. The study was conducted in January–February 2023. The study population included all articles published in accredited national and international journals between 2018 and 2023 on the impact of physical activity on formal sector workers or office workers in the health and economic sectors. Articles were found by searching three journal databases: Google Scholar, Pubmed, and Garuda. The following keywords were used in the article search: physical activity AND formal workers; physical activity AND formal workers. Articles obtained from search results in the three journal databases were selected based on inclusion criteria including 1) Articles that discuss the impact of physical activity; 2) The research targets are formal sector workers and productive age; 3) The publication type is open access research article with full text attached and has undergone editorial review; 4) Written in Indonesian and English.

Based on the results of a literature search on the selected database, the researcher found 303 articles that matched the search keywords. Then, the articles went through a duplication check process with the result that 3 articles were excluded from the sample, and 300 articles remained. Next, the researcher screened according to the inclusion criteria based on the title and full text. The flow of study selection results can be described in the following flowchart:

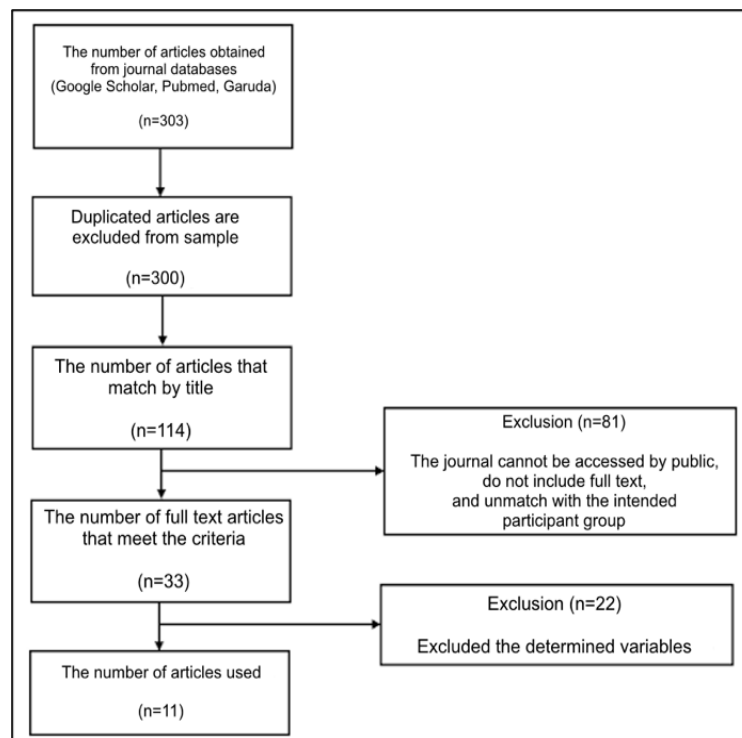


Figure 1. Article Selection Flowchart

3. RESULTS AND DISCUSSION

Scientific articles that go through the data extraction stage are the result of research conducted in Indonesia, the United States, Canada, Zimbabwe, Saudi Arabia, and Australia. The majority of these articles, as many as five, were published in 2020. All studies use primary data as a data source, with most studies involving fewer than 100 people, but several studies use a data source in the form of a community vital recording system involving thousands of samples. The research design used included 8 cross-sectional studies, 2 case-control studies, and 1 cohort study.

The majority of the studies looked at workers' physical activity in conjunction with other variables such as nutritional intake, body anthropometry, stress level, blood pressure, fitness level, sitting time, and screen time. The extracted articles generally discussed the relationship between physical activity and its effects on health (both physical and mental). The findings of these studies show that employees who work in offices (formal workers) have a low level of activity, rarely engage in physical activity, and are more often sedentary. The existence of lockdown rules during the COVID-19 pandemic increased workers' time in front of screens, exacerbating sedentary behavior outside of the working day and making previously active workers inactive. Worker inactivity during a pandemic has been shown to reduce physical function significantly.

The study's findings also explain the impact of physical activity in the health sector, particularly in non-communicable diseases like metabolic syndrome, coronary heart disease, hypertension, and low back pain. A lack of physical activity has been linked to central obesity and other metabolic syndromes. Furthermore, less physically active people had a higher risk of hypertension. Irregular physical activity is considered to have an impact on the problem of low back pain in hospitals and health care workers. Physical activity, besides improving physical health, has been shown to improve mental health, with the finding that any moderate or strenuous physical activity performed every day (for at least 50 minutes) is positively related to mental health (Bernard et al., 2018). Another study found that workers who reduced their physical activity (especially during the COVID-19 pandemic lockdown period) and increased their screen time had higher symptoms of depression, loneliness, and stress and lower positive mental health.

4. DISCUSSION

This study compares the findings of several research articles on the impact of physical activity on formal workers, focusing on the impact from a health and economic standpoint. The majority of the articles explain the impact of physical activity on workers' health, whereas only a few studies explain the economic impact because the economic impact is an indirect impact on workers' level of physical activity.

WHO defines physical activity as any movement (including leisure time, moving from a place, or part of work) produced by skeletal muscles that requires energy expenditure. Regular physical activity has been shown to help prevent and control non-communicable

diseases (coronary heart disease, stroke, diabetes, some types of cancer, hypertension), maintain a healthy weight, improve muscle and cardiorespiratory fitness, bone health, mental health, quality of life, and well-being. Furthermore, physical inactivity is one of the major risk factors for death from non-communicable diseases, with a 20-30% higher risk of death compared to someone who is moderately active ([World Health Organization, 2022](#)).

The Large-Scale Social Restrictions (PSBB) regulations implemented during the COVID-19 pandemic exacerbated the low level of physical activity in formal workers. This regulation restricts residents' activities in areas suspected of having COVID-19 (including restrictions on the mobilization of people and/or goods) at least through the elimination of teaching and learning activities and work, restrictions on religious activities, and/or restrictions on activities in public facilities ([Presiden Republik Indonesia, 2020](#)). During the COVID-19 pandemic, most people spent less time exercising, more time sitting (sedentary behavior), more time using smartphones, and more time sleeping ([Sañudo et al., 2020](#)).

Lack of physical activity and increased sedentary behavior in formal workers are the leading causes of health problems, particularly in diseases caused by metabolic syndrome ([Listyandini et al., 2020](#)). A metabolic syndrome is a group of clinical symptoms caused by changes in lifestyle and diet that lead to cardiovascular diseases, such as central obesity, hypertension, hypertriglyceridemia, hyperglycemia, and microalbuminuria ([Rustika et al., 2019](#)). According to Shafitra, et al. ([2020](#)), most office workers have light physical activity patterns, making them 5.4 times more likely to suffer from central obesity than people who engage in moderate to strenuous physical activity. The process of burning nutrients in the body of someone who does not exercise or exercises infrequently will burden insulin work, causing the resulting glucose to accumulate in the body as fat ([Purnama & Sari, 2019](#); [Kurniawidjadja et al., 2020](#)). During the lockdown period, the risk of obesity increased due to decreased levels of physical activity in the community, they even tended not to do physical activity when carrying out all activities at home ([Alnaami et al., 2019](#)).

Although the articles included in the research sample have not found a relationship between physical activity and hypertension, the study conducted ([Garwahasada & Wirjatmadi, 2020](#)) found that employees who have light activity are more likely to have hypertension (26.1%) than employees who do not have hypertension (0%). Furthermore, the non-hypertensive group had more employees with heavy physical activity (78.3%) than the hypertensive group (52.5%). Regular physical activity, such as aerobics, for 30-45 minutes per day, can reduce the relative risk of hypertension by 19-30%. Making physical activity a part of one's daily routine is thought to lower the risk of hypertension ([Leskinen et al., 2018](#)). Someone not actively participating in physical activities has a higher heart rate, which causes the heart muscle to work harder to pump blood. The harder the heart contraction, the more blood pressure is imposed on the arterial walls, and this condition will cause the person to develop hypertension over time ([Cristanto et al., 2021](#)).

Regular physical activity can also help formal workers reduce musculoskeletal complaints. According to one study conducted in the Aseer region of southwest Saudi Arabia, low back pain is a common occupational disease for health workers ([Alnaami et al., 2019](#)). Low back pain is defined as pain in the lower back that can radiate to the legs (particularly the back

and outer sides) and is caused by inactivity (Sahara & Pristya, 2020). Several preventable risk factors for lower back pain include back trauma due to activity, increased body mass index, and lack of regular exercise (Alnaami et al., 2019). Lack of physical activity reduces the oxygen supply to the muscles, causing them to tire easily and, in the long run, causing muscle complaints, particularly in muscles that sustain a lot of static pressure (Sahara & Pristya, 2020). This serves as the foundation for developing occupational health and safety programs to create ergonomically safe working conditions and encourage workers to engage in regular physical activity.

Maintaining or increasing physical activity (particularly during the COVID-19 pandemic) is thought to significantly impact mental health. Preventing someone from exercising consistently over a long period is associated with increased symptoms of depression and anxiety. However, no dynamic relationship has been found between physical activity and mental health over short periods (Meyer et al., 2020). According to a study by Bernard, et al. (2018), any moderate and strenuous physical activity every day (with a duration of exercise of up to 50 minutes/day) is associated with improved mental health. Light physical activity combined with moderate and vigorous physical activity, or a strategy of "moving more and sitting less" can provide greater benefits for improving mental health. However, another study by Dumith, et al. (2019) found that 75 minutes of moderate to light physical activity per week can help prevent stress, depression, and other mental health issues.

Physical fitness refers to the body's ability to perform daily tasks without fatigue. Physical fitness can theoretically be obtained by performing and increasing physical activity properly, correctly, measurably, and consistently (Wicaksono & Handoko, 2020). Low levels of physical activity can disrupt the body's metabolism, increasing the risk of obesity due to excess fat tissue accumulation. Fat tissue accumulation is primarily caused by an imbalance between energy entering the body through food and energy leaving the body through physical activity (Welis & Rifki, 2013 dalam Pratiwi, 2022). Previous research on the level of physical activity and fitness level by Yunitasari, et al. (2019) and Pratiwi (2022) found the opposite result, namely that physical activity had no impact on body fitness.

Health investment is closely related to the country's economic development. On a macro level, people with good health are the capital of long-term economic development. Meanwhile, on a micro level health is capital for individual and household productivity (Satriawan et al., 2021). Reducing the financial impact of lost office worker productivity due to health factors can benefit businesses (Pereira et al., 2019). Most studies have linked Physical activity to an increase in health status. Still, the authors did not find this positive impact in studies looking at the impact of physical activity on the economic sector, specifically increasing workers' productivity in the formal sector. Energy intake and physical activity are the two most important factors influencing worker productivity. A lack of physical activity is directly proportional to a lack of fitness, so workers will quickly become fatigued at work, interfering with their productivity (Maghfiroh, 2019). However, Shafitra, et al. (2020) discovered no clear impact of physical activity on increasing the productivity of editorial and marketing workers at PT Gatra. It is in line with a study by Maghfiroh (2019) that there is no statistically significant relationship between physical activity and work

productivity. According to the findings of the study's interviews, there was a possibility that these factors were not statistically related because workers' fatigue complaints were not yet bothersome and could still be handled so that they did not affect work productivity.

5. CONCLUSION

The findings of this study which used the literature review method on 11 selected articles summarize the impact of physical activity in the health and economic sectors on formal sector workers. The findings revealed that increasing physical activity in the formal sector, particularly moderate to severe intensity, had a positive impact on workers' health status, including the ability to reduce the risk of non-communicable diseases (metabolic syndrome, coronary heart disease, hypertension, lower back pain) and improve mental health. Physical activity did not significantly impact economic sector improvements, specifically worker productivity.

Future researchers are expected to learn more about the economic impact of physical activity, such as work productivity and company costs incurred due to employee absences due to illness, particularly for formal sector workers or office workers.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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