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PHYSICAL ACTIVITY AND PSYCHOLOGICAL WELL-BEING IN THE ADULT POPULATION DURING THE COVID-19 PANDEMIC: A SYSTEMATIC REVIEW

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ABSTRACT

The COVID-19 pandemic has become a global crisis that has caused various impacts on the psychological well-being and physical activity of the community. Correspondingly, physical activity is known to have a relationship and affect psychological well-being. Therefore, this study aimed to obtain a comprehensive picture of the level and impact of the activity on psychological well-being in the adult population as well as recommendations for physical activity that could be done to improve psychological well-being during the COVID-19 pandemic. The research method used was a systematic literature review with the PRISMA (Preferred Reporting Item for Systematic Review and Meta-Analytic) analysis method. Search literature on the EBSCOhost, ProQuest, and ScienceDirect databases. Literature searches were limited to research articles published between January 1, 2020, to May 20, 2021. The initial search yielded 5,136 articles and finally found 15 articles that met the criteria. The results of the review revealed that during the COVID-19 pandemic, there was a decrease in the level of physical activity and psychological well-being, especially in the adult population, especially women and young adult groups. In addition, it was found that physical activity was either directly or indirectly associated with symptoms of depression, stress, anxiety, and positive feelings and emotions. Physical activity with moderate intensity has the most significant influence on psychological well-being. The forms of activity included lifting weights, yoga, double tennis, aerobics, muscle fitness, and explosive fitness. Based on this, it is certain that physical activity with moderate intensity has the most significant impact on psychological well-being, especially in increasing positive feelings and emotions and reducing depression, stress, and anxiety in adults.

Keywords: adult, COVID-19 pandemic, physical activity, psychological well-being

Introduction

Since the end of 2019, the COVID-19 pandemic has evolved into a global crisis. COVID-19 is a respiratory infection illness characterized by SARS-CoV-2/severe acute respiratory syndrome coronavirus-2.[1] The most common symptoms of COVID-19 infection are fever, coughing, sneezing, and shortness of breath.[2] The risk of contracting COVID-19 increases if a person has comorbid hypertension, diabetes mellitus, is an active smoker,[3,4] has close contact with a COVID-19 patient, and has a history of travel to COVID-19-infected areas.[5] The virus was first suspected of spreading in the Huanan fish market in Wuhan, China,[2] and less than a month after being reported; the disease spread rapidly in many provinces in China, South Korea, Japan, and Thailand.[6] Then, from February to April 2021, globally confirmed cases of COVID-19 increased significantly, increasing by more than 50% from 2,486,744 confirmed cases to 5,740,164 confirmed cases of death, increasing by more than 11% from 67,645 to 93,854 deaths.[7]

Several new policies have been implemented to prevent the spread of COVID-19 and reduce the positive number. Quarantine, isolation,[8-11] lockdown,[12-14] and work from home are among the new policies.[15,16] This policy alters people's social habits by requiring them to always wash their hands, wear masks when leaving the house, maintain a safe distance when interacting with others, avoid crowds, reduce activities outside the home and mobility from one location to another, and even work and go to school from home online.[17] This policy also has an influence on people's and society's psychological well-being, including the development of Post-Traumatic Stress Disorder (PTSD), frustration, confusion, anxiety, fear of affection, sleep disturbances, and feelings of helplessness. Even if the condition worsens, the excessive fear of infection from COVID-19 can lead to xenophobia and suicidal thoughts.[18]

In line with this, it has been reported that there was an increase in psychological disorders during the COVID-19 pandemic, particularly among adults.[19,20] Adults are also confirmed to be the most vulnerable group in several countries to COVID-19 infection.[21,22] These conditions can also disrupt a person's psychological well-being, potentially causing a variety of problems ranging from depression to anxiety,[23,24] reduced intensity of relationships with other people,[25] loss of purpose in life,[26] burnout severity,[27,28] inhibiting personal growth,[29] social isolation, loneliness,[30] and self-harm.[31] Some of these consequences occur in adults,[18] particularly in cases of depression and anxiety.[32]

In general, good psychological well-being in adults will increase body immunity, productivity, and motivation to do activities and work, resulting in greater stability in dealing with various situations.[33] Meanwhile, good psychological well-being in adults, particularly during the COVID-19 pandemic, will result in the ability to respond to stress by engaging in good self-coping behaviors.[34] It is supported by numerous studies on psychological well-being during the COVID-19 pandemic. Based on search results from five international database portals, there are 14,673 studies

discussing psychological well-being during the COVID-19 pandemic. This indirectly demonstrates that psychological well-being is a global issue that requires further investigation.

Psychological well-being is defined as the ability of a person's psychological aspects to function normally and positively.[35] A person's psychological well-being is influenced by a variety of factors, encompassing gender,[36,37] age,[38] social support, optimism,[39,40] gratitude,[41] emotional control,[42] goal attainment,[43] and physical activity.[43-46] Physical activity is one of the psychological well-being factors that will be discussed in this study. The researcher selected physical activity as a factor because it was one of the topics studied extensively during the COVID-19 pandemic, particularly in relation to psychological well-being. A total of 2,072 studies discussing physical activity and psychological well-being during the COVID-19 pandemic were discovered using search results from five international database portals. Several studies have discovered a connection between physical activity and psychological well-being.[47-49] Furthermore, physical activity helps to reduce levels of anxiety, and depression,[50-52] sleep disturbances,[53] enhances cognitive performance,[54] and has a positive effect on the physique.[50-52,55]

Based on the preceding explanation, the objective of this study is to obtain a comprehensive picture of the level and impact of physical activity on psychological well-being in adults. This is consistent with previous research, which indicates that the adult population is the most vulnerable to COVID-19 infection and is psychologically affected. This study was conducted through a systematic review of several previous studies because many studies explained the level and impact of physical activity on psychological well-being during the COVID-19 pandemic. However, no comprehensive research has been conducted in the adult population. As a result, it is expected that this study will provide an overview to the general public, particularly the adult population, of the level and impact of physical activity on psychological well-being, as well as recommendations for what physical activity can be implemented to enhance psychological well-being during the COVID-19 pandemic.

The research problem formulation encompasses: 1) What is the level and impact of physical activity on psychological well-being in the adult population during the COVID-19 pandemic? 2) What forms of physical activity can be done during the COVID-19 pandemic to improve psychological well-being?

Methods

This research procedure started with determining research topics, formulating research questions, identifying keywords, searching and identifying databases, and finally, reading and analyzing. The method employed in this study was a literature study with a systematic literature review approach, which was a systematic literature review method that identifies, evaluates, and interprets all findings on a research topic to answer predetermined research questions. Literature

searches were limited to research articles published between January 1, 2020, to May 20, 2021. Article searches were conducted online employing the words “physical activity” OR “physical exercise” AND “psychological well-being” OR “mental health” OR “mental illness " AND “COVID-19" in titles, keywords, and abstracts in journal articles contained in the ProQuest, ScienceDirect, and EBSCOhost portal databases. The literature search process started by reviewing all search results' titles, keywords, and abstracts, filtering and classifying them based on predetermined criteria, then the final process of the review process was carried out by experts. In addition, the data extraction process was also carried out by reviewing a number of selected articles and writing down the main findings. Then the extraction results would be synthesized by grouping them into findings that could answer the objectives of this study.

The analytical method administered was the Preferred Reporting Item for Systematic Review and Meta-Analytic (PRISMA) method. All articles that passed the selection were then reviewed and summarized based on predetermined criteria starting from the objective, author's name, year of publication, number of respondents, instruments used, and research results. The criteria for this study were demonstrated in Table 1.

Table 1. Inclusion and Exclusion Criteria

Category	Inclusion Criteria	Exclusion Criteria
Publication Criteria	Empirical research articles (research articles) and peer-reviewed in full-text form Research from any country and written in English or Indonesian language.	Non-empirical research, literature review studies, meta-analyses, case studies, reports, proceedings, book chapters, and essays.
Period of time	Articles published from January 1, 2020 to May 20, 2021.	
Study Content	Articles containing physical activity or physical exercise, psychological well-being or mental health, and the COVID-19 pandemic	Subjective well-being, spiritual well-being, physical training, physical health, physical abilities, long covid, measures/ scale
Population	Adult age group (18 – 60 years)	Babies, children, teenagers, and the elderly

The initial search produced 5,132 articles from three databases: science direct (977 articles), ProQuest (4,094 articles), and EBSCOhost (65 articles). The PRISMA method was employed in the flow of the article selection process (Figure 1). Then, the first search concentrates only on articles that contain the keywords "physical activity" OR "physical exercise" AND "psychological well-being" OR "mental health" OR "mental illness" AND "COVID-19". Afterward, duplicate articles were removed until only 4,595 remained. The following stage, screening, was successful in excluding 3,384 articles, as only 1,211 fulfilled the criteria. The screening criteria were as follows: 1) Articles published between January 1, 2020 and May 20, 2021, 2) Full-text, peer-reviewed articles in academic journals or research papers, 3) Articles in Indonesian and English; 4) Open access to articles. Then, at the eligibility stage, the 1,121 articles were screened by reading their titles, abstracts, and keywords. In the end, 241 articles were obtained, while 970 other articles were excluded because they did not fulfill the established criteria, particularly regarding the fact that not all of the articles contained the main topic, as well as the keywords that had been planned at the

beginning. Furthermore, 214 articles were excluded at the included stage since the research subjects were not of adult age. Thus, 27 articles out of a total of 241 articles fulfilled the criteria. Then, from the 27 articles, a final stage of screening was performed, which included reading the articles in their entirety, and 15 articles were identified as meeting the criteria and being designated as material for a systematic review of this research.

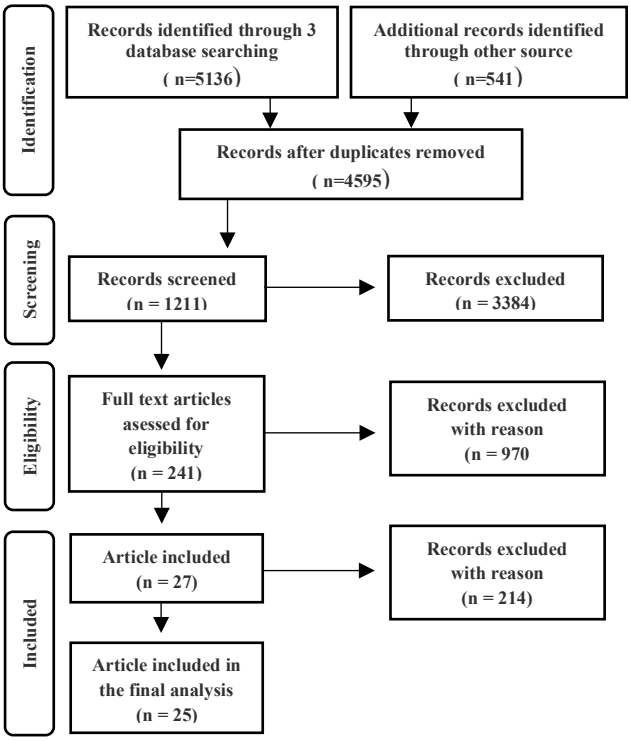

Figure 1. Article Selection Process Flowchart

Results

The majority of the 15 articles mentioned above utilized quantitative research with a cross-sectional study design. Various studies have been conducted in Europe, America, Asia, and Australia. Participants for the study were obtained through online surveys on social media, websites, email, mass media, and government media. The instrument employed in the research was a questionnaire that assessed physical activity (IPAQ, MET, GLTEQ, BREQ-3, AAS), psychological well-being (PGWBI, GHQ−12, WHO Five Well-Being Index (WHO-5), MHC-SF), depression (CES-D, PHQ-9, BDI-II, DASS-21), anxiety (GAD-7, STAI, HADS, DASS-21), stress (PSS, DASS-21, IES-6), sleep quality (PSQI, Sleep Quality Survey), mood (POMS), positive and negative emotions (HOT). Table 2 summarizes the main characteristics of the eligible studies. Table 3 illustrates the definitions, measurements, and results.

Table 2. Study of Main Characteristics

Author	Country	Study Design	Population	Sample	Gender	Age Range	Media
Althumiri et al, 2021 [57]	Saudi Arabia	Cross-Sectional Study	Public Society	n = 8333	P = 4.192 L = 4.141	> 18 years	Online survey
Cecchini et al., 2021[58]	Spain	Longitudinal Study	Public Society	n = 595	P = 342 L = 253	18-84 years	Online survey, social media & mass media
Denget al., 2020[59]	China	Cross-Sectional Study	University Students	n = 1607	P = 566 L = 1.041	18-22 years	Online survey
Dun et al, 2021[60]	China	Cross-Sectional and Retrospective Study	University Students	n = 12.880	P = 10.340 L = 2.540	18-21 years	Online survey
Green et al, 2021[47]	17 countries	Cross-Sectional Study	University Students	n = 7.303	P = 6.129 L = 1.147 Blank = 27	Median 47 years	Online survey
Kilani et al., 2020[61]	Iraq and	Cross-Sectional Study	University Students	n = 1723	P = 806 L = 917	18 – 65 years	E-mail and social media
Lesser et al., 2020[62]	Canada	Cross-Sectional Study	University Students	n = 1098	P = 871 L = 215	> 19 years	Social media, mass, government
Lin, et al, 2020[63]	China	Cross-Sectional Study	University Students	n = 628	P = 405 L = 220	Average 20 years	Online survey
Marashi, et al 2020[64]	Canada & other countries	Cross-Sectional Study	Public Society	n = 1669	P = 1218 L = 249 Blank = 11	> 18 years	Online survey
Maugeri et al., 2020[65]	Italy	Cross-Sectional Study	Public Society	n = .524	P = 1.426 L = 1.098	21-60 years	Online survey, social media, and e-mail
Puccinelli et al., 2021[66]	Brazil	Cross-Sectional Study	Public Society	n = 1853	P = 1.110 L = 743	> 18 years	Online surveys, websites, e-mails, and social media
Qin et al., 2020[67]	China	Cross-Sectional Study	Public Society	n = 12.107	P = 6.474 L = 5.366	18-80 years	Online survey
Reigal et al., 2021[68]	Spain	Correlational Studies	Public Society	n = 328	P = 209 L = 119	19-59 years	Online survey
Stanton et al., 2020[69]	Australia	Cross-Sectional Study	Public Society	n = 1491	P = 999 L = 484	> 18 years	Online survey, social media, and e-mail
Zhang et al., 2020[70]	China	Longitudinal Study	University Students	n = 66	P = 42 L = 25	20-21 years	Online survey

Table 3.Objectives, Instruments, and Outcomes

Author	Objective	Measurement/ Instrument	Result
Althumiri et al, 2021[57]	Exploring the relationship between physical activity and risk and symptoms of depression and anxiety in the Saudi population	PHQ-9, GAD-7	Moderate physical activity (such as light weight lifting, yoga or relaxation, and doubles tennis) can improve general mental health, especially by reducing levels of anxiety and depression. Meanwhile, high physical activity (weight lifting, jogging, aerobics, and fast cycling) can reduce symptoms of depression, but not anxiety.
Cecchini et al., 2021[58]	Assessing the prevalence of depressive symptoms, physical activity and providing guidelines for effective and efficient physical activity during isolation during the Covid pandemic in Spain	IPAQ, MET, Six Item Self-reported questionnaire by Kandel and Davies (1982)	Depressive symptoms increased significantly during isolation during the pandemic, particularly in women and the younger age group. Physical activity has a negative relationship with depressive symptoms. Starting with moderate physical activity (4 hours/week) can reduce symptoms of mild depression and continue with high physical activity (16 hours/week) can further reduce symptoms of depression significantly.
Denget al., 2020[59]	Determining the relationship between mental health and lifestyle associated with the physical activity of students in Wuhan and evaluating a website-based physical education program	DASS-21, Sport-Related Lifestyle Scale	The majority of participants had normal mental health status, and only a few participants experienced depression, anxiety, and stress. Significant correlation between depression, anxiety, and stress with regular exercise 1-2 times a week for an adequate duration of > 1 hour. Meanwhile, web-based sports can be employed as an alternative, but among students, it is considered less effective/unsatisfactory.
Dun et al, 2021[60]	Assessing the prevalence of depression in young adults during the COVID-19 pandemic and exploring its relationship to different types of physical fitness	BDI-II & IPAQ-LC	Moderate and high physical activity demonstrate a lower risk of depression than participants with low levels of physical activity in which men experience a more significant decrease in physical activity. Moderate and high levels of aerobic, explosive, and muscular fitness can reduce the risk of depression.
Green et al, 2021[47]	Examining the differences and relationships between mental health and concerns associated with COVID-19 and exploring the effects of meditation and physical activity on mental health	CDC, SRHI, PSS, IES-6, HADS	Anxiety levels, stress symptoms, depression, and PTSD have increased more severely, particularly in people in countries with high cases of COVID-19 and strict social distancing restrictions. Physical activity and meditation are significant mediators in reducing symptoms of stress, depression, PTSD, and anxiety, particularly those related to concerns about COVID-19
Kilani et al., 2020[61]	Identifying the extent to which lifestyle behaviors such as physical activity, sleep, and diet contribute to mental well-being during the COVID-19 pandemic	WHO Five Well-Being Index (WHO-5), FFQ, PSQI, IPAQ	Physical activity is the primary predictor of better mental health status. The other predictors of improving mental well-being are quality eating and sleeping patterns. Mental well-being scores were higher among participants with moderate and high levels of physical activity (PA). The male population has significantly higher levels of physical activity and mental well-being.
Lesser & Nienhuis., 2020[62]	Investigating the impact of the pandemic on the physical activity and psychological well-being of	GLTEQ, BREQ-3, MHC-SF, NRS, GAD-7	There was a decrease in physical activity in which participants who were more active maintained a physical level and connectedness to nature and demonstrated lower levels of activity anxiety, and higher social, emotional, psychological well-being, autonomy, and

Author	Objective	Measurement/ Instrument	Result
	Canadians and exploring the differences between outdoor physical activity and exposure to nature based on classifications of anxiety and general well-being		self-motivation than participants who were inactive Participants who conduct the moderate physical activity with other people possess higher mental health than those who perform physical activity alone. However, it did not occur in participants who did heavy and light physical activities.
Lin et al, 2020[63]	Examining the relationship between depressive symptoms and physical activity among Chinese college students and examining the effect of gender roles on that relationship during the COVID-19 pandemic.	IPAQ-SF, CES-D	A third of participants illustrate increased rates of depression and decreased levels of physical activity during the COVID-19 pandemic. Gender with high masculinity traits have lower rates of depression. Physical activity has a positive correlation with depression levels, particularly moderate physical activity can reduce depression levels.
Marashi et al, 2020[64]	Investigating changes in physical activity, sedentary behavior, and mental health before and during the COVID-19 pandemic	PASB-Q GAD-7 PHQ-9 PSS	During the pandemic, sedentary activity (sitting) decreased, psychological stress increased, and also symptoms of anxiety and depression increased, particularly in the group with low physical activity. Participants were not motivated to perform physical activity because they were too anxious, lack of social support, or limited access to equipment and facilities. The young adult age group (18-29 years) illustrates higher levels of depression and anxiety than other groups, also experiencing a decrease in physical activity and an increase in sedentary activity.
Maugeri et al., 2020[65]	Examining changes in physical activity levels and physical well-being of individuals during self-quarantine in Italy	IPAQ & PGWBI	Physical activity during the pandemic has decreased significantly in both adult women and men. High and moderate physical activity is positively correlated with psychological well-being (anxiety, depressed mood, positive well-being, self-control), especially in the group of women and young adults.
Puccinelli et al., 2021[66]	Identifying the impact of social distancing on changes in physical activity levels and their relationship to mood (depression and anxiety) as well as people's total income during the Covid pandemic in Spain, Brazil	IPAQ, PHQ-9, GAD-7	During social distancing, physical activity decreased significantly, and 30% of participants reported moderate and high levels of depression and anxiety. Mood (depressive and anxiety symptoms) is negatively correlated with physical activity and family income and is associated with the younger age group.
Qin et al., 2020[67]	Identifying the impact of the COVID-19 pandemic on the level and lifestyle characteristics of the Chinese population during quarantine	PANAS, IPAQ-SF	It was reported that there was a decrease in physical activity and an increase in the duration of screen time, especially for males. Individuals with vigorous physical activity have better emotional states and less screen time than those with light physical activity. There is a positive relationship between physical activity and emotional state. Higher positive emotions were discovered in males and were associated with the effects of high physical activity.
Reigal et al, 2021[68]	Identifying the relationship between physical activity, mood conditions, and self-assessment of health during	IPAQ, POMS, STAI, GHQ−12	Physical activity is positively associated with perceptions of health, anxiety, and mood (anger, depression, enthusiasm, tension). Moderate physical activity predicts better mood and health perceptions than vigorous

Author	Objective	Measurement/ Instrument	Result
	the lockdown in Spain		physical activity and positively affects levels of anger, depression, enthusiasm, stress, and anxiety. Men and younger age groups (19 -39 years) demonstrate better psychological health when performing high/intense physical activity. On the other hand, women and older groups (40 -59 years) illustrated better psychological health when conducting moderate physical activity.
Stanton et al., 2020[69]	Investigating the relationship between psychological disorders and behavioral changes in physical activity, sleep, smoking, and alcohol use during social isolation in Australia.	DASS-21, AUDIT-C, AAS, Sleep Quality Survey	Physical activity and sleep quality have decreased during the COVID-19 pandemic. Participants with low levels of physical activity, possess chronic illnesses, experience negative sleep pattern changes, low incomes, and changes in consumption patterns of alcohol and smoking will be prone to experience depression, anxiety, and stress. Women and young age groups are significantly more susceptible to depression, anxiety, and stress.
Zhang et al., 2020[70]	Identifying the impact and relationship between the COVID-19 pandemic and mental health (depression, anxiety, stress, sleep quality), and exploring the effects of appropriate mitigation/physical activity.	IPAQ-SF, DASS 21, PSQI, BPAQ,	The COVID-19 pandemic has significantly reduced the quality of sleep for young adults and has implications for increasing negative emotions, especially stress, and anxiety. Women experienced a more significant decrease in physical activity. The death rate and severity of the COVID-19 outbreak have an indirect effect on negative emotions (stress, depression, and anxiety), sleep quality and reduce people's level of aggressiveness, in which the majority of participants, particularly women, felt more anxious about COVID-19, stress, anxiety, and depression in themselves. Moderate physical activity significantly reduces negative emotions.

According to the findings of a review of 15 articles, the most common symptoms of psychological disorders during the COVID-19 pandemic were depression, anxiety, stress, sleep disturbances, and various emotional and mood disorders demonstrated in Table 4.

Table 4. Psychological Well-Being

Category	Author
Depression	Althumiri et al, 2021[57]; Cecchini et al., 2021[58]; Deng et al., 2020[59,60]; Dun et al, 2021[60];Green et al, 2021[47]; Lin et al, 2020[63]; Marashi et al, 2020[64]; Stanton et al., 2020[69]; Puccinelli et al., 2021[66]; Reigal et al, 2021[68]; Zhang et al., 2020[70]
Anxiety	Althumiri et al, 2021[57]; Cecchini et al., 2021[58]; Deng et al., 2020[59]; Dun et al, 2021[60]; Green et al, 2021[47]; Lin et al, 2020[63]; Marashi et al, 2020[64]; Stanton et al., 2020[69]; Puccinelli et al., 2021[66]; Reigal et al, 2021[68]; Zhang et al., 2020[70]
Stress	Deng et al., 2020[59]; Green et al, 2021[47]; Marashi et al, 2020[64]; Stanton et al., 2020[69]; Zhang et al., 2020[70]
Emotional and Mood Disorders	Lesser & Nienhuis., 2020[62]; Maugeri et al., 2020[65]; Qin et al., 2020[67]; Reigal et al, 2021[68]
Sleep Disorders	Kilani et al., 2020[61]; Stanton et al., 2020[69]; Zhang et al., 2020[70]

The primary question addressed in this study is the level and impact of physical activity on psychological well-being in the adult population during the COVID-19 pandemic. In accordance with the review's findings, the majority of studies discovered that the amount of physical activity in the adult population had decreased.[63-69] On the other hand, sedentary physical activities, such as sitting, lying down, and using screens, have elevated during the COVID-19 pandemic.[64,67] This is also indirectly due to the policy of limiting activities outside the home during the COVID-19 pandemic, such as quarantine,[65,67] isolation,[58,69] lockdown,[68] work from home,[15,16] and social distancing.[66] Furthermore, the subject is less motivated to engage in physical activities because they are too anxious, lack social support, or are ineffective and have limited access to physical activity equipment and facilities.[59,64]

Both men and women experience a decrease in physical activity,[63,65,66] with men experiencing a greater decrease than women.[67] Other studies, however, have revealed that women are more likely than men to experience a decrease in physical activity.[60,61,70] Meanwhile, the adult population, particularly those aged 18-24 years, experienced a more significant decrease in physical activity than other individuals.[64,67]

Based on the results of a systematic review that has been carried out, it shows that the level of physical activity either directly or indirectly also impacts psychological well-being. In general, doing physical activity can improve mental health,[61,62,65] self-control,[65] reduce symptoms of depression, anxiety, and stress,[47,64,66,68,69] PTSD,[47] and negative mood.[65,68] Meanwhile, based explicitly on intensity, the review results show that moderate-intensity physical activity has the

most significant effect on psychological well-being compared to low and high-intensity physical activity. These results are also supported by several studies which report that moderate-intensity physical activity can reduce symptoms of depression,[57,58,60,63] anxiety,[57] negative emotions, and feelings.[70,68] However, the results of other studies also report that physical activity with high or vigorous intensity is effective only on some psychological well-being, such as reducing symptoms of depression,[57,58,60] anxiety,[65] and increasing positive emotions and moods.[67,68]

Then, respond to the second problem formulation, which is about physical activity recommendations that can be performed during the COVID-19 pandemic to enhance psychological well-being. In accordance with the findings of a systematic review, the most effective form of physical activity for enhancing psychological well-being is to engage in moderate-intensity physical activity 1-2 times per week for at least 1 hour [59] or approximately 4 hours per week.[58] Performing light weights, yoga, doubles tennis,[57] aerobics, muscular fitness (push-ups, sit-ups, squats, dance, digging, shovelling, climbing stairs), and explosive fitness (high steps, long jumps, and repeated squat jumps) are all recommended forms of moderate-intensity physical activity.[60] Furthermore, forms of high-intensity physical activity such as weight lifting, jogging, aerobics, cycling, muscular, and explosive fitness for a long period of time are recommended because they possess an effect on some psychological well-being. [60]

Discussion

Some research reveals that women are more likely than males to experience a decline in physical activity.[60,61,70] However, physical activity decreases for both men and women,[63,65,66] with men reporting a higher reduction than women.[67] Meanwhile, the adult population, particularly those aged 18-24 years, suffered a greater reduction in physical activity than the general population.[64,67] These findings are justified by other investigations that age and gender have a large role in dropping the number of physical activities, and even this effect tends to raise the risk of mental health.[71] According to the findings of a comprehensive review, the degree of physical activity has an impact on psychological well-being, either directly or indirectly. Physical activity, in general, can promote mental health[61,62,65] and reduce symptoms of anxiety and stress.[47,64,66,68,69] Furthermore, these findings are confirmed by the study that shows the level of physical activity has a crucial effect on enhancing mental health and reducing the probability of depression.[72]

The study's major question is the level and influence of physical exercise on psychological well-being in the adult population during the COVID-19 pandemic. According to the review's findings, the majority of studies discovered that physical activity levels in the adult population had declined.[63-69] On the other hand, Sedentary physical behaviors, including sitting, lying down, and utilizing screens, have increased. During the COVID-19 pandemic.[64,67] These findings are confirmed by research conducted in Italy, during the COVID-19 pandemic, the vast majority of

Italian can not do anything. Because of that, sedentary activities have increased, whereas physical activity has decreased.[73] Furthermore, the victim of the pandemic is less motivated to participate in physical activities because they are very nervous, lack social support, are ineffective, and have restricted access to physical exercise equipment and facilities.[59,64] These findings are related to another research that has the same findings. It reveals that the poor state of emotions during the COVID-19 pandemic leads us to obtain less motivation in order to do physical activities.[74]

Meanwhile, the review results reveal that moderate-intensity physical activity has the greatest influence on psychological well-being when compared to low and high-intensity physical activity. Furthermore, moderate-intensity physical activity has been shown to lower symptoms of depression,[57,58,60,63] anxiety,[57] negative emotions, and sentiments.[70,68] The findings of other studies indicate that high-intensity physical activity is useful only on particular aspects of psychological well-being, such as reducing symptoms of depression,[57,58,60] anxiety,[65] and raising positive feelings and moods. [67,68] These findings are supported by some research that reveals the effect of intense physical activity on psychological well-being. The study justifies that the intensity of physical activity, such as week-intensity and vigorous-intensity, has a substantial role in achieving psychological well-being.[73]

Then, respond to the second problem formulation, which is about physical activity recommendations that can be performed during the COVID-19 pandemic to enhance psychological well-being. According to the findings of a comprehensive study, the most effective form of physical activity for improving psychological well-being is moderate-intensity physical activity 1-2 times per week for at least 1 hour or about 4 hours each week.[58] That suggestion has the same main point as other physical activity recommendations during the COVID-19 pandemic.

Moderate-intensity physical exercise is defined as lifting light weights, yoga, doubles tennis,[57] aerobics, muscular fitness (push-ups, sit-ups, squats, dance, digging, shoveling, climbing stairs), and explosive fitness (high steps, long jumps, and repeated squat jumps).[60] Furthermore, long-term high-intensity physical activity such as weight lifting, jogging, aerobics, cycling, muscular and explosive fitness are encouraged since they have an effect on some psychological well-being.[60] That kind of recommendation has been sported by other studies that show some physical exercise which has the advantage of enhancing the immune system and reducing the risk of diseases during the COVID-19 pandemic.[76]

Conclusion

Based on the findings and discussion, it is possible to conclude that the adult population's level of physical activity and psychological well-being decreased during the COVID-19 pandemic, particularly among women and young adults. Physical activity could have an impact on psychological well-being both directly and indirectly, particularly in increasing positive feelings

and emotions and decreasing symptoms of depression, stress, and anxiety in the adult population. Furthermore, regular moderate-intensity physical activity 1-2 times per week for more than 1 hour, or approximately 4 hours per week, produced the most significant effect on psychological well-being. Performing light weights, yoga, doubles tennis, aerobics, muscular fitness, and explosive fitness are several moderate-intensity physical activities that are recommended. Furthermore, forms of high-intensity physical activity such as weight lifting, jogging, aerobics, cycling, muscular fitness, and explosive fitness of strong duration are also highly recommended as they are also effective in several psychological well-being.

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Conflict of Interest

During and after this research was conducted, there was no conflict of interest.

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