

2023

## Physical activity in managing stress among managers during a COVID-19 pandemic – systematic review

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### Recommended Citation

Hryniewicz A, Gmiat A, Jaroch-Lidzbarska M, Lipowski M. Physical activity in managing stress among managers during the COVID-19 pandemic – A systematic review. *Balt J Health Phys Act.* 2023;15(2):Article2. <https://doi.org/10.29359/BJHPA.15.2.02>

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## Physical activity in managing stress among managers during a COVID-19 pandemic – systematic review

### Abstract

**Introduction:** During the COVID-19 pandemic managers experienced additional stress connected with taking responsibility for workers at the time of a worldwide crisis. Maintaining a high level of physical activity in this specific group possibly could have contributed to keeping both management skills and health condition at a high required standard. The purpose of this review is to verify the range of scientific interest on the subject of physical activity among managers as a stress coping strategy during the pandemic. **Materials and Methods:** For this systematic review six studies were chosen (two of them are qualitative descriptive, three are cross-sectional, one is a report). The inclusion criteria were as follows: studies focusing on stress, physical activity and managers; studies conducted in the years of COVID-19 epidemic available in full-text. The exclusion criteria applied to studies where the managers' group was not specified. The number of study participants ranged from 20 to 255. **Results:** The frequency of exercise was insufficient and unsuitable to the managers' specific needs, especially during the demanding time of the COVID-19 pandemic. **Conclusions:** The managers were highly aware of the role of sport in lowering stress and improving health, especially during the pandemic. However, this has not resulted in more frequent physical activity among this group. There is a high probability that further confronting the leaders with their real physical activity daily habits would have influenced their reflection about the subject and initiated change.

### Keywords

managers, exercise, COVID-19, stress management, physical activity

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Review

## Physical activity in managing stress among managers during the COVID-19 pandemic – A systematic review

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**Abstract:** Introduction: During the COVID-19 pandemic managers experienced additional stress connected with taking responsibility for workers at the time of a worldwide crisis. Maintaining a high level of physical activity in this specific group possibly could have contributed to keeping both management skills and health condition at a high required standard. The purpose of this review is to verify the range of scientific interest on the subject of physical activity among managers as a stress coping strategy during the pandemic. Materials and Methods: For this systematic review six studies were chosen (two of them are qualitative descriptive, three are cross-sectional, one is a report). The inclusion criteria were as follows: studies focusing on stress, physical activity and managers; studies conducted in the years of COVID-19 epidemic available in full-text. The exclusion criteria applied to studies where the managers' group was not specified. The number of study participants ranged from 20 to 255. Results: The frequency of exercise was insufficient and unsuitable to the managers' specific needs, especially during the demanding time of the COVID-19 pandemic. Conclusions: The managers were highly aware of the role of sport in lowering stress and improving health, especially during the pandemic. However, this has not resulted in more frequent physical activity among this group. There is a high probability that further confronting the leaders with their real physical activity daily habits would have influenced their reflection about the subject and initiated change.

**Keywords:** managers, exercise, COVID-19, stress management, physical activity.

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<https://doi.org/10.29359/BJHPA.15.2.02>

Academic Editor:

Aleksandra Bojarczuk

Received: November 2022

Accepted: March 2023

Published: May 2023

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### 1. Introduction

The ability to deal with stress is one of the key qualifications of people working in management positions. The stress experienced by managers goes far beyond the individual and affects other members of the working community. Work stress is present when the demands of work overcome humans' available resources and capabilities. Stress defined as a physical and emotional response to the work–life imbalance is a psychosocial factor of work that has both psychological and physical effects [1]. It can be especially harmful to mental and physical health when it is chronic or excessively intense. Indeed, persistent stress that is difficult to deal with may result in mental diseases characterized by symptoms related to anxiety and depression [2]. Psychological stress can cause acute physiological effects in the body, such as increased heart rate and blood pressure, which

can lead to future health consequences, including an increased risk of many non-communicable diseases [3]. Currently, due to the rapid acceleration of the world's technology development and the related emergence of many new various stressors, stress at work has become a public health issue [4]. Work-related stress is one of the most serious challenges in the field of occupational health and safety. These issues have a significant impact both on employees' health and on national organizations and economies. Management positions, in particular, are exposed to numerous stressors at work, which makes them one of the most stressful occupations.

The COVID-19 pandemic as an acute extra organizational stressor differs from chronic workplace stressors, such as role overload or work-life conflict [5]. On the one hand, acute stressors can induce traumas and destabilize individuals and workplaces for an extended period; on the other hand, they constitute catalysts to positive adaptation and growth, in other words, resilience [6]. An individual disaster resilience implicates the range of positive and negative human reactions to heightened stress caused by a significant event [7,8]. Scholars have defined resilience as the ability to rebound from crises and to modify goals and behaviors to cope with changes in the environment, using a recovery trajectory [9]. Researchers have observed that even though people differ with their personal resources, stressor appraisals, and initial stress responses during exposure to a disaster, individual resilience trajectories tend to converge within their workplaces [10, 11]. This suggests that an organization may steer recovery or thriving trajectories by ensuring organizational-level resilience and thus contribute to its own survival-to-decline trajectory [12].

Among a variety of strategies to counteract stress, many studies suggest an increase in physical activity and an integration of healthy eating habits into the daily routine [13]. Physical exercises have long been recognized as a predictor of a healthy lifestyle as well as considered one of the components of resilience. Health benefits induced by regular physical activity are now well documented and their effects demonstrated, regardless of age and gender [14]. Various national and international organizations have provided physical activity recommendations across the lifespan. The overwhelming evidence indicates that a lack of exercise is associated with an onset of 40 chronic conditions/diseases and premature death [15]. Moreover, it is precisely the lack of physical activity that can be a stressor in itself. The studies suggested that higher physical activity is associated with better well-being, quality of life as well as lower stress, depressive symptoms and anxiety. Additionally, Burton et al. [16] provide interesting evidence that moderate levels of exercise can mitigate abuse by supervisors targeting their subordinates and thus have a positive effect on well-being at work. Moreover, with the growing awareness of a healthy lifestyle, one can get an impression that staying in good physical shape belongs to the image of a modern manager.

Since the COVID-19 pandemic, changes in lifestyle behaviors have occurred, causing disparities in exercises practice. Overall, studies around the world showed a negative impact on physical exercises during COVID-19 health restrictions of lockdown, mainly as a consequence of the stay-at-home strategies [17]. As suggested by reports from surveys conducted in many countries [18, 19], the lockdown likely resulted in disruptions of food-related practices and physical activity, as well as body weight changes and increased sedentariness. It is not astonishing that the pandemic contributed to the growth of job stress [20]. This unprecedented situation resulted in a sudden disruption of daily routines, accompanied by insecurities and worries related both to the pandemic and to professional and familial organization during and after the lockdown. The stress caused by the coronavirus crisis can put workers' individual resources at risk. This loss of resources can then reduce workers' ability to respond to their work demands and stressors, thereby affecting their performance at work [21, 22].

The previous research has confirmed that managers positively or negatively affect employees' mental health in the workplace, by influencing exposure to psychosocial risk factors such as work overload or decision-making freedom, and by helping employees to cope with work-related stress [21, 23]. The above phenomena constitute evidence of the

need to increase knowledge about the problem in order to take effective preventive actions. In times when people are less active, the significance of studies on the positive impact of exercise on managing stress and mental health is critical.

The aim of this article is to examine the state of current research and the interests of researchers around the world in the field of the relationship between physical activity in coping with stress among managers during the years of the pandemic. The resulting knowledge of extant evidence regarding physical activity in managing stress among managers from this review will help to define an agenda for future research on the topic – what is known and what warrants new research. In this review of recent literature, it was quite difficult to find any research on the topic of the managers' health habits and ways of stress management during pandemic. For this reason, the authors wanted to pay special attention to this neglected research topic.

## 2. Materials and Methods

### 2.1. Database Search

A systematic literature research was conducted from July to September 2022 using the Scopus, Cochrane Library, EBSCOhost, Web of Science, Google Scholar, ResearchGate and PubMed databases. Available research articles published between 2020–2022 were searched for using the following keywords: “manager” or “leader,” or “leadership” or “director” or “leadership” or “CEO” and “exercise” or “physical activity” or “sport” and “diet” or “nutrition” and “stress” and “stress management” and “COVID-19” and “pandemic”. The searches were conducted using single and combined terms. Articles were chosen according to their relevance to our research topic. The papers were published in the years 2020–2022, so they present the information on the COVID-19 pandemic years. Only articles published in English and Polish in peer-reviewed journals were considered for review.

Following the keywords given above, 382 publication matches were found. In the qualification process, six of them were isolated and thoroughly analyzed in the systematic review below.

### 2.2. Selection Process

The screening of the title, abstract and reference list of each study to locate potentially relevant studies was independently performed by the two authors (GA and MJ-L). Additionally, all authors reviewed the full version of the included papers in detail to identify articles that met the selection criteria.

### 2.3. Data Analysis. Inclusion and Exclusion Criteria

Considering the fact that there is not a large number of studies directly regarding the relationship between physical exercise and managers and COVID-19, we included all articles about stress, physical exercise and managers which were published in the years 2020–2022, so they present the most up-to-date information on the topic. The inclusion criteria were as follows: studies focusing on stress, physical activity and managers, studies conducted in the years of the COVID-19 epidemic and available in full-text. The exclusion criteria applied to studies where the managers group was not specified.

**Table 1.** Summary of the selected articles with links.

Database	Search code line of an article	Number of extracted articles
PubMed	1. <a href="https://pubmed.ncbi.nlm.nih.gov/33362330/">https://pubmed.ncbi.nlm.nih.gov/33362330/</a> 2. <a href="https://pubmed.ncbi.nlm.nih.gov/33305687/">https://pubmed.ncbi.nlm.nih.gov/33305687/</a> 3. <a href="https://pubmed.ncbi.nlm.nih.gov/32503308/">https://pubmed.ncbi.nlm.nih.gov/32503308/</a>	3
Research-Gate	4. <a href="https://www.researchgate.net/publication/358590614_After_All_No_One_Is_Superhuman_Here_An_Analysis_of_the_Perceived_Effects_of_Management_Athleticism">https://www.researchgate.net/publication/358590614_After_All_No_One_Is_Superhuman_Here_An_Analysis_of_the_Perceived_Effects_of_Management_Athleticism</a>	1
EBSCO-host	5. <a href="https://web.p.ebscohost.com/abstract?direct=true&amp;profile=ehost&amp;scope=site&amp;authtype=crawler&amp;jrnl=21755361&amp;AN=154807942&amp;h=LQB2YT6tFhrk9%2fY2fPgs717c2d1dWcOqllvLLrif2QiXUq8WWQVomT7Go%2fsoflNbNk-FWfKIR%2b4Ka166JftGLWQ%3d%3d&amp;crl=c&amp;resultNs=AdminWebAuth&amp;resultLocal=ErrCrlNotAuth&amp;crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d21755361%26AN%3d154807942">https://web.p.ebscohost.com/abstract?direct=true&amp;profile=ehost&amp;scope=site&amp;authtype=crawler&amp;jrnl=21755361&amp;AN=154807942&amp;h=LQB2YT6tFhrk9%2fY2fPgs717c2d1dWcOqllvLLrif2QiXUq8WWQVomT7Go%2fsoflNbNk-FWfKIR%2b4Ka166JftGLWQ%3d%3d&amp;crl=c&amp;resultNs=AdminWebAuth&amp;resultLocal=ErrCrlNotAuth&amp;crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d21755361%26AN%3d154807942</a>	1
Google Web search*	6. <a href="https://think-tank.pl/przeciazony-jak-lider-podsumowanie-pierwszego-w-polsce-objektywnego-badania-stresu-wsrod-polskich-menedzerow-podczas-pandemii/">https://think-tank.pl/przeciazony-jak-lider-podsumowanie-pierwszego-w-polsce-objektywnego-badania-stresu-wsrod-polskich-menedzerow-podczas-pandemii/</a>	1

\*A report, as the only one, was found not in a scientific database.

#### 2.4. Data Items

To help in addressing our main aim, the recorded data are as follows: (a) study identification (authors, year and title); (b) study design; (c) sample characteristic of the participants; (d) measurement methods and (e) the main findings related to the purpose of this review.

### 3. Results

#### 3.1. Study Characteristic

In our review of research articles published between 2020–2022 on the relationship between physical activity and stress among managers, through literature search, we detected similar articles focusing on physical activity and stress during pandemic among workers, but we only selected the studies which contained separated data on managers. Only six articles provided information in line with the purpose of this review. Two articles are qualitative descriptive study articles and three articles are cross-sectional studies. In addition one report research carried out by the company was included because it provided useful information for the present review, for instance, prevalence data of insufficient level of physical activity among the managers during pandemic. All articles were selected purposefully based on the objectives of the present review study. No article was found containing intervention studies on the effects of physical activity or exercise and stress among managers.

Two of the studies were from Europe (Finland, Poland), two from South America (Brazil, Mexico), one from Asia (India) and one from New Zealand. The number of study participants ranged from 20 to 255.

The impact factor for the magazines varied from 1.66 to 3.39. Two of the publications found in a journal had an impact factor smaller than 1.0 or none.

### 3.2 General Findings

In this study, the physical activity and stress management among managers during the years of COVID-19 pandemic was assessed. Four studies were found that were connected with the subject of physical activity used as a stress coping strategy which included uniquely the leaders' environment; in the two remaining studies, the managerial population represented only part of the investigated group. In three out of six articles, the age group of the researched population was similar and comprised leaders in early and middle adulthood.

In a cross-sectional study by Armenta-Hernandez et al. from 2020 [24], concerning effects of job content and physical activity on BMI among obese leaders of a Mexican manufacturing industry, 255 managers with a BMI >30, at the age of 31–40 years were involved; they were both men and women. The measurement methods encompassed the Job Content Questionnaire, Baecke's Short Physical Activity Questionnaire and the Sociodemographic Data Questionnaire. The main findings showed that both work stress and physical activity exerted observed direct effects on BMI reduction among obese managers. One can also find a correlation of all these factors with the quality of life, which may be important for resilience during a crisis such as a pandemic.

In case reports/qualitative descriptive study by Raisio et al. from 2021 [25], which focused on an analysis of the perceived effects of managerial athleticism, 20 physically active executive-level leaders participated (e.g., cabinet ministers and CEOs), 11 men and 9 women at the age of 43–64 years. They were examined with semi-structured reviews. The study revealed that the interviewees saw many good aspects of physical exercise, such as providing physical, affective, cognitive, and social resources. In addition, managers admitted the importance of physical activity not only for them-selves, but the impact of their practice on employees emerged. The study highlighted the role of balancing the harmonious and obsessive aspects of the relationship with exercising.

On the other hand, in 2021 Azevedo et al. did [26] a qualitative descriptive study with 44 managers of the Health Unit, 16 men and 28 women, interviewed individually. The results showed that stressors outweighed the discourse on coping strategies (words linked to the word stress), which demonstrates that coping mechanisms among managers are still incipient. Health services and medications, as well as leisure time, but not physical activity, were sought as strategies for coping with stress.

In 2022, Shaikh et al. [27] involved 203 people in their cross-sectional study, out of whom 178 (87.7%) were employees, 25 (12.3%) employers (managers); 132 men at the age of 29 ±12 were examined with a semi-structured "Knowledge, Attitude and Practice of Physical Activity Questionnaire". The study showed that though employers and employees have adequate knowledge and attitude, the practice of SB interventions and PA practices are found to be low in Indian workplaces. The study showed that though employers and employees have adequate knowledge and attitude, the practice of sedentary behavior interventions and physical activity practices are found to be low in Indian workplaces and it have been any significant difference in attitudes among employees and employers.

In a 2021 cross-sectional study by Kuntz [12] focused on resilience in times of the COVID-19 pandemic, 61 workers from all over New Zealand from several sectors participated in May 2020. 17 of them were managers and 44 had non-managerial positions. The respondents stated that lack of leadership by example and poor support for wellbeing significantly contributed to their stress levels and difficulty coping with role demands during the lockdown. Almost 60 per cent of the interviewees across all sectors surveyed remarked on the importance of managerial support for wellbeing as stress management factors.

De Nisau et al. [28] chose as their population study a representation of 40 leaders from the company BIG4, at the average age of 37, with average BMI of 24.1. They participated in direct measurement with the Bodyguard device and presented the results of stress measurement during a total of 500 days and nights during the COVID-19 pandemic. It is the first objective stress research conducted among the managers in Poland. Each examined manager participated in at least three days and nights of measurement with the device equipped with electrodes, which diagnosed the leaders twenty-four-hours and enabled collecting data about body functions with precision similar to clinical research. The purpose of the research was to learn how the managers were coping with stress during the pandemic, regenerated and if their physical activity was sufficient to keep fit or improve their fitness level. The study results showed that 56% of the respondents presented an insufficient level of undertaken physical activity, and only 14% of the managers presented a very good or extraordinary fitness level. 55% of the leaders claimed that their physical activity was adequate to bring them health benefits; however, the study showed that, actually, 44% of them were active enough to improve their health. The researchers claim that being in good physical shape is crucial for leadership because our fitness capacity and VO<sub>2</sub>max influence our ability to cope with stress. Below is the table containing the summary of studies presented in the article.

**Table 2.** Summary of the studies.

	Authors (years)	Study design	Population	Sample characteristics (n, sex, age)	Measurement methods	Main findings related to the purpose of this review
1	Armenta-Hernandez, O.D.; Maldonado-Macias, A.A.; Ortiz Solís, M.; Serrano-Rosa, M.Á.; Baez-López, Y.A.; Hernández-Arellano, J.L. (2020)	cross-sectional study	Managers from the Mexican industry, with a (BMI >30)	N = 255 age: 31–40 years, sex: men and women	- Job Content Questionnaire - Baecke's short Physical Activity Questionnaire - The Sociodemographic Data Questionnaire	Both work stress and the physical activity exerted observed direct effects on BMI reduction among managers.
2	Raisio, H.; Kuorikoski, T.; Rantala, T.; Rask, M (2021)	case reports/qualitative descriptive study	Physically active executive-level leaders (e.g., cabinet ministers and CEOs) from Finland	N = 20 age: 43–64 years sex: 11 men, 9 women	- semi-structured interviews	The interviewees saw many good aspects of physical exercise, such as providing physical, affective, cognitive, and social resources. The study highlights the role of balancing the harmonious and obsessive aspects of the relationship with exercising.



	Authors (years)	Study design	Population	Sample characteristics (n, sex, age)	Measurement methods	Main findings related to the purpose of this review
3	Azevedo SJS; Queiroz AP; Oliveira IRS; Lima FRA; Rodrigues CCFM; Salvador PTCO (2021)	qualitative descriptive study	Managers of the Health Unit	N = 44 sex: 16 men, 28 women	- individual interviews	Stressors outweigh the discourse on coping strategies (words linked to the word stress), which demonstrates that coping mechanisms among managers are still incipient. As coping strategies with stress, there was the search for health services and medications, as well as leisure but not physical activity.
4	Shaikh A.; Mohapatra S.; Baskaran Ch. (2022)	cross-sectional study	White-collar workers (both employees and managers) from 8 corporate sectors at India	N = 203: 178 (87.7%) employees, 25 (12.3%) employers (managers) sex: 132 men age: 29 ± 12	- semi-structured questionnaire, "Knowledge, Attitude and Practice of Physical Activity Questionnaire"	Though employers and employees have adequate knowledge and attitude, the practice of SB interventions and PA practices are found to be low in Indian workplaces.  Any significant difference in attitudes among employees and employers toward PA practices at work except "bike or walk to work" construct.
5	Kuntz J.C. (2020)	cross-sectional study	Workers throughout New Zealand during the month of May 2020 from several sectors.	N = 61 17 - managers 44 - non-managerial	- semi-structured interviews	The respondents stated that lack of leadership by example and poor support for wellbeing, significantly contributed to their stress levels and difficulty coping with role demands during the lockdown. Almost 60 per cent of the interviewees across all sectors surveyed remarked on the importance of managerial support for wellbeing as stress management factors.
6	de Nisau (2021)	population study	Leaders from the company BIG4; average BMI: 24,1	N = 40 average age: 37	- direct measurement with the Bodyguard device	The study results showed that 56% of respondents presented insufficient level of undertaken physical activity and only 14% of the managers presented very good or extraordinary fitness level.

#### 4. Discussion

To our knowledge, this is the first review describing the relationship between physical exercises and stress during a pandemic among managers. The studies in this literature review have been interpreted by examining six related articles. Moreover, this study analyzed evidence from different regions of the world (Mexico, New Zealand, Brazil, Finland, India, Poland) and different professions. The review showed that during the pandemic the research into the manager's group was neglected. In most cases, the conducted surveys and interviews included the general population, not specific groups, such as for instance the managers. Only four of the studies we found specifically concerned the group of managers. Based on our review, it can be assumed that the knowledge and attitude towards the importance of physical activity among managers was adequate; however, the frequency of undertaken physical activity was not enough and suitable to the managers' real needs.

Physical activity has been a good and effective choice to mitigate the negative effects of the COVID-19 pandemic on mental health. Marconcin's [29] study suggested that higher physical activity is associated with higher well-being and quality of life as well as with lower depressive symptoms, anxiety, and stress, independently of age during the first year of the COVID-19 pandemic. Similarly, the research by Hernandez et al. [24] and Raisio et al. [25] show that physical activity during the COVID-19 pandemic has been helpful and contributed to the important benefits among managers.

The leadership is connected with high levels of work pressure and stress, long working hours, numerous meetings, the need for global travel and uncertainty of the surrounding environment. A high level of physical fitness is then seen as contribution to maintaining high management skills and health condition [30]. The leaders who exercise regularly might benefit from, for instance, improved information processing, error recognition, executive function, and decision-making. In addition, physically active leaders should be able to dispose of an elevated level of physical resilience, which should decrease their physical exhaustion due to intensive work and should also be able to prevent different health stressors [31]. Moreover, undertaking regular sport activity can result in psychological benefits or affective resources, such as positive affect and increased self-esteem. Finally, physical exercise is associated with enhanced cognitive resources, such as attention, memory, and reaction time [25].

Managerial positions are highly stressful, and although physical activity may reduce the negative effects of work stress, the relationships between undertaking sport and its effect on managers' body mass index (BMI) is rarely studied. Meanwhile, the subject of increased BMI in the population and its risk is an issue raised for a long time. The WHO Expert Consultation on Obesity, already in 1997, warned of an escalating epidemic of obesity, which would put the populations of most countries at high risk of developing non communicable diseases (NCDs) [32]. The Department of Nutrition for Health and Development at WHO has been working to establish a Global Database on the Body Mass Index. The worldwide surveys conducted by them between 1994–2002, including both sexes and the population at the age of 15–84, showed that the highest rates of overweight are concentrated on the Pacific Islands (Cook Islands, 78% with BMI > 25), North America is second (the USA, 63% with BMI > 25), Middle East comes third (Bahrain, Egypt, 62–61% with BMI > 25), followed Europe (Germany, 60% with BMI > 25), South Africa (45% with BMI > 25) and Asia (Singapore, 30% with BMI > 25). Then, the highest obesity rate represented again the region of the Pacific Islands (Nauru, 43% with BMI > 30), second was the USA (28% with BMI > 30), third Middle East (Bahrain, 29% with BMI > 30), Africa (South Africa) and Europe (Germany) with the same rate – 21% of the population with BMI > 30 were at the bottom at the data list (Prentice, 2005). A conclusion from the extracted articles is that there is a great importance of physical activity for the managers' both physical and mental well-being.

From the extracted articles, a conclusion emerges about the great importance of physical activity for the managers' both physical and mental well-being. At the same time, the years of the pandemic showed still insufficient amount of this activity, which could have contributed to increasing stress in this group. On the other hand, the specificity of the managers' group could have resulted in two possible options of undertaking physical activity during the COVID-19 pandemic – excess resulting in self-concentration and negligence of workers and family or deficit connected with health problems and distress increase. Future studies should systematically assess and quantify individual differences among managers, both as a baseline predictor of physical activity engagement and across time as a mechanism of resilience improvements.

The research conducted on the subject of stress management strategies among managers before the pandemic contained significant information about the resistance of some of the examined managers who were not interested in disclosing their lowered mood or self-esteem. The probable reason for this could have been the apprehension of image disturbance of “a successful man” [33,34]. In our opinion, this significant factor could have resulted in less research conducted among the managers.

It appears that the population with managerial positions appreciate the role of physical activity as a reliable tool of self-improvement and stress control. The undoubted crisis caused by a sudden outbreak of the COVID-19 pandemic could entirely surprise the leaders and compel them to make new and unexpected choices connected with their and their employees' new or other responsibilities. It is highly likely that in the longer term it could have caused physical activity, even as valued part of their daily routine, to become less significant in the time of a worldwide crisis. Bearing in mind the great responsibility incumbent on many managers, this is a group that should be surrounded by special support also through the conducted research. There is no doubt that stress in the workplace has a negative impact on managers and employees' mental and physical health [35]. It is very important for people suffering from work-related stress to learn to recognize it and deal with it easily in order to maintain good mental health and work effectively by taking advantage of the benefits of physical activity. The future study should be designed to bridge the gap between what is already known about the coping strategies related to physical activity used by managers and about how people working in managerial positions are actually coping with stress during a crisis situation like the COVID-19 pandemic.

In summary, the subject seems to be essential for further research to broaden the knowledge regarding this specific social group and their positioning of physical activity as a stress lowering tool. Taking into consideration the daily high responsibility of managers, subsequent research can contribute to help them find and develop the most effective ways of using sport in their everyday schedule, not only in critical conditions, as it was during the COVID-19 pandemic.

## 5. Limitations

This review has limitations. Longitudinal and intervention studies were not found, and there is very little literature regarding the subject. The constraints of a cross-sectional study prevents drawing definitive conclusions regarding the subject. In our opinion, the research based on interviews is insufficient, and objective research is highly required.

## 6. Conclusions

In 2020, together with the global spread of the COVID-19 pandemic, humankind experienced an emergency situation. The protection of human life and health became a priority. Medical research on COVID-19 has revealed a wide variety of symptoms of the disease. In the meantime, it turned out that maintaining physical activity may effectively contribute to reducing the negative effects of COVID-19. People who exercise can be fitter and healthier and deal with stress in more constructive ways [33].

This review on the subject of physical activity as a stress coping strategy among managers showed that very few studies have been conducted on this population during the pandemic. The articles on the subject which have been taken into consideration showed that managers were highly aware of the role of sport in lowering stress and improving health, especially during the pandemic. However, this did not result in more frequent physical activity among the leaders. Moreover, the managers perceived themselves as more active than they were in reality. There is a high probability that confronting the leaders with their real physical activity daily habits further, not imaginary athletic vision of themselves, would have influenced their reflection about the subject and initiated change.

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**Author Contributions:** Study Design, AH, AG, MJ-L and ML; Data Collection, AH, AG, MJ-L and ML; Statistical Analysis, AH, AG, MJ-L and ML; Data Interpretation, AH, AG, MJ-L and ML; Manuscript Preparation, AH, AG, MJ-L and ML; Literature Search, AH, AG, MJ-L and ML. All authors have read and agreed to the published version of the manuscript.

**Funding:** Funding Work of Mariusz Lipowski was supported by the Fundamental Research Funds for the Polish National Agency for Academic Exchange under the Urgency Grants program (BPN/GIN/2021/1/00010/U/00001).

**Institutional Review Board Statement:** N/a.

**Informed Consent Statement:** N/a.

**Data Availability Statement:** Data available from the corresponding author on request.

**Conflicts of Interest:** The authors declare no conflict of interest.