

THE INFLUENCE OF LOCKDOWN ON THE PHYSICAL ACTIVITY AND SUBJECTIVE HEALTH IN THE TEACHERS OF PHYSICAL EDUCATION IN POLAND

Adam Kozubal^{A, D}

Institute of Physical Culture Sciences, College of Medical Sciences, University of Rzeszów, Rzeszów, Poland
ORCID: 0000-0002-9124-7855

Katarzyna Kozubal^{A, B}

Institute of Health Sciences, Collegium Medicum, Jan Kochanowski University in Kielce, Kielce, Poland
ORCID: 0000-0003-0675-4199

Krzysztof Warchol^{A, B}

Institute of Physical Culture Sciences, College of Medical Sciences, University of Rzeszów, Poland
ORCID: 0000-0002-8004-9001

Anna Bartosiewicz^{B, C}

Institute of Health Sciences, College of Medical Sciences, University of Rzeszów, Poland
ORCID: 0000-0003-2359-7818

Edyta Łuszczki^{B, C}

Institute of Health Sciences, College of Medical Sciences, University of Rzeszów, Poland
ORCID: 0000-0002-4619-7705

Paweł Król^{A, B, C}

Institute of Physical Culture Sciences, College of Medical Sciences, University of Rzeszów, Poland
ORCID: 0000-0002-1189-0083

Anna Krajewska-Pędzik^{A, D}

Faculty of Physical Culture and Health, Institute of Physical Culture Sciences, University of Szczecin, Szczecin, Poland
ORCID: 0000-0003-0991-635X

Marta Stępień-Słodkowska^{A, D, E}

Faculty of Physical Culture and Health, Institute of Physical Culture Sciences, University of Szczecin, Szczecin, Poland
ORCID: 0000-0001-5005-6721 | e-mail: marta.stepien-slodkowska@usz.edu.pl

^A Study Design; ^B Data Collection; ^C Statistical Analysis; ^D Manuscript Preparation; ^E Funds Collection

Abstract The global COVID-19 pandemic has resulted in restrictions in most countries. One of them was to replace traditional education in schools with online learning. Such a change could provoke a build-up of negative feelings due to insecurity and loneliness. In addition, reducing daily physical activity and closing sports venues can have a detrimental effect on health. The article presents the results of the study of the impact of distance learning on the daily physical activity and condition of physical education teachers in Poland, as well as the subjective perception of physical and mental health in this professional group. Google forms were used to collect the data. The research tool was a questionnaire. The analysis showed that distance learning had a significant negative impact on the physical and mental health of the study group. The impact of distance learning on physical and mental health is gender independent. Teachers more often negatively assessed their physical and mental health compared to the studies in previous years. Daily physical activity of the subjects decreased, and most of them increased their body weight. Less than 3% of the surveyed teachers during the blockade felt happy and full of life.

Key words public health, physical education teachers, lockdown, physical activity, psychological stress

Introduction

On January 30, 2020, the World Health Organization announced the outbreak of epidemics caused by the novel coronavirus to be a public health emergency of international concern. In the same year, in early March, the SARS-CoV-2 virus was detected in 84 countries around the world. In Poland, the first case of infection was recorded on March 4, 2020 (Duszyński et al., 2020). Therefore, an epidemic emergency was introduced in the country which resulted in restrictions in all sectors of economic and public life. All the citizens felt the restrictions personally, as well as individual social groups. Teachers constitute one of the largest professional and social groups in Poland. In the 2019/2020 school year, the total number of full-time jobs in educational institutions was 513,868 predominantly occupied by women 423,120 (82.34%). Most of the teachers worked in primary schools – 270,652, pre-school education institutions – 111,230, and technical schools, high schools and first-degree industrial schools – 112,769 (Główny Urząd Statystyczny, 2020).

In the studies conducted so far in Poland, just a few concern health and health care among teachers, although they are a very important factor influencing the quality of education. The focus has been shifted towards the health of the students. Research relating to teachers treated mainly selected health issues, such as voice disorders or occupational burnout (Łoś-Spychalska, Fiszer, Śliwińska-Kowalska, 2002; Tucholska, 2009). In some European countries, for example in Germany, health surveys of the teacher population were carried out. The published results indicated that the incidence of chronic and long-term diseases is high and has been aggravating in recent years. Most of the diseases are related to the musculoskeletal system, hormonal, neurological and metabolic disorders (Brütting, Druschke, Spitzer, Seibt, 2018). A study of teachers' health in Belgium conducted on a group of N = 1066 people indicated that in terms of both mental and physical health teachers showed lower levels compared to the general population of Belgium (Bogaert, De Martelaer, Deforche, Clarys, Zinzen, 2014). Such disturbing research results and the dynamic changes that took place in the Polish education system in 2020 prompted to conduct an analysis study in the field of teacher health in Poland. For the first time, introduced as a result of the spreading COVID-19 pandemic throughout the country, many months of remote learning changed the system of work, lifestyle, and, in particular, the physical activity of individual groups of school communities, including school employees, students and, to some extent, their parents (Woynarowska-Soldan, Węziak-Białowska, 2010).

Among the pedagogical staff in Poland, teachers of physical education (PE) are one of the most numerous groups and this group was selected for the study. The choice of the study population was also influenced by the role that PE teachers play in schools. It is them who play a key role in educating students about health and healthy lifestyle.

Objective of the work

The aim of the study was to determine the impact of lockdown on teachers' health, to find out whether remote work has had an impact on the daily physical activity of this group. The following research questions were asked in the study:

1. Has remote work affected the physical and mental health of PE teachers?
2. Has remote teaching had an impact on the daily activity and physical condition of teachers?

Material and methods

Characteristics of the group and organization of research

The research was carried out in 2021. Due to the ongoing pandemic, the diagnostic survey method and the survey technique were chosen. 1,498 physical education teachers, including 49.11% women, participated in the study. The respondents taught in primary schools (75.32%), in secondary schools (23.55%) and other types of institutions (1.13%). Teachers had various levels of professional advancement, i.e. a certified teacher (81.10%), appointed teacher (11.35%), contract teacher (6.54%) and trainee (1.01%).

A large part of the respondents were people aged over 50 (38.07%), and people between 41 and 50 years old (38.81%), which is consistent with the data on the average age of teachers in Poland (44.1 years) and in the European Union where two-thirds of teachers are over 40 years of age. In the range of 31–40 years, the respondents accounted for 19.64%, and 3.49% were 30 years and younger. The study area covered all voivodeships in Poland. Most numerous the survey questionnaires were completed by the respondents from Śląskie, Podkarpackie and Mazowieckie voivodships, and the least numerous from Lubuskie and Świętokrzyskie voivodships.

Research tools

Google forms were used to collect the data. The research tool was a questionnaire. Its questions concerned the impact of remote learning and work on health and its selected aspects, such as: physical health, mental health, physical activity and condition, and body mass:

1. How do you currently evaluate your health? Response categories: Very good, Good, Neither good nor bad, Bad.
2. In your opinion, has distance learning had an impact on your physical health? Response categories: Yes, positive – my physical health has improved, Yes, negative – my physical health has deteriorated, Don't know, No.
3. In your opinion, has distance learning had an impact on your mental health? Response categories: Yes, positive – my mental health has improved, Yes, negative – my mental health has deteriorated, Don't know, No.

4. If you feel a deterioration of your health, it particularly concerns:
 - aggravation of chronic diseases,
 - back pain,
 - joint pain,
 - abdominal pain,
 - migraines, acute headaches,
 - deterioration of vision,
 - heartburn,
 - gastric problems,
 - sleep problems,
 - other.
5. What degree of pain or physical discomfort have you experienced during the distance learning period? Response categories: I do not feel any, Slight, Moderate, Strong, Extremely strong.
6. During most of your remote learning days, have you been: Response categories: Full of life, Calm and composed, Happy, Stressed, Tired, Exhausted.
7. Has remote teaching had an impact on your daily activity and physical condition? Response categories: Yes, it is increased, Yes, it is decreased, No, it remains at a similar level.
8. Has your body mass changed during the distance learning period? Response categories: Yes, increased by more than 2.5 kg, Yes, increased 0.5 to 2.5 kg, Unchanged, Yes, decreased 0.5 to 2.5 kg, Yes, decreased more than 2.5 kg.

Statistical analysis of the results

The analysis of the results was made by gender. The significance of differences between the study groups was tested using the chi-square test. The Statistica ver. 13.3 program was used in the calculations.

Results

Every ninth respondent (11.35%) assessed their health as very good, more often those were men (5.17%). Most of the teachers described their health as good (56.15%). This answer, in turn, was chosen more often by women (4.91). A large proportion of the respondents could not determine their health condition (28.41%). Few (4.10%) assessed it as bad. The statistical data show that the subjective health condition is gender dependent ($\chi^2 = 10.51$ at $p = 0.05$) (Table 1).

Table 1. General assessment of teachers' health (percentage of respondents)

Answers to the question: How do you currently evaluate your health?	Total (N = 1,489)	Women (N = 760)	Men (N = 729)
Very good	11.35	8.82	13.99
Good	56.15	58.55	53.64
Neither good nor bad	28.41	28.68	28.12
Bad	4.10	3.95	4.25

Differences: women/men $p = 0.05$.

Almost half of the teachers believe that the change of active work mode to sedentary work with many hours of computer use in remote learning mode, has had a negative impact on their physical health and that it has worsened (49.33%). Very few respondents believe that this is a period when their physical health has improved (6.56%). One third of the surveyed group is unable to determine it (33.67%), and every tenth respondent believes that the period of remote learning has had no effect on their physical health (10.46%).

Defining the influence of distance learning on mental health, the most numerous group are the people claiming that remote work has had a negative impact on their psyche (53.39%). A minority believe that this has been a period when their mental health has improved (7.98%). Every fourth respondent could not define it (26.43%), and every eighth thinks that the period of remote learning has had no influence on their psyche (12.21%).

Based on the empirical analysis of statistical data, it was found that remote learning and its impact on physical health ($\chi^2 = 1.233$ at $p = 0.05$) and mental health ($\chi^2 = 1.116$ at $p = 0.05$) is gender independent (Table 2).

Table 2. The impact of remote work on physical and mental health as assessed by teachers (percentage of respondents)

	1. Answers to the question				2. Answers to the question			
	<i>Has distance learning had an impact on your physical health?</i>				<i>Has distance learning had an impact on your mental health?</i>			
	yes, positive – my physical health has improved	yes, negative – my physical health has declined	hard to say	no	yes, positive – my physical health has improved	yes, negative – my physical health has declined	hard to say	no
Total (N1 = 1,482 N2 = 1,491)	6.56	49.33	33.67	10.46	7.98	53.39	26.43	12.21
Women (N1 = 755 N2 = 759)	6.62	50.60	32.85	9.93	8.30	54.28	25.82	11.59
Men (N1 = 727 N2 = 732)	6.46	48.01	34.53	11.00	7.65	52.46	27.05	12.84

Differences: women/men $p = 0.05$.

The most common deterioration in physical health was related to back pain, visual impairment and sleep problems. Women indicated a greater degree of back problems, visual impairment and the occurrence of migraines. Men were more likely to notice gastric problems, heartburn, and joint pain. The perceived pain or physical discomfort was described by 50.58% as moderate, 22.99% as slight, 17.14% did not mention any pain, 8.53% as severe and 0.76% as extremely strong. When carrying out the empirical analysis of statistical data, it was found that the deterioration of health of the surveyed respondents during distance learning was dependent on the gender of the respondents ($\chi^2 = 46.94$, at $p = 0.05$) (Table 3).

Most of the respondents mentioned negative emotional states during remote work. Most teachers felt tired (53.18%) and stressed (29.94%). Women felt it stronger. Out of positive feelings and moods, nearly every third respondent felt calm and composed (29.97%). Men chose this answer much more often. Very few respondents felt full of life (2.48%) and happy (2.21%). Analysing the statistical data, it was found that the emotions of the respondents during distance learning were dependent on the gender of the respondents ($\chi^2 = 33.04$, at $p = 0.05$) (Table 4).

Table 3. The most common health problems caused by remote work (percentage of respondents)

Answers to the question: If you feel a deterioration of your health, it concerns	Total (N = 1,259)	Women (N = 657)	Men (N = 602)
Back pain	64.34	66.67	61.79
Deterioration of vision	57.82	63.62	51.50
Sleep problems	45.99	45.36	46.68
Joint pain	22.80	21.61	24.09
Migraines, acute headaches	21.05	26.64	14.95
Gastric problems	6.99	5.78	8.31
Heartburn	5.80	3.20	8.64
Aggravation of chronic diseases	4.69	4.72	4.65
Abdominal pain	4.69	4.72	4.65
Other	5.08	5.94	4.15

Differences: women/men $p = 0.05$.**Table 4.** Experiencing positive and negative feelings and moods during the period of remote work (percentage of respondents)

Answers to the question: During most of the days within the distance learning period, did you feel	Total subjects (N = 1,493)	Women (N = 761)	Men (N = 732)
Full of life	2.48	1.84	3.14
Calm and composed	29.87	24.97	34.97
Happy	2.21	1.97	2.46
Stressed out	29.94	33.51	26.23
Tired	53.18	56.64	49.59
Exhausted	15.67	18.79	12.43

Differences: women/men $p = 0.05$.

When asked about the influence of distance learning on daily activity and physical condition, the vast majority believed that it had decreased (68.46%). More women than men replied in this way (by 6.13%). Over one fifth stated that their condition remained at a similar level (21.97%), and almost one in ten said that their condition had improved (9.57%). The period of remote work also had an impact on the body weight change of PE teachers. More than half of the respondents stated that their weight increased more than 2.5 kg in 20.62% and in the range from 0.5 to 2.5 kg in 36.39%. Every third respondent remained at the same body weight, and every tenth lost weight. Based on the empirical analysis of statistical data, it was found that the body weight of the respondents was gender dependent ($\chi^2 = 11.64$, with $p = 0.05$) (Table 5).

Table 5. Change in body weight during remote work (percentage of respondents)

Answers to the question: Has your body weight changed during the distance learning period?	Total (N = 1484)	Women (N = 759)	Men (N = 725)
Yes, increased above 2.5 kg	20.62	18.18	23.17
Yes, increased between 0.5 and 2.5 kg	36.39	37.68	35.03
Hasn't changed	33.36	34.91	31.72
Yes, decreased between 0.5 and 2.5 kg	6.13	6.72	5.52
Yes, decreased above 2.5 kg	3.50	2.50	4.55

Differences: women/men $p = 0.05$.

Discussion

The definition of health included in the constitutional act of the World Health Organization defines health as physical, mental and social well-being, and therefore something more than just an antonym of disease or infirmity (WHO, 1986). Therefore, health is a sense of life force, the ability to overcome obstacles, and the willingness to undertake physical and mental challenges. Three planes are distinguished in the cited definition of health. The first – physical or somatic health – related to the body, the second – mental health – determines consent and disagreement with oneself, the third – social health – is an opposition to those deviations that violate social norms. We can also distinguish two “dimensions” of health: individual and public health, as well as two “facets” of health: subjective and objective (Demel, 2002). The definition of health quoted above, along with the definition of its three planes, two dimensions and two facets, essentially corresponds to the content of the current work. The aim of this article is to present the results of the research on the state of physical and mental health, as well as everyday fitness and physical activity of a large group (N = 1498) of physical education teachers in the period of distance learning. The surveyed respondents come from all voivodeships in Poland and work in both primary and secondary schools. Therefore, the conducted research has a high representativeness factor and is the first study of this type on such a large scale in Poland.

Regarding the first research question (Has remote work had an impact on the physical and mental health of physical education teachers?), the study showed that changing the way of working had had an impact on the teachers' health. The subjective assessment of general health of the surveyed teachers at a very good and good level was 67.5%, and at a bad level – 4.10%. In similar studies, these values were respectively: 76.8% and 1.7% (Woynarowska-Soldan, Węziak-Białowolska, 2012). Thus, compared to the surveyed group of teachers in Poland in 2012 (N = 750), the number of teachers describing their health as very good and good decreased by 9.3%, and the number assessing their health as bad increased by 2.4%.

A disturbing phenomenon is the fact that as many as 28.41% of the surveyed teachers were unable to determine their health condition using a very simple cafeteria of answers. Therefore, it can be concluded that these teachers have very low awareness of their own health, which is an undesirable phenomenon in the case of their professional and pedagogical roles in the context of health education.

When comparing the indicators, remote learning for almost half of the respondents (49.33%) had negative effects and in the opinion of these teachers their physical health deteriorated. It should be noted that the deterioration of their physical condition was most often related to: back pain (64.34%), deterioration of vision (57.82%), as well as problems with sleep (45.99%). At this point, it is worth presenting the results of the pre-pandemic research on the physical health of teachers conducted in many other countries. A cross-sectional study of the health of 3,679 teachers and 1,817 other education workers in France confirmed the significantly worse health of the study group of teachers. The greatest number of health problems concerned the nose inflammation, throat and bronchi, urinary tract infections, skin problems, conjunctivitis and varicose veins of the lower extremities (Kovess-Masféty, Sevilla-Dedieu, Rios-Seidel, Nerrière, Chan Chee, 2006). The analysis of subjective symptoms among 1,710 teachers in Hong Kong showed that as many as 99.5% of people reported at least one health problem. The most frequently indicated were voice (73.5%), eyesight (79.9%), shoulder pain (73.4%), neck pain (68.9%), problems with the lower spine (59.2%), headaches (67.1%), frequent colds (66.1%) and chronic fatigue (93.4%) (Chong, Chan, 2010). Comparative studies of teachers in Sweden showed neck pain that occurred in 44% of people, shoulder pain in 37% of the respondents, and pain in the lumbar region of the spine was reported by 36% of teachers (Arvidsson et al.,

2016). Research conducted in Malaysia on a group of 1,482 randomly selected teachers also confirmed a high percentage of pains in the lumbar spine – 48% of the people and in the neck – 60% of the people (Zamri, Moy, Hoe, 2017). In our query, however, no health research was found that covered only a group of physical education teachers, who are supposed to be more physically active on a daily basis than other pedagogical workers. Therefore, comparing the above data with the results of the study, it can only be concluded that major health problems related to back pain in the group of pedagogical workers had occurred earlier (Bortkiewicz, Szyjkowska, Siedlecka, Makowiec-Dąbrowska, Gadzicka, 2020), and remote learning could have worsened them, especially among physical education teachers. In addition, this study group reported problems with eyesight and sleep which appeared or intensified that can be explained by a large number of hours spent at the monitors while working remotely.

Based on the results of the conducted research, it was noticed that distance learning has a negative impact on the mental health of teachers. Such a correlation was indicated by 53.39% of people. The analysis of emotional states, divided into positive and negative, is particularly disturbing. Most of the respondents experienced negative emotional states during remote work. Most teachers felt tired (53.18%) and stressed (29.94%). Very few respondents felt “full of life” (2.48%) and “happy” (2.21%). Compared to the 2013 survey results, these two parameters dropped very significantly. At that time, the answers “full of life” were chosen by 59.0% and “happy” 65.7%, respectively (Wojnarowska-Soldan, Tabak, 2013). In pedagogical literature and in reports and studies on the health of education workers, there are many scientific dissertations dealing with the issues of mental health of teachers.

The main factors that caused stress in this occupational group in Poland before the pandemic period were: high organizational burden, work overload, dissatisfaction with social working conditions, including those related to the amount of remuneration (Pyżalski, 2008). The requirements set by educational authorities and continuous social evaluation can also contribute to the mental stress experienced by teachers (Garbacik, 2018). Such mental discomfort can lead to the burnout syndrome / complex, which was recognized as a public health problem as early as 2010. It is associated with serious health consequences for employees and a reduction in the efficiency and quality of work, resulting in high economic and social costs (Batista, Carlotto, Coutinho, Augusto, 2010). Stress that may be a consequence of the psychological burden in pedagogical work was also noticed and emphasized in studies conducted in Great Britain, New Zealand, Australia, Scotland and the United States.

Of all the surveyed in these countries, 30% said their profession was “stressful” or “very stressful” (Bortkiewicz et al., 2020; Pithers, Soden, 1998).

Based on the literature and conducted research, it can be concluded that the period of distance learning has been a big challenge for physical education teachers in Poland and caused the intensification of everyday work-related stress. Additionally, the need to learn and apply new tools in remote work increased the feeling of uncertainty. These factors, combined with reduced daily contact with students and reduced physical activity, have caused a permanent feeling of fatigue and stress in a large part of the respondents.

Referring to the second research question (Has remote teaching had an impact on the daily activity and physical condition of teachers?), it should be stated that the period of distance learning negatively affected the daily activity and physical condition. It decreased for 68.46% of the respondents. More women than men provided this answer, the difference is 6.13% of the respondents. The activity and physical fitness of teachers were also the subject of scientific research and publications by other authors. In the cohort California Teacher's Study on a sample of 329,684 female teachers working in the United States, it was confirmed that 30% of the respondents

did not undertake any form of physical activity, and the remaining persons performed various types of physical activity for an average of 4.2 hours a week (Bortkiewicz et al., 2020). The analysis of physical activity of teachers in secondary schools in Poland in 2011 showed that more men (36.6%) than women (14.9%) would undertake daily physical activity, while more women (53.2%) compared to men (29.3%) would spend their time actively several times a week (Prażmowska, Dziubak, Morawska, Stach, 2011). On the other hand, the results of the research on active recreation among PE teachers in Poland in 2012 indicated that this group of teachers spent an average of 7 hours on physical activity during the week. Most of the respondents (19.0%) exercised 10 hours a week, 14.0% exercised 5-6 hours a week, 2 hours (10.0%), and 12.0% of the respondents spent 4 hours actively (Lipowski, Szczepańska-Klunder, 2013). Additional research on physical activity among physical education teachers was carried out in 2018 (Ziemia, 2019). The conclusions of the empirical research were as follows: 26.7% of the respondents exercise twice or once a week, and 16.7% of the participants exercise daily. The preferred forms of exercise are: walking (46.7%), cycling (23.3%) and running (20%). Analysing the data obtained from the period of remote work and the frequency of undertaking pro-health behaviours before the pandemic, it should be concluded that it has had a negative impact on everyday physical activity and health-promoting behaviours undertaken by physical education teachers in Poland. Referring this to the Lalonde concept, the conditions necessary to maintain good health are not met (Lalonde, 1974).

Conclusion

The presented analysis of the results of cross-sectional research on the physical and mental health, fitness and physical activity of PE teachers in Poland in combination with the results of other studies in this area carried out in Poland, other European countries and worldwide justifies the complexity of the studied issues. The analysis has shown that remote learning has had a significant negative impact on the physical and mental health of the studied group. If the above-mentioned research results were far from satisfactory in the past, the period of the pandemic has only intensified the outlined doubts both in the individual and population spheres. The study of the impact of lockdown on physical activity and the subjective perception of health by physical education teachers in Poland suggests the following conclusions:

1. Based on the empirical analysis of statistical data, it was found that the influence of distance learning on physical and mental health is gender independent.
2. Based on the empirical analysis of statistical data, differences were found in the scope of the analysed factors depending on gender (physical ailments, emotional states, body weight).
3. Teachers more often negatively assessed their physical and mental health in comparison to studies from previous years.
4. The daily physical activity of the respondents decreased, and the majority of them increased their body weight.
5. Less than 3% of the surveyed teachers in the lockdown period felt happy and full of life, thus, the psychological discomfort felt by most may lead to the burnout syndrome.

The results of the research on the subjective health of physical education teachers in Poland provide new data on the health condition of this professional group. They can offer a certain basis for educational policy making and should be taken into account in planning the ongoing and prospective activities to improve the health of this study group, especially through:

1. Developing an action plan to support teachers in times of high psychosocial burdens of the COVID-19 pandemic.
2. Ensuring optimal conditions for remote work of physical education teachers by adjusting regulations, implementing modern work tools and providing appropriate training.
3. Conducting in-depth research on the physical and mental health of teachers taking into account the burnout syndrome.

References

- Arvidsson, I., Gremark-Simonsen, J., Dahlqvist, C., Axmon, A., Karlson, B., Björkwsp, J. (2016). Cross-sectional associations between occupational factors and musculoskeletal pain in women teachers, nurses and sonographers. *BMC Musculoskeletal Disorders*, 17 (35). DOI: 10.1186/s12891-016-0883-4.
- Batista, J.B., Carlotto, M.S., Coutinho, A.S., Augusto, L.G. (2010). Prevalence of Burnout Syndrome and sociodemographic and work factors of elementary education teachers of the City of João Pessoa. *Revista Brasileira de Epidemiologia*, 13 (3), 502–512. DOI: 10.1590/S1415-790X2010000300013.
- Bogaert, I., De Martelaer, K., Deforche, B., Clarys, P., Zinzen, E. (2014). Associations between different types of physical activity and teachers' perceived mental, physical, and work-related health. *BMC Public Health*, 14 (534). DOI: 10.1186/1471-2458-14-534.
- Bortkiewicz, A., Szyjowska, A., Siedlecka, J., Makowiec-Dąbrowska, T., Gadzicka, E. (2020). Wybrane choroby przewlekłe i ich czynniki ryzyka u nauczycieli. *Medycyna Pracy*, 71 (2), 221–231. DOI: 10.13075/mp.5893.00831.
- Brütting, J., Druschke, D., Spitzer, S., Seibt, R. (2018). Health status of long-term sick leave and working female teachers in Germany. A cross-sectional study. *Int. J. Occup. Med. Environ. Health*, 31 (2), 227–242. DOI: 10.13075/ijom.1896.01115.
- Chong, Y.E., Chan, H.A. (2010). Subjective health complaints of teachers from primary and secondary schools in Hong Kong. *International Journal of Occupational Safety and Ergonomics*, 16 (1), 23–39. DOI: 10.1080/10803548.2010.11076825.
- Demel, M. (2002). Pedagogika zdrowia. *Chowanna*, 1, 13–26.
- Duszyński, J., Afelt, A., Ochab-Marcinek, A., Owczuk, R., Pyrc, K., Rosińska, M., Rychard, A., Smiatacz, T. (2020). *Zrozumieć COVID-19*. Warszawa: PAN.
- Garbaciak, Ż. (2018). *Stres w pracy nauczycieli. Szkoła – zawód – praca*. 16, 109–126.
- Główny Urząd Statystyczny. (2020). *Oświata i wychowanie w roku szkolnym 2019/2020*. Warszawa: GUS. 136–142.
- Kovess-Masféty, V., Sevilla-Dedieu, C., Rios-Seidel, C., Nerriè-re, E., Chan Chee, C. (2006). Do teachers have more health problems? Results from a French cross-sectional survey. *BMC Public Health*, 6 (101). DOI:10.1186/1471-2458-6-101.
- Lalonde, M. (1974). *A new perspective on the health of Canadians*. Ottawa: Minister of Supply and Services Canada.
- Lipowski, M., Szczepańska-Klunder, Ż. (2013). Zachowania zdrowotne nauczycieli wychowania fizycznego. In: Z. Jastrzębski (ed.), *Teoria i praktyka wychowania fizycznego i sportu. T. 1* (pp. 9–26). Łódź: Wyższa Szkoła Sportowa w Łodzi.
- Łoś-Spychalska, T., Fiszer, M., Śliwińska-Kowalska, M. (2002). Ocena częstości występowania chorób narządu głosu u nauczycieli. *Otolaryngologia*, 1, 9–44.
- Pithers, T.R., Soden, R. (1998). Scottish and Australian teacher stress and strain: a Comparative Study. *The British Journal of Educational Psychology*, 68, 269–279. DOI: 10.1111/j.2044-8279.1998.tb01289.x.
- Prażmowska, B., Dziubak, M., Morawska, S., Stach, J. (2011). Wybrane zachowania zdrowotne nauczycieli szkół średnich. *Via Medica*, 19 (2), 1–9.
- Pyżalski, J. (2008). Obciążenia psychospołeczne w zawodzie pedagoga – wstępne wyniki badań uzyskane kwestionariuszem obciążeń zawodowych pedagoga (KOZP). *Medycyna Pracy*, 59 (3), 229–235.
- Tucholska, S. (2009). *Wypalenie zawodowe u nauczycieli. Psychologiczna analiza zjawiska i jego osobowościowych uwarunkowań*. Lublin: KUL.
- World Health Organization (1986). Ottawa Charter for health promotion.
- Woynarowska-Soldan, M., Tabak, I. (2013). Zdrowie subiektywne i dbałość o zdrowie nauczycieli i innych pracowników szkół podstawowych i gimnazjów. *Zdrowie Publiczne i Zarządzanie*, 11 (4), 349–357.
- Woynarowska-Soldan, M., Węziak-Białowolska, D. (2010). Narzędzia do badania klimatu społecznego w szkole promującej zdrowie i ich analiza psychometryczna. *Edukacja. Studia. Badania. Innowacje*, 111 (3), 71–80.

- Woynarowska-Soldan, M., Węziak-Białowolska, D. (2012). Samoocena zdrowia i dbałość o zdrowie u nauczycieli. *Problemy Higieny i Epidemiologii*, 93 (4), 739–245.
- Zamri, N.E., Moy, M.F., Hoe, V.C.W. (2017). Association of psychological distress and work psychosocial factors with self – reported musculoskeletal pain among secondary school teachers in Malaysia. *PLOS ONE*, 12 (2). DOI: 10.1371/journal.pone.017219.
- Ziemba, A. (2019). Aktywność fizyczna w czasie wolnym tarnowskich nauczycieli wychowania fizycznego. *Health Promotion & Physical Activity*, 6 (1), 20–23.

Cite this article as: Kozubal, A., Kozubal, K., Warchoń, K., Bartosiewicz, A., Łuszczki, E., Król, P., Krajewska-Pędzik, A., Stępień-Słodkowska, M. (2022). The Influence of Lockdown on the Physical Activity and Subjective Health in the Teachers of Physical Education in Poland. *Central European Journal of Sport Sciences and Medicine*, 2 (38), 27–37. DOI: 10.18276/cej.2022.2-03.