The Mood of Elite Polish Athletes and P.E. Students During the First Wave of the COVID-19 Pandemic

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Summary
The aim of the study was to compare mood during the first wave of the COVID-19 pandemic in athletes - potential Olympians (n = 57, including 28 men and 29 women) involved in Olympic preparations and extramural physical education students (n = 54, including 28 men and 26 women). The age of the subjects was between 18 and 45 years. The additional objective was to determine differentiation according to gender. The Polish version of the Profile of Mood States by McNair, Lorr & Droppleman was used in the form of an on-line survey. There were no significant differences between the men and women (main gender effect). The athletes demonstrated lower levels of anger and confusion than the students (main group effect). In the case of tension, a significant interaction was found between the group and gender: among athletes, a lower level of tension was found in men, and among students - in women.

Keywords: Athletes Mood COVID-19

Introduction
COVID-19 (coronavirus disease 2019) is a highly contagious disease caused by the Sars-Cov-2 coronavirus (Huang et al., 2020). Its widespread transmission has been declared a pandemic by the World Health Organization (Li, Wang, Xue, Zhao,& Zhu, 2020; WHO, 2020). An epidemic or pandemic situation, due to the high possibility of infection with a disease that threatens health and life, disturbs the internal balance of an individual and can be treated as a strong stressor (Norris, Friedman, & Watson, 2002).

A pandemic is a universal stressor, but for some social groups, it has become a source of additional stress, resulting from special restrictions. Such groups include athletes who had to cease organised daily training, almost overnight. Isolation at home, limitation of previous physical activity, separation from members of the team and the sports community, and lack of social support, negatively affect their psychophysical state, causing emotional distress. Athletes are probably just as vulnerable as the general population to the negative psychological consequences of COVID-19 – such as stress, anxiety and depression (AIS, 2020; Mehrsafar, Gazerani, Zadeh, & Sanchez 2020). An additional source of stress is the inability to participate in sports competitions. The postponement of the XXXII Summer Olympics to be held in Tokyo in 2020 (Olympic Channel, 2020) probably had the most serious consequences. Participation in the Olympic Games is usually the most important event in one’s sporting career, and an Olympic nomination is a particularly important long-term goal for many athletes. All obstacles on the way to its implementation are probably a source of frustration, arousing strong negative emotions and requiring adaptation (e.g. Jewett, Kerr & Tamminen, 2019; Koukouris, 2005). Therefore, it may be expected that the athletes involved in preparation for the Olympic Games experienced additional stress, resulting from the change of the date of the event and the ban on participation in organised training.

In order to prevent spreading of the disease, in the first wave of the pandemic, schools and universities were closed at national or local levels, which globally, has affected nearly 1.27 billion pupils and students (72.4%) (UNESCO, 2020). These actions have made the pandemic a source of additional stress for students, including at university level. These students had to adapt to the changes resulting from new forms of remote learning, limited access to information sources and obtaining knowledge in a distanced manner. Some of them were deprived of opportunities to earn money, while many were forced to return to their family homes (UNESCO, 2020).

Stressors are requirements of an environment, for which there are no ready or automated adaptive reactions (Antonovsky, 2005). They generate states of emotional tension, the content of which, according to the relational approach, will depend on cognitive assessment of the situation (Lazarus & Folkman, 1984). In the case of assessing a situation as unfavourable (burdensome, exceeding resources and threatening well-being), the subject experiences a state of stress, which consists of strong, most often negative emotions (fear, anxiety, anger), less often hope and the accompanying physiological as well as biochemical changes exceeding the basic level of arousal (Strelau, 2000).

Such affective phenomena as short-term emotional states, but also mood, can be treated as indicators of a state of stress. The results of studies on the mood of
various populations during the COVID-19 pandemic, as well as earlier epidemics of viral diseases (SARS, MERS, H1N1), indicate significant deterioration of mood among various social groups, as compared to the pre-pandemic period (Batawii et al., 2019; Charles et al., 2020; Huang & Zhao, 2020; Liu, Zhang et al., 2020; Tian et al., 2020).

The question arises – what was the mood of the elite athletes and extramural students of physical education practicing sports during the pandemic – two groups of physically active people, differing in terms of their sports level and main activity (training – work and study)? The aim of the study was to compare the mood of these 2 groups: athletes covered by preparations for the Olympic Games in Tokyo and P.E. students.

During the COVID-19 pandemic in China (Liu, Luo et al., 2020), women appeared to be more prone to anxiety than men, which may be connected with their sensitivity to psychological stress. Female healthcare workers exhibited higher rates of affective symptoms compared to those male (Pappa et al., 2020). Also, female adolescents showed higher risk of depression and anxiety during the COVID-19 pandemic (Chen et al., 2020). Female gender was one of the factors associated with higher risk of psychiatric symptoms and/or low psychological well-being (Vindegaard& Benros, 2020). Due to the fact that in many studies it has been found that women tend to experience worse overall mood than men, an additional aim of the study was to establish the differences in mood depending on gender.

Participants

The research involved 2 groups of people practicing sports at different levels. The first group consisted of 57 Polish, potential Olympians, between the age of 18 and 45 ($M = 26.61; SD = 5.56$), including 29 women (52.7%) and 28 men (49.1%), practicing individual sports disciplines such as athletics, rowing, fencing, shooting, sport climbing, badminton, swimming, modern pentathlon, taekwondo, sailing, wrestling, canoeing, judo, cycling, equestrianism and weightlifting. Their professional experience ranged from 4 to 25 years ($M = 14.59; SD = 5.98$). The second group consisted of 54 extramural students of physical education aged 19 to 40 ($M = 25.69; SD = 5.91$), including 26 women (48.1%) and 28 men (51.9%) who practiced recreational sports. There were no significant differences between the proportion of men and women in either of the groups ($\chi^2 = 0.083; p = 0.774$).

Selection for the group was deliberate. The inclusion criterion of competitors in the study was to incorporate athletes in Olympic preparation, which meant achieving an Olympic qualification or a good chance of obtaining it in the following year. The group of students was selected from among volunteers systematically undertaking recreational sports activities. This was done in such a way that it was as close as possible to the group of athletes in terms of gender and age.

All subjects were of legal age. The survey was anonymous and voluntary. It was carried out in accordance with the principles of the Code of Ethics proposed by the World Medical Association (1967, Declaration of Helsinki).

Measures

The POMS (Profile of Mood State) by McNair, Lorr and Droppleman (1971) was used to measure mood. In the original version, POMS consists of 6 scales: anger, fatigue, confusion, depression, tension and vigour. In the Polish version, developed by Dudek and Koniarek (1987), supplemented with a kindness scale, it consists of 65 adjectives. The respondent assesses the intensity degree of her/his mood state in the last week, described by the adjective, using a scale from 0 (definitely not) to 4 (definitely yes). The number of adjectives making up individual scales, therefore, also their theoretical variability, differs. The questionnaire has no standards for the Polish population. The psychometric results of the tool are satisfactory (Cronbach’s alpha is within the range of 0.74-0.91).

In order to compare the results from the scales, the total result was divided by the number of items. Thus, the score on each scale ranged from 0 to 4. The total mood index was also calculated by subtracting the sum of vigour and friendliness indices from the sum of negative mood indices. The higher the summary index, the worse the mood. Based on the summary index, the respondents were divided into 3 equal groups ($n = 37$): those with the best, average and worst mood.

Research procedure

The research was conducted in the form of an online survey on the https://www.survio.com/pl platform in 2020, during the COVID-19 pandemic, from the period of April 7-28 when lockdown was introduced by the Ministry of Sport to participation in sports activities1. At that time, all classes at universities were held remotely. All subjects participated in the study during the period of this lockdown.

Statistical analysis

Two-dimensional analysis of variance (group x gender) and Student’s $t$-tests for independent samples were used to determine the significance of intergroup differences. The Paired Student’s $t$-test was used to determine differences in the intensity of mood states among

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1 On the establishment of certain restrictions, orders and bans in connection with an epidemic (Journal of Laws, item 560), on the basis of the Act from March 6, 2018 - Law of entrepreneurs and other entities, activities related to sports, entertainment and recreation (included in the Polish Classification of Activities in section 93.0 and in subclass 96.04.Z), access date June 15, 2020.
the entire group. The \( \chi^2 \) test was used to compare the frequencies of nominal variables.

**Results**

As POMS has no norms for the Polish population, in order to present the level of mood states, arithmetic means and standard deviations of the averaged results from each scale were calculated (Tab. 1). Their theoretical variability is within the range of 0-4. Among the negative mood states, the highest value was noted for tension, and the lowest – for depression. The means that the levels of positive states (vigour, kindness) were higher than for negative states.

All differences between the means (except for confusion and tension; \( p = 0.400 \)) were statistically significant. In most cases, \( p < 0.001 \); only in the comparison of anger – depression (\( p = 0.040 \)) and anger – fatigue (\( p = 0.029 \)) was \( p \) higher.

The main group effect was significant with regard to confusion and anger. Higher levels of these negative mood states were observed in students. No significant gender-related main effect was found. In the case of tension, the interaction between the group and gender was important (Fig. 1). Among athletes, a lower level of tension was found in men than in women (\( t = 2.14; \ p = 0.037 \)). In students, the level of tension did not differ significantly depending on gender (\( t = 1.30; \ p > 0.05 \)). In the case of men, a higher level of tension was found in students (\( t = 2.79; \ p = 0.005 \)). Female students and athletes did not differ significantly in terms of tension (\( t = 0.72; \ p > 0.05 \)).

In Table 3, the number of students and athletes in groups distinguished according to the total mood index is presented. The differences were statistically significant (\( \chi^2 = 9.43; \ p = 0.09 \)). Among the athletes, the most numerous group was made up of people with the best mood. Most of the students were people from the group with an average mood.

The number of women and men in such groups did not differ significantly (\( \chi^2 = 1.17; \ p > 0.05 \)) (Tab. 4). Both among women and men, the proportion of people in the 3 mood groups was similar (approx. 1/3).

### Table 1. Averaged results of POMS in the entire study group

<table>
<thead>
<tr>
<th>Mood state</th>
<th>M</th>
<th>SD</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger</td>
<td>0.84</td>
<td>0.70</td>
<td>6</td>
</tr>
<tr>
<td>Confusion</td>
<td>1.22</td>
<td>0.67</td>
<td>4</td>
</tr>
<tr>
<td>Depression</td>
<td>0.74</td>
<td>0.72</td>
<td>7</td>
</tr>
<tr>
<td>Fatigue</td>
<td>0.98</td>
<td>0.79</td>
<td>5</td>
</tr>
<tr>
<td>Tension</td>
<td>1.27</td>
<td>0.79</td>
<td>3</td>
</tr>
<tr>
<td>Vigour</td>
<td>2.34</td>
<td>0.74</td>
<td>2</td>
</tr>
<tr>
<td>Kindness</td>
<td>2.72</td>
<td>0.84</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 2. Results of POMS according to group and gender (two-dimensional ANOVA)

<table>
<thead>
<tr>
<th>Factor Mood</th>
<th>Group</th>
<th>Gender</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group ( (F, \ p, \ \eta^2) )</td>
</tr>
<tr>
<td>0.69±0.61</td>
<td>1.00±0.76</td>
<td>0.92±0.80</td>
<td>0.77±0.59</td>
</tr>
<tr>
<td>1.09±0.73</td>
<td>1.35±0.58</td>
<td>1.29±0.68</td>
<td>1.15±0.66</td>
</tr>
<tr>
<td>0.70±0.68</td>
<td>0.77±0.77</td>
<td>0.75±0.74</td>
<td>0.71±0.70</td>
</tr>
<tr>
<td>0.96±0.82</td>
<td>0.99±0.77</td>
<td>1.07±0.83</td>
<td>0.88±0.75</td>
</tr>
<tr>
<td>1.17±0.80</td>
<td>1.37±0.77</td>
<td>1.23±0.79</td>
<td>1.31±0.80</td>
</tr>
<tr>
<td>2.44±0.77</td>
<td>2.23±0.71</td>
<td>2.35±0.75</td>
<td>2.32±0.75</td>
</tr>
<tr>
<td>2.73±0.75</td>
<td>2.71±0.93</td>
<td>2.65±0.94</td>
<td>2.79±0.72</td>
</tr>
</tbody>
</table>
Discussion

The results of studies in the general population indicate that the pandemic COVID-19 causes stress manifested by an increase in the level of anxiety, fear and depression (Altena et al., 2020; Li, Wang et al., 2020). Clear symptoms of stress and deterioration in mental health were also observed among students (Li, Lv et al., 2020). At least one-third of young adults studied in USA by Liu, Zhang et al. (2020) reported having clinically elevated levels of depression (43.3%), anxiety (45.4%), and PTSD symptoms (31.8%). The results of our study allow to indicate that physically active people showed fairly good mood during the first wave of the pandemic. Anger and depression were particularly low. This is probably due to their high physical activity. The results of comparative and experimental studies allow to demonstrate that physically active people cope better with stress and bear lower emotional and health costs of the stress transaction (Guszkowska, 2013). The relatively good mood of active P.E. students and elite athletes during the pandemic is in line with other observations made at the time of the COVID-19 pandemic (Clemente-Suarez et al., 2020).

In the present study, higher levels of confusion and anger were observed in students, regardless of gender. Higher levels of tension were found, but only in male students. The group with the best mood predominated among the athletes. This is probably due to the fact that Olympians have better cognitive and personality resources in coping with stress, and they have more experience in stress transactions than students.

Clemente-Suarez et al. (2020) concluded that the quarantine did not affect anxiety levels of Olympic and Paralympic athletes. Spanish athletes presented a high perception of social alarm, but concern about the
COVID-19 pandemic was medium. They demonstrated negative perception of the pandemic caused by confinement with regard to their workouts, but not their performance. The authors speculated that this was due to their strong sense of control. In light of previous research conducted before the pandemic, Olympic athletes seem to be less prone to experiencing anxiety and more mentally flexible than lower-level athletes (Bond et al., 2011; Belinchon-deMiguel et al., 2019). However, we should remember that inactivity, isolation from athletic teams, distance from the athletic community, less qualified interactions with athletic coaches and lack of social support can cause emotional distress and psychological disorders, even in elite athletes (Mehrsafar et al., 2020).

It cannot be ruled out that differences in the mood of both groups resulted from their different life and material situations. The Olympians were guaranteed material security in the form of scholarships. Part-time students may have been concerned about the possibility of losing their jobs due to the pandemic. The degree of perceived threat and uncertainty about the future could be greater in this group, which intensified the state of stress. On the other hand, the economic future of Olympic athletes depends on the result of a single competition that is held every 4 years. This can be a source of extra pressure and stress (Kellman & Günther, 2000). Resiliency and ability to control anxiety is a key factor in achieving success (Fletcher & Sarkar, 2012).

Contrary to previous results obtained in different age groups during the COVID-19 pandemic (Chen et al., 2020; Liu, Luo et al., 2020; Pappa et al., 2020; Vindegaard & Benros, 2020), no significant differences in the mood of men and women were found. One significant interaction between group and gender with regard to tension was found. Only among athletes was a lower level of tension found in men than in women. Also, in a study on the Polish population, Goryńska (2005) found higher scores on the scale of tension arousal in women. What could be the reasons for the lack of gender differences in other mood states? After all, women are usually characterised by greater emotional reactivity, perseverance and sensory sensitivity, as well as lower endurance and activity, lower sensation seeking, which makes them experience stronger negative affective states in stressful situations (Butković & Bratko, 2003; Roth, Schumacher & Brähler, 2005; Zawadzki & Strelau, 1997; Zuckerman, 2006). The lack of these expected differences probably results from natural selection, which takes place at the initial stages of involvement in sports activities. More stable and emotionally resistant women engage in sport more often and more willingly. As a consequence, athletes tend to show less gender-related differences in affective traits than the general population.

To conclude, physically active young Poles (Olympians and P.E. students) maintained relatively good mood during the first phase of the pandemic. It was slightly better in elite athletes than in students, and did not differ significantly according to gender. Our work is obviously not free from limitations. Its weak point is the small number of respondents. It should be borne in mind, however, that the criterion for inclusion in the group of Olympians was the athlete’s participation in preparations for the XXXII Olympic Summer Games. This whole group is not large. When creating a comparative group of students, the aim was to make it as similar as possible in terms of sex and age. The lack of standards for POMS in the Polish population made it impossible to precisely interpret the results, only intergroup comparisons were possible. We also had little sociodemographic data, which made it difficult to interpret the results of the study. As this is one of the first studies on the affective well-being of Olympic athletes and P.E. students during the first wave of the COVID-19 pandemic, we felt our results were worth presenting.

References:


