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EXAMINATION OF PHYSICAL ACTIVITY AND SUBJECTIVE WELL-BEING BEFORE AND DURING THE FIRST WAVE OF THE COVID-19 PANDEMIC AMONGST THE HUNGARIAN SPORTSMEN AND PROFESSIONALS IN THE SPORTS SECTOR

BADANIE AKTYWNOŚCI FIZYCZNEJ I SUBIEKTYWNEGO SAMOPOCZUCIA PRZED I W TRAKCIE PIERWSZEJ FALI PANDEMII COVID-19 WŚRÓD WĘGIERSKICH SPORTOWCÓW I OSÓB PRACUJĄCYCH W SEKTORZE SPORTOWYM

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Wkład autorów:
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zaplanowanie badań
B. Data collection/entry
zebranie danych
C. Data analysis/statistics
dane – analiza i statystyki
D. Data interpretation
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E. Preparation of manuscript
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F. Literature analysis/search
wyszukiwanie i analiza literatury
G. Funds collection
zebranie funduszy

Summary

Background. The aim of the research was to analyze the changing exercising frequency, the well-being, the mental health, and the social relationships before and during the curfew of the COVID-19 first wave.
Material and methods. The data collection was May-June in 2020 via an online questionnaire survey amongst the sportsmen and professionals in the sports sector. The descriptive and inferential statistical methods were used with the SPSS 27.0 software (Chi-square test, Wilcoxon, Mann-Whitney U and Kruskal-Wallis tests).
Results. The respondents were 44.17% female and 55.83% male. The average age was 36.36±16.52 years. The sample was classified into four sectors: elite sportsmen (20.60%), recreational sportsmen (34.29%), sports professionals (28.21%) and multiple roles (16.90%). There was a significant difference at the exercising frequency before and during the curfew between the sectors (p<0.001). The well-being, the mental health and the social relations did not show any significant differences. Regarding physical activity, there were decreases in every category: -268.36 minutes weekly average in the elite sportsmen, -194.90 minutes weekly average in the recreational sportsmen and -250.33 minutes weekly average in the multiple roles' category (p<0.001).
Conclusions. The curfew of the COVID-19 pandemic had a major impact on the exercising frequency and physical activity amongst the sportsmen and professionals in the sports sector.
Keywords: sports sector, curfew, physical activity, COVID-19, well-being

Streszczenie

Wprowadzenie. Celem badań była analiza zmieniającej się częstotliwości wykonywania ćwiczeń, samopoczucia, zdrowia psychicznego i relacji społecznych przed i w trakcie obowiązywania restrykcji podczas pierwszej fali COVID-19.
Materiały i metody. Gromadzenie danych miało miejsce w okresie od maja do czerwca 2020 roku poprzez przeprowadzenie badania ankietowego online wśród sportowców i osób pracujących w sektorze sportowym. Zostały zastosowane metody statystyki opisowej i inferencyjnej za pomocą oprogramowania SPSS 27.0 (test Chi-kwadrat, testy Wilcoxona, Manna-Whitneya U i Kruskala-Wallisa).
Wyniki. Wśród badanych było 44,17% kobiet i 55,83% mężczyzn. Średnia wieku wynosiła 36,36±16,52 lat. Próba została podzielona na cztery grupy: sportowcy elitarni (20,60%), sportowcy uprawiający sport rekreacyjnie (34,29%), specjaliści w dziedzinie sportu (28,21%) oraz osoby zajmujące różne stanowiska związane ze sportem (16,90%). Stwierdzono istotną różnicę między poszczególnymi grupami w zakresie częstotliwości ćwiczeń przed i w trakcie obowiązywania restrykcji (p<0,001). Nie stwierdzono istotnych różnic w zakresie samopoczucia, zdrowia psychicznego i relacji społecznych. Zauważono spadek aktywności fizycznej w każdej z grup: średnio -268,36 minut tygodniowo w grupie sportowców elitarnych, średnio -194,90 minut tygodniowo w grupie sportowców uprawiających sport rekreacyjnie i średnio -250,33 minut tygodniowo w grupie osób zajmujących różne stanowiska związane ze sportem (p<0,001).
Wnioski. Podczas badania stwierdzono, że restrykcje w trakcie pandemii COVID-19 miały istotny wpływ na częstotliwość wykonywania ćwiczeń i aktywność fizyczną wśród sportowców.
Słowa kluczowe. sektor sportowy, restrykcje, aktywność fizyczna, COVID-19, samopoczucie

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Introduction

Our research focuses on COVID-19, a new coronavirus disease that has shaken the world. In Hungary, the first positive case was registered on 4 March 2020, and the number of cases increased steadily thereafter. On 11 March 2020, the Government of Hungary declared a state of emergency throughout the country to protect the health of Hungarian citizens. Strict regulations were put in place to ensure the safety of the public, and, to avoid physical contact, teaching and education were conducted online. Perhaps the most significant of the restrictive measures during the first wave (March-May 2020) was the curfew restriction, which was introduced in our country from 28 March to 11 April 2020. In addition to the regulations, leisure, recreation and sporting activities were also restricted, which generated changes in the regularity of physical activity [1]. The rapidly spreading disease reduced the opportunity to exercise in all age groups, resulting in changes in the frequency and amount of exercise [2]. COVID-19 generated major changes in the sporting scene, as the Government decided to suspend championships and sports competitions. The Hungarian Football Federation (MLSZ), for example, suspended the men's first division football championship from the 26th round, and allowed the cancelled matches to be played in May and June on a Wednesday-Saturday schedule [3]. The Hungarian Handball Federation established a so-called COVID protocol, which meant a change in the competition schedule [4].

The sports population proved to be an interesting area of research for us in this difficult period, because, for them, movement, training and preparation are essential, so we thought it important to investigate how the Hungarian sports population coped with the restrictions, and how they reacted to the quarantine situation. Due to the closure of sports and training centers, clubs had to introduce alternative solutions, with the primary aim of preventing and maintaining the decline in athlete performance. Answers were sought to the question of the extent to which strict regulations have affected athletes and sports professionals.

The importance of physical activity is highlighted by the World Health Organization (WHO) every year, and its guidelines recommend that people under 65 years of age should engage in at least 150 minutes/week of moderate-intensity or 75 minutes/week of vigorous-intensity physical activity to maintain good health. Regular physical activity reduces the risk of coronary heart disease, heart attack, stroke, and obesity [5,6].

Athletes need much more exercise than the WHO recommended guidelines to maintain their physical performance and fitness levels, which has proved quite difficult during the curfew period, with gyms and sports centers, and outdoor gyms closing. In order to prevent a decline in performance, Eirale et al. published medical recommendations for footballers to train at home, which were particularly important to follow in order to reduce the risk of illness [7]. For athletes, the closures resulted in a significant loss of prospects, with a reduction in fitness of up to 10% after 1 week of inactivity [8]. We wondered whether the sports community could maintain this level of pre-quarantine exercise habits with alternative solutions in this unusual situation, as some authors have found associations between physical activity decline, curfew restriction and the lockdown period [9-11]. Ráthonyi's study found that adult workers had decreased physical activity levels and increased sedentary time during lockdowns [12]. Szabó et al. also came to a similar conclusion for sportspeople [9]. McCarthy et al. found a correlation between physical inactivity and lockdowns [11].

It is also important to note that individuals with a history of depression, trauma or psychiatric treatment were more vulnerable at the time of COVID-19 closures, but those who had been regularly exercising were less affected by changes in their life situation [13].

An interesting area of research for athletes has been the assessment of well-being, subjective mental health and social relationships during the pandemic. With regard to well-being, we conducted a relevant literature review and found that athletes rated their well-being index higher during the lockdowns than non-athletes [1,14]. We hypothesized that this may be due to the fact that athletes or persons with sports experience have a higher adaptive and tolerance capacity due to their involvement in sports.

Surveys in different countries have found that a lack of social contact and the resulting feeling of loneliness is associated with lower mental health [15,16]. The importance of regular physical activity was also confirmed by Mikulán's study, which found that young people who regularly engage in physical activity on a weekly basis have higher rates of assessing their health as better [17].

The aim of our research is to examine how the regularity of physical activity, well-being, mental health and social relationship perception of sportsmen and sports professionals changed during the curfew period compared to the period before the curfew, in relation to the first wave.

Material and methods

The data collection was carried out in 2020, during the first wave of COVID-19 (beginning of May and beginning of June) with an online self-designed questionnaire survey (Google Forms) among sportspeople and professionals in the sport sector. The Hungarian sports federations (88) were included in the survey, and the heads of the sports federations were asked to distribute the questionnaires. A total of 840 participants took part in the sample, which is the total number of assessable responses (N=840). Based on the data obtained during the questionnaire processing, three persons did not agree to the data obtained being used for analysis and research purposes, the reason for which is not known due to the electronic nature of the survey. Although the database is not representative, its large-sample make it suitable for visualizing trends.

The online questionnaire contained a total of 44 questions, with open (9) and closed questions (36), using a 4-factor Likert scale (0-3), and direct and indirect questions according to their orientation. The questionnaire used was validated for the Hungarian population in the Hungarostudy research in 2002 [18,19]. The inclusion criterion was that the participant belonged to one of the sports associations included in the study. Respondents who did not speak Hungarian or had mobility difficulties were excluded. In addition to demographic questions, questions were directed at sporting habits, physical activity volume (IPAQ-SF) and quality of life indicators (WHO-5 well-being index). To assess physical activity during the restrictions, we used the International Physical Activity Questionnaire-Short version (IPAQ-SF) [20]. The IPAQ-SF version is suitable for monitoring the physical activity of the respondents, with questions covering the preceding seven days. The questionnaire includes several domains of physical activity, such as intensity, frequency, and duration of physical activity, and examines physical activity related to work, transport and leisure [21]. The general well-being of the participants in the sports sector was measured on the 5-item scale of the WHO General Well-being Scale; the Hungarian version of the questionnaire is considered a valid instrument for the assessment of the positive quality of life [18]. The Hungarian version of the WHO General Well-being Scale provides information on the general well-being of the participants in the sports sector, the higher the score on the scale, the more positive the psychological state is.

Statistical data were analyzed using descriptive and inferential statistical methods using SPSS 27.0. In descriptive statistics, means and standard deviation (SD) were calculated, and frequencies and proportions were constructed. Based on the results of the normality test (Kolmogorov-Smirnov test) parametric and non-parametric tests were used (Chi-square test, Wilcoxon, Mann-Whitney U and Kruskal-Wallis tests). Our results were considered significant if $p<0.05$.

Data collection and processing was anonymous, so respondents could decide whether to complete our questionnaire and which questions to answer based on their own judgement. Responses were given on a voluntary basis with the consent of the respondents. Before completing the questionnaire, participants were clearly informed that the data would be collected for scientific purposes only, and that the results would not be disclosed to third parties. Our research is based on the license of the Hungarian Scientific and Research Ethics Committee (IV/4599-2/2020/EKU).

Results

Our study focused on the self-reported mental health of sport sector participants, their perceptions of social relationships, sporting habits, sporting regularity, and the frequency of leaving home during the first wave of COVID-19, and we also considered it important to examine how sportspeople and persons involved in sports related to and experienced such a historically significant impact. The sample was composed of 44.17% women and 55.83% men, with an average age of 36.36±16.52. In terms of education level, the largest groups were college graduates (23.50%) and university graduates (19.20%). The sample was composed of sportsmen and sports professionals from the Heracles Program and were grouped according to their responses to the questionnaire. The first sector was made up of elite sportspeople (20.60%), the second sector was made up of recreational sportspeople (34.29%), the third group was made up of sports professionals (28.21%) and the fourth group was made up of people with multiple roles in the sports sector (16.90%) (Figure 1).

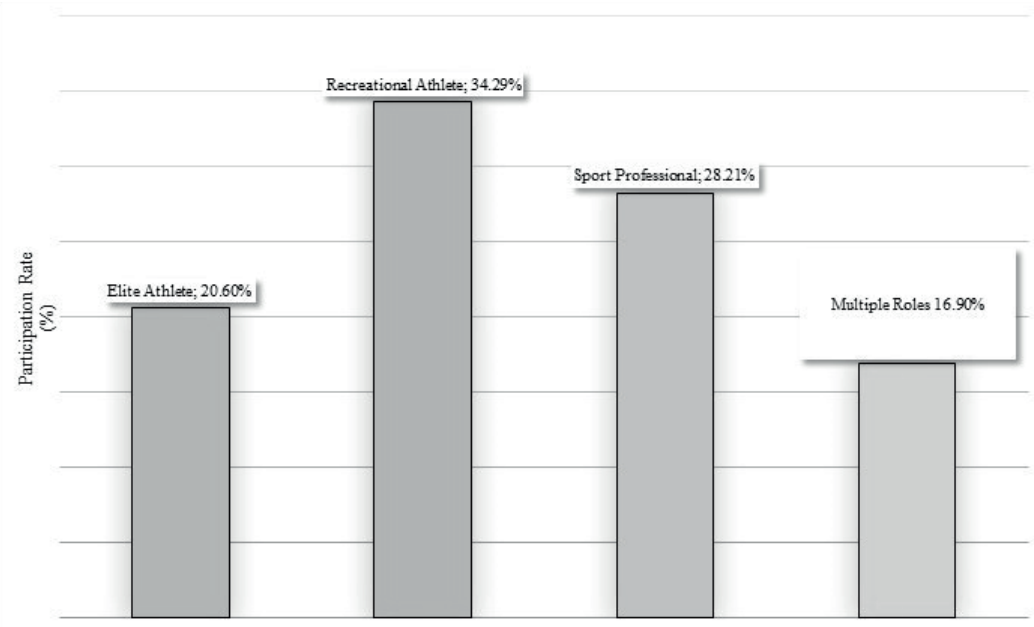

Figure 1. Role in the sport sector (N=840)

The non-parametric Wilcoxon test indicates that there is a significant difference in the regularity of sporting activity between the period before and during the curfew period among those in the sports sector, with a significant decrease in the regularity of sporting activity compared to the period before the curfew (p=0.008). A detailed analysis of the time spent exercising shows that 36.43% of the respondents exercised 3-4 times a week in the pre-curfew period; 30.95% exercised 5 or more times a week; 24.76% exercised 1-2 times a week, and 7.86% of the respondents did not exercise on a weekly basis in the period before the lockdown restrictions. Only 31.50% of respondents exercised 3-4 times a week during the curfew period; 26.30% exercised 5 or more times a week, and the proportion of those exercising 1-2 times a week (31.50%) increased during the curfew. The proportion of respondents who did not exercise on a weekly basis (10%) also increased during the COVID-19 curfew period (Figure 2).

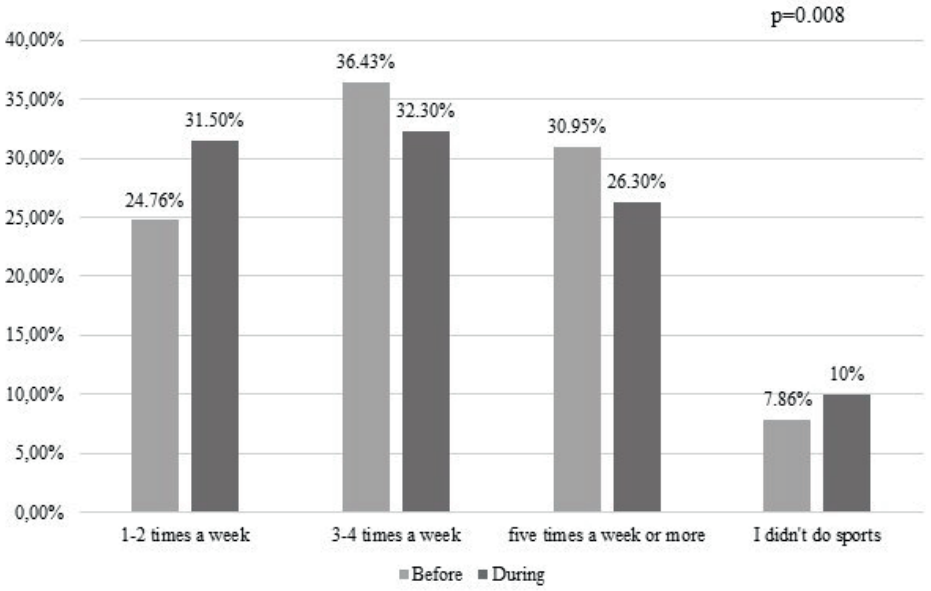

Figure 2. Regularity of sport activity before and after the COVID-19 curfew (p=0.008; N=840)

Next, we examined the frequency of leaving home during the COVID-19 curfew period. Based on the full sample survey (N=840), 49.40% of respondents left home several times a day or at least once a day, 21.55% of respondents left home 2-3 times a day and 29.05% of respondents left home fewer times. The frequency of leaving home was also examined among the participants in the sports sector. 27.17% of the elite sportspeople left their residence less frequently; 22.54% at least once a week; 32.37% at least once a day, and 17.92% more than once a day during the COVID-19 curfew period. 33.68% of recreational sportsmen left their residence less frequently; 23.61% left their residence once a week; 28.47% left their residence once a day and only 14.24% left their residence more than once a day during the restriction period. The highest proportion of sports professionals were those who left their homes more than once a day during the time of the lockdown (24.05%). The highest proportion of those in multiple roles left their homes only once a week (18.31%). The statistical analysis (Chi^2 test) shows that there is no significant difference (p=0.025) between the four sectors (elite sportsmen, recreational sportsperson, professional, multi-role) in terms of patterns of leaving their residence (Figure 3).

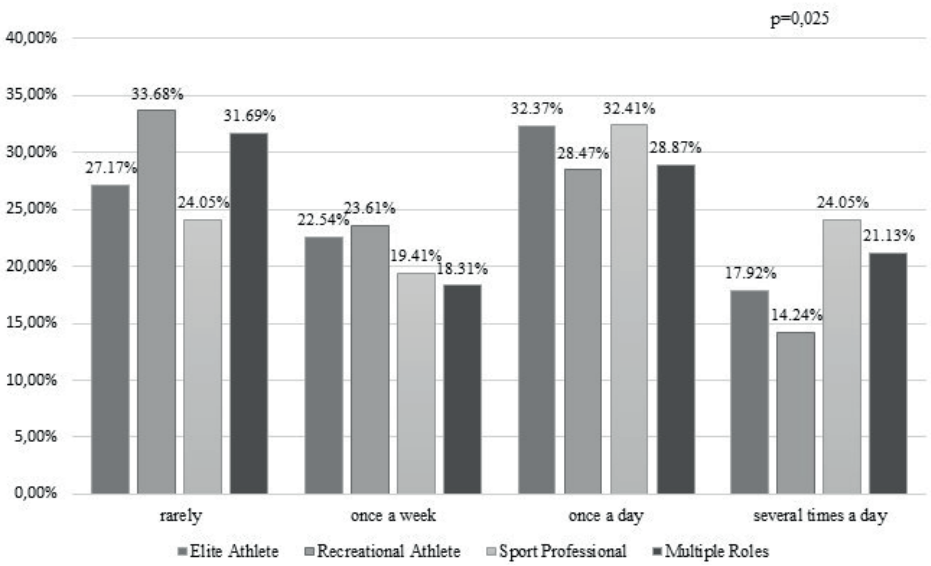

Figure 3. Residence leaving patterns by sectors (N=840)

There was no significant difference – based of the results of the chi² test – between the sectors in terms of social interactions, as all four groups were moderately satisfied with the frequency of their social interactions (p=0.242) (Figure 4).

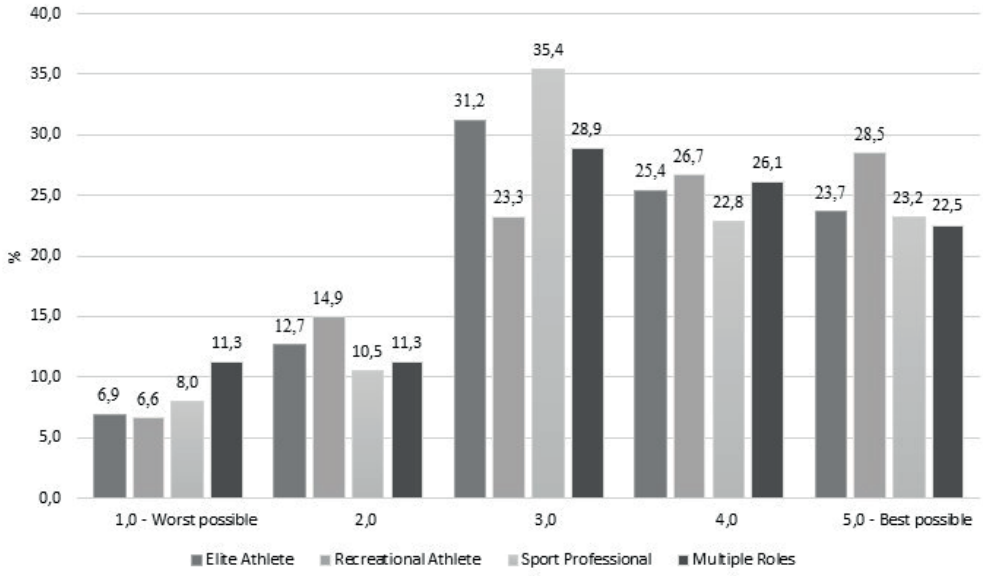

Figure 4. Evaluation of social interactions during the first wave of COVID-19 (p=0.242; N=840)

The assessment of social interactions was also examined in terms of gender, and it was found that men were significantly less affected by fewer opportunities to meet family and friends due to curfew restrictions (p<0.001).

The results of the self-assessment of mental health showed no significant difference between sportspeople and sports professionals in the sector (p=0.321), but it is important to highlight that a higher proportion of elite sportspeople marked "worst possible" as a response (3.47%). In terms of gender, no significant difference was found between women and men for mental health (p=0.231) (Figure 5).

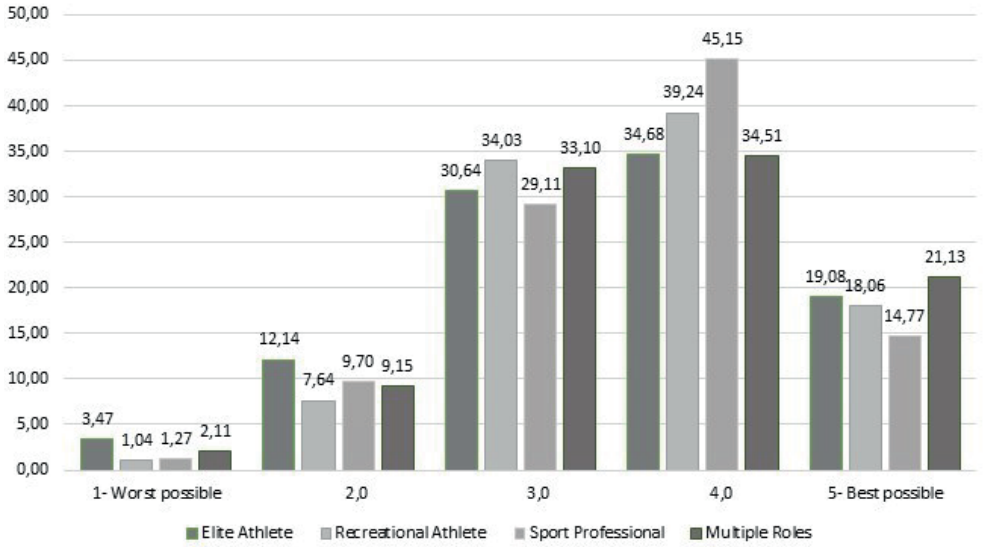

Figure 5. Evaluation of mental health in the first wave of COVID-19 by sectors (N=840)

Based on the results of the Mann-Whitney test, no significant gender difference was found between male (8.78±3.74) and female (8.39±3.24) elite athletes (p=0.37) in the well-being index of sports sector participants (WHO WBI-5) during the curfew period, between male (8.37±3.06) and female (7.98±2.98) recreational athletes (p=0.35), between male (8.49±3.17) and female (8.71±3.40) sports professionals (p=0.93), and between male (8.89±3.35) and female (7.68±3.35) multiple role players (p=0.05). For the total sample, there was also no significant difference between females (8.19±3.18) and males (8.59±3.28) for the well-being index (p=0.414) (Figure 6).

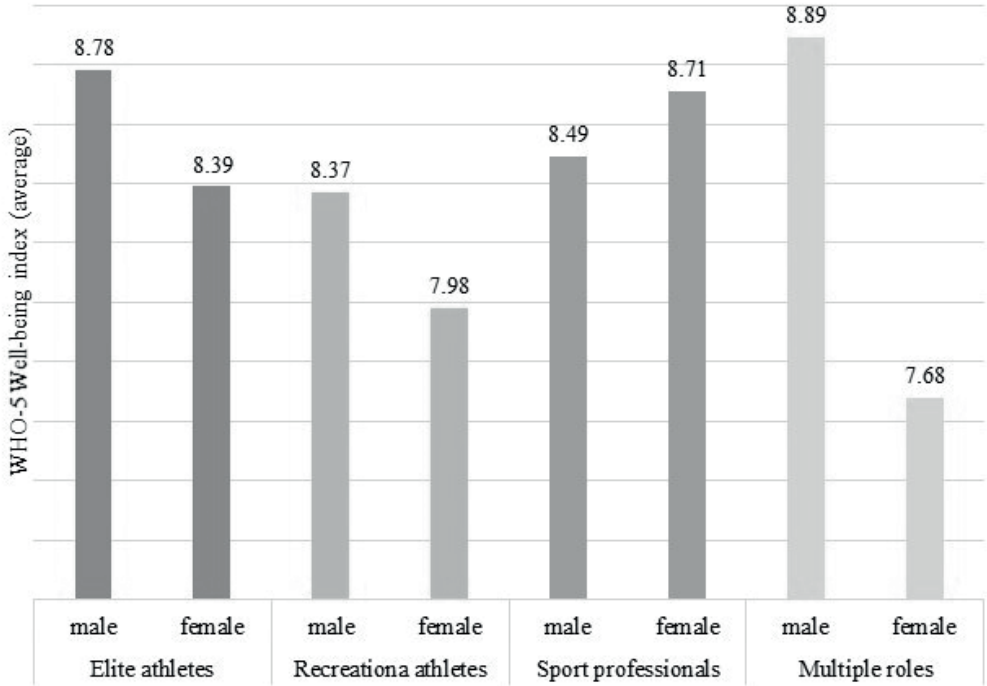

Figure 6. Well-being index analysis by gender and sector during the COVID-19 curfew period

Furthermore, regarding gender, no significant differences were found between women (8.19±3.18) and men (8.59±3.28) in the well-being index (p=0.058).

The next area of examination was the regularity of sporting activity before and during curfew in different areas of the sports sector. The results of the Kruskal-Wallis test indicated significant differences in the regularity of sporting activity for the target group, and a significant decrease for all four groups (p<0.001) (Figure 7).

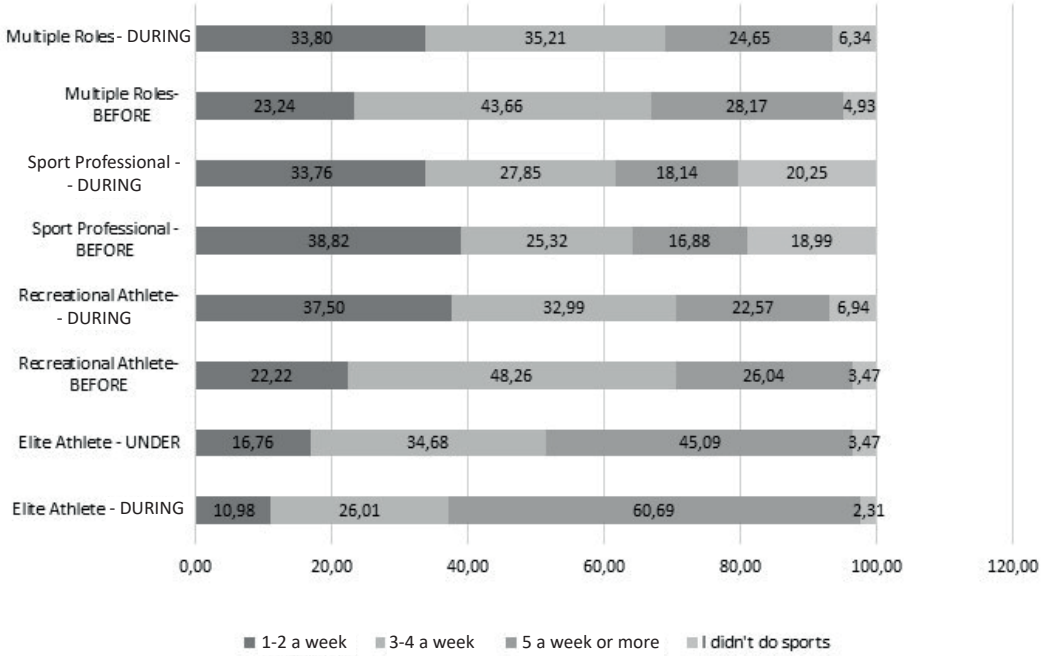

Figure 7. Regularity of sporting activity before curfew and during curfew in different areas of the sport sector (p<0.001; N=840)

Analyzing the subjective level of physical activity, we can see that before and during the curfew period, the level of physical activity decreased by -199.68±1480.47 minutes (min/week) for male elite athletes and by -322.18±1194.93 minutes (min/week) for female elite athletes (male: p=0.010; female: p<0.001), which represents a significant decrease. For elite athletes, there was a total decrease of -268.36±1325.29 minutes (p<0.001). For male recreational athletes, there was a decrease of -92.31±1112.26 (p<0.001); for female recreational athletes, there was a decrease of -275.83±1304.53 minutes of physical activity, compared to the pre-curfew value, also a significant decrease (p<0.001). There was also a significant decrease for the total sample (p<0.001). No significant difference was found for sports professionals, either for gender (male: p=0.799; female: p=0.627) or for the total group (p=0.648). Only among women with multiple roles was there a verifiable significant difference in the period before COVID-19, compared to the period during the curfew (p=0.002) (Table 1).

Table 1. Physical activity levels based on IPAQ short questionnaire results before and during curfew restrictions (gender and sector)

Gender and sector		IPAQ Total before COVID (min/week) mean±SD	IPAQ Total during COVID (min/week) mean±SD	IPAQ Total change (min/week) mean±SD	(*p* – Wilcoxon test)
Elite Athletes (N=173)	**male (N=76)**	1444.91±1420.98	1245.22±1590.09	-199.68±1480.47	0.010
	female (N=97)	1313.58±1363.99	991.40±1324.58	-322.18±1194.93	<0.001
	total	1371.27±1386.77	1102.91±1448.35	-268.36±1325.29	<0.001
	gender differences (*p* - Mann-Whitney U test)	0.585	0.832	0.396	
Recreational athletes (N=288)	**male (N=127)**	1043.73±1242.59	951.42±1249.45	-92.31±1112.26	<0.001
	female (N=161)	1044.29±1737.67	768.47±1515.29	-275.83±1304.53	<0.001
	total	1044.05±1536.62	849.14±1404.89	-194.90±1224.83	<0.001
	gender differences (*p* - Mann-Whitney U test)	0.792	0.155	0.083	
Sport professionals (N=237)	**male (N=168)**	796.21±965.44	773.08±882.54	-23.14±821.07	0.799
	female (N=69)	573.78±587.52	601.88±593.98	28.10±416.26	0.627
	total	731.46±877.08	723.24±811.72	-8.22±726.30	0.648
	gender differences (*p* - Mann-Whitney U test)	0.121	0.155	0.852	
Multiple roles (N=142)	**male (N=98)**	1043.40±1606.73	865.13±1109.02	-178.27±1327.63	0.068
	female (N=44)	992.39±1121.44	581.55±505.48	-410.84±836.07	0.002
	total	1027.59±1469.72	777.26±970.24	-250.33±1198.92	<0.001
	gender differences (*p* - Mann-Whitney U test)	0.575	0.284	0.155	

Discussion

In our research, we investigated the sporting habits, physical activity, subjective mental health and perception of social relationships of athletes and sports professionals during the first wave of the COVID-19 curfew, and hypothesized that the extent and evaluation of these factors induced changes in Hungarian sporting life, as a result of the strict measures of the pandemic. Analyzing the results of our study sample, it is clear that even the sporting habits of elite athletes, recreational athletes and professionals with multiple roles were negatively affected by COVID-19, as the weekly sporting frequency and physical activity levels of participants decreased during the period of curfew, compared to the period before curfew. Ács et al. found a similar decrease in the time spent exercising, with 64.17% of the Hungarian population surveyed not exercising at all before the curfew, and this proportion increased to 78.33% during the curfew period [1].

Szabó et al. also examined the physical activity level in the sports sector, and their results show that the physical activity level decreased significantly, -268.36±1325 minutes (p=0.008) for elite athletes, while 194.90±1224.83 minutes (p=0.007) among recreational sportspeople, and, among multiple role players, 250±1198 minutes (p=0.014) compared to the pre-curfew period [9].

The results of an online cross-sectional study by Ráthonyi and colleagues, similar to our study, demonstrated a decrease in physical activity and an increase in sedentary time during the pandemic [12].

The decrease in physical activity in our study varied by gender and sector, but in general, both nationally and internationally, women were found to exercise less and for shorter periods of time than men [22]. Fiorilli's study confirms the gender difference especially for athletes, as their findings show that female athletes were more affected by COVID-19 and felt more insecure about their life situation during the curfew than men [23].

Havasi's study is in line with the Italian study, as in their study women were on average (5.95) worse affected by the impact of COVID-19 than men (6.4) [24]. Although in our study no significant difference between men and women could be demonstrated in terms of sectors, men in all four groups scored higher in terms of well-being. Regular physical activity would also be important in COVID-19, because it has been shown that an active lifestyle is a protective factor against the pandemic [25].

Botero's study sought answers to the question of whether there was a correlation between lifestyle before COVID-19 and lifestyle during the restrictions, and his results showed that individuals who spent less time exercising and were overweight before the pandemic had a significant increase in sedentary time during the closures (p=0.001) [10].

In the analysis of the quality of life variables, no significant gender differences were found in the well-being index across sectors based on the self-reported well-being of the respondents. In the study of Szabó et al., athletes and sports sector workers rated their well-being index with an average score of 8.41±3.24 [9], which was higher than the representative mean score of 7.67 for Hungarian residents in the study of Ács et al. In our study, men with multiple roles rated their well-being with the highest score (8.89), followed by elite male athletes (8.78). Kovács' study suggests that an athlete or a person with a sporting background has higher adaptability and tolerance due to playing sport, as the personality traits of an athlete make it easier to overcome difficulties [26]. Both mean scores were found to be lower than the Hungarostudy test mean score (9.63), so the sense of isolation and hopelessness generated by COVID-19 significantly affected the population's sense of well-being [27]. According to WHO data, physical inactivity is the fourth leading cause of death in the world [28].

According to Newcombe, athletes are more extroverted, more emotionally stable and less stressed than non-athletes [29], and this claim is confirmed by Mikulán et al., who found that young people who engage in regular weekly physical activity have a higher rate of rating their own health as better (27.5%) [17].

In our study, we found no significant gender differences in the well-being index across sectors, but male elite athletes (8.78), male recreational athletes (7.98) and men with multiple roles (8.89) rated their well-being slightly higher than women.

Conclusions

Based on the knowledge gained from relevant literature reviews and our findings, the pandemic has had serious consequences for sporting habits and daily life, both domestically and internationally.

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