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Effect of COVID-19 Lockdown on Young Egyptian Soccer Players

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Abstract

The present study was designed to highlight the physical and psychological health hazards that a young Egyptian soccer team faced during the first COVID-19 wave lockdown. The study included 37 young Egyptian male soccer players. History taking and anthropometric measurements were taken. Two questionnaires were filled covering the athletes'` sleep habits and quality of life (QoL). Finally, the mothers were asked to fill in a questionnaire concerned with depression, anxiety, and stress. More than 50% of the enrolled athletes gained weight during the lockdown especially those without compliance to home exercises. The mothers' anxiety score correlated positively with the increased body mass index (BMI) of the athletes. The athletes mean QoL Score worsened significantly and significant negative correlation was found between the increased BMI and the change of QoL. The increased BMI was significantly reported among the athletes who didn't do home exercises and had a negative correlation with their QoL change throughout the lockdown. The mothers' anxiety had a possible reflection on their youngsters' weight gain. These findings highlight the need for weight control when outdoors physical activity is restricted during pandemics with better compliance to home exercising schedules and less screen time.

Keywords

athletes, BMI, COVID-19, depression, pandemic, quality of life

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Introduction

The COVID-19 pandemic causing the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which originated in Wuhan, China, spread globally destructing human health, lives, and economies.[1] As of January 25, 2021, this disease has spread in 216 countries and has infected 98 794 942 persons including 2 124 193 deaths with a mortality rate of 2.15%.[2]

This novel coronavirus illness that started to prevail late in 2019 (COVID-19) and caused the recent pandemic with its extensive health, social, and financial consequences led many countries to lockdown. Decision was made to suspend schools for Egyptian children together with curfew restrictions all over the country aiming at alleviating the pandemic repercussions. For a healthy lifestyle, the World Health Organization (WHO) recommends 60 minutes of moderate-to-vigorous daily PA for children and adolescents.[3] Although practicing a physically active lifestyle is recommended to counteract health and mental outcomes of the COVID-19 pandemic as advised by Jiménez-Pavón et al.[4] for older people, many of the children worldwide ended almost leading a sedentary lifestyle during the lockdown. Home confinement had a negative impact on this vulnerable age group and since sporting clubs were closed as well, the athletes among such children faced an additional hardship.

Sedentary behavior and decreased daily physical activity are associated with copious adverse health effects that collectively predispose to weight gain.[5] Another consequence of lockdown is reduced exposure to daylight and the accompanying disturbance in physical activity patterns, with interruption in meal timing and sleep patterns. Ultimately, circadian rhythms are disrupted, predisposing susceptible individuals to a plethora of metabolic abnormalities.[5] Additionally, psychological effects of quarantine measures play a

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pivotal role in all these health hazards.[6] Xiang et al.[7] reported a substantial decrease in physical activity and increase in screen time during the COVID-19 pandemic among 6 to 17 years old Chinese students and warned against their negative impact on children's and adolescents' physical and mental health. Similarly, Schmidt et al.[8] found that sports activity declined whereas recreational screen time increased among 4 to 17 years old German children and adolescents. The latter authors added that improved physical activity levels have been associated with improved physical, psychosocial, and mental health among these vulnerable ages.

Aim of the Work

This study was designed to highlight the physical as well as some of the psychological health hazards that young Egyptian soccer team players might have faced during the early COVID-19 lockdown measures.

Subjects and Methods

Study Population

This study included 37 young Egyptian male soccer players whose ages ranged between 9 and 11 years. They were the soccer team members who practiced in a private sporting club in Cairo. Their regular routine was 5 weekly practices each is 2 hours long. The single practice was divided into 3 parts; warming up for 15 minutes which starts by stretching exercises and ends by running down the soccer field outer track then another half an hour muscle strengthening exercises followed by 30 minutes of soccer tactics and lastly 45 minutes playing soccer in the field. The coach encouraged them to stay active and engage in all sports during school day. Unfortunately, schools were closed on the 25th February 2020 and clubs followed in March 2020. The young athletes were instructed to do daily home exercises in the form of attending 3 weekly online training sessions 120 minutes long each. Nevertheless, 90 minutes daily attendance was considered sufficient since some athletes' families didn't have high speed unlimited internet subscriptions. The young athletes were supposed to substitute the strengthening muscle exercises for actual soccer playing as most of them had restrictions due to lack of adequate spaces at home. According to their response to these instructions the team was further divided into;

1. The intense exercise group which included those who did the whole 90- or 120-minutes online training daily and performed all the strengthening and stretching exercises. Attending the daily mental speech session which the coach started for psychological support was also required from this group.
2. The medium exercise group and this comprised those who could achieve at least 90 minutes 2 to 3 times per week online training, exercises, and psychological support sessions.
3. The mild exercise group who were only able to do at least once per week the 90 minutes online training and couldn't maintain all exercises or psychological support sessions.
4. The no exercise group contained those who didn't do any neither daily training nor exercises during the lockdown period. This group wasn't compliant to the psychological support session either.

Methodology

Approval was obtained from. . . . . .(Blinded) prior to athletes' enrollment. Informed consents were obtained from the mothers who were the primary care givers for the young athletes enrolled in the current study.

History taking:

Each athlete was subjected to detailed history taking laying stress on their compliance during the lock down period and any family illnesses or deaths witnessed. History of their daily sleeping hours, screen time and video gaming were obtained in details. The mothers were also asked whether their sons experienced any tics during their home lockdown period.

Anthropometric measurements:

Their anthropometric measurements were taken in July 2020, mainly weight and height with calculation of their body mass index (BMI) and the values were plotted against the growth charts.[9,10] The measurements were compared to the ones recorded in March 2020 during their last training session before the COVID 19 lockdown. Mechanical Health Scale, Model: ZT-200 was used to measure the weight and height of the players. Weight was measured bare-footed with light clothes after micturition and for the height the feet were parallel, with the head held comfortably erect and the arms were hanging relaxed at the sides.

Questionnaires used:

Two questionnaires concerned each of the enrolled athlete. The first one covered their sleep habits[11] and the second was concerned with their quality of life (QoL).[12,13] Finally, the mothers were asked to fill in a questionnaire concerned with depression, anxiety and stress (DASS-21).

Sleep questionnaire. The Children's Sleep Habits Questionnaire (CSHQ) was utilized in the present study. It is a structured interview to assess sleep problems in school children. The questionnaire consists of 33 items covering 8 domains or parameters: bedtime resistance, sleep onset delay, sleep duration, sleep-related anxiety problems, sleep-related breathing disorder, as well as excessive daytime somnolence. It was originally developed by Owens et al.[11]

QoL questionnaire. Regarding the QoL the current study applied the multidimensional PedsQL 4.0 questionnaire created by Varni et al.[12,13] to measure the essential core domains for pediatric health related quality of life (HRQoL): Physical functioning, emotional functioning, and social functioning, as delineated by the World Health Organization, as well as school functioning.

Depression, anxiety, and stress questionnaire. The Arabic version of the Depression Anxiety Stress Scale (DASS-21) was used in the current study and it is based on the original English DASS-21.[14] It is a set of 3 self-report scales designed to measure the emotional states of depression, anxiety, and stress. Each of the 3 DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic nonspecific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive, and impatient. Scores for depression, anxiety, and stress are calculated by summing the scores for the relevant items.

Statistical Analysis

The collected data were processed and coded before being analyzed using the IBM SPSS program (Statistical Package for Social Sciences) Version 20.0 for Windows. Qualitative data are presented using frequencies and related percentages. Quantitative data are presented using means and standard deviations. An independent samples *t*-test was used to compare the difference in parametric variables between 2 independent means of 2 groups. ANOVA was performed to compare quantitative variables among 3 categories. The chi-squared or Fisher's exact test was performed for qualitative variable analysis. The statistical methods were verified, assuming a significance level of $P < .05$.

Table 1. Comparison between Weight, Height, BMI, Weight Percentile, and Weight-for-Height Z Score in March and July 2020.

Variable	March 2020	July 2020	*P* value
Height	141.3 ± 5.3	141.5 ± 5.2	.000*
Weight	36.5 ± 6.4	37.6 ± 6.7	.000*
BMI	18.2 ± 2.3	18.7 ± 2.3	.000*
BMI percentile	58.6 ± 26.5	64.8 ± 22.8	.002 θ
BMI *Z* Score	0.25 ± 0.92	0.47 ± 0.77	.001 θ

*Parametric data was compared using Paired *t*-test and θ non-parametric data using Wilcoxon signed-rank test.

Results

Our study included 37 male athletes practicing soccer in a private sporting club in Cairo (Egypt). The mean age of participants was 10.8 (Sd 0.46) years old and ranged between 9 and 11 years old. Only 15 (40.5%) children did not gain weight, based on BMI, during the lockdown from March to July 2020. The mean change in BMI was 0.51 (Sd 0.76) and ranged between −0.6 and 2.3.

Table 1 compares weight, height, BMI, BMI percentile, and BMI Z score in March and July 2020. All these variables increased significantly during the mentioned period.

Out of the enrolled athletes 24 (64.9%) didn't perform home exercises during the lockdown while 10 (27%) carried out mild exercises, 2 (5.4%) were moderately exercising and only 1 (2.7%) fulfilled the intense schedule.

The mean sleep hours per day during the lockdown were 11.1 (Sd 0.8) hours and ranged between 10 and 13 hours. All participants played video games with an average time of 3.2 (Sd 1.3) daily hours and ranged between 1 and 6 hours.

Only 10 (27%) of our enrolled athletes had tics during the lockdown, 5 (13.5%) reported not feeling healthy during the lockdown, and 9 (24.3%) lost a family member during this particular period.

Participants' mothers have a relatively high depression score with mean of 16.4 (Sd 2.6) and range between 12 and 21. They have a mean anxiety score of 16.9 (Sd 1.4) and ranged between 14 and 19. After 4 months of lockdown, the athletes' mothers had a mean stress score of 18.2 (Sd 1.3) and ranged between 15 and 20.

Table 2 shows correlations between change in BMI and the next possible independent variables; sleeping hours per day, sleep questionnaire, screen time (hours/day) of the athletes as well as the 3 DASS-21 domains (depression, anxiety, and stress) of their mothers. It is noted that increase in BMI was negatively correlated with their mothers' DASS-21 depression score (*P* value

Table 2. Correlations between Change in BMI and the Next Possible Independent Variables; Sleep Hours Per Day, CSHQ, Screen Time (Hours/Day) for the Young Athletes and the 3 DASS-21 Domains Reported by Mothers (Depression, Anxiety, and Stress).

Change in BMI	Correlation	*P* value
Sleep hours per day	0.27	.106
CSHQ	0.256	.126
Screen time (hours/day)	0.233	.495
DASS-21 (depression score)	−0.417	.010
DASS-21 (anxiety score)	−0.009	.959
DASS-21 (stress score)	0.365	.026

.010) and positively correlated with their mothers' DASS-21 stress score (*P* value .026).

Table 3 compares between children with or without weight gain. Twenty two out of the 37 studied athletes had weight gain (59.5%) based on increase in BMI percentiles. There were no significant differences among those 2 groups regarding screen time (hours/day), sleep questionnaire, and video games (hours/day). It also compares children with or without weight gain regarding their mothers' DASS-21 depression, DASS-21 anxiety, and DASS-21 stress scores and no significant differences were recorded. The only significant differences were the prolonged sleeping hours among the athletes who gained weight (*P* value .038) and that more young athletes who gained weight from March till July 2020 reported no compliance to the assigned home exercise schedules (*P* value .013).

Lastly, the athletes mean QoL Score filled in March 2020 worsened compared with that of July 2020 [82.8 (Sd 4.6) versus 71.1 (Sd 0.72)] with statistically significant difference (*P* value .000). The mean QoL change was −11 (Sd 4) and ranged between −3 and −18. Additionally, a significant negative correlation was found between the change of BMI and the change of QoL from March to July 2020 ($r = -0.393$, *P* value .016).

Discussion

Based on BMI, more than half of the enrolled athletes (59.5%) gained weight during the lockdown from March to July 2020. Weight, height, BMI, BMI percentile, and BMI Z score increased significantly during that period. Weight gain among athletes can greatly affect their performance. For many athletes across various sport disciplines there is a direct causal connection between success and low body weight which explains why many of them resort to losing weight to enhance their performance.[15]

Contrary to the coach instructions, almost two thirds of the enrolled athletes didn't perform any home exercises. With further analysis significantly more of those athletes who were not complaint to the home exercise program gained weight during the pandemic lockdown. Rundle et al.[16] warned that increased unstructured time during the COVID-19 pandemic will exacerbate obesity risk factors in children. A longitudinal study by Pietrobelli et al.[17] analyzed 41 children during self-quarantine and validated Rundle's hypothesis. The latter authors highlighted the role of eating, activity, and sleep behaviors disturbances in promoting weight gain.[17] This result is also validated above 18 years old by Zeigler et al.[18] who reported lack of exercise as a risk factor for weight gain during the COVID pandemic self-quarantine periods.

Lack of exercise and its related overweight problems can gravely impact the immune system of those athletes. It has been mentioned that although moderate-levels of exercise can boost overall immunity,[19] intensive and prolonged physical exertion has been linked with an "open-window" of impaired immunity up to 72 hours after the exercise.[20] Nevertheless, Campbell and Turner[21] challenged the latter theory and reinforced that it is a misconception to label any form of acute exercise as immunosuppressive, and, instead, they stated that exercise most likely improves immune competency across the lifespan. Another hit to the immune system can come from the extra weight. In addition to metabolic and cardiovascular obesity-related diseases, recent evidence suggested that obesity might affect immune system function.[22] From another perspective obesity was linked to severity of COVID-19 infection among children in Canada[23] and USA.[24] It is thus clear that exercise is essential for boosting the immune system which is greatly needed during pandemics not to mention the benefits of weight control in this domain.

The mean sleep hours per day during the lockdown were 11.1 which is within the appropriate sleeping hours of this age group as stated by the American Academy of Sleep Medicine.[25] Although sleeping hours were significantly higher among athletes who gained weight and all of them had CHQS above 41, which reflected their disturbed sleep pattern; the higher CHQS among the athletes who gained weight didn't reach statistical significance. The previous findings are supported by the report of Jarrin et al.[26] regarding the relation between disturbed sleep and weight gain.

All participants reported screen time ranging between 4 to 10 hours/day and played video games with an average time of 3.2 hours daily. Although both screen time and its important element, which is video gaming, were found increased among athletes who

Table 3. Comparison between Children with or without Weight Gain Regarding Sleep Hours Per Day, Screen Time (Hours/Day) CSHQ, Video Games (Hours/Day) for the Young Athletes and the 3 DASS-21 Domains Reported by Mothers (Depression, Anxiety, and Stress) As Well As Home Exercise Performance, Compliance to Lockdown, and Occurrence of Tics.[a]

Variable	No weight gain (N = 15)	Weight gain (N = 22)	*P* value[b]
Sleep hours per day	10.7 ± 0.7	11.3 ± 0.8	.038
Screen time (hours/day)	6.2 ± 1.1	7.1 ± 1.7	.088
CSHQ	55.1 ± 2.9	57.1 ± 3.3	.061
Video games (hours/day)	3.1 ± 0.9	3.3 ± 1.5	.988
DASS-21 (depression score)	17.1 ± 2.4	16 ± 2.7	.196
DASS-21 (anxiety score)	17.1 ± 1.2	16.7 ± 1.5	.465
DASS-21 (stress score)	17.8 ± 1.0	18.4 ± 1.4	.092
Home exercise			
Intense	0 (0)	1 (4.5)	.013
Moderate	2 (13.3)	0 (0)	
Mild	7 (46.7)	3 (13.6)	
No	6 (40)	18 (81.8)	
Compliance to lockdown			
Compliant	10 (66.7)	18 (81.8)	.438
Non-compliant	5 (33.3)	4 (18.2)	
Tics			
No	12 (80)	15 (68.2)	.481
Yes	3 (20)	7 (31.8)	

[a]Quantitative data are expressed as mean ± SD; Number in parentheses adjacent to the actual number indicates percentage of cases.
[b]Student's *t*-test/Mann-Whitney *U* test for continuous variables and Pearson's Chi square/Fisher's Exact test for categorical variables.

gained weight, these results didn't reach statistical significance. Goncalves et al.[27] reported that screen time is related to obesity among children yet video gaming role is still inconclusive with a promising role of exergame play as a tool for weight reduction.[28]

Only 10 (27%) of our enrolled athletes had tics during the lockdown, 5 (13.5%) reported feeling unhealthy during the lockdown, and 9 (24.3%) lost a family member during this particular period. Although these points represent psychosocial stress and are among the non-chemical stressors affecting childhood obesity,[29] this wasn't the case among our studied young athletes.

Although the participants' mothers had a relatively high depression score it correlated negatively with the increased BMI of the athletes. On the other hand, the high anxiety score of mothers correlated positively with the athletes increase in BMI. Although Marshall et al.[30] reported that maternal depression influences children's weight and may increase risk of obesity, Vehmeijer et al.[31] confirmed the current study findings and reported that maternal anxiety was associated with higher children BMI with no associations observed for maternal depression.

The athletes mean QoL Score filled in March 2020 worsened significantly compared to that of July 2020. The previous finding can be easily interpreted in view of a latest publication by Ghosh et al.[32] The latter authors reported that being quarantined in homes and institutions may impose greater psychological burden on children than the physical sufferings caused by the virus. School closure, lack of outdoor activity, aberrant dietary, and sleeping habits are likely to disrupt children's usual lifestyle and can potentially promote monotony, distress, impatience, annoyance, and varied neuropsychiatric manifestations. Additionally, in the current study a significant negative correlation was found between the increase in BMI and the change of QoL from March to July 2020. QoL worsening with the increase in BMI is due to the fact that children and adolescents with obesity frequently report an impaired health-related quality of life,[33] which can be defined as "the impact of health or disease on physical, mental, and social well-being from the patient's point of view".[34]

Conclusion

In conclusion, the recent COVID-19 pandemic lockdown had both physical and psychological effects on Egyptian young soccer team players with plausible interrelations correlating them. Additionally, maternal psychological status during these extreme measures has their reflections on the children. Since athletes' performance is vulnerable to such effects, they should be aware of the need for weight control when outdoors

physical activity is necessarily restricted by pandemic control and preventive measures. Compliance to home exercising schedules with less screen time and video gaming can be of crucial importance to them during these extenuating circumstances. It is prudent to say that following all these previous measures can have a positive effect on the athletes QoL.

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