

Training Frequency, Weight, and Mental Well-being During COVID-19 Lockdown in Professional Mixed Martial Arts Fighters

Original Research

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Abstract

Introduction: Mixed Martial Arts (MMA) is a combat sport which includes weight management and periodized training schedules. In light of the COVID-19 pandemic, we intend to analyze training frequency, weight, and mood as a result of the lockdown. We hypothesize that overall training frequency will decrease as a result.

Methods: Seventeen professional MMA fighters completed a survey, self-reporting behaviors associated with mixed martial arts training, nutrition, and mental-wellness as a result of COVID-19 lockdown. A Wilcoxon signed-rank test was utilized to analyze results.

Results: Analysis determined that COVID-19 lockdown elicited a statistically significant ($p \leq 0.05$) decrease in self-reported MMA training frequency, grappling, fight 'readiness', happiness, and mood.

Conclusions: These results may warrant the need for potential physical and mental support following COVID-19 lockdown in professional MMA fighters. Although the fighters were able to maintain weight and meal frequency, they were unable to train adequately to maintain fight 'readiness.'

Key Words: MMA, Mood, Readiness

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Introduction

Mixed Martial Arts (MMA) is a combat sport which consists of three rounds of five minutes, or five rounds of five minutes (in a title defense fight), with breaks of one minute¹. Most common backgrounds of modern MMA fighters include jiu-jitsu, wrestling, and kickboxing². Like many other combat and grappling sports, MMA has weight classes³⁻⁷. To compete in a specific weight class, MMA athletes lose weight through a variety of methods including fluid restriction, water loading, hot salt baths, fasting, and low carb diets^{8,9}, conferring a size/strength advantage once weight is regained post-weigh-ins³. An MMA athlete trains multiple aspects of striking, grappling, sparring, strength training, and conditioning. Training and competition require a high level of cardiorespiratory fitness, while throwing impactful strikes repeatedly, grappling, and wrestling require a high level of strength,

power, and muscular endurance¹⁰. MMA is intermittent, requiring short periods of maximal exertion that could decide the fight, such as a grappling battle which may last 30-90 seconds, or a high intensity bout of punches and kicks¹¹. Since MMA is unique in its work to rest ratio of 1:3, falling in between striking and grappling sports, and requires a combination of cardiorespiratory fitness, strength, power, and muscular endurance, a proper training schedule is necessary to compete¹¹.

Recently, a COVID-19 pandemic resulted in quarantine, mandatory shelter in place, and a lockdown of many businesses and public transportation¹². The World Health Organization (WHO) declared the outbreak a global health emergency on January 30th, 2020¹³. COVID-19 spreads when an infected person coughs or sneezes, and may survive on surfaces for 96 hours¹⁴. The basic reproduction number is estimated to be between 2.24 to 3.58¹⁵, and the mean incubation period is between 5-7 days¹⁶. Public health measures such as isolation, quarantine, social distancing and business shutdowns, have been used to curb the spread of the disease¹⁷. Large scale sporting events, like the 2020 Olympics have been pushed back by a year as well^{18,19}. However, like many other professional sporting organizations, The Ultimate Fighting Championship (UFC) has worked ahead while hosting events to crowd-less audiences, beginning with UFC 241²⁰. As a result, they have experienced their share of criticism due to high profile fighters testing positive for the virus²¹. Since most MMA athletes continue to compete, training has continued despite gym shutdowns, distance guidelines, and increasing COVID-19 cases. Therefore, to better analyze training habits during lockdown, we proposed a self-reported survey. We hypothesized that MMA athletes would decrease training sessions, decrease close-contact sessions such as grappling, and increase weight during COVID-19 lockdown.

Scientific Methods

Seventeen professional MMA fighters completed a 25 question survey, self-reporting individual behaviors associated with mixed martial arts training, diet, and mental wellness. The survey was formatted to compare pre-COVID-19 (PRE) lockdown and during-COVID-19 (COV) lockdown behaviors in professional MMA fighters. Reporting was completed using numbers as a rank, or a scale of less than normal/worse than normal, normal, or more than normal/better than normal, when replying to survey questions relative to PRE behaviors. The fighters reported total MMA sessions, total grappling sessions, total strength sessions, total sparring sessions, fight readiness, sleep quality, weight management, meal frequency, mood, anger, and happiness per week, comparing PRE and COV. All surveys were administered during COV. Means and measures of variability was calculated for all descriptive data. A Wilcoxon signed-rank test was utilized to analyze group differences between conditions (PRE vs COV). Significance was set at $p \leq 0.05$.

Results

Descriptive data (Table 1) for the seventeen professional MMA fighters (age: 28 ± 4.1 years, body mass: 85.7 ± 12.0 kilograms, height: 181.8 ± 6.9 centimeters, BMI: 25.8 ± 2.3 kg/m²) was calculated. Further analysis (Table 2) was carried out to examine group differences between conditions (PRE vs COV). A Wilcoxon signed-rank test determined that COV elicited a statistically significant ($p \leq 0.05$) decrease in self-reported MMA training frequency ($z = -3.317$, $p \leq 0.001$), grappling training frequency ($z = -2.111$, $p = 0.035$), fight 'readiness' ($z = -2.972$, $p = .003$), happiness ($z = -2.449$, $p = 0.014$), and mood ($z = -2.121$, $p = 0.034$). A Wilcoxon signed-rank test also determined that COV elicited a non-significant ($p \geq 0.05$) effect in self-reported strength training frequency ($z = 0.707$, $p = 0.480$), sparring training frequency ($z = -1.667$, $p = 0.096$), sleep quantity ($z = -1.000$, $p = 0.312$), weight relative to weight class ($z = -1.000$, $p = 0.312$), meal frequency ($z = -1.414$, $p = 0.312$), and anger ($z = -1.037$, $p = 0.102$).

Table 1 – Self-Reported Data

Variable	Mean	SD
Age (yrs)	28	4.1
Body Mass (kg)	85.7	12.0
Height (cm)	181.8	6.9
Body Mass Index (kg/m ²)	25.8	2.3

Data are expressed as the mean $\pm$ SD.

Table 2 – Self-Reported Data PRE vs COV

Variable	Z	P
MMA Sessions	-3.317	0.001*
Grappling Sessions	-2.111	0.035*
S&C Sessions	0.707	0.480
Sparring Sessions	-1.667	0.096
Fight Readiness	-2.972	0.003*
Sleep Quantity	-1.000	0.312
Weight relative to Class	-1.000	0.312



Meal Frequency	-1.414	0.157
Mood	-2.121	0.034*
Anger	-1.037	0.102
Happiness	-2.449	0.014*

*denotes significance ($P \leq 0.05$).

Discussion

The unpredictable and rapid spread of COVID-19, mass hysteria associated with the disease, shutdowns, isolation, and economic downturn, have universally increased poor mental wellbeing²². With respect to the athlete, a large part of a competitive athlete's self-identity is tied to sport excellence²³, which makes athletes vulnerable to grief, anxiety, frustration, sadness, and other mental well-being concerns due to the removal of social support and normal training routine²⁴. For some, these training routines and social supports associated with training were a critical component of managing pre-COVID-19 depression or anxiety²⁵. Cancellation of competitions may augment these concerns²⁵. This is consistent with prior global pandemics, which reported effects such as frustration, fear of contracting and spreading disease, denial, anxiety, and an increase in suicide²⁶⁻³². The data supports a decrease in MMA athlete's mental wellbeing, as they reported a significant decrease in both happiness and mood.

Training options for the athlete have become limited, given the guidelines of social distancing and closure of gyms, parks, and sports venues³³. Lack of training knowledge in an unfamiliar environment may lead to less than optimal training routines³³. Exercise in home may be dependent on the available equipment, such as a stationary bike, treadmill, or resistance training²⁵. Athletes may also be monitored by a strength and conditioning coach remotely²⁵. Recent trends have led to an increase in the popularity of home fitness apps that use real-time personalized health data, on-demand, and livestream workouts via YouTube and free mobile apps, and virtual training sessions²⁵. These trends seem likely to continue after the age of COVID. As a result of these societal changes and guidelines, the data supports a decrease in athlete's MMA training sessions, grappling sessions, and overall readiness for competition.

COVID-19 may potentially affect an individual's nutrition, since it has disrupted the food supply chain³⁴, leading to shortages of staple foods, such as eggs, milk, and meat. This has been made worse through alterations in consumer behavior because of COVID-19 hysteria, such as hoarding³⁵. Additionally, misinformation is abundant on social media about nutrition, promising foods or herbs to help protect against COVID-19. All of these may lead to alterations of the athletes' diet³⁶. During periods of anxiety, it has also been reported more frequent consumption of higher calorie foods and poor diet quality³⁷. It has been theorized that lockdown could increase irregular eating patterns and frequent snacking³⁸. Despite these possible effects, the data supports no differences in MMA fighters' overall weight and self-reported nutrition habits as a result of COVID-19.

Conclusions

The results indicated that COV did elicit a statistically significant decrease in self-reported MMA training frequency, grappling training frequency, fight 'readiness', happiness, and mood. Results indicated that COV did not elicit a statistically significant change in self-reported strength training frequency, sparring training frequency, striking training frequency, sleep frequency, weight relative to weight class, meal frequency, and anger. Although the fighters were able to maintain weight and meal frequency, they were unable to train adequately to maintain fight 'readiness.' It is unknown if MMA athlete's decrease in fight 'readiness' and changes in training as a result of COVID-19 will lead to adverse effects, like higher risk of injury, decreased athletic performance, or increased instances of mental health issues. However, an increase in these adverse effects, if present, would be consistent with previous literature on disruptions to other athlete's training³⁹⁻⁴¹, and consistent with trends of mental health in the general population during COVID-19²⁶⁻³². Additionally, further decrements in mental wellbeing are known to correspond with longer durations of lockdown⁴²⁻⁴³, which is relevant since adverse effects may intensify past the time frame of this study. These results may support the need for ongoing monitoring of MMA athletes, and the need for potential physical and mental support during and after COV. Future research is currently underway analyzing safe and effective physical and mental support strategies as guidelines change, vaccines are introduced, and gyms re-open.

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