



The Health Aspects of CrossFit™

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Introduction

With close to sixty percent of Americans either already diagnosed with a chronic illness, or likely to face this issue in their future, finding a long-term solution is a public health necessity. Practicing sports regularly has been recommended by associations such as the World Health Organization for years as a preventive measure to keep people healthy.

The sport of CrossFit was created by Greg Glassman and trademarked in 2000. It is most commonly defined as “constantly varied, high-intensity, functional movement.” (Glassman, 2007, para. 3) and has been growing immensely in the last 5 years, with over 15,000 official CrossFit affiliates (gyms) in the world (CrossFit.com, 2020).

Health is defined by the World Health Organization (2006) as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (para. 2). Greg Glassman (2002) defines fitness as the opposite of sickness, and he says that “sickness, wellness and fitness are three measures of a single quality: health” (Figure 2). Following these definitions, one can make the assumption that someone very fit, such as a CrossFit athlete who has been training consistently and regularly for at least one year ought to be healthy as defined by these standards.

This present study investigates the potential health benefits of practicing CrossFit at least twice a week, both physically and mentally, through the use of a survey.



Methods

A survey composed of 40 questions was distributed to participants from a local CrossFit gym, CrossFit Helix in Greeley, Colorado. Half of the survey inquired about physical health (components such as resting heart rate, blood pressure, presence of illness etc.), and the other half focused on the mental health aspect of this sport and used two pre-existing questionnaires to examine participants' well-being and body positivity.

The WHO-5 was developed in 1998 by the World Health Organization, as a scale to determine overall well-being. Made of 5 items, graded from 0 to 5, giving an overall score out of a maximum of 25, this scale can be used as a first-line tool to screen for depression.

The BI-AAQ was developed by Sandoz et al. in 2013 as a scale to determine body positivity. The 5 item questionnaire was adapted from the original version by Basarkod et al. in 2018, and has been shown to yield similar results. The most recent version is made of 5 questions, graded from 0 to 7, with higher total scores indicating higher body positivity.

Correlation analyses were used to analyze the responses to the survey, using the software MS Excel, using p-values with a significance level of 0.05 to determine whether correlations were significant or not.

Results

Table 1 – General characteristics

	Total sample size (n = 30)
Female (%)	70%
Male (%)	30%
Age (years)	40.2 (11.9)
CrossFit experience (years)	5.1 (2.8)
Attendance (times per week)	4.2 (1.5)
RHR (beats/minute)	62.6 (10)
Systolic blood pressure (mmHg, % of participants)	
Below 120	58.6%
120-129	34.4%
130-139	7%
Cholesterol (mg/dL)	177.6 (50.9)
Taking daily medication (%)	
Yes	70%
No	30%
Starting CrossFit brought an increased awareness in the participant's importance of having a balanced diet (%)	
Yes	90%
No	10%
Starting CrossFit led to a healthy body perception change (%)	
Yes	90%
No	10%
Well-being (mean %)	71.9 (10)
BIAAQ (mean %)	77.7 (16.6)

Values are mean (SD), unless noted otherwise

Resting heart rate – According to the American Heart Association (2021) a healthy resting heart rate range should be situated between 60 and 100 beats per minute, with the idea that “lower is better”. All but one participant reported having a resting heart rate inferior to 100 beats per minute.

Blood pressure – According to the American College of Cardiology (2017), a healthy blood pressure should be lower than 120/80mmHg. Different thresholds were established in 2017 to determine potential risks of hypertension, with blood pressures between 120-129/80mmHg or less being at risk for hypertension (defined as prehypertension), and values between 130-139/80-89mmHg qualifying as hypertension.

Well-being –. All but one participant had scores above 13, a score below which it is advised to administer a depression assessment. The mean percentage was a 71.9%, indicating an overall high well-being across most participants. Additionally, all participants reported that participating in CrossFit helped reduce their symptoms of daily stress and/or anxiety, two factors known to decrease well-being.

Body positivity – The mean score for this study's participants was a 77.7%, indicating an overall highly positive body image across most participants.

Participants were asked whether starting CrossFit had changed their perception of what a healthy body looks like, 90% responded yes.

“I no longer look at skinny people as ‘healthy’. I look at those who are strong and athletic as ‘healthy’ and fit. Being the lightest weight I can be is not a goal anymore, but rather the way I feel, and how my body performs in the gym is the overarching goal.”

Presence of illnesses – The WHO (2005) defines health as the “absence of disease”, diseases such as chronic illnesses being an important factor in determining someone's health. Participants were asked to indicate whether they had ever been diagnosed with diabetes, high blood pressure and/or an eating disorder. While the first two are major contributors to the chronic illness toll in the U.S., the latter aimed to bridge the physiological and psychological parts of this study.

Table 2 – Presence of illness

	Diabetes (T1 or T2)	High blood pressure	Eating disorders
Percentage of participants having been diagnosed	6.7%	10%	3.3%
Percentage of participants having never been diagnosed	93.3%	90%	96.7%

Table 3 – Correlation matrix

	RHR	BP	Age	Gender	Well-being	BIAAQ	CFY	CFF	Comp CF	Cholesterol
RHR	1									
BP	0.02	1								
Age	0.074	-0.072	1							
Gender	-0.255	0.141	-0.082	1						
Well-being	0.226	0.144	0.015	0.045	1					
BIAAQ	0.19	0.049	0.116	-0.03	0.153	1				
CFY	0.017	-0.024	0.164	-0.278	-0.11	0.21	1			
CFF	-0.2136	-0.125	-0.1564	0.111	0.1163	0.0118	0.101	1		
Comp CF	-0.075	-0.2	0.1159	-0.162	-0.0479	0.1549	0.895*	0.478*	1	
Cholesterol	-0.04	-0.336	0.277	0.091	0.012	-0.836*	-0.173	0.262	0.77*	1

*Coefficients considered statistically significant, with a p-value < 0.05

Discussion

The only significant correlations found were between cholesterol and both body positivity and overall CrossFit experience. These correlations could be an indication that CrossFit has a positive impact on cholesterol. Additionally, the vast majority of this study's participants can be deemed as healthy according to the standards set forth by organizations such as the American Heart Association or by the definition of health being the absence of disease from the World Health Organization, with over 90% of participants reporting an absence of chronic illnesses. Values for resting heart rates and blood pressure were also within values considered healthy for the vast majority of the participants. Regarding the psychological aspect of this study, the same overall conclusion can be drawn as for the physiological side namely that while no significant correlations were established, the majority of participants appeared healthy.

The absence of correlation between age and well-being as well as body positivity does offer an interesting conclusion as those two relationships have been shown to often be negatively correlated (Larson, 1978). These findings could be an indication that CrossFit positively impacts such psychological concepts in older participants.

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References

- American College of Cardiology. (2017). *New ACC/AHA high blood pressure guidelines lower definition of hypertension*. <https://www.acc.org/latest-in-cardiology/articles/2017/11/08/11/47/mon-5pm-bp-guideline-aha-2017>
- American Heart Association. *Recommendations for physical activity in adults and kids*. Retrieved March 3rd, 2021. <https://www.heart.org/en/healthy-living/fitness/fitness-basics/aha-recs-for-physical-activity-in-adults>
- American Heart Association. *Target Heart Rates Charts*. Retrieved February 28th, 2021. <https://www.heart.org/en/healthy-living/fitness/fitness-basics/target-heart-rates>
- Basarkod, G., Sahdra, B., & Ciarrochi, J. (2018). Body Image-Acceptance and Action Questionnaire-5: An abbreviation using genetic algorithms. *Behavior Therapy* 49(3), 388-402. doi: 10.1016/j.beth.2017.09.006.
- CrossFit inc. (n.d.) *About affiliation*. Retrieved April 18, 2020. <https://www.crossfit.com/affiliate>
- Glassman, G. (2007). *Understanding CrossFit: The CrossFit Journal* (56). http://library.crossfit.com/free/pdf/CFJ_56-07_Understanding.pdf Glassman, G. (2002). *What is Fitness. The CrossFit Journal*. <https://journal.crossfit.com/article/what-is-fitness>
- Larson, R. (1978). Thirty years of research on the subjective well-being of older Americans. *Journal of Gerontology* 33(1), 109-125.
- Sandoz, E.K., Merwin, R.M., Kellum, K.K. (2013). Assessment of body image flexibility: The Body Image-Acceptance and Action Questionnaire. *Journal of Contextual Behavioral Science*. 2, 39-48. doi: 10.1016/j.jcbs.2013.03.002.
- World Health Organization (2006). *Constitution of the World Health Organization*. https://www.who.int/governance/eb/who_constitution_en.pdf
- World Health Organization (1998). *Wellbeing Measures in Primary Healthcare/Depcare Project, Index 1*. https://www.euro.who.int/_data/assets/pdf_file/0016/130750/E60246.pdf