LGJDX ISSN No: 1008-0562 Journal Of Liaoning Technical University Natural Science Edition

ASSOCIATION BETWEEN PERFORMANCE AND OVERTRAINING AMONG UNIVERSITY LEVEL ATHLETES IN LAHORE

Dr. Sheher Bano
Physiotherapist at Superior University, Lahore

Dr.Rubab Naqvi
Assistant Professor at Superior University Lahore

AQIB LIAQAT
Lecturer at Government College University Lahore

M.Mujtaba Masood
Physical therapist at Afro Asian Institute

Esha Tahir
Lecturer at Afro Asian Institute

Hira Nawaz
Head of Department at Afro Asian Institute.
Consultant Physiotherapist at Noor Zainab Rehabilitation Center

Hafiza Natasha Hirra
Lecture at Kasur Institute of Allied Health Science

LGJDX ISSN No: 1008-0562 Journal Of Liaoning Technical University Natural Science Edition

ABSTRACT

Back Ground : Over training appear when an athlete try to overcome their body's ability to recover from exercise. Overtraining was a trendy term used to explain each procedure of training excessively and the fatigue states.

Objective: Of this study was to examine the effect of overtraining on overall performance of an athlete and to find out association between performance and overtraining.

Methods : It was a cross- sectional study. This study ran from April 2022 to September 2022 .Sample size 129 athletes was taken from both genders aged between 18 -25 years, calculated through Cochrane formula by using purposive sampling technique. Data collection was done by use of an abbreviated Profile of mode state (POMS) and Rest and Recovery (REST) Questionnaire that comprises of 40 and 19 items respectively. Collected data was analyzed by using chi-square test through SPSS tool version 26 .

Results : It was concluded that some factors like anger(48.1%) stress(34.5%), depression(24.8%) and fatigue(24%) produced by overtraining forms an inverse relationship between overtraining and performance from which it was concluded that there was significant association between overtraining and performance . P value obtained was 0.01.

Conclusion: When training exceed with the planned maximum level then there are lot of negative effect of it, and researcher find out that major negative effect of overtraining is the low performance.

Keywords: Performance, Overtraining, Athlete and Fatigue.

INTRODUCTION

When a person tries to increase his ability by increasing the exercise, it usually called over training. Overtraining reduces the ability of performance. At that point, a person who's suffering in overtraining, gradually stepping up himself towards failure. Performing a certain level of exercise, which may exceed to the recovery capacity. (1)Overtraining can be caused by tiredness of hardest exercise, muscle soreness, and elevated resting heart rate. A high heart rate after rest like after sleep in the morning could be a sign of overtraining. A reduced heart rate variability may cause of injuries, irritability, mentally disturbance, boringness, poor physical performance and inability to wholeness of workout. It may also cause a person to suffer an increase of susceptibility to infection and early onset of fatigue Overtraining, occurs when an athlete engages in intense training without allowing for adequate recovery time. (2)Overextending one's capabilities can lead to a performance decline that can be corrected in a matter of days or weeks if identified timely(3) When an athlete doesn't fully recover from repeated rigorous training, it's known as overtraining syndrome. Symptoms include exhaustion and decreased performance or capability damage. It's admirable to teach tough to succeed in your preferred recreation. If your workouts experience not possible to get through or you're dizzy, agitated, or moody, you can have pushed too tough(4) Resistance exercise may generate acute tiredness owing to reduced neuromuscular activation and sequencing, resulting in a temporary drop in performance due to critical and peripheral causes.(5) Recovery from RT depends on education intensity, duration, and modality. Overtraining syndrome (OTS) is long-term performance decline over months.Athletes can be susceptible to maladaptation and overall performance decrease because of OTS Unfairness in between the fatigue triggered from extreme schooling, and insufficient put up-exercise/opposition recovery intervals can result in reduce in bodily general performance. As

a matter of, extended duration of this unfairness between fatigue and recovery may leads to widen duration of general performance impairment.it referred to as the country of overreaching that could be progress into (OTS). (6) Overtraining syndrome (OTS) is a condition marked by exhaustion and poor performance that results from an imbalance in nutrition, rest, and education. Most top athletes tend to be impacted by it at least once in their entire lives. Despite the excessive prevalence of OTS and its results, the proper underlying triggers and precise styles of OTS continue to be doubtful. (7)The intention of energy and conditioning is to enhance performance of athletes. When an intensive, immoderate and extended schooling are carried out concurrent with insufficient restoration, many of the wonderful physiological alterations related to bodily education are reversed with overtraining syndrome (8)The basic objective of sports education is to subject the body to enough physical stress to provoke behavioral changes that will enhance performance. Recovery is essential between times of significant physical stress or academic study for progress and repair.(9) However, imbalances can occur periodically when an athlete's body is subjected to greater physical stress than it can handle or when the recuperation process takes too long. Overtraining and overreaching (OR) rise up when there may be an imbalance between training fatigue and/or non- schooling stressors and recovery. (10)The motive of an exercise schooling program for athletes is to enhance their physical performance capability. Aggressive athletes need to perform a extraordinary quantity of exercise on an ordinary foundation. (11)Unexplained decline in overall performance can lead to long-term maladaptation, which can eventually lead to overtraining syndrome (OTS). Athletes who use a short period (like a training camp) to take on more coursework may see a short-term drop in performance, but their decision won't have any long-term or severe mental effects.(12, 13) If you want to have the best athletic performance and be ready for competition, you must strike a balance between overtraining and adequate rest and recovery. Improving athletic performance necessitates significant and/or revolutionary increases in the amount of work that students must complete(14, 15) Increased training loads and/or insufficient recovery, on the other hand, can result in school-related maladaptation, which, if allowed to persist, can lead to overreaching and overtraining. Athletes rely on sleep for a significant portion of their recovery due to the restorative effects it has on their bodies and minds (16)Discovered that after a 30% increase in the amount of work to be completed, sleep duration and total hours slept decreased, and poor sleep quality is a common complaint among athletes who have overreached or over trained themselves(17)

METHODS

A cross-sectional study was conducted to examine the association between performance and overtraining among university level athletes. For this study one hundred and twenty nine athletes both male and female were selected by using Cochran' formula and purposive sampling technique was used study ran from April 20222 to September 2022. Both male and female athletes ,8-12 weeks trained athletes Athletes aged between 18 to 25 years Athletes who want to participate willingly were included Athletes of low intensity games, Games of long duration and Athletes who are physically unfit were excluded. This study Data was collected using abbreviated PMOS Questionnaire and REST questionnaire then analyzed using SPSS tool version 26 and results were obtained by using Chi-square test. Percentage and frequency tool were also used.

RESULTS

Table 1 :Age

Age group	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	18 to 20	42	32.6	32.6	32.6
	21 to 23	57	44.2	44.2	76.7
	24 to 35	30	23.3	23.3	100.0
	Total	129	100.0	100.0	

Table shows Age group 21-23 shows maximum frequency 57 and percentage 44.2%. Age group 18-20 showed 42 frequency and 32.6 percentage. Age group between24-35 showed 30 frequency and 23.3 percentage which is the least results.

Table 2 : Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	67	51.9	51.9	51.9
	Female	62	48.1	48.1	100.0
	Total	129	100.0	100.0	

Maximum results were observed among male athlete's that were 67 (51.9%) and minimum among female that were 62 (48.1%).

Table 3: Tense Factor

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Not at All	62	48.1	48.1	48.1
	A little	35	27.1	27.1	75.2
	Moderately	20	15.5	15.5	90.7
	Quit a lot	8	6.2	6.2	96.9

	Extremely	4	3.1	3.1	100.0
	Total	129	100.0	100.0	

Table shows athletes toward factor Tense which occur due to overtraining 48.1% (62 frequency) athletes reported that were not at all (which is highest), 27.1% athletes were reported a little, 15.5% athletes were reported moderately, 6.2% athletes were reported quit a lot and 3.1% athletes were reported extremely which is lowest.

Table 4: Anger factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at All	38	29.5	29.5	29.5
	A little	45	34.9	34.9	64.3
	Moderately	25	19.4	19.4	83.7
	Quit a lot	15	11.6	11.6	95.3
	Extremely	6	4.7	4.7	100.0
	Total	129	100.0	100.0	

Table shows the results of the athletes toward factor anger which occur due to overtraining 29.5% respondents reported that were not at all, 34.9% respondents were reported a little which is maximum, 19.4% respondents were reported moderately, 11.6% respondent were reported quit a lot and 4.7% respondents were reported extremely which is lowest.

Table 5: Fatigued factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at All	31	24.0	24.0	24.0
	A little	36	27.9	27.9	51.9
	Moderately	29	22.5	22.5	74.4

	Quit a lot	22	17.1	17.1	91.5
	Extremely	11	8.5	8.5	100.0
	Total	129	100.0	100.0	

Table shows the response of athletes toward factor Fatigue which occur due to overtraining 24.0% respondents reported that were not at all, 27.9% respondents were reported a little which is the maximum, 22.5% respondents were reported moderately, 17.1% respondent were reported quit a lot and 8.5% respondents were reported extremely which is minimum results.

Table 6: Depression factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at All	28	21.7	21.7	21.7
	A little	30	23.3	23.3	45.0
	Moderately	32	24.8	24.8	69.8
	Quit a lot	31	24.0	24.0	93.8
	Extremely	8	6.2	6.2	100.0
	Total	129	100.0	100.0	

Table shows the response of athlete towards factor depression which occur due to overtraining. 21.7% respondents reported that were not at all, 23.3% respondents were reported a little, 24.8% respondents were reported moderately which is maximum, 24.0% respondent were

reported quit a lot and 6.2% respondents were reported extremely which is minimum results.

Table 7 : Confused factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at All	36	27.9	27.9	27.9
	A little	28	21.7	21.7	49.6
	Moderately	27	20.9	20.9	70.5
	Quit a lot	23	17.8	17.8	88.4
	Extremely	15	11.6	11.6	100.0
	Total	129	100.0	100.0	

Table shows the response of the athletes for confused factor which occur due to overtraining. 27.9% respondents reported that were not at all which is the maximum results , 21.7% respondents were reported a little, 20.9% respondents were reported moderately, 17.8% respondent were reported quit a lot and 11.6% respondents were reported extremely which is the minimum results.

Table 8: Vigorous factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at All	25	19.4	19.4	19.4
	A little	28	21.7	21.7	41.1
	Moderately	35	27.1	27.1	68.2
	Quit a lot	27	20.9	20.9	89.1
	Extremely	14	10.9	10.9	100.0
	Total	129	100.0	100.0	

Table shows the response of the athletes for vigorous factor which occur due to overtraining.

19.4% respondents reported that were not at all, 21.7% respondents were reported a little, 27.1% respondents were reported moderately which is the maximum results, 20.9% respondent were reported quit a lot and 10.9% respondents were reported extremely which is the minimum results.

Table 9: Total mood distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at All	35	27.1	27.1	27.1
	A little	32	24.8	24.8	51.9
	Moderately	30	23.3	23.3	75.2
	Quit a lot	18	14.0	14.0	89.1
	Extremely	14	10.9	10.9	100.0
	Total	129	100.0	100.0	

Table shows the response of the athletes for total mood distribution factor which occur due to overtraining 27.1% respondents reported that were not at all which is the maximum results, 24.8% respondents were reported a little, 23.3% respondents were reported moderately, 14.0% respondent were reported quit a lot and 10.9% respondents were reported extremely which was the minimum results.

Table 10: Chi-Square Test

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	106.988a	64	.001
N of Valid Cases	129		

Chi-square test was used to find statistical significance value of association (Sharpe, 2015). Level of significance was adjusted to 0.05 (α=0.05).As the asymptotic significance value i.e., p-value was less than the significance level (α) i.e., 0.05, which meant we could

accept the study hypothesis. It concluded that there was a significant relationship between performance and training. So, alternative hypothesis was accepted and null hypothesis was rejected. It concluded that there was a significant relationship between performance and training.

DISCUSSION

From results it was concluded that some factors like anger(48.1%) stress(34.5%), depression(24.8) and fatigue(24%) produced by overtraining forms an inverse relationship between overtraining and performance from which it is concluded that there was significant association between overtraining and performance . P value obtained was 0.01.

Eid –H et al. in 2023 investigated how OT and OTS were perceived in high-overall performance power training. Fourteen coaches specialising in high-level strength and conditioning were present.According to a recent research, the prevalence of OTS in energy sports is thought to be modest, and the majority of participants do not report seeing or experiencing sustained declines in their athletes' performance. Athletes lose focus in 27.9% of cases, which lowers their performance.(18)

Brenner JS, et al.2024 did research on the subject of young athletes who train too much. Some of the symptoms were upper respiratory tract infections, muscle pain, trouble sleeping, loss of appetite, mood changes, short temper, less interest in school and sports, less self-confidence, and trouble paying attention these results were accordance to current study showed athletes having anger(48.1%) stress(34.5%), depression(24.8) and fatigue(24%) .(19)

Wada et al. which was conducted in 2020 for overtraining syndrome showed athletes depressed due to overtraining these results were accordance to current study stress(34.5%) rate among athletes. (20)

Arthur et al. investigated to discover if symptoms of overtraining and a high degree of self-determined motivation at the beginning of the competition season in top athletes may predict an athlete's propensity towards burnout at the conclusion of the season .According to the findings, athlete burnout was inversely proportional to self- determined motivation and positively proportional to signs of overtraining these results were accordance to current showed due to overtraining athletes stress(34.5%), depression(24.8) and fatigue(24%) .(21)

Purvis, Dianna et al . conducted study over training cause fatigue among athletes so this fatigue cause low performance among athlete over training and performance have inverse relationship these results were accordance to current study showed fatigue(24%) produced by overtraining forms an inverse relationship between overtraining and performance from which it is concluded that there was significant association between overtraining and performance . P value obtained was 0.01. (22)

Freitas DS et al. carried out a study to find out over training impact on athlete and how it work on 30 athlete research was conducted results showed over training cause fatigue among athlete due to this athlete showed poor performance in field these results were compatible to current study showed fatigue(24%) produced by overtraining forms an inverse relationship between overtraining and performance from which it is concluded that there was significant association between overtraining and performance . P value obtained was 0.01 (23)

CONCLUSION

Concluded that there is an inversely relationship between overtraining and performance. When training exceed with the planned maximum level then there are lot of negative effect of it, and researcher find out that major negative effect of overtraining is the low performance.

REFRENCES

1. Wada N, Ito K, Nakagawa T. Optimal training plans on physical performance considering supercompensation. Communications in Statistics-Theory and Methods. 2020;49(15):3761-71.

2. 김태우. Muscular exercise and muscle fatigue. 한국 스포츠 리서치. 2007;18(5):829-40.

3. Gaudino C, Canova R, Duca M, Silvaggi N, Gaudino P. Optimizing Training and Performance. Management of Track and Field Injures. 2022:349-62.

4. Bell L, Ruddock A, Maden-Wilkinson T, Hembrough D, Rogerson D. “Is it overtraining or just work ethic?”: Coaches’ perceptions of overtraining in high-performance strength sports. Sports. 2021;9(6):85.

5. Richardson SO, Andersen MB, Morris T. Overtraining athletes: Personal journeys in sport: Human Kinetics; 2008.

6. Cheng AJ, Jude B, Lanner JT. Intramuscular mechanisms of overtraining. Redox biology. 2020;35:101480.

7. Cadegiani FA, Kater CE, Gazola M. Clinical and biochemical characteristics of high-intensity functional training (HIFT) and overtraining syndrome: findings from the EROS study (The EROS-HIFT). Journal of sports sciences. 2019;37(11):1296-307.

8. Grivas GV. Diagnosis of overtraining and overreaching syndrome in athletes. Sport Exerc Med Open J. 2018;4(3):74-6.

9. Mallardo M, Daniele A, Musumeci G, Nigro E. A Narrative Review on Adipose Tissue and Overtraining: Shedding Light on the Interplay among Adipokines, Exercise and Overtraining. International Journal of Molecular Sciences. 2024;25(7):4089.

10. zum Berge AH, Kellmann M. Overtraining. Routledge Handbook of Applied Sport Psychology: Routledge. p. 326-37.

11. Tibbert SJ, Andersen MB. Overtraining in Professional Sport. Doing Exercise Psychology. 2014:233.

12. la Torre ME, Monda A, Messina A, de Stefano MI, Monda V, Moscatelli F, et al. The Potential Role of Nutrition in Overtraining Syndrome: A Narrative Review. Nutrients. 2023;15(23):4916.

13. Nixdorf R, Madigan DJ, Kenttä G, Hassmén P. Depression, athlete burnout, and overtraining: A review of similarities and differences. Routledge Handbook of Mental Health in Elite Sport.

2023:188-200.
14. Symons IK, Bruce L, Main LC. Impact of Overtraining on Cognitive Function in Endurance Athletes: A Systematic Review. Sports Medicine-Open. 2023;9(1):69.
15. Orunbayev A. RECOVERY STRATEGY IN SPORTS. American Journal Of Social Sciences And Humanity Research. 2023;3(12):135-47.
16. Hausswirth C, Louis J, Aubry A, Bonnet G, Duffield R, Le Meur Y. Evidence of disturbed sleep and increased illness in overreached endurance athletes. Medicine and science in sports and exercise. 2014.
17. Tibbert SJ. Mental toughness and overtraining behaviours: Victoria University; 2013.
18. Eid H. Analysis of Endurance Coaches' and Athletes' perceptions and experiences of causes for long-term underperformance and recovery strategies used in the return to previous performance levels: NTNU; 2023.
19. Brenner JS, Watson A. Overuse Injuries, Overtraining, and Burnout in Young Athletes. Pediatrics. 2024;153(2):e2023065129.
20. Wada N, Ito K, Nakagawa T. Optimal training plans on physical performance considering supercompensation. Communications in Statistics - Theory and Methods. 2020;49:1-11.
21. Arthur-Cameselle J, Martignetti A, Gurung R, Shapiro J. Overtraining and Burnout in Sport. Routledge.
22. Purvis D, Gonsalves S, Deuster PA. Physiological and psychological fatigue in extreme conditions: overtraining and elite athletes. Pm&r. 2010;2(5):442-50.
23. Freitas DS, Miranda R, Bara Filho M. Psychological, physiological and biochemical markers of the training load and the overtraining effects. Revista Brasileira de Cineantropometria e Desempenho Humano. 2009;11(4):457-.