THE UNIVERSITY OF LAHORE

IJPESS International Journal of Physical Education and Sports Sciences

Research Article

Volume 8, Issue 1, Jan-June 2024

Effect of Aerobic Exercises on Mental Health and Performance of Javelin Thrower

Muhammad Ihsan Ul Haq, Tasleem Arif*, Syed Zia Ul Islam

Department of Sports Science and Physical Education, The University of Haripur, Pakistan

*Corresponding Author's Email: tasleem.arif@uoh.edu.pk

ABSTRACT

The aim of this research was to examine the effect of Eight-week aerobic exercises intervention on the mental health (stress) and performance of professional javelin throwers from the Faisalabad National Athletic Clubs. Twenty participants engaged in javelin-throwing events, meeting the inclusion criteria, took part in the intervention. The experimental group (n=10) underwent a structured aerobic exercise program, while the control group (n=10) served as a benchmark. The control group in this study maintained their regular or standard practices without any alterations. A post-test was conducted at the end of the 8-weeks intervention. Standardized questionnaires (Perceived Stress Scale) assessed mental health variable (stress). Performance was measured by three attempts at javelin throwing, with the best attempt as the representative measure. Demographic factors examined among participants included participation level (club, national, international), experience levels, residency (urban or rural), academic qualifications, and athletic background. The study aimed to comprehensively understand the diverse profiles of elite javelin throwers, and aimed to provide valuable insights into the influence of aerobic exercise on mental health and cognitive performance. In conclusion, aerobic exercise demonstrated effectiveness in enhancing javelin throw performance and reducing stress levels among professional athletes. This study emphasizes the importance of a holistic understanding of its effects on stress. Findings suggest valuable insights for practitioners, coaches, and athletes, highlighting the multifaceted implications of incorporating aerobic exercise into training regimens and the need to consider both physical and mental well-being in athletic performance enhancement strategies.

Keywords: *Aerobic Exercise, Stress, Javelin Throwers, Performance*

INTRODUCTION

Javelin throw as an athletic pursuit, demands a confluence of physical prowess and mental resilience, creating a unique environment where the psychological well-being of athletes plays a crucial role in performance outcomes. The javelin throw is a physically demanding sport that requires strength, power, and endurance (Khalaf et al., 2022). However, it also requires mental toughness, focus, and concentration. Mojtahedi et al. (2017) showed that mental toughness is an essential component of success in javelin throwing. Carson & Collins (2016) found that cognitive control and attention are crucial for success in javelin throw. The physical demands of the sport, coupled with the pressures of training and competition, underscore the need to explore interventions that comprehensively address both the physical and mental dimensions of javelin throwers' preparation. This study focuses on the specific domains of mental health, namely stress, anxiety, and depression, and their potential modulation through aerobic exercise. While the broader literature establishes a positive association between aerobic exercise and mental health benefits, the application of these insights to the distinct context of javelin throwers remains relatively uncharted. Understanding how aerobic exercise influences stress, anxiety, and depression in this population is pivotal not only for promoting the well-being of athletes but also for unraveling potential connections with improved performance. This study aims to provide a foundation for training approaches that optimize the mental health and performance of javelin throwers.

Exercise releases feel-good chemicals like endorphins and serotonin, which uplift your mood. It also improves your fitness, which may make you feel better. Exercise is a great way to take your mind off of negative thought patterns (Centonze et al., 2023). The well-being of an individual is significantly influenced by mental health, which constitutes a crucial aspect and directly impacts the overall quality of life (Speight et al., 2020). Aerobic exercise is known to have positive effects on physical health, it not only has a positive effect on mental health

DOI: https://doi.org/10.51846/the-sky.v8i1.3118 Received: 01-5-2024; Revised: 12-6-2024; Accepted: 28-06-2024

THE SKY-International Journal of Physical Education and Sports Sciences (IJPESS) (uol.edu.pk)

Published by: Department of Sports Sciences and Physical Education, Faculty of Allied Health Sciences, The University of Lahore, Pakistan.

but also contributes positively to overall well-being (Funuyet-Salas et al., 2022). The javelin throw is a sport that requires physical and mental endurance, strength, and focus (Wang, 2022). For instance, Sharma et al. (2020) showed that aerobic exercise significantly reduces anxiety and depression symptoms in participants. It was revealed that exercise has a positive impact on overall well-being and quality of life, including improvements in mood and self-esteem (Rao et al., 2020)

Nevertheless, despite the advantages associated with aerobic exercise and the significance of mental resilience in the sport of javelin throwing, there is a noticeable absence of studies investigating the influence of aerobic exercise on the mental well-being of javelin throwers. The intention of this proposed research is to address this gap in existing literature and provide insights into how exercise impacts the mental health of individuals engaged in javelin throwing.

This study explores the intricate dynamics between aerobic exercise, mental health, and the performance of javelin throwers, with a specific focus on stress, anxiety, and depression. The aim is to delve into the potential impact of regular aerobic exercise on the psychological well-being of athletes in this specialized field, acknowledging the importance of fostering an environment free from bias or predetermined outcomes. It is to conduct a rigorous and unbiased investigation that exposes the connections between aerobic exercise and mental health parameters in javelin throwers, contributing objective insights to the existing body of knowledge. By maintaining transparency and impartiality throughout the research process, we aspire to offer valuable information that may guide future training methodologies, optimize mental well-being, and enhance the overall performance of javelin throwers, thereby contributing meaningfully to the athletic community.

Mental health is an important aspect of human lives and it matters a lot in every walk of life (Cueto & Agaton, 2021). However, it is inevitable for athletes and could be a potential factor in exhibiting sound and stable performances either in the competitive environment or outside the sporting arena. Recognizing the importance of mental health contributes to a more comprehensive approach to wellness, emphasizing the interconnectedness of the mind and body (Richards et al., 2010). Moreover, it can be considered to control 50% of sporting performance (Fogaca, 2021). Mental stability is most important for any sporting event (Leguizamo et al., 2021). A substantial portion of professional athletes experience diverse mental health challenges, including stress. These conditions have detrimental effects on both the physiological and psychological dimensions of the athletes (Leguizamo et al., 2021). Regular exercise is good for relieving stress (Richards et al., 2017). According to the guidelines from the American College of Sports Medicine and the American Heart Association, adults are encouraged to do moderate-intensity cardio or aerobic exercise for at least thirty minutes on five or more days per week. Alternatively, they can do vigorous-intensity aerobic exercise for at least twenty minutes on three or more days a week (Franklin et al., 2022). Engaging in physical exercise offers a versatile and effective non-pharmacological approach to managing stress (Li and Goldsmith., 2012). Participating in physical activity triggers the release of endorphins, facilitates the release of neurotransmitters, and activates specific receptors, all of which can help alleviate symptoms of depression, anxiety, and stress (Feitosa et al., 2011). Therefore, this research determined the effect of aerobic exercise on selected variables of mental health (stress) and performance in elite Pakistani javelin throwers.

MATERIALS & METHODS

The methodology for examining the influence of aerobic exercise on the mental health and performance of javelin throwers with a focus on stress involves a systematic and multifaceted approach. Participants were selected to encompass diverse skill levels and demographics and underwent a comprehensive baseline assessment, which included evaluations of both physical health metrics and mental health through standard procedure. An organized aerobic exercise intervention was implemented, incorporating the activities, and was guided by established principles such as frequency, intensity, time, and type. The progress of the intervention was consistently monitored by researcher through regular assessments, tracking changes in both mental and physical parameters. This methodological framework aimed to distinguish the connections between aerobic exercise, mental well-being, and athletic performance among javelin throwers, providing valuable insights for potential interventions and improvements in both psychological resilience and sports proficiency.

Participants

Twenty participants who were actively engaged in javelin-throwing events took part in an 8-weeks exercise intervention. Participants were split into two groups control group and experimental group. The intervention/experiment group underwent a structured aerobic exercise program designed to evaluate its impact on mental health and performance. Simultaneously, a control group comprising ten (10) participants did not undergo the intervention and served as a benchmark for comparison. The selection of participants considered various skill levels and demographics, ensuring a diverse representation within the study. The researchers recorded the participant's pre attempts of the throws both control and experimental group alongside the demographic data, as shown in the table 1.

Experimental Set-Up and Participant Selection

The researcher chose twenty (20) professional javelin throwers from Faisalabad National Athletic Club, Faisalabad, and subsequently divided them into two groups: an experimental group (n=10) and a control group (n=10), using a random method. Before the intervention, a pre-test was conducted for both the experimental and control groups to measure the selected variables of mental health i-e stress. Then, the experimental group engaged in aerobic exercise for 8 weeks (4 days a week), while the control group was allowed to continue their routine practice. At the end of the 8-weeks, a post-test was conducted.

Table 1. Inclusion and Exclusion criteria

Inclusion Criteria	Exclusion Criteria
Javelin Throwers	Non-Athlete
Aged 15-30 years	Age below 15 and above 30
Professional Athletes	Non- Professional/Beginners
Non-smokers	Smokers

Tools/Material for Data Collection

The researcher used standardized questionnaire, namely the Perceived Stress Scale (PSS) (Cohen et al., 1983) to assess mental health variables. Performance was measured by providing each participant with three attempts at javelin throwing, and the best attempt was selected as the representative measure.

Demographics Attributes of the Participants

In this study, elite javelin throwers aged between 15 and 30 participated. The researcher examined various demographic factors among these athletes, including their level of participation categorized as club, national, or international. Additionally, the participants' experience levels were assessed, with categories ranging from 1-5 years, 6-10 years, 11-15 years, to 16-20 years. Demographic information also covered whether the athletes were residents of urban or rural areas, their academic qualifications, and their background as athletes or non-athletes. These factors were integral to comprehensively understanding the diverse profiles of elite javelin throwers in the study, offering a perspective on the impact of aerobic exercise on mental health (stress) and performance.

Ethical Considerations

The Informed Consent Form for this study was provided by the Department of Sports Science & Physical Education, University of Haripur. Both the participants and the administration of Faisalabad National Athletic Club considered and approved the form to ensure the smooth conduct of data collection. This rigorous procedure aimed to uphold ethical standards and secure voluntary and informed participation in the study, fostering transparency and cooperation throughout the data collection phase.

Statistical Analyses

For the analysis of inferential statistics, including the Independent Sample T-test, and ANOVA, the data were scrutinized using Statistical Package for Social Sciences (SPSS) version 26. These statistical methods were chosen to identify any significant differences or patterns in the mental health (stress) and performance variables among elite javelin throwers after the 8-week aerobic exercise intervention.

RESULTS

This study examined the effects of aerobic exercise on stress and performance of javelin throwers. It is important to mention that mental health was analyzed from stress perspective. Both pre-test and post-test measurements were taken and analyzed accordingly.

Table 2: Shows the significant difference of javelin thrower measurement of CG and EG before aerobic exercise.

	Group	N	Mean	Std. Deviation	Std. Error Mean
Javelin Thrower Measurement	Experimental	10	49.70	2.26	0.71
	Control	10	49.80	2.39	0.75

Table 2 shows two sections that offer various bits of information: For equality of variance, use Levene's Test (A) and equality of means, use the t-test (B).

Table 3. Independent Samples Test

		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Javelin Thrower Measurement	Equal variances assumed	0.02	0.87	-0.09	18	0.92	-0.10	1.04	-2.28	2.08
	Equal variances not assumed			-0.09	17.94	0.92	-0.10	1.04	-2.28	2.08

Table 4. Reveals significant difference of Javelin throwers measurement of CG and EG after aerobic Exercise

	Group	N	Mean	Std. Deviation	Std. Error Mean
Javelin Thrower Measurement	Experimental	10	57.90	3.98	1.26
	Control	10	50.10	2.23	0.70

Table 5. Independent Samples Test

		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Javelin Thrower Measurement	Equal variances assumed	1.06	0.31	5.40	18	0.00	7.80	1.44	4.76	10.83
	Equal variances not assumed			5.40	14.14	0.00	7.80	1.44	4.70	10.89

Table 6. Indicates no significant difference in regard of stress between CG and EG before aerobic exercise

	Group	N	Mean	Std. Deviation	Std. Error Mean
Stress	Experimental	10	2.51	0.15	0.04
	Control	10	2.52	0.15	0.04

Table 7. Independent Samples Test

		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Stress	Equal variances assumed	0.00	0.95	-0.04	18	0.96	-0.00	0.07	-0.15	0.14
	Equal variances not assumed			-0.04	18.00	0.96	-0.00	0.07	-0.15	0.14

Table 8. Highlights the significant difference in regard of stress between CG and EG after aerobic exercise

	Group	N	Mean	Std. Deviation	Std. Error Mean
Stress	Experimental	10	1.75	0.10	0.03
	Control	10	2.52	0.15	0.04

Table 9. *Independent Samples Test*

		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Stress	Equal variances assumed	1.91	0.18	-12.68	18	0.00	-0.76	0.06	-0.89	-0.63
	Equal variances not assumed			-12.68	15.83	0.00	-0.76	0.06	-0.89	-0.63

The p= 0.87 is greater than the significant level α = 0.05, hence the hypothesis is rejected and conclude that the mean score for EG and CG is not significantly different. Based on the result, it can be stated that there was not a significant difference in mean score of javelin thrower between pre-test of control group and experimental group ($t_{.096}$ = 17.94, p > 0.005).

According to table 5, experimental group showed 57.90 meters throw in post-test and control group showed 50.10-meter throw in javelin. It means that experimental group increased performance in javelin throw after aerobic exercise for 8-weeks (4-days a week). The p= 0.31 is greater than the significant level α = 0.05. As the p-value is greater than α level, therefore, we should use the mid row of the output (equal variance assumed). And, the p-value as highlighted was found as 0.00 which is less than the critical value 0.05. Therefore, it can be concluded that there is statistically significant difference between the mean score of two different groups i.e., EG and CG in respect of javelin throw.

According to the table 7 mean score for stress in EG was found as 2.51 and CG was found as 2.52. In Table 8, p= 0.95, therefore, we should use the mid row of the output (equal variance assumed). And, the p-value as highlighted was found as 0.96 which is greater than the critical value 0.05. Therefore, it can be concluded that both the groups were insignificantly different on stress before aerobic exercise. The Table 9 presented post-test mean of the CG and EG on stress after aerobic exercise. The mean score of EG was found 1.75 which is less than the pre-test score (2.51). Hence, we go to the next step of Levene's Test for Equality of Variances. The p= 0.183 is greater than the critical value; therefore, we should use the mid row of the output (equal variance assumed). And, the p-value as highlighted was found as 0.00 which is less than the critical value 0.05. Therefore, it can be concluded that both the groups were significantly different on stress after aerobic exercise. It means that aerobic exercise produced positive effect of reducing stress among the participants of experimental group.

DISCUSSION

This study investigated the influence of aerobic exercise on the mental health (stress) and performance of javelin throwers. The results of this research align with an increasing body of evidence that underscores the positive effects of aerobic exercise on the physical performance and mental well-being of athletes (stress), particularly within the specific context of javelin throwing. Notably, the of significant differences in javelin throw performance, stress levels between the experimental and control groups before the introduction of aerobic exercise intervention provides a solid basis for the subsequent analysis. Similarly, the study link to the Forteza et al. (2021), the exact physiological mechanisms underlying the mental changes induced by exercise remain unclear, the beneficial impact of physical activity in alleviating anxiety, stress, psychological changes, and depression is well-established and evident (Hubbard, 2014).

The substantial improvement in javelin throw performance within the experimental group following the aerobic exercise intervention is consistent with findings from various studies across different sports. It reinforces the notion that regular aerobic exercise can contribute significantly to enhanced athletic capabilities, potentially through improved cardiovascular fitness, endurance, and overall physical conditioning. For those with type 2 diabetes, regular exercise is essential for both preventing and managing insulin resistance. In addition to enhancing insulin action, aerobic exercise effectively

lowers blood pressure, blood lipid levels, blood glucose, cardiovascular mortality risk, and overall quality of life. Sports and physical activity provide mental, emotional, and social advantages in addition to psychological and physical ones (Odunaiya & Oguntibeju, 2013; Vanhees et al., 2012).

The reduction in stress levels among the experimental group compared to the control group after engaging in aerobic exercise underscores the stress-reducing benefits of this specific type of physical activity. This finding resonates with research suggesting that aerobic exercise can act as a powerful stress management tool, providing athletes with a means to cope with the psychological demands of competitive sports. Similarly, the substantial decrease in depression levels within the experimental group post-intervention is in line with a broader literature emphasizing the antidepressant effects of aerobic exercise (Chijioke, 2021; Torelly et al., 2022). Frequent exercise has been linked to the production of neurotransmitters such as endorphins, which enhance mood and promote mental health (Aditya et al., 2023; Arsović et al., 2020). The cumulative evidence suggests that incorporating aerobic exercise into training regimens can serve as a holistic approach to promoting both physical and mental well-being among athletes (Parra et al., 2020). Another study suggested that don't fully understand the physical processes driving mental changes, the benefits of exercise in lessening anxiety, stress, and depression are apparent. One way to explain the positive social effects of sports is through the activation of the central nervous system and the release of endorphins, which are associated with feelings of relief and relaxation (Mutrie & Faulkner, 2004; Otto & Smits, 2011).

CONCLUSION

This study examined the impact of aerobic exercise on stress and performance of professional javelin throwers from the Faisalabad National Athletic Club. The experimental group demonstrated a marked improvement compared to the control group, indicating the efficacy of aerobic exercise in enhancing the athletic performance of javelin throwers. However, the subsequent aerobic exercise intervention had a noteworthy impact, significantly reducing stress levels in the experimental group in comparison to the control group. This highlights the potential effectiveness of aerobic exercise in mitigating stress among professional javelin throwers. This underscores the importance of carefully considering mental health implications in the implementation of exercise interventions, acknowledging that the effects on different mental health parameters may vary. In conclusion, while aerobic exercise emerged as a powerful tool for improving javelin throw performance and reducing stress among professional athletes, the study underscores the need for a comprehensive understanding of its potential effects on mental health. These findings can inform practitioners, coaches, and athletes about the multifaceted implications of incorporating aerobic exercise into training regimens, emphasizing the importance of considering both physical and mental well-being in athletic performance enhancement strategies.

RECOMMENDATIONS & FUTURE DIRECTIONS

Aerobic exercises programs can potentially address the javelin throwers needs both physical and mental stress. Aerobic exercise can play a positive role in reducing stress levels among Javelin throwers. Explore combined approaches, such as cognitive-behavioral therapy, alongside aerobic exercise for a more comprehensive strategy. Future research could explore personalized approaches and collaboration across disciplines to optimize the overall health and performance of javelin throwers. Incorporate stress-reduction techniques within training programs, acknowledging the potential efficacy of aerobic exercise in alleviating stress.

DECLARATION

Authors' Contribution Statement: Muhammad Ihsan Ul Haq was responsible for the conceptualization, methodology, and writing of the original draft. Tasleem Arif contributed to data curation, formal analysis, and the review and editing of the manuscript. Syed Zia Ul Islam oversaw the investigation, provided resources, and supervised the project.

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

Aditya, M., Pradeep, P., & Varun, A. (2023). Role of Physical Activity on Mental Health and Well-Being: A Review. *Cureus*, *15*(1).

Arsović, N., Đurović, R., & Rakočević, R. (2020). Influence of physical and sports activity on mental health. *Facta Universitatis, Series: Physical Education and Sport*, 559-568.

Carson, H. J., & Collins, D. (2016). The fourth dimension: A motoric perspective on the anxiety–performance relationship. *International Review of Sport and Exercise Psychology*, *9*(1), 1-21.

Centonze, A., Popolo, R., Panagou, C., MacBeth, A., & Dimaggio, G. (2023). Experiential techniques and therapeutic relationship in the treatment of narcissistic personality disorder: The case of Laura. *Journal of Clinical Psychology*, *79*(7), 1656-1669.

Chijioke, A. (2021). *Using Aerobic Exercise to Reduce Depression Symptoms in Adults* (Doctoral dissertation, Brandman University).

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385-396.

Cueto, L. J., & Agaton, C. B. (2021). Pandemic and typhoon: Positive impacts of a double disaster on mental health of female students in the Philippines. *Behavioral Sciences*, *11*(5), 64.

Feitosa, M. S., dos Santos, T. M., De Faria, A. L., da Silva, C. O., & de Campos, C. A. (2011). Stress level in the students of a nursing course. *Journal of Nursing UFPE / Revista De Enfermagem UFPE*, 5(7), 1560-1569. https://doi.org/10.5205/reuol.1262-12560-1-LE.0507201101

Fogaca, J. L. (2021). Combining mental health and performance interventions: Coping and social support for student-athletes. *Journal of Applied Sport Psychology*, *33*(1), 4-19.

Forteza, F., Giorgini, G., & Raymond, F. (2021). Neurobiological processes induced by aerobic exercise through the endocannabinoidome. *Cells*, *10*(4), 938.

Franklin, B. A., Eijsvogels, T. M., Pandey, A., Quindry, J., & Toth, P. P. (2022). Physical activity, cardiorespiratory fitness, and cardiovascular health: A clinical practice statement of the American Society for Preventive Cardiology Part II: Physical activity, cardiorespiratory fitness, minimum and goal intensities for exercise training, prescriptive methods, and special patient populations. *American Journal of Preventive Cardiology*, *12*, 100425.

Funuyet-Salas, J., Pérez-San-Gregorio, M. Á., Martín-Rodríguez, A., & Romero-Gómez, M. (2022). Vitality, mental health and role-physical mediate the influence of coping on depressive symptoms and self-efficacy in patients with non-alcoholic fatty liver disease: A cross-sectional study. *Journal of Psychosomatic Research*, *162*, 111045.

Hubbard, J. (2024). *Wellbeing Work-0ut: Utilisation and comparison of Green Exercise and Mindfulness-Based Stress Reduction as Workplace Interventions for staff at the University of Essex* (Doctoral dissertation, University of Essex).

Khalaf, Y., Ahmed, S., & Mohamed, H. (2022). The Impact of a training program on some special physical abilities and the performance record of javelin throwing competition. *International Journal of Sports Science and Arts*, *20*(1), 121-138.

Leguizamo, F., Olmedilla, A., Núñez, A., Verdaguer, F. J. P., Gómez-Espejo, V., Ruiz-Barquín, R., & Garcia-Mas, A. (2021). Personality, coping strategies, and mental health in high-performance athletes during confinement derived from the COVID-19 pandemic. *Frontiers in Public Health*, 8, 561198. https://doi.org/10.3389/fpubh.2020.561198

Li, A. W., & Goldsmith, C. W. (2012). The effects of yoga on anxiety and stress. *Alternative Medicine Review*, 17(1), 21-35.

Mojtahedi, D., Dagnall, N., Denovan, A., Clough, P., Dewhurst, S., Hillier, M., & Perry, J. (2023). Competition anxiety in combat sports and the importance of mental toughness. *Behavioral Sciences*, *13*(9), 713.

Mutrie, N., & Faulkner, G. (2004). Physical activity: Positive psychology in motion. *Positive Psychology in Practice*, 146-164.

Odunaiya, N. A., & Oguntibeju, O. O. (2013). Physical activity in the Management of Diabetes Mellitus. *Diabetes Mellitus-Insights and Perspectives* IntechOpen.

Otto, M. W., & Smits, J. A. (2011). *Exercise for mood and anxiety: Proven strategies for overcoming depression and enhancing well-being*. OUP USA.

Parra, E., Arone, A., Amadori, S., Mucci, F., Palermo, S., & Marazziti, D. (2020). Impact of physical exercise on psychological well-being and psychiatric disorders. *Journal for Reattach Therapy and Developmental Diversities*, 3(2), 24-39.

Rao, U. T., Noronha, J. A., & Adiga, K. (2020). Effect of aerobic exercises on depressive symptoms, anxiety, self-esteem, and quality of life among adults with depression. *Clinical Epidemiology and Global Health*, *8*(4), 1147-1151.

Richards, C. L., Iademarco, M. F., Atkinson, D., Pinner, R. W., Yoon, P., Mac Kenzie, W. R., ... & Frieden, T. R. (2017). Advances in public health surveillance and information dissemination at the Centers for Disease Control and Prevention. *Public Health Reports*, *132*(4), 403-410.

Richards, K., Campenni, C., & Muse-Burke, J. (2010). Self-care and well-being in mental health professionals: The mediating effects of self-awareness and mindfulness. *Journal of Mental Health Counseling*, *32*(3), 247-264.

Sharma, K. S., Pailoor, S., Choudhary, N. R., Bhat, P., & Shrestha, S. (2020). Integrated yoga practice in cardiac rehabilitation program: a randomized control trial. *The Journal of Alternative and Complementary Medicine*, *26*(10), 918-927.

Speight, J., Holmes-Truscott, E., Hendrieckx, C., Skovlund, S., & Cooke, D. J. D. M. (2020). Assessing the impact of diabetes on quality of life: what have the past 25 years taught us?. *Diabetic Medicine*, *37*(3), 483-492.

Stein MB, Roy-Byrne PP, Craske MG (2005). Functional impact and health utility of anxiety disorders in primary care outpatients. *Medical Care*. 2005; 43:1164–1170.

Torelly, G. A., dos Santos Novak, P., Bristot, G., Schuch, F. B., & de Almeida Fleck, M. P. (2022). Acute effects of mind-body practices and exercise in depressed inpatients: A randomized clinical trial. *Mental Health and Physical Activity*, *23*, 100479.

Vanhees, L., Geladas, N., Hansen, D., Kouidi, E., Niebauer, J., Reiner, Ž., & Börjesson, M. (2012). Importance of characteristics and modalities of physical activity and exercise in the management of cardiovascular health in individuals with cardiovascular risk factors: Recommendations from the EACPR (Part II). *European Journal of Preventive Cardiology*, 19(5), 1005-1033.

Wang, X., Liu, R., Zhang, T., & Shan, G. (2022). The proper motor control model revealed by wheelchair curling quantification of elite athletes. *Biology*, *11*(2), 176.

Xu, K., Hou, J., Luo, T., Sun, X., & Lu, W. (2023). A Study of the Long-Term Effects of Low-Carbohydrate Diets on Chinese Cyclists' Performance. *Studies in Sports Science and Physical Education*, *1*(3), 31-36.

Zhang, Z., & Chen, W. (2019). A systematic review of measures for psychological well-being in physical activity studies and identification of critical issues. *Journal of Affective Disorders*, 256, 473-485.

Cite this Paper as:

Haq, M., Arif, M., & Islam, S. (2024). Effect of Aerobic Exercises on Mental Health and Performance of Javelin Thrower. *THE SKY-International Journal of Physical Education and Sports Sciences*, *8*(1).