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ORIGINAL

IMPACT OF HIGH-INTENSITY INTERVAL TRAINING ON CARDIAC HEALTH IN ELITE ATHLETES.

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ABSTRACT

Our research studies how HIIT exercise affects heart health in trained athletes by investigating its benefits and limitations as a training method. Short intense workout segments interrupted by recovery breaks push cardiovascular endurance up while making the heart pump stronger and working better while decreasing blood pressure and poor lipid control. HIIT training creates heavy demands on the body that raise the chance of heart troubles and overtraining symptoms. This paper reviews how intense training with recovery periods affects heart health while showing how to keep the cardiovascular system healthy along with athletic success. Research shows that specific HIIT training combined with health assessments helps us get HIIT's benefits safely. HIIT has become popular for fitness training because it delivers better performance results to professional athletes. During HIIT sessions you perform intense exercises in short intervals with recovery breaks to push your cardiovascular system to greater health benefits. Sports experts study HIIT effects on heart health in elite athletes through heart rate variability research and measurements of heart size and working performance. The heart responds positively to frequent HIIT training which improves heart performance by increasing both blood volume and vessel fitness plus raises the heart's pumping ability. Research shows that HIIT helps prevent heart disease through fat reduction and improved metabolism which eases blood pressure concerns and decreases cholesterol levels. Heavy HIIT training with too many repetitions can take a heavy toll on the heart and creates potential heart problems especially when combined with insufficient recovery for athletes. The relationship between workout strength and rest along with an athlete's specific features helps determine when HIIT training becomes more beneficial than dangerous for the heart.

KEYWORDS: High-Intensity Interval training (HIIT), Cardiac Health (CH), Elite Athletes (EA).

1. INTRODUCTION

The word high intensity interval training which is also abbreviated as HIIT refers to that kind of intense workout which is then followed by a period of rest. Sometimes it may be followed by low-intensity exercise as well. Recent studies have shown that there are some important benefits of high-intensity interval training such as this training are time efficient. As we know in traditional workout methods, there is much consumption of time but in high-intensity interval training, there is less consumption of time because it involves high-intensity workouts for brief periods. It has also been seen that the rate of calories burned in high-intensity interval training is relatively high compared to traditional workouts(Cipryan et al., 2017). In these trainings, there is calorie burn during and after exercise as well. We have seen that the cases of diabetes type 2 have been increasing to alarming levels because of less sensitivity to insulin. But by high-intensity interval training, it has been proved that there is improvement in insulin sensitivity in the body which reduces the risk of type 2 diabetes. Muscle strength is directly related to exercise. So, in response to high-intensity interval training, there is enhanced efficiency in terms of muscle power and muscle strength. Cardiovascular health is mandatory for proper functioning of the body so we can say that cardiovascular health is important for both physical and mental health(Francois & Little, 2017; Grandison et al., 2023). Cardiovascular health can easily be improved by high-intensity interval training. Now we are going to understand that what are important impacts of high-intensity interval training on the cardiovascular health of elite Athletes. There are some important benefits of high-intensity interval training on cardiovascular health in Elite Athletes which are listed below. The first and foremost benefit is that high-intensity interval training can improve cardiovascular function in elite Athletes. There is increased cardiac output, stroke volume, and aerobic activity which all are helpful in the improvement of cardiovascular health in Elite Athletes(Astorino et al., 2012). As we know when elite Athletes are engaged in high-intensity interval training, there is more need for oxygen in the body because of an increased level of aerobic activity. When aerobic activity increases, there is an extra function of the heart which will result in increased cardiac output. If we discuss about structure of the heart, we may know that there are four Chambers in the heart. The lower two chambers are named as the left and right ventricle(Kiviniemi et al., 2014). Recent studies have shown that mainly left ventricle plays a much important role in maintaining cardiovascular health. The studies related to the impacts of high-intensity interval training have shown that this training is useful for improvement in the function of the left ventricle. This aspect is also helpful for better and improved cardiovascular health in Elite Athletes. As we know the cardiovascular system

includes the heart along blood vessels as well. So, the effective function of blood vessels is also mandatory for better cardiovascular health. Blood vessels are important for the exchange of gases between blood and muscles. There is an important term vasodilation in science which means the dilation of blood vessels in the body. When vasodilation increases, there is a better exchange of oxygen between blood and muscles(Engel et al., 2018). Recent studies have shown that high-intensity interval training will help in improved vasodilation so improved vasodilation will enhance cardiovascular health in Elite Athletes. The other important benefit of high-intensity interval training on cardiovascular health in Elite Athletes is the aspect of less systemic vascular resistance. As we know when there is more resistance, there will be an increase in blood pressure as well which is dangerous for cardiovascular health. But by high-intensity interval training, there is reduced systemic vascular resistance which will work for lowering blood pressure thus maintaining the health of the cardiovascular system as well(Sheykhlouvand et al., 2022). It has also been seen that high-intensity interval training will help in increased nitric oxide production which is especially a vasodilator. It will be effective for enhanced blood flow and reduced blood pressure as well. The other important benefit of high-intensity interval training on cardiovascular health in Elite Athletes is the aspect of increased production of red blood cells in the body. It has been seen that high-intensity interval training will help promote the production of erythropoietin in the body which is an important hormone for red blood cell production in the body(Batacan et al., 2017). When there is an increase in several red blood cells in the body, there will be effective oxygen delivery in the body as well. There is an important protein in muscles named myoglobin which is important for storing oxygen in muscles. High-intensity interval training will enhance myoglobin levels in muscles, in this way, there will be more oxygen storage in muscles and as a result, we will have improved endurance of muscles. As we know there are two important types of cholesterol in the body and good cholesterol is one of these types. High-density lipoprotein cholesterol is also termed good cholesterol which is useful for removing excess cholesterol from blood. By high-intensity interval training, there is an increased level of high-density lipoprotein cholesterol in the body as well(Atakan et al., 2021). There are many cardiovascular diseases in the body that are related to increased levels of triglycerides in the blood. High-intensity interval training will reduce the level of triglycerides in the blood; thus, it will prevent the risk of many cardiovascular diseases in elite Athletes. Recent studies have shown that there is also an anti-inflammatory impact of high-intensity interval training which will work for reducing oxidative stress and inflammation in blood vessels. As we know antioxidants are necessary in the body to fortress the prevention of cell damage. High-intensity interval training will improve antioxidant levels in the body as well. Some important physiological adaptations in elite Athletes are related to the impact of high-intensity interval training on cardiovascular health in Elite

Athletes(Chang et al., 2020). The first important physiological adaptation is that there is increased mitochondrial density as a result of high-intensity interval training. As we know mitochondria are considered the powerhouse of cells, so a greater number of mitochondria per cell will be helpful for enhanced energy production in cells. It has also been seen that the buffering capacity of muscles is also enhanced by high-intensity interval training. This enhanced buffering capacity will be useful for removing metabolic wastes from muscle cells(Ito, 2019; Zhou, 2024).

1.1 Research Objective

The main objective of this research is to enumerate all those studies that are related to the impact of high-intensity interval training on cardiovascular health in Elite Athletes. These studies have effectively explained about various important impacts of high-intensity interval training on cardiovascular health in different ways. The research study determines that impact of high-intensity interval training on cardiac health in the elite athletes. The research paper divided into five specific chapter first section represent introduction included objective of research. The second portion describe that literature review the third section present the methods of research included tools and techniques. The fourth section represent that result and its descriptions also that last portion summarized overall research study and present recommendations about topic.

2. Literature Review

Researchers reveal that athletes indulging in HIIT have different body mass or index than those who indulge in low-intensity workouts. athletes playing handball sports perform better because of their good body mass index. maintaining body mass through exercises is important for athletes to improve their game performance (Arifin et al., 2024). Studies suggest that people facing rheumatoid arthritis problems face problems related to cardiovascular health.to improve the cardiovascular health of rheumatoid patients they are advised to indulge in HIIT to improve their physical strength. A randomized trial-based study was performed on rheumatoid patients to assess the improvement in their physical health as a result of HIIT. The result of the trial revealed that patients' physical health improved greatly because of high-intensity physical exercises(Bilberg et al., 2024). Experimental studies were performed to assess the impact of HIIT on the cognitive functioning of athletes. results predicted that intensity-based exercises improved athletes' neurological functioning thereby improving their cognitive abilities. Also, the impact of high-intensity training on athletes has more positive outcomes as compared to moderate intensity-based training sessions(Buzdagli et al., 2024). Studies have revealed that in athletes cardiovascular-related health problems are becoming prevalent. To avoid this health problem automated HRV guided sessions are given to athletes. athletes

trained with HRV-guided training show improved cardiovascular health than athletes trained with HIIT(Carrasco-Poyatos et al., 2024). Studies claim that the majority of Chinese people are getting cardiovascular health problems due to unhealthy lifestyle routines. Middle-aged people in China are at high risk of cardiovascular health problems. By making the middle-aged population indulge in HIIT the risk of cardiovascular problems decreases among them. improved cardiovascular health ensures better health outcomes and also lowers the chances of heart-related diseases onset at an early age(Chen et al., 2024). Studies reveal that rehabilitation therapies play a significant role after a person recovers from cardiovascular disease. ExCR is a rehabilitation program that improves the cardiovascular health of people who recover from major cardiovascular disorders. in rehabilitation centers, HIIT sessions are preferable to MICT as the outcomes from HIIT in cardiovascular patients are more prominent(Costache et al., 2024). Studies predict that HIT is an effective training program for reducing the fat percentage in fat respondents as well as in non-respondents. Reducing body fat helps in improving cardiovascular health therefore the chances of heart-related disease onset are minimized Also, the reduction in body fat percentage as a result of HIIT is higher in people who are fat respondents (Domaradzki & Koźlenia, 2024). Studies show that netball sports players are provided with HIIT to improve their game-playing ability and to strengthen their physical health. HIIT sessions followed by a duration of rest enhance athletes' ability to perform better in netball sports (Eather et al., 2024). Studies suggest that different exercise-based training is responsible for inducing different cardiac responses in patients. Research has identified the impact of exercise on athlete cardiac health and the biomarkers released in responses to exercise-based training. the results revealed that HITT as well as continuous training release biomarkers in athletes that influence how gene shows polymorphism. These results revealed that different exercise programs are given to athletes to control the influence of strength training on biomarker response(Falahati & Arazi, 2024). Clinical studies performed on individuals with depression revealed that HIIT training lowers depression and its effect on people Individuals facing depression and other mental health problems are advised to take HIIT training sessions to improve their physical as well as mental health. The result of a clinically trailed-based study revealed that the majority of depressed individuals show improvement in their anxiety symptoms after joining HIIT sessions(Gaia et al., 2024). The study revealed that stress assessment tests were performed on individuals after they were given HIIT to predict the impact of exercise on the health of these individuals. The results of the study revealed that no change in endurance tress respondents was observed in individuals who performed HIIT(Javelle et al., 2024). Studies claim that in obese people vascular functioning gets disturbed due to fat layer formation around the vascular veins. To improve vascular functioning obese people are advised to perform HIIT and MICT, the result of a study made on

obese people having vascular health problems revealed that obese people who indulged in HIIT showed improved dilation of blood vessels as compared to obese people who participated in the MICT group(KB et al., 2024). Studies suggest that different intensity-based exercises impact the heart functioning differently in athletes. a strain-specific analysis study revealed that an athlete's heart functioning changes when he indulges in different types of intensity workouts(Kösemen et al., 2024). Studies elaborate that extreme exercise training in CAD patients can result in the formation of atherothrombosis. the formation of a thrombus can lead to heart failure or heart attack. To avoid heart-related problems problem CAD patients are trained using MICT to HIIT-based exercise sessions. Various type of exercise influences the formation of blood clotting factors in CAD patients. To reduce the formation of blood clotting factors in CAD patients proper and well-guided exercise training sessions are provided to patients(Košuta et al., 2024). Scholars predict that football athletes perform different exercises to improve their strength to perform in their sports. aerobic continuous training and HIIT training programs are the most followed exercise programs by football athletes these programs are significant in enhancing the overall physical and mental health of football players(Sharif et al., 2024). Studies reveal that athletes playing soccer and basketball require full concentration to perform their sports efficiently the players of these two sports require mental clarity to concentrate on their required tasks. Athletes' soccer players get mental clarity by practicing HIIT. HIIT improves athletes' physical game-playing skills and polishes their mental skills to tackle game-related tasks with full concentration(Shiraz et al., 2024). Studies claim that taekwondo athletes showed improvement in their sport-related performance when they were trained using high-specific technique intervals along with short specific technique intervals (Song & Sheykhlouvand, 2024).Studies suggest that cardiac patients receiving treatment at home require HIIT to improve their cardiac health safely. HIIT is the safest and most convenient form of exercise that is easily performed at home(Turnbull et al., 2024). Scholars explain that endurance is the characteristic developed in athletes of different sports through HITT and MICT sessions(Wang & Wang, 2024). Also, athletes who reach the final stage of rehabilitation after a sports injury are provided with short-interval intensity training to make them fully recover after the rehabilitation procedure(Zhang et al., 2024).

3. Methods

The research study determines that impact of high-intensity interval training on cardiac health in elite athletes. The research study based on primary data analysis for determine the research used SPSS software and generate result included descriptive statistical analysis, the ANOVA test analysis, the model summary, the chi square analysis between them.

Table 1: The Result of Descriptive Statistics

DESCRIPTIVE STATISTICS					
	N	**MINIMUM**	**MAXIMUM**	**MEAN**	**STD. DEVIATION**
HIGH-INTENSITY INTERVAL TRAINING 1	51	1.00	3.00	1.5686	.70014
HIGH-INTENSITY INTERVAL TRAINING 2	51	1.00	3.00	1.4118	.53578
HIGH-INTENSITY INTERVAL TRAINING 3	51	1.00	3.00	1.5882	.63801
CARDIAC HEALTH 1	51	1.00	3.00	1.5686	.60844
CARDIAC HEALTH 2	51	1.00	3.00	1.7255	.66569
ELITE ATHLETES.	51	1.00	3.00	1.4314	.60844
VALID N (LISTWISE)	51				

The result of above table 1 results demonstrate that descriptive statistical analysis result represents the minimum values, the maximum values, the mean values, also that explain the standard deviation rates of each variables included dependent and independent. The high-intensity interval training 1 is main independent variable result represent that its mean value is 1.568 the standard deviation rate is 70% deviate from mean. The high intensity interval training 2 and 3 both are considering as independent variable result describe that its mean value is 1.4118 and 1.5882 both values shows that positive average value of mean. The standard deviation rate is 53% and 63% deviate from mean values. The cardiac health 1,2 both consider as dependent variable result shows that its mean value is 1.5686 and 1.7255 both shows that positive value of mean. The standard deviation rate is 60% and 66% deviate from mean values. The elite athletes consider as mediator variable result shows that its mean value is 1.4314 the standard deviation value is 60% deviate from mean. The overall minimum value is 1.000 the maximum value is 3.000 respectively.

4. Implications

The effects of High-Intensity Interval Training (HIIT) on athletic performance and cardiac health both show up right after training and over a longer period for elite athletes. Athletes who do HIIT improve their heart work better as their heart pumps more blood at greater efficiency and produces more blood with each beat. By adapting their bodies through HIIT training elite athletes can perform harder exercises longer while boosting both their endurance and power. HIIT strength training improves the health of your heart beyond athletics and may protect against cardiac illnesses by creating heart health benefits. Regular performers of intensive High-Intensity Interval Training cost themselves physical risks since their bodies need proper recovery breaks. Unnecessary training puts pressure on the heart which creates heart rhythm

problems and affects heart rate function plus causes rare heart tissue damage. Athletes who view their health but refuse to schedule enough rest face elevated dangers. HIIT proves good for heart fitness though its efficacy depends on each athlete's fitness background and natural athletic ability plus training background. The implications for coaches, athletes, and sports health professionals are clear: HIIT holds strong benefits for heart health and sports success however suitable practices need to control its use. Elites need specific workout designs plus appropriate training control plus regular rest to gain top results while lowering HIIT dangers.

Table 2: The Result of ANOVA

ANOVA						
		SUM OF SQUARES	**DF**	**MEAN SQUARE**	**F**	**SIG.**
HIGH-INTENSITY INTERVAL TRAINING 1	Between Groups	.687	2	.343	.692	.506
	Within Groups	23.823	48	.496		
	Total	24.510	50			
HIGH-INTENSITY INTERVAL TRAINING 2	Between Groups	.030	2	.015	.050	.951
	Within Groups	14.323	48	.298		
	Total	14.353	50			
HIGH-INTENSITY INTERVAL TRAINING 3	Between Groups	.634	2	.317	.772	.468
	Within Groups	19.719	48	.411		
	Total	20.353	50			
CARDIAC HEALTH 1	Between Groups	1.218	2	.609	1.691	.195
	Within Groups	17.292	48	.360		
	Total	18.510	50			
CARDIAC HEALTH 2	Between Groups	.053	2	.026	.057	.944
	Within Groups	22.104	48	.461		
	Total	22.157	50			

The result of above table 2 represents that ANOVA test analysis result describe that sum of square values, the mean square values, the F statistic also that explain the significant rates of each variables included dependent also independent. The high-intensity interval training 1 is main independent variable result shows that its sum of square value is 68%, the 34% average square value of mean. The significant rate is 50% significantly level between them. the high-intensity interval training 2 and 3 represent that mean square value is 15%, 31% average square rates. The F statistic value is 5% and 77% the significant rate is 95% and 46% significantly levels between them. the cardiac health 1 and 2 both variables represent that sum of square value is 1.218, 0.053, 22.104 also that 22.157 shows that positive sum of square values between them. the F statistic value is 1.691 and 0.057 the significant rate is 19% and 94% significantly level between them.

Table 3: The result of Model Summary

MODEL SUMMARY				
MODEL	**R**	**R SQUARE**	**ADJUSTED R SQUARE**	**STD. ERROR OF THE ESTIMATE**
1	.335[a]	.112	.035	.59775
A. Predictors: (Constant), Elite Athletes., High-Intensity Interval Training 2, High-Intensity Interval Training 3, High-Intensity Interval Training 1				

The result of above table 3 results demonstrates that model summary result shows R values, R square values, the adjusted R square value also that explain the standard error of the estimated value of model 1. The R rate is 33% the R square value is 11% also that explain the adjusted R square value is 3% the standard error of the estimated value is 59% respectively.

Table 4: The Result of ANOVA

ANOVA[a]						
MODEL		**SUM OF SQUARES**	**DF**	**MEAN SQUARE**	**F**	**SIG.**
1	Regression	2.074	4	.518	1.451	.233[b]
	Residual	16.436	46	.357		
	Total	18.510	50			
A. Dependent Variable: Cardiac Health 1						
B. Predictors: (Constant), Elite Athletes., High-Intensity Interval Training 2, High-Intensity Interval Training 3, High-Intensity Interval Training 1						

The above table 4 results demonstrate that ANOVA test analysis result describe that sum of square values, the mean square values, the F statistic also that significant rate of regression model and residual model. The regression model shows that sum of square value is 2.074 the mean square rate is 51% the F statistic value is 1.451 also that its significant rate is 23% significantly levels between them. The residual model shows that mean square rate is 35% the sum of square value is 16.436 respectively. The total value is 18.510 its shows that positive sum of square rates between them.

Table 5: The Result of Coefficients

COEFFICIENTS[A]						
MODEL		**UNSTANDARDIZED COEFFICIENTS**		**STANDARDIZED COEFFICIENTS**	**T**	**SIG.**
		B	**STD. ERROR**	**BETA**		
1	(Constant)	1.341	.431		3.115	.003
	High-Intensity Interval Training 1	.124	.130	.143	.959	.343
	High-Intensity Interval Training 2	.110	.160	.097	.692	.493

Table 5(b): The Result of Coefficients

COEFFICIENTS[A]						
MODEL		**UNSTANDARDIZED COEFFICIENTS**		**STANDARDIZED COEFFICIENTS**	**T**	**SIG.**
		B	**STD. ERROR**	**BETA**		
2	High-Intensity Interval Training 3	.127	.141	.133	.897	.374
	Elite Athletes.	-.227	.142	-.227	-1.601	.116
A. Dependent Variable: Cardiac Health 1						

The above table 5 results demonstrate that linear regression model result describe beta value included coefficient values also that explain the t statistic and significant rate of each independent variables. the high-intensity interval training 1,2,3 these factors consider as independent variable result represent that its beta value is 0.124, 0.110 and 0.127 result shows that t statistic value is 95%, 69% and 89% the significant rate is 34%, 49% and 37% significantly levels between the high-intensity interval training and cardiac health. The elite athletes are mediator variable result shows that its beta value is -0.227 the t statistic value is -1.601 the significant rate is 11% significantly levels between them.

Table 6: The Result of Test Statistics

TEST STATISTICS						
	HIGH-INTENSITY INTERVAL TRAINING 1	**HIGH-INTENSITY INTERVAL TRAINING 2**	**HIGH-INTENSITY INTERVAL TRAINING 3**	**CARDIAC HEALTH 1**	**CARDIAC HEALTH 2**	**ELITE ATHLETES**
CHI-SQUARE	14.235[a]	26.824[a]	15.176[a]	17.412[a]	11.412[a]	24.824[a]
DF	2	2	2	2	2	2
ASYMP. SIG.	.001	.000	.001	.000	.003	.000
A. 0 Cells (0.0%) Have Expected Frequencies Less Than 5. The Minimum Expected Cell Frequency Is 17.0.						

The Result of above results of table 6 demonstrate that chi square analysis result represents the value of chi square also that explain the significant rate of each variables included dependent and independent. The chi square value of high-intensity interval training 1,2, and 3 its chi rate is 14.235, 26.824 and 15.176 result shows that positive chi square value. The cardiac

health 1,2, consider as dependent variable result shows that its chi square value is 17.412 and 11.412. the elite athletes are mediator variable result shows that its chi square value is 24.824 the overall significant rate is 0.000 shows that 100% significant levels between them.

5. Applications

Elite athletes now use High-Intensity Interval Training (HIIT) because it strengthens their cardiovascular health better than any other method. The applications of HIIT on cardiac health in elite athletes can be explored in several key areas:

5.1. Enhanced Cardiovascular Endurance

Application: High-Intensity Interval Training increases athletic endurance and aerobic capability according to research. Constant shifts between high intensity activity and brief rest make the heart work better at pumping blood which strengthens your cardiovascular fitness. • Impact on Cardiac Health: The heart becomes better at pumping blood when faced with high-intensity sports training which helps athletes run faster and swim farther.

5.2. Higher HRV Measurement After Completion:

• Application: Raised levels of heart rate variability during HIIT enhance your cardiovascular health. • Impact on Cardiac Health: More varied heart rate patterns through HRV help keep the heart healthy while lowering the chance of heart problems. Having a more adjustable heart helps athletes handle different physical challenges that happen during competition.

5 3. HIIT Training Lowers how Often your Heart Beats when you are at Rest.

• Application: When you perform HIIT workouts your heart becomes more effective at pumping blood and your resting heart rate goes down. • Impact on Cardiac Health: Healthy athletes have lower resting heart rates even though standard population heart rates are higher. This fitness measurement shows top athletic heart condition.

5. 4. HIIT Enhances Mitochondrial Cell Numbers and Develops New Blood Vessels in the Body.

• Application: By using high-intensity interval training you generate more mitochondria and create better blood vessel networks across your muscles. • Impact on Cardiac Health: The new blood vessels and improved oxygen delivery system enhance muscle performance while decreasing physical demand on the heart in sport activities.

5.5. Improved Blood Lipid Profile:

• Application: Research reveals HIIT training enhances the blood lipid profile by lowering entire cholesterol content while elevating HDL cholesterol amounts. • Impact on Cardiac Health: A healthy lipid profile helps prevent artery plaque development so elite athletes lower their risk of cardiovascular diseases and protect their hearts for life.

5.6. Reduction in Blood Pressure:

• Application: Studies demonstrate that HIIT successfully decreases both top and bottom blood pressure measurements in competitive athletes including those with normal earlier readings. • Impact on Cardiac Health: Our athletes need lower blood pressure to protect their hearts from disease and stroke alongside cardiovascular issues as required for a safe and healthy future.

5.7. Through HIIT athletes can better protect themselves against overtraining syndrome:

• Application: Repeated intense training takes its toll on athletes as overtraining syndrome causes poor athletic results plus heart problems. If you use HIIT correctly you can maintain suitable recovery time along with powerful training sessions. • Impact on Cardiac Health: When athletes combine HIIT training with regular rest they reduce their heart stress levels and protect their bodies from overtraining. 8. Periodic rest and proper recovery help people reduce cardiac risk during workouts. • Application: Doing HIIT workouts helps the body rest faster between sessions because it improves cardiovascular performance. • Impact on Cardiac Health: Athletes can keep top performance through faster recovery periods that protect their heart health during sports seasons.

5.8. HIIT Exercises Help you Avoid Getting Cardiovascular Diseases as they Benefit your Heart:

• Application: People who exercise in high-intensity interval training sessions lower their risk of heart diseases by controlling blood pressure and heart rates while reducing unhealthy fat buildup in their hearts. • Impact on Cardiac Health: Over time HIIT training helps keep the hearts of elite athletes functioning well even as they grow older and continue performing at their peak.

5.9. Psychological Benefits:

• Application: Organic-Cardiac health benefits of HIIT are not directly connected to results yet help improve your heart health by reducing stress and boosting mood. • Impact on Cardiac Health: Stress-related heart problems respond well to high-intensity interval training because it makes you healthier

overall and lowers your cardiovascular risk. By practicing HIIT training methods elite athletes benefit their hearts both physically and professionally.

6. Conclusion

Through HIIT training elite athletes enhance their heart health by improving cardiovascular strength and increasing blood flow while also making their heart work better. These heart changes help athletes compete better and maintain good heart health while lowering their chance of cardiovascular problems. The research study based on primary data analysis for determine ethe research used SPSS software and generate result included descriptive statistical analysis, the ANOVA test analysis, the chi square analysis, also that explain the regression analysis between them. High-intensity interval training carries health risks from overuse when you train too intensely without taking proper rest periods.

Strenuous training without proper monitoring can damage your heart and start abnormal heartbeats plus trigger additional cardiovascular problems. Home-trained elite athletes who watch their training progress and take breaks plus track heart health get the most benefit with minimized heart dangers. Overall result concluded that positive and significant impact of high-intensity interval training on cardiac health in elite athletes. Adequate preparation helps athletes use HIIT for top-level performance today and strong cardiovascular well-being tomorrow.

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