# The psychological benefits and challenges of using information technology in sports training and performance

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**Abstract**

The essential purpose of this research study is to determine the psychological benefits and challenges related to using information technology in sports training and performance. The research study is based on primary data. The psychological benefits and challenges are the main independent variable, the information technology is the mediator variable, and the training and performance are the main dependent variable. To determine the research use research questions related to variables, these question depends upon open-ended also closed-ended based. To determine the research study used SPSS software and generated selective results related to them. The descriptive statistic, control chart graphical analysis, pair correlation analysis, and variance analysis also describe regression analysis between independent and dependent variables. The overall result found that the psychological benefits directly and significantly link sports training and performance.

**Keywords:** Psychological Benefits (PB), Information Technology (IT), Sports Training and Performance (ST&P).

## 1. Introduction

Information technology is the product of the world's new and innovative technological revolution. The use of information technology in different fields of the world makes it one of the most effective technologies for various purposes. artificial intelligence is an IT-based system used in sports fields to improve the working system of sport-related sectors. In sports, AI helps deliver suitable physical education to athletes using educational training programs. The data about athletic training through physical education training programs are dealt with with the help of AI software. this software can store all information about athletes' physical performance. The old and traditional methods used for storing the information results in error in data. so using an AI system for generating athlete-related information and storing that information in the most up-to-date manner holds importance in sports (Abu Talib, Bettayeb, & Omer, 2021). moreover, in artificial intelligence systems, an algorithmic approach is used that stimulates the human ability to learn and think more creatively.AI provide human with self-learning ability using computer-generated algorithms. The automated task-performing ability of AI makes its effective software that is capable of making decisions better than humans. The technological modes are used in educational institutes to develop an education system that combines the use of AI and computer sciences (Azizi, Atlasi, Ziapour, Abbas, & Naemi, 2021). the physical education technology-based training centers are highly equipped with modern technology and aid the athlete in his physical training sessions in every possible way.

There is a lot of wearable AI technology-based device used in the sports field to make athletes' movement detectable from every angle. The wearable smart sports devices use digital technology to monitor athletes' overall physical state. After monitoring the athlete's body, these wearable smart devices provide information about their physical health and body postures. Digital wearable devices are used by athletes to provide them with the most advanced and intelligence-based sports equipment(Barrot, Llenares, & Del Rosario, 2021). the best feature of digital wearable sensors is that they are made using artificial intelligence and provide intelligence-based data. There are fewer chances of error in data obtained through an artificial intelligence system. Wearable sports devices improve athletes' sports activities and make their sports life more advanced.also, wearable sports sensors have a communication technique that provides feedback based on the athlete's current body language. The feedback is provided by assessing the psychological parameters of the athlete during the physical training sessions. The wearable sensors athletes use to provide information about athletes' heartbeat and blood pressure; at the same time, these sensors assess their physical state(Chow, Shuttleworth, Davids, & Araújo, 2019). Sports performance and training are essential to being an elite athlete and succeeding in competitive sports. Athletes devote themselves to intense training, skill improvement, and mental preparation, whether they are aiming for the podium, setting personal records, or performing at their peak. Modern technologies, support groups, and coaches all play crucial roles in developing potential and assisting athletes in reaching their objectives. The research delves into the vital components that lead to an athlete's success as we examine the complex world of sports training and performance. We will explore the foundational elements that lead to extraordinary athletic accomplishments, from physical preparation and skill development to the significance of mental toughness and tactical acumen. This research study also determines how information technology has transformed sports performance and training. Athletes and coaches can now access effective tools to optimize

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performance, monitor advancement, and acquire a competitive edge recognizes to the integration of advanced analytics, real-time feedback systems, and personalized training plans. This change is manageable, though. We will also examine the psychological challenges that occur as technology becomes more prevalent in sports, such as data overload, dependency issues, and privacy concerns, which must be managed to maximize its advantages. The only disadvantage of traditional wearable sensors is that they do not provide data in bulk and cannot detect occasional circumstances.to fill this gap, artificial intelligence-based wearable sensors are preferable for the sports field to traditional wearable sensors.

The second use of technology systems in sports-related areas is motion-capturing devices. The motion capture device is like a wearable suit that an athlete wears. The full-body suit is wireless and records the athlete's movement while he plays sports. By assessing the whole body, these sensors provide precise data about athletes' movements during sports playing. The third use of It based system in sports devices allows the playback analysis process (Luo, Gao, & Wang, 2021). The playback analysis system first captures the whole movement in a movie form and then pinpoints the athlete's drawbacks in the game. By pinpointing the bad playing skills of athletes, this playback technology-based analysis system provides the athlete a chance to improve their game performance. One more excellent feature of the playback analysis technique is that it provides 3D movements of an athlete so that athlete postures can be analyzed through every direction(Oakman, Kinsman, Stuckey, Graham, & Weale, 2020). This playback analysis technique allows players to observe their game-playing skills from a different view. The playback analysis technique is most often used by golf sports players to improve their performing skills.

The tracking system is the third technology-based system used in sports to aid athletes game performing activities. Real-time tracking system tracks the athlete's position that guides the athlete about his body movements in the game .visual tracking system uses artificial intelligence software that provides intelligence-based information about the athlete's various gestures like the athlete's speech movement is also tracked through the visionary tracking system .visualize tracking system uses cameras and other picture capturing devices that capture even the minor movement of the athlete during playing. The AI algorithm of these visualizing tracking systems makes them a preferable tracking device as compared to traditional tracking systems. Furthermore, the most critical feature of using technology in the sports field is that it enhances the training sessions for athletes(Pedraza-Ramirez, Musculus, Raab, & Laborde, 2020). virtual reality technology-based training centers are established to provide the athlete with real-

world experience using virtual technology. These virtual training sessions create great training opportunities for young athletes and enable them to level their game skills to the next level. All these technology-based software and equipment used in sports training sessions significantly improve athletes' psychological well-being. The psychological parameters of athletes that are improved as a result of AI used in sports training include better mood, improvement in athletic leadership abilities, enhancement of athlete self-esteem quality, maintenance of healthy weight, reduction in depression and stress symptoms, and improvement in athletic focusing ability towards game(Qi, 2019). All these are the benefits that athletes get as a result of using AI-based systems in sport-related physical education providing centers (Ataya et al., 2019).

Athletes playing various sports often suffer from sports-related injuries due to the lack of protection provided to them by sports organizations. To protect athletes from sports injuries and to minimize the risk of sport-related injuries in athletes, they are provided with technology-based sports equipment. The technology system tracks every athlete's movement and saves the athlete before he suffers from any injury incident while playing. The intelligence system used in the sports equipment senses any danger even before its occurrence and provides safety measures to the athlete. Also, athletes' diet and sleep patterns are made regular by coaches during the physical training sessions to ensure that athletes are in good health before playing any sports competitions(Wu, Yu, & Gu, 2020). so the technology-based sports equipment used in training sessions and sports competitions greatly improves athletic performance in every sports-related field. Most sports organizations are trying their best to advance all sports fields using Artificial intelligence-based software to minimize the risk associated with the sports field. The future of sports is fruitful only if advanced technology system replaces the traditional system in sports sectors (Strychalska-Rudzewicz & Rudzewicz, 2021). using AI algorithms in the sports field as a source of advanced technology can help the sports industries to modernize with the latest technological trends.

## Research objective:

This Research paper explains the psychological benefits and challenges of using information technology in sports training and performance. This research study represents that psychological benefits and challenges of using information technology in sports training and performance. the research divided into five specific chapters first section represent that introduction related to the psychological benefits and challenges also that information technology. This portion represent that objective of research study. The second part describe literature

review the third portion represent that research methodology its explain tools and techniques also that present research participants. The fourth section describe result and its descriptions the last portion summarized overall research study and present some recommendations about topic.

## Literature review:

Researchers claim that the Internet of Things is a new technology-based system that improves the knowledge-delivering services of various fields. For providing educational services to students, internet of Things-based systems is used in educational institutes. physical education providence using social media apps makes learning easier for students. the online teaching system is very common in the modern era and helps to make the knowledge acquisition process for the students easy(da Silva Castanheira, Sharp, & Otto, 2021).studies claim that pedagogic models are used in various educational providing institutes for teaching students. The pedagogic model works by using active metrologies to provide social and cultural-based knowledge to students about physical education. The pedagogic teaching models help improve students' ability to learn about the social and cognitive domains related to physical education (Davenport et al., 2018).studies explain that the game-based learning approach helps students of sports to learn more about game playing.

Game-based learning methods improve sports students learning abilities by motivating them to play with full determination. Sports students' academic performance improves through the game-based learning approach (Antoni & Dhabhar, 2019).studies suggest that using mindfulness interventions for improving athlete performance in sports and its related fields holds potential value. most athletes' performance in the sports field gets disturbed due to playing under pressure. Such athletes are provided with mindfulness intervention that makes athletes capable of facing any sports-related challenges.

The athletes' peak performance is achieved through mindfulness-based peak performance trials (F. Liu, Zhao, Liu, & Hao, 2020).studies show that various technology-based software is used in the sports field to make the performing ability of athletes more advanced. using information technology-based augmented reality technology in sports provides athletes with tremendous benefits. computer-generated real-world learning through novel technology-based augmented systems makes the learning ability of sports students more efficient(Brown, Sizov, & Brown, 2015).studies suggest that in the sports field, athlete body movements are detected using wearable sensors. the wearable sensors are made using smart technology that notices every minor detail about the athlete's body movements and posture. the parameters based on the athletic rehabilitation process in the sports field are modified using smart technology-based devices. the information about rehabilitation parameters and speeds help in improving athlete performance in the field(C. Liu, Zhang, & Zhang, 2020).studies show that the Gold Medal Profile For Sports Playing is a sports playing approach that motivates athletes to perform well for gold medals in sports competitions.

The GMP-SP approach helps Mental Performance Consultants improve their delivery and tracking process of mental health programs to improve sports athletes' mental health(Xin-Ge, Yan-Yan, & Shuan-Rong, 2020).studies predict that in teaching athletes about physical fitness and its importance, various physical fitness training approaches are used in physical education institutes. The computer-assisted physical teaching process helps athletes to learn all about sports-playing strategies. An athlete with good physical health and fitness can perform in the sports field with full self-confidence(Al-Omoush, Simón-Moya, & Sendra-García, 2020). Studies show that technology has changed the teaching methodologies of physical education centers. the technological revolution has resulted in the development of a learning environment that provides the best online education to sports students to improve the quality of their learning experience(Dadun et al., 2017).studies explain that various challenging games are used to train athletes to play well in sports. To improve the executive functioning of athletes, they are trained using challenging sports games(Ma, Shepard, Ritter, Martell, & Thomas, 2020).Studies claim that the internet and modern technology have changed the knowledge deliverance patterns of most educational institutes .

Metaverse is a virtual technology platform that involves the use of virtual reality-based technologies .these technologies allow the athlete to gain more knowledge about sports by increasing his real-time physical world interacting experiences(Casals, Carrera, Dominguez, Abrao, & Carmona, 2021).studies explain that virtual technology for providing sports knowledge to sports students is as important as face-to-face sports training. The stress faced by athletes due to being under pressure in sports playing is tackled by providing athletes with virtual stress-managing therapy sessions.by managing stress in athletes using technology, athletic performance in sports-related games improve(Gebre Borojo & Yushi, 2020).studies explain that technology-based systems improve athletes' psychological health, but sports students' overuse of technology-based devices can disturb their lives. Using mobile phones for education about various aspects of life helps in knowledge building, but overuse of this technology device is harmful to the new generation of the world.to stop the youth from overusing technological devices and maintaining their psychological health, they are provided with interventions .timely interventions and prevention measures save the youth of the present world from developing bad psychological health problems(Ruart et

al., 2019).studies show that e-sports is one of the new emerging technology in the sports field that provides sport-related knowledge to athletes using IT. Through esports services in the sports field, an athlete's physical health condition can easily be assessed(Felker et al., 2021).studies highlight that biofeedback training used in the sports fields assesses athlete performance in a specific sport. Neuro feedback is one of the effective training activities employed for making athletes physically fit and making them professional in their sports playing skills.

Reducing stress and improving the self-control abilities of athletes is the main aim of neuro feedback training(Girchenko & Kossmann, 2017).Studie claims that artificial intelligence is a technology-based system used for remotely monitoring athlete health. the athletes facing injury situations due to any sport-related incident are given remote intervention using an Artificial intelligence system .the trend of using artificial intelligence in wearable sensors is increasing in the sports field because of the tremendous application of AI(Gerolamo, 2016).studies explain that the physical therapy approach is taught using digital education programs. the innovative technology used in the providence of physical knowledge helps educate the young athlete about the importance of physical therapy(Adams, Hollingsworth, & Osman, 2019).

Scholars predict that in Higher education institutes, students are provided knowledge using AI software, which motivates students to get knowledge about their required field with full attention. The learning, as well as the self-creativity ability of students in educational training institutes, improves greatly using the AI technology in these institutes(Rodríguez-Montalvo et al., 2020).moreover, the interactive technology used in physical education training sessions speeds up the athlete's creativity development ability (Dong, Ma, & Li, 2021).studies suggest that combining the use of virtual reality as well as robotics system in sports-related sectors holds significance. Also, the robotics-based physical education centers use VR and AR technology to attract students to learn about robotics-based education and its application in sports(Fathoni, Muhibbin, Arifin, Habiby, & Ismail, 2021).

# Research methodology:

This research study determines the psychological benefits and challenges of using information technology in sports training and performance. the research based on primary data analysis for collecting the data used questions related to the variables. the psychological benefit is main independent variable and the sport training and performance is dependent variable.

For determine the research study used SPSS software and generate informative results related to them. descriptive statistic analysis, the pair correlation analysis, the regression analysis represent the relation between them.

## Sports training and performance:

Sports performance and training are essential components of athletic growth that enhance an athlete's physical, technical, tactical, and psychological skills to perform at their best in the sport they have chosen. There are some essential components and factors to consider when it comes to sports performance. The first one is A well-designed physical conditioning program that emphasizes strength, speed, endurance, flexibility, and agility as necessary components of sports training. Different sports call for different physical characteristics, so training should be adapted to the needs of the sport. Athletes must develop the technical abilities necessary for their particular sport. Techniques must be repeatedly practiced and improved upon in order to perform consistently. It's important to comprehend the strategic facets of the sport. Athletes work with coaches to improve their tactical awareness, decision-making abilities, and flexibility in-game scenarios. Another periodization model, which divides the training program into various phases with separate objectives, is frequently used in effective training. This strategy maximizes performance while overtraining and injury risk are reduced. Sports performance depends on mental toughness as well as physical ability(Zamudio & Jewell, 2020).

Focus and confidence can be improved by using mental training strategies like visualization, goal-setting, concentration, and stress management. An athlete's body needs proper nourishment to fuel their training and competition. To enable the body to repair and adjust to the training stimulus, adequate rest and recovery are also essential. An athlete's performance can be greatly impacted by having a thorough understanding of the psychological components of sports training and competition. Athletes can perform at their peak under pressure by using strategies like encouraging self-talk, mental imagery, and goal visualization. An athlete's entire growth and performance can be greatly influenced by a qualified and knowledgeable coaching team, as well as assistance from sports scientists, physiotherapists, nutritionists, and other professionals. A well-designed physical conditioning program is essential to enhance an athlete's physical attributes, such as strength, speed, endurance, flexibility, and agility. Different sports require different physical characteristics, so training should be tailored to suit the specific demands of the sport.

For instance, a basketball player might focus on improving vertical jumping ability and lateral quickness, while a long-distance runner may prioritize endurance and cardiovascular conditioning. Developing and refining technical skills relevant to the chosen sport is crucial. Regular and focused practice of techniques allows athletes to perform consistently and

efficiently during competitions. Whether it's shooting a basketball, perfecting a tennis serve, or executing a gymnastics routine, technical abilities are honed through repetition and dedicated training

## Result and description:

Table 1: *Descriptive Statistics*

|  | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| psychological benefits 1 | 50 | 1.00 | 4.00 | 1.7200 | .83397 |
| psychological benefit 2 | 50 | 1.00 | 4.00 | 1.6400 | .72168 |
| information technology in Sport 1 | 50 | 1.00 | 4.00 | 1.6000 | .75593 |
| information technology in sport 2 | 50 | 1.00 | 4.00 | 1.9400 | .76692 |
| training and performance 1 | 50 | 1.00 | 3.00 | 1.7600 | .71600 |
| training and performance 2 | 50 | 1.00 | 3.00 | 1.7000 | .73540 |
| Valid N (listwise) | 50 |  |  |  |  |

The above result describes descriptive statistical analysis related to the psychological benefits and challenges related to information technology and training also performance. the result represents that minimum values and maximum values also explain the mean rates and standard deviation rates. The psychological benefits are the main independent variable, according to the result. Its mean value is 1.72000, and its standard deviation rate is 0.83, showing that 83% deviate from the mean. The psychological benefits two present that the mean value is 1.6400 and the standard deviation rate is 0.72, showing that 72% deviate from mean values. The information technology in sport shows the mean values are 1.6000 and 1.94000. The standard deviation rates of information technology are 0.75593 and 0.76692, showing that 75% and 76% deviate from mean values. Training and Performance 1 show that the mean value is 1.76000, its standard deviation rate is 0.71600, shows that positive and 71% deviate from mean values. Training and Performance 2 show that 1.7000 and the standard deviation rate is 0.73, presenting that positive and 73% deviate from the average value. According to the result, its minimum value is 1.000, the maximum value is 4.000, and the overall observation level is 50 respectively.

Table-2: *Paired Samples Correlations*

|  |  | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | psychological benefits 1 & information technology in sport 1 | 50 | .175 | .225 |
| Pair 2 | psychological benefit 2 & information technology in sport 2 | 50 | .034 | .815 |
| Pair 3 | psychological benefits 1 & training and performance 1 | 50 | .193 | .180 |
| Pair 4 | psychological benefit 2 & training and performance 2 | 50 | .561 | .000 |

The above result describes the correlation coefficient values. The result presents the paired correlation and also that significant value between the two pairs. The first pair is psychological benefits and information technology in sports. The correlation value is 0.175. Its significant value is 0.225, showing that positive and significant relation between psychological benefits and information technology. The second pair is psychological befits and information technology in sports. Its correlation value is 0.034 shows that positive rate, and its significant value is 0.815, presenting that 81% significant level between them. The third pair is psychological benefits and training, also performance. Its correlation value is 0.193 its significant value is 0.180, showing that a positive rate is present at an 18% significant level between them. The last pair is psychological benefits two and training also performance result present that correlation rate is 0.561 and its significant value is 0.000 shows that positive and 100% significant value shows that positive and 100% significant relation between psychological benefits and training also performance between them. Sports performance and training have been significantly impacted by information technology, which presents both advantages and difficulties related to psychological benefits and challenges.

**Psychological advantages:**

1. **Motivation and Engagement:** Real-time data, individualized feedback, and interactive training programs can all help to increase athletes' motivation. Athletes that are actively involved in their training can maintain their concentration and commitment.

2. **Data-Driven Decision Making:** Athletes and coaches can make better choices if they have access to data and analytics. Athletes can discover strengths and shortcomings and develop tailored training programs by studying their performance metrics.

3. **Competition and Social Interaction:** Technology helps the sporting community connect socially, enabling athletes to compete with peers around the world, share accomplishments, and create a network of allies.

4. Real-time feedback can promote positive behaviors and quickly fix mistakes during training sessions. This immediate feedback loop aids players in improving

their technique more quickly.

5. **Mental Preparation:** IT tools can help athletes with mental prepping, such as mindfulness apps, virtual reality simulations, and visualization exercises, which can help with concentration and lower performance anxiety.

**Psychological challenges:**

1. Data Overload: Due to the plethora of data accessible, athletes may experience data overload and find it difficult to sort through what information is most important. The interpretation and presentation of data by coaches must be clear and useful.

2. **Dependence and Overreliance:** Athletes may rely too heavily on technology when making decisions, ignoring their instincts and intuition. When under duress and with little rapid access to technology, this dependence can be harmful.

3. **Security and Privacy Concerns:** If sensitive information about athletes is not properly handled, it may be misused or exposed. The trust an athlete has in utilizing technology may be impacted by worries about data breaches or hacking.

4. **unreasonable Expectations:** Continuous access to performance information may result in pressure to always improve and unreasonable expectations. If they don't perform to expectations, athletes could become disheartened or unmotivated.

5. **Comparisons and Social Pressure:** Due to the extensive use of technology in sports, players are exposed to additional social pressure to do better as a result of comparisons with other athletes.

6. **Technology Issues:** Technical hiccups or breakdowns at vital times can be upsetting and may have an impact on an athlete's confidence and concentration.

To address these challenges, athletes can work with sports psychologists and mental performance coaches who specialize in helping athletes cope with technical difficulties and maintain mental resilience during competition.

Strategies such as mindfulness, visualization, positive self-talk, and focusing on the present moment can be beneficial in managing anxiety and regaining focus after technical hiccups. Additionally, coaches can play a crucial role in supporting athletes through technical challenges by fostering a positive and constructive training environment. Emphasizing the learning process, providing constructive feedback, and encouraging a growth mindset can help athletes view technical errors as opportunities for improvement rather than failures.

Ultimately, overcoming technical breakdowns is part of the athlete's journey, and developing mental toughness and coping skills can lead to increased confidence and enhanced performance during vital times. The role of coaches is paramount in supporting athletes through technical challenges. A positive and constructive training environment fostered by coaches can make a significant difference in how athletes perceive and cope with technical errors.

Emphasizing the learning process rather than focusing solely on outcomes helps athletes view technical hiccups as opportunities for growth and improvement, rather than failures. Constructive feedback from coaches can provide guidance and direction for improvement, building an athlete's skills and confidence. Adopting a growth mindset, where athletes understand that skills can be developed through effort and perseverance, encourages resilience in the face of technical difficulties. Coaches can instill this mindset, allowing athletes to approach challenges with a belief in their ability to overcome them. Overcoming technical breakdowns is an inherent part of an athlete's journey. By developing mental toughness and coping skills, athletes can navigate such challenges with confidence, leading to improved performance during crucial moments. Technical difficulties may arise unexpectedly, but with the right support and mindset, athletes can emerge stronger, more focused, and better prepared for future competitions.

Table 3: *Total Varance Explained*

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 1.889 | 31.485 | 31.485 | 1.889 | 31.485 | 31.485 |
| 2 | 1.516 | 25.275 | 56.760 | 1.516 | 25.275 | 56.760 |
| 3 | .928 | 15.470 | 72.230 | | | |
| 4 | .773 | 12.887 | 85.117 | | | |
| 5 | .546 | 9.104 | 94.221 | | | |
| 6 | .347 | 5.779 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

The above result describes that total Variance explained analysis result describes the % of Variance also that % of cumulative its present that total value related to the extraction sums of squared included % variance also that cumulative rate. The total values are 1.889, 1.516, 0.928, 0.773, 0.546 also that 0.347

present that positive rate of total value related to initial eigenvalues. According to the result, its % of Variance is 31.485, 25.275, 15.470, etc. All values show positive rates of Variance. Similarly, the % of Variance related to the sums of squared rates shows a positive link between psychological benefits with information

technology. The cumulative percentage present that

31.485 and 56.760, respectively.

Table 4: *Test Statistics*

|  | psychological benefits 1 | psychological benefit 2 | information technology in sport 1 | information technology in sport 2 | training and performance 1 | training and performance 2 |
|---|---|---|---|---|---|---|
| Chi-Square | 25.200[a] | 32.720[a] | 33.520[a] | 22.160[a] | 6.880[b] | 7.240[b] |
| df | 3 | 3 | 3 | 3 | 2 | 2 |
| Asymp. Sig. | .000 | .000 | .000 | .000 | .032 | .027 |

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.5.
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.7.

The above result describes the chi-square values of each variable. The result presents the test statistic and significant values of each variable, including independent and dependent variables. the chi-square of psychological benefits is 25.200, 32.720 the information technology shows chi-square value is 33.520 and 22.160. according to the result, the training and performance show chi-square values are 6.880 and 7.240, which shows that positive chi-square. The overall significant value is 0.000 shows that 100% significant level of dependent and independent variables.
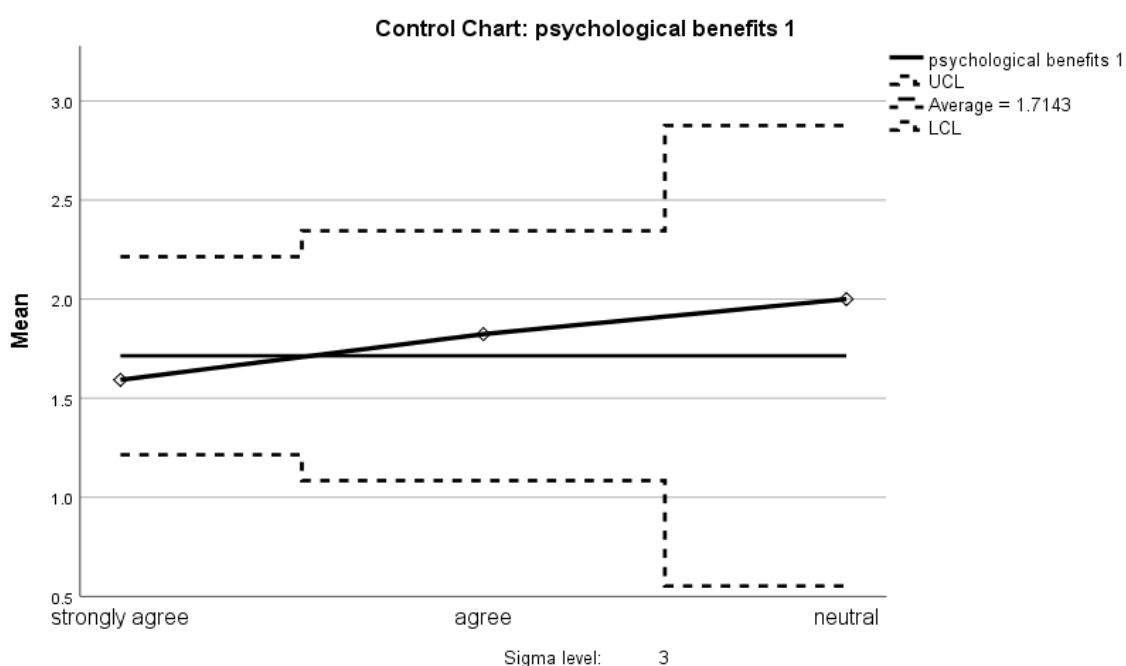


The above graph represents a control chart that presents data on the vertical and horizontal sides. The vertical side represents the mean value in its range, ranging from 1.0 to 3.0.
The horizontal side, on the other hand, displays the levels of response categories, including "strongly agree," "agree," and "neutral." Based on the control chart, the average rate for psychological benefits is calculated to be 1.7143. This average rate likely represents the mean value of the responses given by participants to questions related to psychological benefits.

Table 5: *Model Summary*

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .535[a] | .287 | .205 | .67381 |

a. Predictors: (Constant), training and performance 2, psychological benefits 1, information technology in sport 2, training and performance 1, psychological benefit 2

The above result represents that model summary analysis result describe that R square values, the adjusted R square values also that present the standard error of the estimate values of regression model. According to the result R value is 0.535 the R square value is 0.287 shows that 28% the adjusted r square value is 0.205 shows that 20% rate the standard error of the estimate value present that 67% error of the estimation between them. overall result present positive link between training and performance and psychological benefits also information technology. This value indicates the average distance between the observed data points and the regression line. It represents the accuracy of the model's predictions. The

provided percentage of 67% seems incorrect, as the standard error of the estimate is a numerical value, not a percentage. The actual standard error value needs to be provided to interpret this result correctly

Table 6: *ANOVA*[a]

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 8.023 | 5 | 1.605 | 3.534 | .009[b] |
| | Residual | 19.977 | 44 | .454 | | |
| | Total | 28.000 | 49 | | | |

a. Dependent Variable: information technology in sport 1

b. Predictors: (Constant), training and performance 2, psychological benefits 1, information technology in sport 2, training and performance 1, psychological benefit 2

The above result describes that ANOVA test analysis related to regression and residual values results to describe the sum of square values, mean square values, F statistic values also that significant value. The result shows that the sum of the square values is 8.023, 19.977. Also the total value is 28.000, respectively. The mean square values are 1.605, and 0.454 shows that positive average square value. The F statistic value is 3.534, and the significant value is 0.009, showing that there are positive and 100% significant levels between them.

## Conclusion:

It's vital to achieve a balance when integrating information technology in sports so that it complements the human element of preparation and performance in order to maximize the psychological benefits. Technology should be viewed by athletes and coaches as a tool to support and improve their efforts rather than as a replacement for their knowledge, wisdom, and experience. A strategic approach to data management that prioritizes privacy and security will also enable coaches and athletes to fully utilize IT without jeopardizing their well-being. In conclusion, both athletes and coaches have experienced major psychological benefits from and obstacles posed by the integration of information technology in sports training and performance.

Increased motivation and engagement, better goal planning and tracking, data-driven decision-making, greater social interaction and competition, quick feedback, and better mental preparation are just a few of the psychological advantages. These benefits give athletes the ability to maximize their training, track

their development, and maintain relationships with the sporting community. The overall research concluded that there are positive and significant relation of psychological benefits and challenges of using information technology in sports training and performance. However, there are psychological issues related to technology use that must be addressed. Athletes may struggle with information overload, technology dependence, privacy and security issues, unreasonable expectations, social pressure, and the potential for technology failures at vital times. It's crucial to strike a balance between embracing technology's benefits and acknowledging its limitations in order to maximize its potential. While admitting that human intuition, experience, and skill continue to be essential components of sports training and performance, coaches and athletes must embrace technology as a supplemental tool. Furthermore, to substitute confidence among athletes and guarantee the security of sensitive data, data management should place a priority on privacy and security. Athletes and coaches can use information technology to improve performance, accomplish their goals, and preserve general well-being in the fast-paced world of sports by carefully navigating these hurdles. As technology develops, success and excellence in sports depend on a comprehensive strategy that integrates human skill and technological support. In the end, sports performance and training are iterative learning processes. While coaches and support staff are crucial in guiding and forming athletes' development, athletes must remain devoted, disciplined, and passionate about their sport. Athletes can reach their full potential and excel in their chosen sports with the proper mix of physical, technical, tactical, and psychological training.

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