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ORIGINAL

WEARABLE TECHNOLOGY: ENHANCING PERFORMANCE AND MONITORING HEALTH METRICS IN ELITE SPORTS

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ABSTRACT

In sports, WT devices include sensors, GNSS, and IMU, and these devices give athletes real-time data to check their performance, physiological features, biomechanical features, and neuromuscular characteristics of metabolic exhaustion. Subsequently, many WT devices are used as the source of considerable improvement in sports training and reduction in injuries, and they also help in recovery from injuries. Hence, WT assists in the improvement of athlete's training activities that help to boost their performance. Many WT devices are equipped with accelerometers, gyroscopes and magnetometers used for training and competitions and also measure the quantification of an athlete's load. The research study was based on primary data analysis, which was used to measure the data using SPSS and AMOS software. Therefore, the demand for WT devices is increasing rapidly. Elite sports put emotional, physical and intellectual demands on athletes' careers, and it has a greater impact on their cognitive and physical health. Analyzing the physiological, biochemical and biomechanical characteristics of the real world for athletes is important to maintain their good health. However, these characteristics should be measured in the real world during their physical activity and competitive environment. These goals can be achieved using wearable technology measuring various parameters in training athletes. For instance, American football players used helmet accelerometers and eye-tracking technology to measure concussion injuries. Overall, the result found that wearable technology directly and significantly affects enhancing performance and monitoring health metrics in elite sports. Additionally, WT devices help in monitoring physiological factors during races with the help of biometric sensors that measure heart rate and pulls.

KEYWORDS: Wearable Technology (WT), Enhancing Performance (EP), Monitoring Health Metrics (MHM), Elite Sports (ES), AMOS Software

1. INTRODUCTION

There is no doubt and underestimation that there is an exceptional use of technology in Elite Sports as well, which works to enhance the performance of athletes in various ways. For example, continuous monitoring of physical and mental health metrics for improving the performance of athletes. Wearable technology is one of those factors used to enhance athletes' performance by focusing on physical measures to improve their physical health. In this introduction, we are going to discuss how wearable Technology can enhance performance and monitor health metrics in elite sports(Seshadri et al., 2019b). We can define Elite sports as sports that demand high energy from the body and can also result in high stress as output. There is a high risk of injury during elite sports such as badminton, cricket, hockey, squash, tennis, and others so there is a dire need to use any such kind of technology which can prevent injury as much as possible during the athlete's performance. If we talk about sensors that are used in wearable technologies, there are a variety of sensors Such as physical sensors, biomechanical sensors, location sensors, environmental condition sensors, network layers, processing layers, and others. If we discuss physical sensors Such as ECG, EEG, and others, these sensors are mostly used for measuring physical parameters such as heart rate, breathing rate, pulse rate, and others(Benson, Räisänen, Volkova, Pasanen, & Emery, 2020). Biomechanical sensors such as EMG force sensors, pressureand pressure sensors for position, motion, force, and pressure parameters. Suppose we understand the function of location sensors, such as GNSS, UWB, and other positioning systems. In that case, these sensors are used to locate the position, distance travelled, and an athlete's speed during the performance. Suppose we try to enumerate the function of environmental condition sensors. In that case, these sensors are mostly used to measure physical parameters of the environment, such as humidity, atmospheric pressure, UV rays, wind speed, temperature, and others. The network layer sensors are mostly used to communicate among different devices and to analyze data from this communication(Seshadri et al., 2021). The processing layer is mandatory because it is used to process the data obtained with the help of sensors. The most important examples of wearable technology with their functions are discussed here. One wearable Technology is the smart watch which has versatile functions such as music, mobile control, fitness tracking, heart rate measurement, body temperature, pulse rate, and others. If we consider that these Smartwatches are used during sports, these watches can provide very helpful information in a very short period which can be used to analyze the physical health and level of stress in athletes during performance in sports(Chidambaram et al., 2022). For example, if there is an abrupt and abnormal change in the heartbeat of athletes, this data can be used to prevent

any possible injury or damage to the heart or cardiac tissues. The other example of wearable technology is fitness trackers, which have recently gained much importance for athletes. These particular fitness trackers can be used in various ways, such as to track steps, distance covered, speed of athletes, and others(Toner, 2023). The fitness trackers can also be used to track calories burnt and sleep awake cycle as well. As we know, there is demand for a particular weight for any specific sport, so this fitness tracker can be used to lose body fat because it can track the amount of calories burnt in the body in One day. The other most important wearable technology is smart glasses, which come in different ranges and have different and versatile functions. Some smart glasses are voice-resistant, some are designed to enhance the visual display, and others are used to reflect harmful sun radiations to protect the eye. As we know, there is too much confrontation of athletes to sunlight during performance in sports(Cardinale & Varley, 2017). These radiations of sunlight can cause damage to athletes' eyes, but with the use of these smart glasses, such eye damage can easily be reduced. The other function that we have seen of smart glasses is to provide voice resistance, so these glasses can be used to increase focus during sports for athletes. The other beneficial wearable technology is smart clothing, which is designed to prevent any injury during elite sports. As described earlier, elite sports may result in injury to an athlete's body, so there must be possible and suitable measures to minimize the effect and chance of that Injury. Smart clothing can be used for this purpose while keeping the athlete's health in view(Muniz-Pardos et al., 2021). For example, wearing smart helmets and caps during elite sports can reduce the risk of head injury to an extent as well. Wearing knee covers and belts can also reduce the risk of injury to bones. Some sorts of smart shoes for athletes are designed to prevent muscle cramps and reduce tension and stress on muscles during performance in sports. The other example of wearable Technology is smart to hear which may have versatile functions such as noise cancellation, better focus, clear voice transmission, and others. All of these wearable technologies are mainly focused on enhancing the performance of athletes by improving health parameters (Suresh, Sameer, & Susan, 2022).

The other example of wearable Technology is the posture corrector, which has gained much repute. As we know, every type of sport needs a particular posture at a given time. This posture corrector can be used to guide athletes about their posture, which can be a decisive factor in enhancing the performance of athletes(Seçkin, Ateş, & Seçkin, 2023). It is pertinent to mention that smartwatches are now present in the form of smart rings but has the same or better function than smartwatches. These wearable technologies are not only used during performance in sports but can also be used during Training to enhance performance(Li et al., 2016). All of these wearable technologies have improved the performance of athletes to an extent. This is true evidence of the importance of technology in the sports sector in life. These wearable technologies can be more advanced shortly(Page, 2015).

1.1. Research Objective

This research aims to understand how wearable Technology can enhance performance and prevent injury in athletes. This study has effectively explained the importance of technology in sports. The research determined that Wearable Technology is related to the Enhancing Performance and Monitoring Health Metrics in Elite Sports. The research paper is divided into five specific research chapters. The first section describes the introduction and includes the objective of the research. The second portion represents the literature review, which includes wearable technology and monitoring health metrics. The third section represents the methodology, tools and techniques. The fourth section describes the result and its descriptions. The last portion summarized the overall research study and presented recommendations about enhancing performance and wearable technology.

2. Literature Review

Researchers reveal that habiliment innovation & biometrical information examination have been almost for various years inside the First-class sports area. The study will emphasise in fundamentally on 4 points; the degree to which information from the habiliment gadgets can be good for mentors and competitors; how much habiliment gadgets can improve preparation; the degree to which wearable innovation might forestall wounds; & furthermore, investigate what's in store for first-class level habiliment innovation. Experiences assembled incorporate how the information given by the habiliment gadgets might help the well-being and prosperity of a competitor(Page, 2015). Studies suggest that wearable execution gadgets & detectors are turning out to be all the more promptly accessible to everyone and powerful groups. Progresses in innovation have permitted individual perseverance competitors, sports groups, & doctors to screen useful developments, responsibilities, & allometry indicators to expand execution and limit wounds. The motivation behind this audit is to acquaint medical care experts and group doctors with the different accessible sorts of Wearable detectors, talk about their ongoing usage, & give subsequent uses in athletic medication(Li et al., 2016). Studies elaborate that wearable innovation is progressively fundamental for further developing game execution over constant information examination and following. This thorough audit investigates the estimation and checking of sturdy execution, damage avoidance, restoration, and, in general, execution advancement utilizing body habiliment detectors. The development of habiliment imaging gadgets guarantea es athletics restoration and execution checking, empowering improved competitor wellbeing, well-beingion, and execution in the games business(Seçkin et al., 2023). Scholars suggest that quick upgrades in habiliment advances and ongoing observing have brought about significant advances in the realm of sporting and first-class sport. One the development is the utilization of ongoing

checking, which includes a Garmin use and biological system intended to gather, process & communicate a wide variety of Physiological, bionic & natural information utilizing network-enabled administrations(Muniz-Pardos et al., 2021). Studies claim that progress in innovation could help in growing superior Wearable apparatuses ready to facilitate the troubles and expenses related to directing lengthwise empirical examinations in athletic associates and perhaps give the best data on the natural ramifications of explicit outside load designs(Cardinale & Varley, 2017). Scholars explain that wearable innovations are little automated, and cell phones with remote correspondence capacities could be shabby on the body as gadgets, extras, or garments. Researchers characterized the examinations as per the phase of an occasion, containing pre-occasion preparing to direct execution and foresee the chance of wounds; throughout occasions to improve execution and illuminate procedures; & in diagnosing wounds later an occasion. In view of the contained examinations, man-made intelligence methods to handle information from detectors can identify designs in Physiological factors and locational and kinematics information to illuminate how competitors can work on their exhibition(Chidambaram et al., 2022). Studies show that wearable detectors empower the ongoing and painless observing of bionic, physiologic boundaries appropriate to the exhibition of competitors. This study audit examines the use of business detectors used by athletics groups at present & the development of spellbinding investigation to screen the interior and outer responsibility, aquation status, rest, cardio wellbeing, & return to brandish rank of competitors(Seshadri et al., 2021). Studies explain that competitors adjust their preparation every day to enhance execution and keep away from weariness, over-exercises & other unwanted consequences for their well-being. Scholars recommend that a blend of a few Wearables is best for getting to every significant boundary, upsetting the competitor at best could be expected, and upgrading execution and advancing wellbeing(Düking, Hotho, Holmberg, Fuss, & Sperlich, 2016). Scholar studies reveal that competitors persistently track for latest innovations and treatments to acquire an upper hand to expand their wellbeing and execution. Competitors have inclined to utilize habiliment detectors to screen their preparation and recuperation. Habiliment advancements presently used by athletics groups screen the competitors' inward & outside responsibility (Seshadri et al., 2019b). The essential goal of this study is to give an exhaustive survey of the uses of Wearable innovation for evaluating the bionic & corporal boundaries of the competitor. An optional goal of this study is to recognize cooperative examination open doors amid scholastic exploration gatherings, athletics medication wellbeing facilities, & athletics group execution projects to additional the usefulness of this innovation to aid the re-visitation of play for competitors beyond different wearing spaces(Seshadri et al., 2019a). The reason for this survey is to portray how the comprehension of game execution has advanced with the improvement of information examination, performer global positioning frameworks, & Wearable

innovation, along with representing the potential open doors for mix of such latest estimates in the games medication writing to tackle the requests of the world class competitor(Fury, Oh, & Berkson, 2022). Researchers examine that this emphasis on innovation and execution over significant wearing rivalries is expected to empower additional continuous observing developments, including a more extensive range of information. In addition, making a difference in comprehending donning execution, scholars feature the capacity as a precaution & restorative E-health apparatus to advise the well-being of competitors amid contest and possibly the more extensive populace in the destiny. Utilizing habiliment innovations sending various information continuously will undoubtedly become the standard at significant games as global wearing organizations pursue to make their game better intuitive & disseminate well disposed(James et al., 2024). Researchers suggested that the arrangement consolidates the situating information & inward detector information to follow a competitor's developments precisely. Scholars, therefore, break down the exactness utilizing information gathered from a financially utilized competitor following habiliment gadget. Scholars observed that the outcomes are exceptionally encouraging, & the intended arrangement executes multiple times more than an ordinary detector combination calculation for situating(Waqar, Ahmad, Habibi, Hart, & Phung, 2021). Scholars reveal that wounds coming about because of athletics & proactive tasks might be persevering and represent a significant issue for contestants' monetary prosperity and personal satisfaction. Habiliment advancements related to examination can assist with moderating the gamble to challengers by distinguishing wound danger components & zeroing in on danger decrease. In this study, researchers examine how Wearable advancements might work on the well-being and sports execution of competitors by checking members over numerous factors. In synopsis, outcomes from this research exhibit that habiliment innovation permits contestants with an expanded gamble of wound to be recognized & focused on for mediation(Zadeh et al., 2021). The purpose of this survey was to comprehend the utilization of Wearable innovation in athletic to improve execution and forestall wound. Inactive estimation squids, bend detectors & attractive area and precise estimate detectors were among the gadgets utilized in more than fifteen games to evaluate movement. Habiliment innovation utilization is quite an experimental stage, yet there is possibility for this innovation to impact training and competitors' strategy decidedly(Adesida, Papi, & McGregor, 2019). Researchers suggest that habiliment gadgets address quite possibly of the majority famous pattern in wellbeing and wellness. Headways in Wearable innovation ought to contemplate normalizing approval measurements, giving straightforwardness in utilized calculations, & further developing how innovation might be custom-made to people. Up to that point, it is reasonable to practice alert when deciphering measurements announced from purchaser adequate gadgets(Shei, Holder, Oumsang, Paris, & Paris, 2022). Scholars elaborate that in athletics,

mentors and care workers invest significant energy dissecting competitors' strategy. It is notable that competitors who may execute developments related with their game of decision utilizing an improved procedure are bound to introduce best exhibitions. Researchers summarize that Wearable innovation is turning into a reasonable and exact option for ongoing obtaining of corporal & motor information in a few games where traditional camera based global positioning frameworks confront various difficulties(Morais, 2023). Researchers claim that athletics execution following has acquired a great deal of concern & broad utilize lately, particularly in world class and sub-tip top games. It is consequently conceivable to work on the adequacy of preparing, to align and adjust jobs as per genuine force consumption, & to lessen the probability of wounds because of unnecessary actual pressure. However, this examination confirmed the way that adequate gadgets are being utilized for different uses in the domain of area hockey(Latino & Tafuri, 2024b). Researchers explain that ongoing innovative improvements have prompted the development of cheap, painless, small inductor inactive detectors, perfect for acquiring athletic execution estimates over preparing or contest. This orderly audit assesses ongoing proof & the subsequent capability of their utilization in athletic execution assessment. Signs on the unwavering quality of detector based execution markers are given, along with basic contemplations and subsequent patterns(Camomilla, Bergamini, Fantozzi, & Vannozzi, 2018). Scholars examining the job of Wearable innovation for various clients & why there exists that requirement for such gadgets in regular daily existences. It presents how various detectors are powerful in conveying different versions that are valuable in numerous paths in regards to athletic ascribes. Habiliments are expanding in capability, & amid coordinating innovation, clients are assembling greater information regarding oneself. How much habiliment innovation accessible is wide, every playing its own part to sport in various businesses(Aroganam, Manivannan, & Harrison, 2019). Scholars show that wearable innovation items utilize various paths, for example, "Worldwide Situating Framework, Neighborhood Situating Framework, Miniature bionic Framework, Coriolis Estimation Framework" & it ought to be considered that various detectors gather information at various densities & interaction this information with changeable calculations. With the broad presentation of various business items over the most recent ten years, utilizing adequate innovation might be supposed to be basic partners for coaches attempting to further develop execution in athletics(Şahin, 2021). Researcher studies reveal that habiliment innovation has permitted specialists to typify the actual results that performers are presented at matches & instructional courses. Worldwide situating frameworks & pulse observing are the best involved methods in tip top football. This study explores at what factors are substantial and dependable, however more critically, what is pertinent in various contexts. Deciphering and conveying the significant data are fundamental obligations of professionals at the first class level. Sympathy the strategies and limits with revealing is analyzed(Rice,

Kovacevic, Calder, & Carter, 2022). Researchers reveal that wearable & Web of things advancements in athletics public another period in competitor's preparation, for execution checking and assessment as well as for wellness evaluation. These innovations depend on detector frameworks that gather, proceeding & communicate pertinent information, like biological indicators as well as other execution markers that are urgent to assess the development of the competitor's status, & in this manner potentiate their exhibition. But, the development degree of that innovations are still down, especially with the requirement for the securing of greater & also powerful biological indicators in regards to the competitor's interior responsibility, which restricts its more extensive reception by the games local area(Passos et al., 2021). This study features an outline of the conditions whereby the Wearables are utilized. It explains their utilization in person along with group related execution examinations with an extraordinary spotlight on unwavering quality and legitimacy, difficulties, and subsequent headings(Lutz, Memmert, Raabe, Dornberger, & Donath, 2020). This review researched the uses & comprehension of this innovation by group activities experts. 72 specialists engaged with group and competitor execution observing utilizing Global Positioning System & velocimetry innovation finished the study. This overview acquired knowledge into use, demand, sympathy, specialist desires, & affairs and reactions encompassing the utilization of Global Positioning System and velocimetry measurements for competitor burden observing. This data might be utilized to work on the execution of this innovation in group activity checking & feature holes in the writing that will assist with planning subsequent examinations to help professional necessities(Dawson, McErlain-Naylor, Devereux, & Beato, 2024; Oliveira, Stall, Coelho, Silva, & Franca, 2022).

3. Methodology

The research study measure the Wearable Technology related to the Enhancing Performance and Monitoring Health Metrics in Elite Sports. The research depends upon primary data analysis for collected these data from questions related to wearable technology, enhancing performance and monitoring health. For measuring these data through SPSS and AMOS software and generate result included descriptive statistical analysis, correlation analysis, the one-way ANOVA test analysis, the control chart also that explain the chi square analysis between them. Let’s discuss one example of WT devices; generally, athletes tend to sleep less as compared to non–athletes due to their training schedule, travelling and anxiety about competition. The deprived sleep of athletes leads to their poor performance, mental stress and bad impact on their physical health. In elite sports, sleep time of more than eight hours reduces the risk of injuries by 61%. WT devices that accurately measure the sleep-wake cycle are much needed these devices include wristbands that can analyze the indicator of sleep by overestimating the sleep cycle and underestimating the wake cycle (Latino & Tafuri, 2024b; Peake, Kerr,

& Sullivan, 2018). For instance, GPS watches monitor the heart rate, altitude changes and walking changes during trial and training. Additionally, it also provides a vision of the performance of players in various environments. Additionally, natural atmospheres also have different challenges such as weather variation, and topographical and altitude changes and these wearable devices can withstand these challenges and can provide real-time data in harsh circumstances. These developments in devices allow athletes to rely on these devices irrespective of the environment in which they practice training and competition. Hence, the capability of WT devices to collect real time data is essential for athletes to have efficient performance (Latino & Tafuri, 2024a). Sports injuries lead to a financial burden, decreased physical activity, and increased risk of cardiovascular diseases, obesity and osteoarthritis. Usually, injuries in sports exist when stress and strain are applied to the body. Workload monitoring in athletes is common practice in the sports field due to advancements in Wearable technology that easily measures workload metrics. Workload is measured by measuring the external and internal load. External load is the physical activity load and it can be measured by quantifying the training, locomotion, travelling, walking and jumping and it can be measured by using wearable technology. Internal load is the psychophysiological activities (heart rate, heartbeat, etc.) measured by WT devices (Benson et al., 2020; Muniz-Pardos et al., 2021) (Figure 1) .

3.1 Theoretical Model

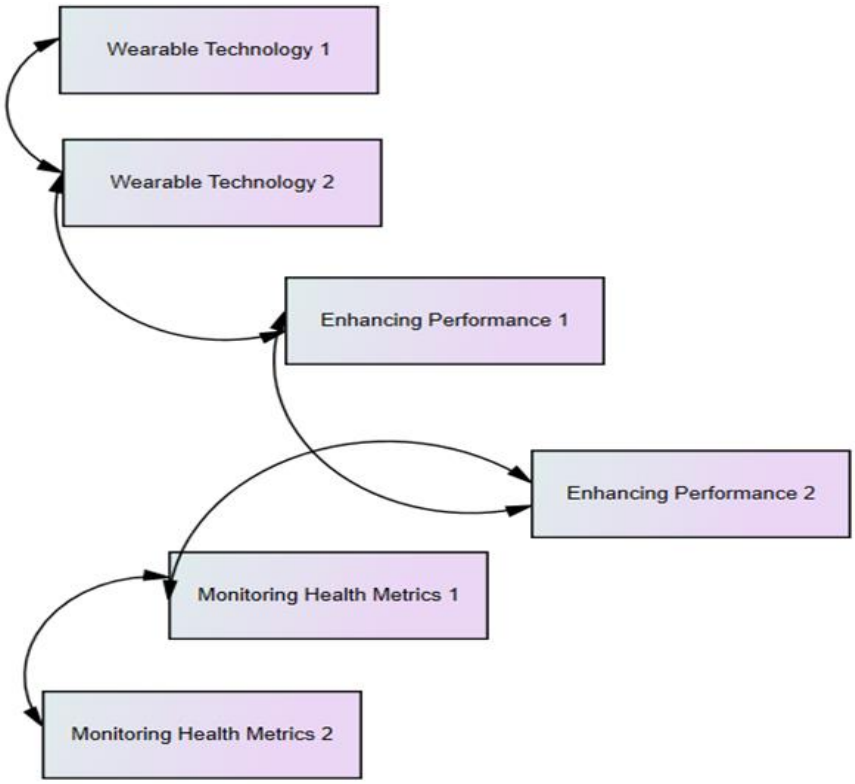

Figure 1: Theoretical Model

4. Result and Descriptions

Table 1: Result of Bayesian Estimates of Coefficients

BAYESIAN ESTIMATES OF COEFFICIENTS					
PARAMETER	**POSTERIOR**			**95% CREDIBLE INTERVAL**	
	Mode	Mean	Variance	Lower Bound	Upper Bound
WEARABLE TECHNOLOGY 1 = STRONGLY AGREE	1.514	1.514	.016	1.263	1.764
WEARABLE TECHNOLOGY 1 = AGREE	1.636	1.636	.014	1.407	1.866
WEARABLE TECHNOLOGY 1 = NEUTRAL	1.750	1.750	.075	1.212	2.288

The above result shown in table 1 represent that one-way ANOVA test analysis result demonstrate the posterior mode value, the mean rate, variance rate, also that lower bound and upper bound value related to the 95% credible interval. According to the result the first parameter is wearable technology 1 related to strongly agree its mode rate is 1.514 the mean value is 1.514 similarly, the lower bound value is 1.263 and upper bound is 1.764 respectively. The second parameter is wearable technology 2 based on agree its mean value is 1.636 the 95% credible rate is 1.407 and 1.866 respectively. The third parameter is wearable technology 1 based on neutral level its mean value is 1.750 the variance rate is 0.075 the lower bound rate is 2.288 and upper bound rate is 1.212 respectively.

Table 2: Result of Test Statistics

TEST STATISTICS							
	WEARABLE TECHNOLOGY 1	**WEARABLE TECHNOLOGY 2**	**ENHANCING PERFORMANCE 1**	**ENHANCING PERFORMANCE 2**	**MONITORING HEALTH METRICS 1**	**MONITORING HEALTH METRICS 2**	**ELITE SPORTS**
CHI-SQUARE	17.100[a]	23.700[a]	20.800[a]	24.700[a]	19.300[a]	21.900[a]	25.900[a]
DF	2	2	2	2	2	2	2
ASYMP. SIG.	.000	.000	.000	.000	.000	.000	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 20.0.							

The above result shown in table 2 describes that chi square value result represent significant value and chi square value of each variable. the chi square value of wearable technology 1,2 is 17.100 and 23.700 respectively. The second variable is enhancing performance its chi square value is 24.700 the elite sports shows that 25.900 chi square value between them. the overall significant rate is 0.000 shows that 100% significant level between them. Sports scientists are constantly in search of the development of new technologies, therapies and data platforms to assist players in improving their performance and reducing the risk of injuries. The sports field has increased the use of wearable technology over few years due to its advancement in data analysis, sensor technology and sports disciplines. Wearable technology comes in various forms such as GPS, wrist monitors, and smart dresses which help to monitor physiological parameters such as heartbeat, heart pulse, heart rate, respiration ratio etc. For instance, wearable technology also analyzes the sleep cycle in athletes. Sleep affects the performance of athletes and the rate of injuries (Seshadri et al., 2021).

Table 3: Result of Paired Samples Statistics

PAIRED SAMPLES STATISTICS					
		MEAN	**N**	**STD. DEVIATION**	**STD. ERROR MEAN**
PAIR 1	Wearable Technology 1	1.6500	60	.63313	.08174
	Monitoring Health Metrics 1	1.6167	60	.61318	.07916
PAIR 2	Wearable Technology 2	1.5000	60	.59660	.07702
	Enhancing Performance 1	1.5333	60	.62346	.08049
PAIR 3	Monitoring Health Metrics 1	1.6167	60	.61318	.07916
	Enhancing Performance 2	1.5167	60	.56723	.07323
PAIR 4	Wearable Technology 1	1.6500	60	.63313	.08174
	Elite Sports	1.4833	60	.56723	.07323

The above result shown in table 3 describes that paired sample statistical analysis result demonstrate the mean values, the standard deviation rate also that explain the standard error of the mean value. The first pair is wearable technology 1 and monitoring health metrics its standard deviation rate is 0.63313 the standard error of the mean value is 0.08174 and 0.079 shows that 81% and 79% error of the mean value. The second pair is wearable technology 2 and enhancing performance 1 its shows that mean value is 1.5333 and 1.5000 respectively the standard deviation rate is 59% and 62% deviate from mean. The third pair is monitoring health metrics and enhancing performance 2 its shows that mean value is 1.6167 and 1.5167 positive average rate the standard deviation rate is 61% and 56% deviate from mean. According to the result fourth pair is wearable technology 1 and elite sports its standard deviation rate is 63% and 56% deviate from mean.

Table 4: Result of Paired Samples Correlations

PAIRED SAMPLES CORRELATIONS				
		N	CORRELATION	SIG.
PAIR 1	Wearable Technology 1 & Monitoring Health Metrics 1	60	.129	.327
PAIR 2	Wearable Technology 2 & Enhancing Performance 1	60	.091	.489
PAIR 3	Monitoring Health Metrics 1 & Enhancing Performance 2	60	.043	.744
PAIR 4	Wearable Technology 1 & Elite Sports	60	.101	.440

The above result shown in table 4 describe that correlation coefficient analysis the result represents significant value and correlation value of each pair included dependent and independent. The first pair is wearable technology 1 and monitoring health metrics 1 its correlation rate is 0.129 the significant rate is 0.327 shows that positive and 32% significant correlation between them. the second pair is wearable technology 2 and enhancing performance 1 shows that correlation value is 0.091 and significant value is 48% respectively. The pair 3 describe that monitoring health metrics 1 and enhancing performance 2 shows that correlation value is 0.043 and significant rate is 74%. The fourth pair is wearable technology 1 and elite sports its correlation rate is 0.101 and significant value is 44% respectively.

4.1. Control Chart

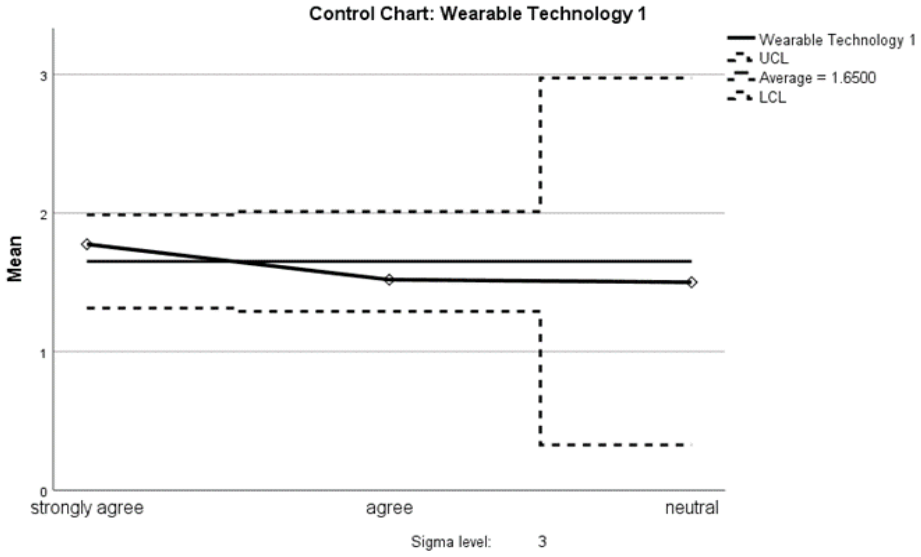

Figure 2: Control Chart

The above result shown in figure 2 represents the control chart result shows that vertical side present mean value the horizontal side represent the

range related to strongly agree, agree and neutral level. According to the result the average rate is 1.6500 respectively. Wearable technology (WT) in sports has been used for a long time and these devices have been improved by internet and sensor technology and are used in daily life by sports persons (Zadeh et al., 2021). WT is considered an interdisciplinary field relevant to health, sports and engineering. Wearable technology helps develop sports by providing real-time information to sportspersons to improve the abilities of coaches to improve game strategies and training and enable players to improve their athletic skills. The incorporation of wearable technology in sports sciences and medicines is expanding progressively. Currently, many players, national and international players use WT devices to achieve and improve their sports skills for competitions, training load and physiological information (Brown & Brison, 2020; Seçkin et al., 2023).

5. Conclusion

The increase in demand for WT devices is due to their ability to reduce the risk of injuries, injury prevention, and rehabilitation, analyzing performance and reducing the risk during play. These devices are micro-sensors and are available in three forms: accelerometers, gyroscopes and magnetometers. IMU units are used to measure variables by these devices and recent progression in WT technologies leads to a decrease in the size and price and an increase in their efficiency. The sportspersons face many injuries from sports and physical activities and this can impose a serious issue on the health and life of athletes. The research was based on primary data analysis to determine the research use of AMOS and SPSS software. Overall research concluded that direct and significant relationship between wearable technology and enhancing performance. WT devices help athletes reduce the risk of injuries by recognizing the risk and its reduction. Wearable technology is defined as electronic devices that can be worn directly on the body or clothes. These devices can monitor, analyze and detect information from vigorous signs of the body. Moreover, these devices have various characteristics that enable the collection of data in an ecological atmosphere. These WT devices enable the athletes and coaches to improve performance, prevent injuries and attain their goals in ecological space. WT devices enable athletes to monitor their performance in real-world environments and this is different from a controlled environment. WT devices provide more accurate data on the performance and efficient training of athletes by collecting data from activities in outdoor environments and it does not replicate in a controlled environment

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